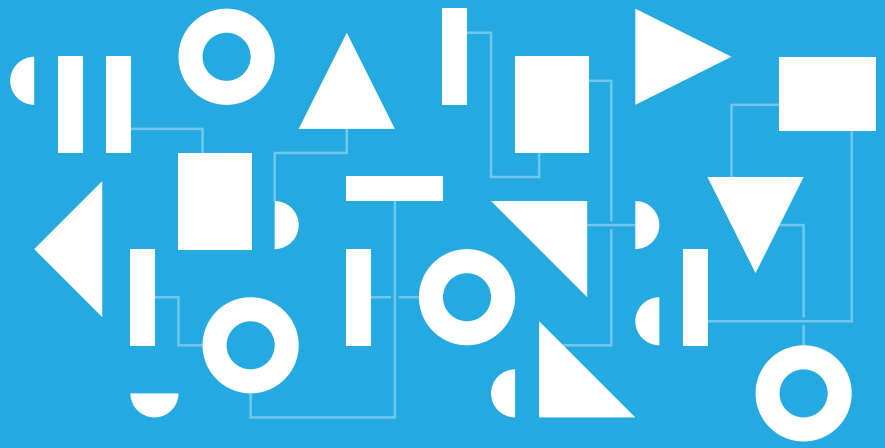

Methodological Guidelines for the Gender Analysis of National Population and Housing Census Data

Technical Division of the United Nations Population Fund (UNFPA)
Population and Development Branch
Gender, Human Rights and Culture Branch

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Foreword

A national Population and Housing Census has the enormous advantage of enumerating every single household and individual in a country, thereby making it possible to provide more robust and disaggregated detail on particular geographic areas and social groups than almost any other data source.

One of the main pillars of UNFPA's technical support for national Population and Housing Censuses is to make certain that the best possible use is made of the information collected to inform policy and programming; particularly in areas such as sexual and reproductive health and rights, adolescents and youth, population dynamics and gender. In the case of gender, many National Statistical Offices (NSOs) have sought UNFPA's support in the analysis and production of special gender monographs based on their census data. While developing these monographs, social scientists have often been confronted with two challenges. One is that the statistical analysis of gender issues (using any data source), is often limited to an over-simplified analysis of indicators that document differences by sex. While this is a necessary step in a more comprehensive gender analysis, it is by no means sufficient. True gender analysis needs to assess, analyze and reveal the processes of differential social roles, variance in

social treatment and outright discrimination that explain the observed results.

The second challenge is that census data only address a limited number of concerns that are of interest to gender analysis. Issues such as division of household tasks, access to services, fertility preferences or domestic violence are generally beyond the scope of what can be asked for in a census.

The Needs Assessment Conferences for Census Analysis (NACCA), which the Population and Development Branch of UNFPA's Technical Division organized between 2009 and 2011 in Dakar, Senegal, Punta Cana, Dominican Republic and Bali, Indonesia, identified the need for a better orientation of NSOs in the production of census gender monographs. More specifically, suggestions were made to take better advantage of the unique opportunities offered by the census and – to the extent possible – overcome the limitations described above. In the process of identifying best practices and proposing novel approaches to the best use of census data for this purpose, UNFPA collaborated up with UN Women, the UN Statistics Division and UNICEF. This manual is the result of three years of work which benefited from

the input of a large number of consultants and readers. It complements the more general manual on gender statistics recently launched by the UN Statistics Division (United Nations, 2013), reviews a variety of data sources, and the manual recently published by the Asia and Pacific Regional Office (UNFPA, 2013), which covers all aspects of the census process in the specific context of Southern Asia.

It is anticipated that the methodological guidance provided in this manual will offer National Statistical Offices and those concerned with gender issues to make increasingly effective use of the data from Population and Housing Censuses. More importantly, based on sound systematic analysis, we hope that national authorities are in a better position to celebrate success where it has been measurably achieved, and squarely address inequality and discrimination wherever it remains.

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Acknowledgements

The initiative for this manual was taken as the result of a presentation on the gender analysis of census data given by Grace Bediako at the First Needs Assessment Conference on Census Analysis (NACCA), in Dakar, in November of 2009. Ralph Hakkert from the Population and Development Branch had the over-all responsibility for the project.

Gayle Nelson was responsible for the contributions of the Gender, Culture and Human Rights Branch. Nancy Stiegler and later Tina Tordjman-Nebe took care of the coordination of the team of consultants which consisted of Ana Lúcia Cunha, Jean-Michel Durr, Catherine Raissigiuer and Loretta Bass. Frank Eelens joined the team later, to develop some further examples of multi-variate analysis.

Eduard Jongstra from UNFPA contributed to Chapter 4. Jennifer Olmsted and Sabrina Juran from UNFPA wrote parts of Chapters 10 and 11.

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Introduction: About this Guide

1. This guide is meant to serve as a tool for the staff of National Statistical Offices (NSOs)–possibly in collaboration with academic or research institutions–, National Ministries responsible for gender equality and women's empowerment, and civil society gender advocates, to be used in their efforts to promote equality, human rights and equity issues between women and men through the appropriate analysis of census data. It is also expected to be utilized by various United Nations Regional, Subregional and Country Offices in the gender analysis of census data, to better support government partners in their formulation of gender-responsive policies and programmes in all areas and all levels of government.

2. The guide has been produced by the United Nations Population Fund (UNFPA), in close collaboration with UN Women, the United Nations Children's Fund and the United Nations Statistics Division, following two Needs Assessment Conferences for Census Analysis (Dakar, Senegal in 2009 and Bávaro, Dominican Republic in 2010). As one NSO delegate noted:

Gender is not systematically analysed [in censuses]. Many countries still do not consistently disaggregate data by age

and sex and do not distinguish between sex disaggregated data and specific gender analysis from census data. There is a clear need that countries ensure the production and provision of easy access of age and sex-disaggregated data for users who require such information. Also, countries should develop specific gender databases from their censuses and mainstream gender in the entire national statistical system. UNFPA needs to build capacity for gender analysis in the form of both technical guidelines and practical training of staff (Dakar Conference Report, 2009: 8).

Besides responding to a clear national need, there are at least three additional rationales for producing this guide:

Intrinsic Rationale

3. Promoting gender-responsive census analysis is in line with the human rights-based approach and supports countries in fulfilling their human rights obligations.

- Gender differences and gender inequalities have often been overlooked in statistical production even though it is now widely acknowledged that access and control over resources, as well as the various dimensions

of wellbeing, is gendered and that women and men have different needs and interests. It follows that national statistics that do not reflect these differences do not adequately reflect social reality in a way that supports sound development policy-making and planning. Gender-responsive census analysis can therefore contribute to making the national statistics base more relevant and comprehensive, and improve decision-making for development planning and programmes.

- Gender analysis focuses on gender-related social inequalities, discriminatory practices and unjust power relations. Cross-referencing this information and going beyond sex-disaggregation to consider other factors such as ethnicity, age, place of residence can help identify additional social issues related to subsets of excluded or vulnerable groups.

Instrumental Rationale

4. Carrying out gender analysis of census data can contribute to better and more sustainable human development outcomes.

- Gender analysis of census data helps build up the evidence-base informing development policies and programmes in a way that takes into account the specific needs of women and men, and girls and boys. Many Least Developed Countries (LDCs) and

countries undergoing humanitarian crises suffer from data scarcity and planners find it difficult to assess what the population's needs are. Where in addition resources are limited, census data are a good place to start: It is sometimes the only available source of national statistics and some relevant gender analyses can be performed on the basis of census data, as this manual will show.

- Taking gender differences into account and overcoming gender inequality is an obligation under international law (CEDAW) and not optional. International guidelines exist on how gender statistics should be produced (BPFA, Strategic Objective H.3). This is so because the international community now agrees that gender equality is a prerequisite to advancing social justice and sustainable development.

Institutional Rationale

5. Promoting gender analysis of census data is timely.

- The vast majority of countries have undertaken a census during the 2010 Population and Housing Census round or are scheduled to do so soon. Although there are several manuals on gender statistics, there is not, as yet, a comprehensive orientation on how to analyse census data for gender purposes.

- Countries have repeatedly requested help in fulfilling their reporting obligations on gender equality issues (e.g. CEDAW) and in producing thematic census reports. Although the fact that censuses usually happen only once every ten years is a limitation in this regard, it can also be interpreted as an opportunity that should be taken advantage of whenever it presents itself. In particular, NSOs are often at a loss when it comes to writing reports on gender statistics from censuses, and consequently the census data on this and many other issues end up being under-utilized. The earlier a guide on this issue becomes available, the better.

PART ONE

Background and Conceptual Clarifications for Gender Analysis of Census Data

CHAPTER 1

Gender in Population and Housing Censuses

1. Scarcity of relevant, reliable and correctly analysed gender data is a challenge most development planners and policy-makers have come up against. Yet, globally a lot of data already have been collected: NGOs carry out needs assessments, university researchers do surveys, governments take censuses and so forth. The data may not be easily accessible to the public and may not have been analysed or presented in a format that is easy to be used. But data often exist on a wide range of topics. It follows that many of the issues that are commonly assumed to be lacking in information can in fact be examined with existing data.

2. Furthermore, it is now widely acknowledged as good practice to routinely disaggregate statistical data on individual characteristics by sex and age. This not only provides evidence of gender differences, but strengthens and improves the whole statistical system. Women and men have different roles in society, different needs and interests and different access to and control over resources. National statistics that do not reflect these differences are insufficient and potentially misleading.

A. The Scope of Census Data

3. Census data are an important resource of data on gender issues. Almost all countries in the world—including Least Developed Countries (LDCs) and many countries under crisis conditions—carry out censuses to measure accurately the total number and key characteristics of women and men, girls and boys in all geographical units of the country. Indeed, most countries conduct one population census every 10 years, as recommended by the UN's Principles and Recommendations for Population and Housing Censuses, Revision 2 (Par. 1.12) (United Nations, 2008 a). Notable exceptions are eight European countries with excellent administrative databases that allow them to collect the necessary data from these systems, rather than through census field work.

4. This has not always been the case. Historically, censuses only enumerated male adults because they existed primarily as a system for revenue control which enabled the rulers to estimate the wealth of the country with considerable accuracy, and register their subjects for taxation or military purposes (Dunn, 1940).

5. Censuses are among the most complex peace time operations undertaken by states. Census-taking requires mapping the entire country, mobilizing and training vast numbers of enumerators, conducting public information campaigns, collecting individual-level information and processing millions of questionnaires, monitoring

procedures and finally, analysing the results.

6. Using systematic data collection methods, modern censuses aim to measure accurately the total number and key characteristics of inhabitants for all administrative units of the country. As a result, censuses provide universal population data and information on demographic and social characteristics of the population, such as age, sex, place of usual residence, education and training, employment and occupation, economic status, disability, migration, household structure, etc. Censuses tell us about the relationships between household members, educational attainment, economic activity status, occupation and housing arrangements. As such, they constitute a key source of information for a variety of policy and research purposes.

Text Box 1: Definitions—Population and Housing Census

A population census is the total process of collecting, compiling, evaluating, analysing and publishing or otherwise disseminating demographic, economic and social data pertaining, at a specified time, to all persons in a country or in a well-delimited part of a country.

A housing census is the total process of collecting, compiling, evaluating, analysing and publishing or otherwise disseminating statistical data pertaining, at a specified time, to all living quarters and occupants thereof in a country or in a well-delimited part of a country.

The essential features of population and housing censuses (the two are usually combined) are individual enumeration, universality (i.e. all individuals are enumerated) within a defined territory, simultaneity and defined periodicity.

Population and housing censuses are a principal means of collecting basic population and housing statistics as part of an integrated programme of data collection and compilation aimed at providing a comprehensive source of statistical information for economic and social development planning, for administrative purposes, for assessing conditions in human settlements, for research and for commercial and other uses.

Principles and Recommendations for Population and Housing Censuses, Articles 1.4, 1.6, 1.8 and 1.20 (United Nations, 2008 a)

7. According to the United Nations Statistics Division, "two hundred twenty eight (228) countries or areas have scheduled at least one census in the 2010 census round

spanning the period 2005 to 2014". As of 1 November 2011, "171 have already conducted a census in this census round. Six countries or areas have not yet scheduled any census until 2014. […] At the end of the census round in 2014, 98.9 per cent of the world population will have been enumerated (based on the current census schedule)".[1]

Table 1: Progress in census-taking in the 2010 Census Round

	All countries or areas	Conducted a census in the 2010 Round (2005-2012)	Scheduled a census in the 2010 Round (2013-2014)	Not scheduled a census in the 2010 Round
World	235	209	19	7
Africa	58	45	10	3
Americas	52	51	1	0
Asia	50	41	5	4
Europe	50	47	3	0
Oceania	25	25	0	0

Source: Elaborated on the basis of data provided by UN Statistics Division (see footnote 1)

8. A census is one of the most important tools for policymakers. It takes stock of the most important asset of a country—its human capital, women and men, girls and boys. Population data gained from censuses, together with vital registration data and various kinds of administrative records are critical for ensuring that appropriate policies

1 http://unstats.un.org/unsd/demographic/sources/census/2010_PHC/censusclockmore.htm; last accessed on 3 December 2012. The data indicates that the majority of countries is succeeding in their census planning and taking. However, as conducting a census is a complex and costly process that requires great efforts in capacity building, some countries and regions have been forced to delay or even cancel their censuses. Some of the challenges that countries are facing include: administrative organization, funding constraints, post-conflict situations, humanitarian crisis, natural hazards, etc.

and programmes are prioritized at national and local levels.

Text Box 2: Uses of Census Data

- Census data can serve
- Planning at the national, regional and local levels
- Decision-making for strategies or policies
- Policy and programme development, (monitoring) and evaluation
- Reporting obligations
- Administrative purposes

9. Therefore, censuses are a rich source of information about the differences between men and women, girls and boys, or about the needs and requirements of population subgroups such as elderly men in rural areas or adolescent girls. Their greatest advantage for the purpose of gender analysis is that censuses allow for disaggregation down to the smallest geographical unit. Regional NGOs and policy-makers in city councils, for instance, will be able to extract data specifically on their region/city of interest and understand the population composition within that restricted area.

10. Censuses can also provide basic national-level development indicators, for instance on fertility and spatial

distribution of men and women. For more complex indicators, census data often serve as a denominator. They can for instance help uncover gender disparities in employment, literacy and age of marriage. Where international definitions and classifications are used, indicators derived from censuses are comparable among countries. Such indicators can then be used to benchmark progress in achieving the Millennium Development Goals (MDGs) or the ICPD Programme of Action and to monitor compliance with human rights obligations such as CEDAW.

Methodology Box 1: Combining Data from Different Sources

The main advantage of census data is their universal coverage. The main drawback is the generality of the information provided, which is usually lacking in detail for the purposes of an in-depth gender analysis. However, census data may be combined with other sources to examine many of the topics discussed in Part Two of this manual. Drawing on multiple data sources enables one to carry out analyses that cannot be supported by census data alone. The simplest strategy for doing this is to compute aggregate values for the relevant variables from both sources separately at the level of relevant population groups. For example, one may be interested in fertility preferences and income levels for women of different educational levels. Since education is a variable included in both the census and the DHS, these indicators can be computed separately using either data source, and the results can be compared. The main limitations of this approach are that it only works for groups that can be defined in terms of both data sources and that the number of such groups cannot be too large, as the DHS does not allow much disaggregation.

In order to go beyond such simple comparisons of groups, one needs to integrate the two data bases. To this end, there are two main strategies: construction of proxy variables and statistical matching. The construction of proxy variables consists in developing a regression model or other multivariate model based on the survey data and using explanatory variables that are common to the survey and the census, to predict the value of the variable that one would like to include in the census data base. The census value of the variable is then constructed by using the same

equation on the explanatory variables, as found in the census. Typically, this approach has been used for the construction of household income data for censuses that do not have this information, by regressing household characteristics such as ownership of consumer durables or the quality of construction of the home on income data from a Living Standards Measurement Survey or other kind of household survey that provides income data (Elbers, Lanjouw and Lanjouw, 2002). The primary objective, in this case, is to construct poverty estimates for smaller geographic areas than is feasible with the income survey itself. But the approach is not necessarily limited to this application. In the particular case mentioned above, one might predict desired family sizes based on, for example, the age and number of living children, level of education and urban/rural residence of the woman and then apply the same equation in the census, in order to relate the desired number of children to typical census variables.

In the statistical matching or "data borrowing" approach, one uses the variables that are common to the census and the survey to construct a measure of similarity or distance between individual cases of the census and survey files. Each individual case found in the census is then matched to its closest neighbour in the survey file. In some cases one may want to divide the data into different subsets, in order to avoid, for example, the matching of men to women or persons from very different parts of the country. The survey data of the closest neighbour are then simply imputed to the individual census records.

When a survey is done shortly after a census it may be possible to establish a match between census records and survey records on the basis of common geographical identifiers. Since surveys typically use a census-based master sample frame such a match

is technically quite feasible, as long as the time interval between census and survey is not too long (say, less than 2-3 years). After appending the two data sets the desired survey variables can be estimated for households or persons that were not covered by the survey on the basis of the relationships found amongst those records where both census and survey data is available.

Both methods are not without their pitfalls and complications. Both the construction of proxies and the statistical matching approach assume that once the common variables have been controlled, the remaining variables from the survey are statistically independent from those in the census. The fact that this is often not the case may introduce systematic biases. A number of procedures have been proposed in the literature to deal with this problem (e.g. Rubin, 1986; Moriarty and Scheuren, 2001). Because of these complications, either of the two main strategies should not be applied without calling in appropriate technical support.

B. Gender Analysis of Census Data

11. Gender analysis as a way of interpreting census data has emerged in response to growing need of gender-relevant information of countries, e.g. to report on progress made in terms of gender equality and the empowerment of women in line with international obligations. As a way of working with data, gender analysis is more than simply analysing quantitative data by 'sex' using standard descriptive statistical techniques. Gender analysis includes a gender-responsive selection of questions to be posed to the data and in the interpretation of sex-disaggregated data in the context of power relations between

the sexes, i.e. in a way that includes other sources of knowledge such as qualitative data, knowledge of cultural factors, or further multivariate analyses shedding light on socio-economic realities.

Text Box 3: What is Gender Analysis?

Gender analysis is a critical examination of how differences in gender roles, activities, needs, opportunities and rights/entitlements affect men, women, girls and boys in certain situation or contexts. Gender analysis examines the relationships between females and males and their access to and control of resources and the constraints they face relative to each other.

Gender Equality, UN Coherence & You—Glossary: Definitions A-Z

12. Gender analysis does the following:

- Critically examines the differences in women's and men's lives;
- Searches for the underlying causes of inequality between women and men and boys and girls;
- Highlights gender-specific variables and is generally (though not exclusively) used to achieve positive change for women and girls.

13. Gender analysis illuminates the extent to which:

- The lives of males and females and therefore their experiences, needs, interests, priorities, and capacities are different.

- Women's lives are not all the same—each woman's life is also shaped by a host of other social characteristics such as ethnicity, religion, income level, immigration status, sexual orientation, age, etc. The same holds for men.
- Women's life experiences, needs, issues and priorities are different for different groups of women.
- Men and women have triple roles with regards to work:
- Reproductive work: including household maintenance and childrearing;
- Productive work: generating income or goods;
- Community work: activities in the public sphere undertaken for the good of the community.
- To a much larger extent than is the case for men, the work of women is often unpaid.
- In most countries the average woman works more total hours than the average man.

14. Gender analysis goes beyond interpreting data. As part of gender-mainstreaming (see Par. 30), it is also a practical, programmatic tool that seeks to be participatory and holistic. Gender analysis should place great importance on empowerment, consultation and participation of those concerned. In addition, a comprehensive gender analysis of census data may require multivariate techniques that go beyond the usual practices of NSOs and that require the involvement of academic or research institutions. Therefore, gender analysis should not be carried out by National Statistics Offices (NSOs) in isolation. NSOs

can identify, plan, implement, monitor and evaluate gender equality with data analysis projects—for example a publication on the status of Women and Men in their countries—with a) representatives of women's machineries (Ministry for Family/Women; national CEDAW committee ...) and b) with representatives of Civil Society (women's movement, NGOs), ideally including community members themselves who can testify as to the lived experiences of women and men in the country. This type of publication can then inform national planning and policy development initiatives.

15. The following sums up some of the strengths of census data with regards to gender analysis (Meena and Chaudhury, 2010; Schkolnik, 2011):

a. **Censuses provide a basic set of sex-disaggregated data at the smallest geographical level.** Thanks to their universal geographical coverage and routine inclusion of demographic categories such as age, sex and marital status, censuses bear great potential for disaggregation. Censuses provide data on the entire resident population in a country at a given reference period by administrative area. They can thus inform local planners about population composition and characteristics for instance, how many widows, adolescent girls or polygamous families are living in a given administrative area? Thus, census data are key to identifying "vulnerable groups" for targeted interventions (e.g. rural vs. urban adolescent girls). Moreover, the fact that census mapping culminates in the delimitation of the entire national territory into small enumeration

areas also means that censuses are used to demarcate constituencies—a basic requirement for election processes, ensuring representation based on accurate numbers and social participation. In the event of natural disaster or human-made crisis, more realistic estimates of the women and men, girls and boys affected can be reconstituted, using information on the enumeration areas affected.

b. **Censuses provide insights into the private and community spheres and (indirectly) into time-use of women and girls, men and boys.** Feminists have long criticized that the public (=male) vs. private (=female) dichotomy allows government to clean its hands of responsibility for the state of the 'private' world. The so-called private sphere (sexuality, reproduction, gender relations including gender-based violence, women's unpaid care- and housework, etc.) is a notoriously sensitive issue and often under-studied. By entering into households and providing details on household and housing characteristics as well as on social infrastructure, the real-life living conditions of girls and boys, men and women including elements of vulnerability are exposed. What does it mean for a widow to head a household composed of herself and her orphaned grandchildren? What impact does the lack of a water source and access to telecommunications have on girls' education? What does it mean for women of reproductive age to live in a locality with limited vital social infrastructure, such as health facilities, schools, churches, community halls, markets and roads? If analysed with a gender lens, one can learn a lot from censuses about gendered differentials in access to resources and services.

c. **Census data for advocacy:** A local-level "early

warning system" on gender inequalities? Analyses of census data may uncover sex ratio imbalances or unconventional population structures that are symptomatic of growing inequalities in a country, region or municipality. In Viet Nam, for instance, gender advocates are alarmed about the decreasing number of girls in some provinces. As census results are usually published and widely disseminated for development planning, they can—if properly analysed—serve media, civil society actors, NGOs, researchers and individuals in their advocacy efforts, as a recognized and official source of information. Note however, that although the published reports from censuses may be easily available, they often provide only aggregate information. The raw data files, which should enable breakdown of data to smaller units, are often not easily accessible, especially to non-State actors (more on this issue below). At worst, they may be so poorly conserved that they are no longer retrievable or they may be rendered inaccessible for political reasons, for instance in multi-ethnic countries.

d. **Censuses provide essential background information allowing for further research on women and men, girls and boys.** The census allows researchers to study household and marriage patterns, and lays the groundwork for population projections (e.g. how many boys and girls will need schooling in 2025 ?) by providing details on the key elements of population dynamics, i.e. fertility, mortality and migration. Second, most surveys (e.g. labour force surveys or studies on maternal mortality) draw their samples from master sampling frames provided by the most recent census.

16. Among the weaknesses of census data for the purpose

of gender analysis, the following can be highlighted (Meena and Chaudhury, 2010; Schkolnik, 2011):

a. **Census data may not have been produced in a gender-responsive way:** In most countries, statisticians without specific training in gender are responsible for producing census questionnaires, defining concepts, variables and classifications and for managing the field operations including enumerator training. As a consequence, the data collected in censuses may not lend themselves easily to gender analysis but may in fact already be gender-biased (ECLAC, 2006 a). For instance, the concept of "head of household" is problematic in several ways, but in particular where question wording (or indeed, an enumerator) refers to the head of household as "he", respondents are likely to underreport on female-headed households.

b. **Census data are of very limited scope and depth:** Census data do not provide all the information needed for gender analysis. For instance, census questionnaires do not generally ask (and indeed, given their objectives and constraints, cannot be expected to ask) about issues such as women's unpaid domestic work or gender-based discrimination in public decision-making. Nor do they ask questions about fertility preferences, time-use, sexual behaviour and many other gender-relevant issues. They generally do not ask about differences in asset and land ownership by sex. Questions on gender-based violence (GBV) require specific ethical and safety standards in data collection to protect the victims, making their inclusion in censuses unrealistic. The mode of census enumeration, calling upon a very high number of interviewers,

allows neither a rigorous selection of high-level personnel nor a thorough training that would adequately protect the respondents. In addition, the population may be reluctant to answer a long questionnaire and might feel that asking detailed questions on sensitive issues (income, ethnicity, etc.) is an intrusion into privacy. Census offices are generally reluctant to increase the number of questions on census forms, especially if the issues may elicit controversy. Not only does each additional question imply a substantial cost increase, but there is also a risk that it will deteriorate the quality of the core information. Where information is collected on maternal mortality, time-use or violence, it is therefore often neither sufficiently detailed nor accurate.

c. **Gender-related discrimination is not explicitly measured by censuses:** Census data do not reveal information related to, for example, behavioural consequences of laws or policy. The results of gender norms can be examined (eg lower schooling rates) but the process whereby this occurred may be difficult to discern. Linked to this, it must be acknowledged that census data can also be misleading about gender relations depending on how questionnaires are designed and administered because respondents may be influenced by gender-related power dynamics. There are a number of good practices regarding gender responsive questionnaires and training of enumerators.

d. **The level of analysis for census data is sex, not gender** while policy interest tends to be on the gender differentiated needs of men and women, the relational socio-cultural construct, not sex, the biological concept (see Chapter 2.A for extended

definitions). As sex-disagreggation is merely a first step to making gender-based analyses, additional effort is needed to unearth women's and men's different needs and aspirations as well as the power differentials and relational factors that explain women's and men's access to resources and services. For instance, the gender pay gap is a measure of earnings differentials between women and men. Even if censuses ask about individual income (many don't), this only tells us how much, in monetary terms, women take out of employment compared with men, as a male/female difference expressed as a percentage of male earnings. To make more specific statements about gender and inform policy-making, this indicator not only has to be further disaggregated—by age groups, by occupation, by part-time, full-time, etc.—but other factors have to be considered such as the availability of child care, social norms about child-rearing and female employment, and the gendered division of labour in routine housework. While the census can be helpful in the former, it does facilitate the latter.

e. **The census data may be outdated or of low quality (e.g. due to underreporting on women):** Many countries, particularly countries prone to humanitarian crises, can not respect the 10-year interval for census-taking. Even in those countries that do, the last census may be several years old and its figures may no longer reflect the lived reality of women and men, girls and boys. Complex projection and estimation techniques are needed to estimate the actual situation on the ground. This is not the case in those countries (especially in the European Union) that rely heavily on continuously

updated population registers. In terms of data quality, underreporting on women is a well-documented phenomenon, especially in countries like China where female births are often hidden to get around the official one child policy. In some parts of South Asia, unmarried women are less likely to be counted, whereas the under-counting of young male adults and young babies of either sex is widespread in much of the world. Female household headship, numbers of children under age 5, and numbers of young male migrants are also routinely under-reported, whereas age data by single ages may be inaccurate. Finally, many censuses suffer from incomplete coverage such that the results have to be adjusted before publication. Under such circumstances, the raw data files contain information that is different from the adjusted and published information, rendering reconstruction of information for smaller geographical units problematic. In particular, the imputation of missing data or the correction of inconsistencies in the information may be done according to criteria that are not gender-neutral and that, in some cases, actually introduce serious distortions.

f. **Data access and the capacity to analyse census data in the appropriate ways may be problematic:** Census data bases are typically much larger than the data sets produced by most surveys, making their analysis more difficult. Moreover, NSOs are generally not at liberty to distribute them to potential users in their raw, unabridged form, due to problems of data confidentiality. This is very different from the situation of, for example, the Demographic Health Surveys, most of which are easily accessible to individual researchers. To deal

with this situation, NSOs typically adopt one of three strategies: i) They analyse as much of the data as they can in-house; ii) They prepare user samples of 1, 5 or 10 per cent that have been processed so as to make the identification of individual households impossible, for use by academic and other research institutions; or iii) They distribute the data to the general public in the form of data bases such as REDATAM which allow users to prepare their own tables without having direct access to the micro-data. Each of these strategies has potential limitations. If the gender analysis of census data is carried out in-house, it will usually be guided by the need to produce certain essential tables, but depending on the analytical capacity of the NSO, it will often not go into in-depth studies of particular relationships, particularly if they involve multivariate analysis. Preparing user samples can be costly[2] and may run into limitations on the user end if users need to produce detailed analyses of very specific population groups. Information management systems such as REDATAM, on the other hand, are extremely useful for the flexible production of tables based on the entire population, but they generally do not allow for multivariate data analysis.

International Conventions and Conferences cited:

- International Conference on Population and Development (ICPD, 1994)
- Beijing Platform for Action (BPA, Fourth World Conference

2 If the cost is too large for the NSO, it may opt for distributing the information through the IPUMS programme of the University of Minnesota, which designs user samples for release to the public, guided by the specifications provided by NSOs.

on Women, 1995)

- Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW, 1979)

Websites consulted:

- United Nations Millennium Declaration (2000) on http://www.un.org/millennium/declaration/ares552e.htm
- Millennium Development Goals (MDGs) on http://www.un.org/millenniumgoals/
- Gender Equality, UN Coherence & You—Glossary: Definitions A-Z on http://www.unicef.org/gender/training/content/scoIndex.html
- 2010 World Population and Housing Census Programme (UN Statistics Division) on http://unstats.un.org/unsd/demographic/sources/census/censusquest.htm
- UNFPA Census Portal on http://www.unfpa.org/public/op/edit/home/sitemap/pid/6734

CHAPTER 2

Conceptual Clarifications on Gender Equality and Gender-Responsive Data Analysis

17. The following reviews some core concepts that sometimes lead to misunderstandings between producers and users of data. By pointing out where differences in meaning exist between the common statistical usage and that of the gender literature and by offering a shared definition for the purpose of this manual, dialogue will be enhanced in view of a shared goal: Making statistics reflect all the national population and measuring progress towards gender equality.

A. Sex and Gender

18. In its most basic meaning, the concept of gender helps us understand how biological differences between men and women (sex) acquire cultural and social meanings and produce identities, differences, and inequalities in a given setting (gender). Sex characteristics at birth

are universal. By contrast, gender refers to socio-cultural differences and social relationships between women and men that can change, over time for the same individual, and differ within and among societies. In the English language, it is helpful to think of the terms female and male as referring to sex differences, and feminine and masculine as referring to gender differences. Something is "gendered" when socially and culturally defined gender differences intervene in constructing it. Integrating gender analysis into development work means analysing the various forms gender differences take and the ways they intersect with other social markers (race, class, caste, religion, ethnicity, sexuality, etc.).

Text Box 4: Definitions–Sex vs. Gender

Sex: Refers to the classification of people as male or female, based on biological and physiological characteristics such as chromosomes, hormones, and reproductive organs.

Gender: is a social and cultural construct, which values men's and women's, girls' and boys' attributes differently. Accordingly, it assigns socially acceptable and often stereotypical roles and responsibilities to men and women. Gender-based roles and other attributes, therefore, change over time and vary with different cultural contexts. The concept of gender includes the expectations held about the characteristics, aptitudes and likely behaviours of both women and men (femininity and masculinity). This concept is also useful in analysing how commonly shared practices legitimise discrepancies between sexes.

19. Gender is a social organising principle that influences people's roles and responsibilities in the context of other social variables including ethnicity, culture, economic and social class, religion. It is also a social structure that places women and men in different positions, roles, and responsibilities. Finally, it is a social stratification that values what women and men do differently. As a result, there are vast differences in the resources that women and men are able to access, in the value attributed to their respective contributions, and in their ability to effectively act on the world and on their own behalf (Lorber, 1994; Kabeer, 2002).

20. In terms of policy, three points are crucial to

understanding the way gender works; gender affects peoples' lives with regards to needs, access to power/resources and differential effects a policy may have on women and men.

a. **Needs:** One must be aware that women, men, girls and boys may have different needs as a function of their socio-cultural and economic situations in a given context. For instance, to enhance the schooling of girls, an increase in the number of female teachers and separate girls' bathrooms in mixed schools may be instrumental. Girls have specific needs in this context as sexual violence may be a real problem in many places and parents need to be reassured so that they are willing to send their daughters to a school.

b. **Power/Resources:** Access to, and control of, power and resources including decision-making is gender-differentiated. For instance, the role of household head is more often ascribed to men than women due to social bias that men are family leaders, regardless of whether they are the main income earners. Similarly, the fact that parliaments and local governments are strongly male-dominated may translate into a bias toward spending municipal resources on larger roads that support trade and create jobs for men, whereas less consideration is given for instance to street lighting and police services that increase safety for women.

c. **Effects:** Social programmes and policies may have (unintended) differential effects on women and men, and girls and boys. For instance, health policies that do not consider the different—and often lower—income status of women-headed households may inadvertently restrict poor women

from accessing user-paid services and consequently reinforce poor health outcomes for population subgroups such as households headed by single women.

As a consequence, conceptualizing gender in statistics—beyond the simple disaggregation of data by sex - is complex. Much of the remainder of this guide will suggest ways of doing this that are meaningful and consistent—or valid and reliable.

Text Box 5: What is Sex-Disaggregated Data?

Sex-disaggregated data are data thatare cross-classified by sex, presenting information separately for men and women, boys and girls. When data is not disaggregated by sex, it is more difficult to identify real and potential inequalities. Sex-disaggregated data is necessary for effective gender analysis.

Gender Equality, UN Coherence & You—Glossary, July 2010

Note, however, that sex-disaggregated data is rarely sufficient for a proper gender analysis. Further disaggregations by age, ethnicity and level of education may be necessary. And in order to make sense of the differences that emerge, theory is indispensable.

21. The terms gender and sex are often used synonymously. Indeed, the terms "gender disaggregation" or "disaggregated by gender" continue to be widely used and to confuse those who were taught during gender training that sex and gender are quite different concepts. Although

the English language (unlike most others) does allow the use of the word "gender" in the sense of "sex", there is now broad international consensus that gender is not a useful category for defining statistical variables: gender statistics are actually disaggregated by sex and not by gender.

22. Interpretation is needed to make sense of sex-disaggregated statistics in terms of gender. Sex-disaggregated data are an indispensible starting-point and should be routinely available. However, socio-cultural and economic analysis on sex-differences (i.e. gender analysis) needs to be carried out on those data in order to make them meaningful in terms of gender. Not every disaggregation by sex yields data that are useful for gender analysis. In order for any particular disaggregation to help understand gender roles in a society, it has to address some kind of theoretical question or hypothesis. It is tempting to disaggregate "everything by everything", but the risk is that this will only generate a large volume of tables that cannot be interpreted in any meaningful way. Gender analysis is not necessarily well served by disaggregating the largest possible number of cross-tabulated data by sex, unless there is a definite purpose behind the particular disaggregation chosen.

B. Measuring sex/gender differences, gender inequality and gender inequity through gender analysis

23. Gender Statistics is a policy-oriented approach to data analysis, focusing on gender (the socio-cultural construct) rather than sex (the biological marker) as an analytical category. (Appendix 4 provides a more detailed overview of the evolution of gender statistics). Gender Statistics involve producing and disseminating statistics that reflect the realities of females and males of all ages, with a view to informing gender equality initiatives and policies. Current challenges in gender statistics include financial shortages and capacity gaps that lead to low data quality, or insufficient data analysis and dissemination, as well as a lack of normative frameworks in-country, and coherent definitions and methods worldwide that lead to shortcomings in political will and in implementation on the ground.

24. In February of 2012, the UN Statistical Commission approved a Minimum Set of Gender Indicators, consisting of 52 quantitative indicators and 15 policy indicators related to the existence of national norms. In the substantive chapters that follow, systematic reference will be made to this set of indicators and the degree to which they can be estimated from census data. The operationalization of the indicator set is still being discussed at the time of

publication of this guide, so the the fact that this guide indicates that a certain indicator can be estimated from census data is no guarantee that the methodology that will ultimately be approved will actually endorse this option.

25. It is customary to distinguish between two categories of gender statistics, namely sex-disaggregated statistics and other gender-relevant statistics. The latter refer to data that provide information on the situation of either sex or the gender relations between men and women, but that cannot be meaningfully compared between the sexes. For example, maternal mortality is an inherently female phenomenon, whereas the incidence of prostate cancer is an inherently male phenomenon. Although fertility can, in principle, be quantified for both men and women, the former is much more difficult than the latter. In addition, men and women have inherent biological differences with respect to the way in which they are affected by fertility. Therefore, fertility is probably better thought of as a gender-related statistic, rather than in terms of sex disaggregation.

26. Statisticians use words like "variance", "variation", "disparity", "dispersion", "inequality" or "differentiation" descriptively, without much regard for the inherent fairness or injustice of the differences observed between individuals. Sociologists make distinctions between such concepts as "inequality of opportunities" and "inequality of outcomes". And economists may distinguish between

kinds or degrees of inequality that are functional or dysfunctional to economic growth.[3] The gender area has its own terminology for describing disparities between the sexes in terms of their fairness or lack thereof. Sex/gender difference is a descriptive, value-neutral concept. Sex/gender difference refers to disparities or lack of similarities between men and women—as social groups—in their respective status and livelihood conditions. For instance, if women and men have different consumption preferences, needs and aspirations, this creates differences in the way they spend their money. Similarly, they may have different inclinations with respect to their career paths or ways to spend their leisure time. Preferences, needs and aspirations are generally influenced by representations of femininity and masculinity and can therefore be described as "gender differences". Where differences are related to biological traits—think of reproductive health issues for instance—one can speak of "sex differences." Where no differences exist, there is a situation of "parity". But parity is not always the ultimate goal of gender equality as some differences between the sexes are acceptable. For example, the goal that men and women should have the same distribution of occupations may not be a pertinent one, while it is pertinent to require that barriers restricting entry are eliminated and that the occupational status and incomes associated with these occupations to be similar.

3 In addition, economists often use the term "equity" in a sense that is completely distinct from the one explained in this section, namely to refer to debt-free assets in the form of real estate, bonds or particularly stocks.

27. Gender inequality is a human-rights-related, normative concept; it implies an assessment of a given gender difference as unfair. Gender inequality refers to women's and men's, girls' and boys' unequal "conditions, treatment and opportunities for realizing their full potential, human rights and dignity, and for contributing to (and benefiting from) economic, social, cultural and political development" (Gender Equality, UN Coherence & You—Glossary 2010). Unequal valuing by society of the similarities and the differences between men and women, and of the roles they play, also constitutes a form of inequality. Achieving gender equality in turn requires women's empowerment to ensure that decision-making at private and public levels and access to and control of resources are no longer weighted in men's favour. This will result in women's and men's ability to participate as equal partners in productive and reproductive spheres of life.

28. To illustrate the concepts of gender difference and inequality, think about a village where the girl's school starts and finishes after the boy's school. As long as the variation in time is not too large, this constitutes a "difference" between them, to be taken into account when planning transportation systems for example. This difference may or may not be due to discrimination or unfairness in the way society values men and women. By calling it a "difference", the fact that times vary is acknowledged but not judged. Now consider a village with equal numbers of girls and boys of schooling age but with two boys' schools

and only one school for girls. Here, girls and boys do not have the same opportunities for realising their potential as access to education is harder for girls. Hence, there is gender inequality - it is unfair that on average girls have fewer educational resources than boys which may negatively affect their educational achievement.

Text Box 6: What is Gender Mainstreaming?

Gender Mainstreaming: "Mainstreaming a gender perspective is the process of assessing the implications for women and men of any planned action, including legislation, policies or programmes, in any area and at all levels. It is a strategy for making the concerns and experiences of women as well as of men an integral part of the design, implementation, monitoring and evaluation of policies and programmes in all political, economic and societal spheres, so that women and men benefit equally, and inequality is not perpetuated. The ultimate goal of mainstreaming is to achieve gender equality.

United Nations Economic and Social Council (ECOSOC), 1997

29. Gender inequity is a policy-oriented concept that considers whether women and men, girls and boys have the same chances of reaching expected outcomes such as literacy or decent work. Gender equitable policies "ensure that women and men, girls and boys have equal chance not only at the starting point but also when reaching the finish line" (Gender Equality, UN Coherence &

You—Glossary, 2010). They cannot be limited to providing equal access but must also consider the fact that individuals start from unequal positions and hence may require different degrees of policy intervention in order to achieve the same end result. In practice, this will often involve some sort of positive discrimination to level the playing field, such as special scholarships for girls to counter unequal access to secondary or tertiary education or quotas to promote a balance of women and men in senior management positions or parliaments.For example Mexico put in place policies aimed at providing incentives to families to keep their girls in school, because of higher drop-out rates among female students.

30. The means to achieve gender equality and gender equity may therefore differ. For example, regardless of the time girls and boys leave for school—which is a random inequality –girls on average are more vulnerable to sexual assault and/or sexual harassment than boys both at and on their way to school. Equity policies would try to ensure that schools have facilities needed by girls so that they are allowed and willing to attend (i.e. private and separate toilets) and that the education system aims to mitigate risk factors by providing safe passages for girls. Equality policies, on the other hand, would try to ensure that girls continue to be sent to school and that those schools provide them equal opportunity to learn so they

have the potential to achieve equal outcomes.[4]

31. 'Gender mainstreaming' is the chosen approach of the United Nations system and international community toward realising gender equality. The key concern with regard to gender equity, on the other hand, is fairness of opportunities, and the chosen approach is the empowerment of women and girls through targeted interventions, or special measures. Equality and equity are inter-related concepts. Discrimination based on sex/gender is both the root for needing equity policies and the barrier for achieving gender equality.

32. While sex/gender difference can be measured fairly easily, measuring gender equality and gender inequity poses greater challenges. To define sex/gender difference, variance, or the degree to which the objects or individuals being described are different from the mean (average), can be used. Similarly, to detect inequity and inequality, variance can show where parity has not been achieved between women and men, girls and boys. Nevertheless, much caution has to be employed in the construction of gender indicators because, as was pointed out earlier, parity

4 This discussion parallels the one of "equality of opportunities" versus "equality of outcomes" in regard to the role of the school system. While some consider schools as the great equalizers of opportunities between children of different social backgrounds (or, in this case, different sexes), others (e.g. Jencks, 1972) have demonstrated that, even in societies like the United States, which places a lot of emphasis on the principle of equal opportunity, only a relatively small proportion of the inequality of outcomes can be explained in terms of differences in access to education.

may not always be relevant or desirable nor does it describe the equitable access to or fairness of opportunities. Rather what is more typically measured is the stated commitment to equality and the existence of equity interventions.

33. In most cases, in addition to mainstreaming statistical analysis, qualitative and policy research is needed in order to assess whether the opportunities of women and men are unequal. While gender differences in literacy, for example, is fairly easy to pinpoint on the basis of variance by sex, an investigation of gender inequality in literacy would need to consider opportunity factors such as the access to scholarships or stipends and explicit criteria for admission to schools and literacy programmes. In addition, the ability to take advantage of the opportunities being offered may differ between population groups. For example, even if boys and girls have access to the same schools, girls may be restricted by the fact that they need to care for their younger siblings part of the time, or in some other cases boys may be restricted by the fact that parents count on them from an early age to contribute income to the household. The field of gender statistics is devoted to holistically assessing such gender inequalities through gender analysis.

34. Gender analysis is not about women per se and cannot be carried out on women as an isolated group. Rather, gender analysis involves looking at power relations between men and women and it may even focus

specifically on men and boys to analyse how certain behaviours come to be socially perceived as "masculine behaviours". In this vein, many countries have underscored the need to improve the quality and dissemination of their gender analysis of human development indicators and promoted the use of gender-responsive indicators. Such indicators need to capture and reflect the potentially different impacts of development strategies and actions on men and women, and boys and girls. This requires going beyond simply disaggregating data by sex and/or socioeconomic group, ethnicity, race and generation (i.e. age). It entails, among other things, efforts to select indicators that are sensitive to policy interventions—such as control of and access to resources such as schools– from the outset of the analysis and mainstreaming gender perspectives into the entire statistical system.

Text Box 7: Conceptual Differences between Statistics on Women, Sex-Disaggregated Data and Gender Analysis

Statistics on women: Women-only statistics produced mainly to report on the situation of women in different countries and regions. They are historically connected to the Women in Development (WID) approach, although even this approach usually contextualizes the situation of women by comparing it to that of men. One limitation is that they do not allow for comparisons between men

and women and thus cannot provide data on gender gaps.

Sex-disaggregated data: Describe gender ratios of a certain phenomenon and are a crucial tool for quantifying differences and inequities between men and women. Historically connected to the Gender and Development (GAD) approach, sex-disaggregated data, although crucial, are not sufficient for the development of adequate gender analyses.

Gender analysis is an intellectual effort that involves at least the following fundamental aspects:

- Sex-disaggregated data for measuring gender differences and different cultural and socioeconomic realities faced by women and men;
- Multivariate analysis for capturing and interpreting relations that may not be visible if using sex-disaggregated data only;
- Gender-specific indicators for topics that may be of greater relevance to one sex than the other;
- In-depth examination and interpretation in order to get a fuller, more valid picture of what is occurring in context and which are the social constraints that lead to inequality;
- Identifying areas where new data need to be collected in order to fully grasp elements of inequality;
- Translating data into policy and planning to provide the evidence base for strategy formulation. Census data, combined with gender analysis, provide one of the ways in which policies can be informed by evidence-based research.

Text Box 8: Evidence-Based Advocacy

Advocacy is the pursuit of influencing outcomes—including public policy and resource allocation decisions within political, economic, and social systems and institutions—that directly affect people's lives. In practice, it includes the continuous and adaptive process of gathering, organising and formulating information and data into an effective argument, which is then communicated to policy-makers through various interpersonal and mass media communication channels. In the context of gender analysis, advocacy seeks to influence policymakers, political and social leaders to create an enabling policy and legislative environment and allocate resources equitably.

Evidence-based advocacy can be contrasted with normative-based advocacy. While normative-based advocacy draws its legitimacy from national legislation and/or international norms and standards such as Human Rights conventions, evidence-based advocacy is based on demonstrable facts and measurable data and information from official statistics, surveys, experiments, evaluations, direct observation, etc. In terms of presentation, evidence-based advocacy uses graphs, tables and charts and includes citations to show the strength of the evidence on which a particular argument is based.

In order to be persuasive, evidence must be reliable and relevant to the interests of the decision-maker or audience targeted. Therefore, different types of evidence have to be organised and presented differently for different audiences and part of effective advocacy is understanding and taking into account the interests, needs and prejudice of the various target groups. Often, evidence-based advocacy provides evidence about the problem,

the likely impact of change, the feasibility of possible solutions, and about who is responsible to make the change. UNFPA (2002). *Advocacy: Action, Change and Commitment. Distance Learning Courses on Population Issues*, Course 4. United Nations Population Fund (UNFPA) and United Nations System Staff College (UNSSC), New York and Turin.

UNICEF (2009). *Evidence-Based Advocacy for Gender in Education*. A Learning Guide. UNICEF, Bangkok.

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- UNFPA Census Portal on http://www.unfpa.org/public/op/edit/home/sitemap/pid/6734

C. Some issues in data analysis and the construction of indicators

A basic typology of indicators

35. Indicators that compare the situation of women to that of men can be constructed in a variety of ways and the results may vary according to the specifics of the definitions used. For some purposes, a particular indicator definition may be ideal, while it may be highly misleading when used for other ends. Take the example of teenage

pregnancy. Reproductive health providers often use the percentage of deliveries in which the mother is under age 20 as an indicator for the user profile of maternity clinics. To the extent that young mothers may require special care for which clinics need to be prepared, this is a perfectly adequate indicator. However, the same indicator is also often used to quantify the incidence of teenage pregnancy, a use for which it is ill-suited. This is because the percentage of women under age 20 who become mothers may be stationary or even diminish, but as the fertility rates of older women decline faster than those of adolescents (as is often the case), the result will be an increase of the percentage of deliveries in which the mother is under age 20. This is due to older women having less children, not to younger women having more.

Percentage distribution indicators

36. Problems similar to the ones outlined above often characterize the use of indicators in which the comparison between men and women is made in terms of absolute numbers. For example, one might quantify the degree to which unemployment is a problem for men and women by constructing an indicator consisting of the percentage of the unemployed that are women. If the objective of this indicator is to define the profile of users of particular services available to the unemployed (e.g. to know if the unemployment agency should make a greater effort to provide information on job openings or

training courses that usually attract a lot of female applicants), this indicator may be entirely reasonable. But if the objective is to quantify if women have a higher or a lower risk of becoming unemployed, it is inadequate, at least in countries where female labour force participation is lower than male labour force participation, as is usually the case. The absolute number of unemployed women may be smaller than that of unemployed men, but when computed as a percentage of the female and male labour forces, the picture may be entirely different as the percentage of economically active women that are unemployed is often higher than that of men.

37. The same applies to indicators such as school enrollment. The percentage of primary school students who are girls may be a perfectly adequate indicator for planning purposes, e.g. to know how many toilet facilities schools need to have for boys or girls, respectively, but as an indicator for the propensity of boys or girls to enroll in secondary education, it may be flawed by the fact that the base population of boys and girls in the relevant age group is not the same, particularly at the local level. An alternative indicator, which quantifies the relationship not in terms of percentages, but as a ratio between the number of boys and girls has the same disadvantage. This is why the MDG indicator that deals with differential school enrollment is not stated in terms of absolute numbers, but rather in terms of Gross Enrollment Ratios, i.e. the number of girls enrolled (regardless of age) as a

proportion of the population of the relevant age group, divided by the equivalent proportion of boys in the same age group (gender parity index). This corrects for the problem of unequal base populations. It does not correct, however, for the the fact that the larger numbers of students of one sex may be due not to a higher propensity to receive education, but to high repetition rates. In Brazil, for instance, Gross Enrollment Ratios for girls are higher than those for boys at all levels, except primary because boys tend to stay longer in primary school, due to their lower educational performance. The use of the Net Enrollment Ratio, rather than the Gross Enrollment Ratio, would prevent this bias (Leonardo Athias, of IBGE, Brazil, personal communication).

Ratio indicators

38. The previous paragraph shows how a ratio indicator based on rates is an improvement over a ratio indicator based on absolute numbers or a percentage distribution indicator. Nevertheless, indicators of this type do have one major limitation, namely that the same result can be brought about either by high rates in the numerator and the denominator or by low rates in both. Thus, it is difficult to decide whether an enrollment ratio of 1 represents a good or a bad outcome from the viewpoint of female education. For example, in Iraq under sanctions, male enrollment rates declined, leading to a smaller gap in schooling outcomes for boys and girls, but due

to declining schooling rates overall. Similarly, in some instances the wage gap between men and women has been narrowed because men's wages are declining. Nor do such ratios provide a clear idea of how easy or how difficult it would be to correct such problems. An enrollment ratio of 0.9 is much easier to correct when it results from a female rate of 18 per cent, compared to a male rate of 20 per cent than when it results from a female rate of 81 per cent compared to a male rate of 90 per cent.

Standardized and unstandardized indicators

39. Despite the drawbacks outlined in the previous paragraph, ratio indicators are sufficiently detailed for many purposes. In those cases in which they are not, there is always the option of computing the male and female indicators separately, so that one can evaluate their individual values, rather than just their relative size. However, there are situations in which ratios or even individual male and female indicators can be uninformative or even misleading if no account is taken of intervening factors.

40. As an example, take the proportion of men and women that experience multiple divorces. This proportion will usually be higher for men. But how to interpret this ? Is it because men in their second or third marriage are more likely to divorce again than women in the same situation ? That may be, but a more likely explanation is that more men than women remarry after

a first divorce or widowhood and consequently, even if the divorce rate for men and women in second or third marriages is the same, there will still be more men than women with multiple divorces. In order to take account of this fact, one should either break down the information by second, third, fourth etc. marriages, or one should weight the divorce rates by some uniform distribution of second, third, fourth etc. marriages, which does not vary by sex. This so-called standardization by order of marriage will ensure that the result can be used to compare the actual propensity of men and women to experience additional divorces in later unions, rather than depending on an intervening factor (in this case, remarriage). Of course, if the only objective of the analysis is to estimate the proportion of men and women that ever experience a multiple divorce, rather than to estimate the risk of a renewed divorce of men or women in higher order marriages, standardization is not necessary.

41. It is partly for the same reason that the literacy rate in the MDG indicators has been defined in relation to men and women aged 15-24, rather than 15 and over. Literacy rates are lower at higher ages and since it is at these ages that women predominate, the male-female differential is disproportionally weighted in favour of males. Again, this is not a problem if the only objective is to know how many illiterates there are in the population, by sex. But in order to get a realistic imagine of male-female differentials, it is better to compute the indicator by age group, or

to standardize. An additional reason for using the 15-24 age category is that it provides a better measure of the recent performance of the educational system, rather than a historical assessment of something that is more difficult to correct by regular educational policies.

42. Standardization is particularly relevant in the case of disability, which is why the chapter on that subject illustrates it in some detail. A short example out of that chapter may serve to further clarify the issue. One way to express the differential incidence of disability in men and women is to compute the number of years that men and women of a certain age can expect to live with a disability in the future. This number tends to be higher for women. But the number of years that they can expect to live without a disability is also higher for women. One solution to this ambiguous relationship is to compute the percentage of the expected number of remaining years of life that men and women should expect to live with a disability. But an alternative is to compute the expected number of years with a disability in a mortality-standardized way, by using the same life table (e.g. an average for both sexes) for men and women. The latter removes the differential impact of the intervening variable (mortality) from the indicator of interest.

Indicators of differential impact

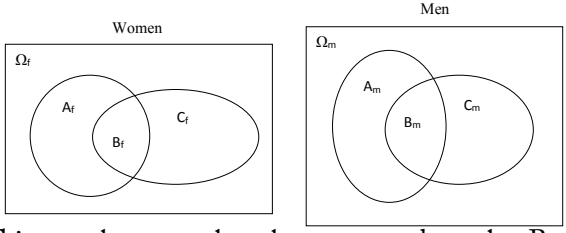
43. There are many situations in which one is interested

in how a certain condition (e.g. being married) impacts on another (e.g. being economically active) and how this impact varies by sex. In this example, being married would be expected to have little impact or even to increase economic activity among men, but to reduce economic activity among women. One would like to express this differential impact as an indicator (most likely a ratio indicator) in such a way that it does not depend on the total number of women (Ω_f), the total number of men (Ω_m), the total number of married women (A_f+B_f), the total number of married men (A_m+B_m), the total number of economically active women (B_f+C_f) or the number of economically active men (B_m+C_m), but only on B_f and B_m.

44. The correct way to construct this indicator is to start from the number of married and economically active men and women (B_m and B_f) that one would expect to find if marriage and economic participation were statistically completely independent:

$$E\,B_f = (A_f + B_f)\,(B_f + C_f) / \Omega_f$$

$$E\,B_m = (A_m + B_m)\,(B_m + C_m) / \Omega_m$$



This number can then be compared to the B_f and B_m numbers actually observed: B_f / EB_f and B_m / EB_m. Finally,

the ratio of the latter two can be computed, yielding the differential impact by sex:

$$\frac{B_f}{B_m} \frac{\Omega_f}{\Omega_m} \frac{(A_m + B_m)(B_m + C_m)}{(A_f + B_f)(B_f + C_f)}$$

Multivariate analysis to disentangle intra-group variability and interrelationships

45. Men and women are not homogeneous groups. While women as a group may have lower educational attainment than men, some sub-groups of women may have higher educational attainment than some sub-groups of men or even men in general. The relationship may vary in terms of other intervening socio-economic and demographic factors such as economic level, rural or urban residence, and age. Therefore, one may want to know if this relationship of women's lower educational attainment holds at different economic levels, in both rural and urban places of residence, and at varying ages. Additionally, when two variables are correlated, such as lower education and early marriage, the next step is to ascertain whether one causes the other or whether the two are co-determined. Two characteristics may be correlated without being causally related. In this example, early marriage could be highly correlated with lower education, yet their relationship could be spurious, i.e. caused by another factor, such as belonging to a certain ethnic group with prescribed cultural norms regarding both education for girls and early

marriage.

46. Multivariate analysis—meaning analysis with multiple predictor variables—allows, inter alia, for the measurement of the effects of two or more independent (also called predictor or explanatory) variables on a dependent or outcome variable. It makes it possible to measure the effect of each separate explanatory variable on the dependent variable, while controlling for (i.e. keeping constant, as in the famous condition "ceteris paribus"—all other factors being equal) the effect of all other explanatory variables being considered. While multivariate analysis cannot, strictly speaking, demonstrate the existence of causal relationships, it can approximate the analysis to a causal interpretation in that it provides a more comprehensive view of the different relationships, thereby making it easier to identify situations in which, for example, the relationship between two variables can be accounted for by their common dependence on a third factor.

47. Two types of multivariate analyses which have proven very useful in social studies are multiple linear regression and logistic regression. Multiple classification analysis (MCA) is another useful technique, closely related to linear regression.

a. Multiple linear regression uses several explanatory variables (which may be continuous or discrete) to predict a dependent variable, which has to be continuous (interval level, meaning that differences

between values have a true numerical interpretation). The relationship has to be linear, but rather than using the original independent variables, one may transform or combine them, as long as the transformations do not introduce any non-linear parameters to be estimated. For example, if the original explanatory variables include age a) and educational attainment e), one may introduce other variables equal to A2 or A*E or even E/(A-6), but not E/(A-k), where k has to be estimated from the data. In the end, what is being estimated is a set of coefficients—one for each independent variable—which quantify the influence of each of them on the dependent variable.

b. Another attractive technique, which is closely related to linear regression, is Multiple Classification Analysis (MCA). MCA (also named Factorial ANOVA) quantifies the interrelationship between a set of predictors and a dependent variable in a linear, additive model. As is the case with linear regression, the dependent value should be at the interval scale. It is one of the nice features of MCA that it so easily handles discrete explanatory variables that do not allow a true numerical interpretation (e.g. ethnic group or level of agreement with a statement). In the MCA-analysis these categorical independent variables are called factors. MCA also allows the inclusion of continuous explanatory variables, called covariates. MCA basically produces the same results as a multiple linear regression with a set of discrete variables expressed as dichotomous so-called dummy variables (e.g. economically active or not, completed high school or not, etc.). However, the advantage of MCA over linear regression lies in the way the results are

presented. The constant in the MCA analysis is simply the overall mean of the dependent variable. Each coefficient of the categorical, independent variables is presented as a deviation from the overall mean. First, unadjusted deviations are given, and thereafter, adjusted deviations are presented, i.e. after controlling for the effect of all other independent variables (factors and covariates).

c. Logistic regression also uses several explanatory variables to predict a dependent variable, but in this case the dependent variable is discrete, taking two dichotomous values (e.g. yes or no, attending or not attending school). A variant of logistic regression is multinomial regression, in which the outcome has more than two alternatives (e.g. marital status). The actual outcome of the logistic or multinomial regression equation is a number between 0 and 1, which describes the probability that a given outcome will happen. The same considerations about linearity mentioned above apply here as well, with the difference that the entire linear expression is linked to this probability through a logistic function which, by definition, can only take on values between 0 and 1. The slope coefficients (B) in a logistic regression are so-called log odds ratios, which are hard to interpret. Therefore, the exponential of the log odds ratio is calculated (eB) which gives the odds ratio, i.e. the probability that something will happen divided by the probability that it will not.

48. Multivariate analysis relies upon a set of assumptions about the variables in the model. Before applying a certain technique, researchers should always test whether these assumptions hold. For instance, in the case of linear

regression, assumptions that are regularly violated by researchers are: a) The assumption of linearity between the predictor and the dependent variable, b) The assumption of constant variance of the error terms (homoscedasticity) c) The assumption of no correlation between the error term and the predicted variable, and d) The assumption of absence of high correlation between the predictor variables (multicollinearity). A violation of homoscedasticity would, for instance, be 'age' as a predictor of children ever born by women. The variance of the number of children ever born among younger women is much smaller than among older women. An example of multicollinearity would be the use of both weight and height as predictors in a regression model, as the two are highly correlated. For more detailed information on multivariate methods, their variations and the ways to deal with the problems that can arise when applying them, there are numerous standard texts that one can consult, among them Hoyle, Harris and Judd (2001), Knoke, Bohmstedt and Potter Mee (2002), Linneman (2011) and Stock and Watson (2010).

49. Some examples of the use of multivariate analysis include:

a. Nguelebe (2005) using 2003 census data on early marriage and schooling in the Central African Republic (CAR) found that just over one-fourth (26.3 per cent) of girls between the ages of 12 and 19 were already in a union, compared with

just 4.2 per cent of boys in the same age group. Census data can examine if there are bivariate relationships (using cross-tabulations) between early marriage and such factors as attending school, literacy, urban/rural residence, regional of origin, ethnic group, religious affiliation, and employment status of the mother. But this leaves open the possibility of misinterpretations, due to the kinds of problems pointed out earlier, e.g. that both early marriage and low schooling may be the result of belonging to a certain ethnic group or religion. A multiple regression model to predict early marriage might take the age of first marriage as an outcome variable or one might use logistic regression if the outcome variable is whether a given girl is married or not by the time she reaches a certain age. Factors that share bivariate relationships with early marriage would be included as independent or predictor variables. Qualitative (discrete, categorical) explanatory variables, such as ethnic group or religion, have to be broken down into a series of binary choices (called dummy variables), which are then treated as separate variables, e.g. Catholic (yes/no), Protestant (yes/no), Muslim (yes/no), etc.

b. Census data could be used to examine the relative effects of the independent variables of racial or ethnic composition and rural or urban residence on poverty, a dependent variable. Persons of a specific ethnicity may make up a majority of those residing in the rural area of a country. Multivariate analysis allows us to determine the relative effects of living in a rural area and belonging to a specific ethnic group on poverty, while accounting for the possible interrelations amongst the three variables: 1) place of residence, 2) ethnicity and 3) poverty. A possible

result of this analysis might be that ethnicity does not affect poverty outcomes once place of residence is controlled for. Of course, this may be because place of residence is itself determined by ethnicity, so it does not prove that ethnicity is not a relevant factor.

c. Census data could be used to examine the relative effects of living in a certain region, type of household (i.e. with or without children), sex and educational attainment of the head of household or whether the household head is employed full time or not. With this, the researcher is able to use multivariate analysis to understand to what extent, if any, being employed full time can be explained by region of residence, the sex of the head of household, whether the household has children or not, and the educational attainment of the head of household.

With each of these above examples, the estimation of the effects of the dependent variables is done simultaneously, so the results show the effect of each independent variable on the dependent variable, while controlling for the intervening effects of all other independent variables. The next section focuses on a concrete example using a gendered perspective.

50. A gendered analysis using both bivariate tabulations and multivariate methods can be found in the work of Snyder, McLaughlin and Findeis (2006) using a 5-percent sample of the 2000 US Census data to examine race and residence as independent variables affecting poverty prevalence of female-headed households with children.

This study first cross-tabulates census data to learn that cohabiting and grandmother, female-headed households with children comprise over 25 percent of all female-headed households with children. Using cross-tabulations again, they then find that household poverty is highest for female-headed households with children that do not have other adult household earners. They also note the relative difference in income between these female-headed households 1) with and 2) without other earners or income, and the average difference between these two groups is substantial; those with other earners or income are lifted out of poverty.

51. Then, multivariate models are used to provide validation to these tabular results. Because this is done at the level of individual households, where poverty is a categorical variable (poor versus non-poor households), logistic regression is the method of choice. If it were done at the level of census tracts or other geographical units, conventional multiple regression would be more appropriate. Poverty is found to be highest among racial/ethnic minorities and female-headed households with children in rural areas compared to central cities and suburban areas. The authors are also able to estimate the relative effects of the independent variables of race and residence and family type, while controlling for the effects of other factors, such as region, educational attainment, age, marital status, number of hours worked last year, and public assistance receipt. These findings—that ethnic minorities

and rural female-headed households have even higher rates of poverty than female-headed households in general—are net effects and independent of these other factors.

52. Building on other research that finds a steady rise in female-headed households with children since 1970 (Casper and Bianchi, 2002) and that over one-half of children will live in a female-headed household (Graefe and Lichter, 1999) during childhood, the tabulations establishing the poverty link take on real life course implications for women and children. Understanding the relative effects of defining characteristics, such as race and rural residence, in predicting poverty can then be useful for policy makers and advocates wishing to ameliorate the possible outcome of poverty, especially for ethnic minorities and those in rural areas. Household composition is an important component of the economic support that a family has. Census data can be used to monitor trends in family household composition on the one hand, and even control for family household composition while examining income, poverty status and public assistance receipt on the other.

Geo-spatial analysis

53. With the ever more ubiquitous availability of Geographic Information Systems (GIS), census data are increasingly being represented and analysed in

connection with their underlying geography. In the case of gender studies, Bosak and Schroeder (2005) discuss some of the advantages, as well as the pitfalls, of using these techniques. Although geo-spatial analysis can be done without them, maps are a frequent companion to such endeavors. Poverty maps, for example, have been around for many years, as a visually appealing tool that makes it possible for governments to pinpoint the areas where poverty is most acute (see Chapter 8).

54. A distinction must be made, however, between the mere representation or visualization of data in the format of a map and the analytical use of geospatial analysis to advance the understanding of the processes involved. The first merely uses maps as an alternative to the presentation of data in tables, with the advantage that some characteristics of the data are more easily grasped that way. For example, it may be that the education gap between boys and girls is geographically clustered in certain zones of the country that comprise several geographic base units. This may suggest that the problem has to do with factors that are common to these base units, maybe the fact that a certain type of agriculture is practiced there. Visualizing the data in the format of a map may help to develop an intuition for such explanations. The studies of sex ratios (Ebenstein and Leung, 2010) in Chapter 5 and of female enrollment in Gansu, China (Cao and Lei, 2008) discussed in Chapter 9 are examples of this type of use of spatial data. For more details on these kinds of maps, see

Schultz (2009), among others.

55. Geo-spatial analysis, in the strict sense of the word, goes beyond such intuitions by explicitly linking data that affect each other in ways that allow a spatial interpretation. A certain district may have a large gender gap in education because of something that is not characteristic of the district itself, but of a district situated nearby, e.g. the presence of a large textile factory that employs lots of young girls. Unless the data are analysed taking into account their spatial structure, such relationships may be missed. In the case of employment and mobility, there is already a substantial literature in the more developed countries which links gender factors to the availability of opportunities across space. Some of these analyses (e.g. Hoogstra, 2012; Tkocz and Kristemen, 2010) can be quite complex, involving methodological tools such as autoregressive and cross-regressive spatial lags to detect relations both within and among groups and spatial weights matrices to represent travel times. These econometric techniques are, unfortunately, beyond the scope of this manual. For more information in this regard, one may consult a variety of basic (e.g. Kalkhan, 2011) or more advanced (e.g. Mitze, 2012) texts.

56. Other geo-spatial applications, however, are much simpler, like demonstrating that the education of women in Lesotho and Ethiopia tends to be higher as they live closer to main roads (Walker and Vajjhala, 2009). In this

case, basically all that is required is overlaying the population data from the census or (in this case) DHS with a geographical data base showing the location of roads, elaborating the respective distances and computing their correlation with population characteristics. There are also several studies that—with or without the use of maps - relate the ratio of school enrollment rates between boys and girls with the distance to the nearest school, to explore the assumption that the school enrollment of girls might (or not) be more negatively affected by a large distance from school than the school enrollment of boys (see Chapter 9).

Life course approach

57. The life course approach provides a way to examine a person's life as it is enmeshed within a social, cultural and structural context over time. In this way, it is possible to understand a person's life history as it relates to decisions and actions that lead to later events. As an example, the experience of poverty as a child may affect educational outcomes at that point in time, but also later in life and may trigger a trajectory of lowered opportunity for that individual due to this earlier exposure. Scholars have formally defined life course as "a sequence of socially defined events and roles that the individual enacts over time" (Giele and Elder 1998).Such an analysis may be useful to policy makers who are interested in understanding the optimal point at which a policy intervention should take

place, in order to reduce the risk of poverty.

58. A gendered analysis that utilizes the life course approach examines how a woman's life experiences are shaped differently from those of men because they are female. For example, in Table 2, Heise (1994) puts forward a gendered life course analysis of women's disadvantaged position as it may explain violence against women at each phase of life—from Prenatal, Infancy, Childhood, Adolescence, Reproductive and Old Age phases. At each phase, the social, structural and historical context come together to present women with a lowered level of health and heightened level of violence against them, ranging from sex selection at the Prenatal Phase, to female infanticide at the Infancy Phase, to genital cutting at the Childhood Phase, to dating and courtship violence at the Adolescence Phase, to marital rape at the Reproductive Phase to abuse of widows at the Old Age Phase.

Table 2: Gender discrimination throughout a woman's life course

Phase	Type
Prenatal	Prenatal sex selection, battering during pregnancy, coerced pregnancy (rape during war)
Infancy	Female infanticide, emotional and physical abuse, differential access to food and medical care
Childhood	Genital cutting; incest and sexual abuse; differential access to food, medical care, and education; child prostitution
Adolescence	Dating and courtship violence, economically coerced sex, sexual abuse in the workplace, rape, sexual harassment, forced prostitution
Reproductive	Abuse of women by intimate partners, marital rape, dowry abuse and murders, partner homicide, psychological abuse, sexual abuse in the workplace, sexual harassment, rape, abuse of women with disabilities
Old Age	Abuse of widows, elder abuse (which affects mostly women)

Source: Heise (1994).

59. A gendered life course approach considers that disparities may become more pronounced or attenuated and even reversed in direction as the life cycle progresses. While there may not be major differences for girls and boys in education in Early Childhood, as a child ages and becomes a young adult, any minor differences become more and more apparent. UNICEF (2007) reports in the State of the World's Children that while the gap between girls' and boys' enrollment in primary school has been declining, nearly 20 per cent of girls will drop out of primary school by level 5. Thus, for every 100 boys out of school, 115 girls are in the same situation, and 43 per cent of girls are at the appropriate grade level for their age. Gender parity in primary enrollment does not carry over into parity in secondary school and overall educational attainment. Indeed, by the time these girls reach adulthood, as women they will comprise two-thirds of

the world's illiterate population, although a cohort analysis can also reveal that while adult illiteracy is primarly a female phenomenon, among young women the educational gap has closed considerably.

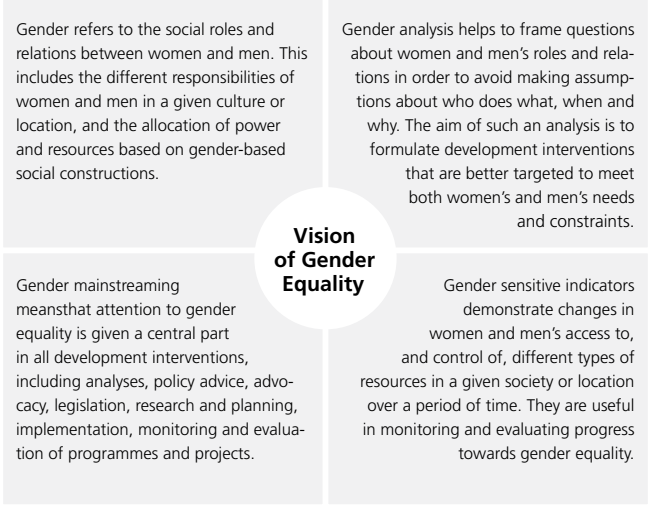
60. Because of their cross-sectional scope, census data present a methodological challenge for the life course approach, which generally uses longitudinal survey data of persons' social, cultural and structural contexts. However, using US census data Stevens (1990) creates synthetic cohorts from the same census year (i.e. computing mean educational attainment for women and men by specific age groups, 20-29 year olds, 30-39 year olds, 40-40 year olds, etc. to know if educational attainment is increasing or decreasing over time for women and men), and Fussell and Furstenberg (2002) follow American cohorts over time using census data gathered at 10-year increments. This method of following cohorts over time is limited in use for countries with irregular census data collections or where question wording has changed. Overall, these cohort construction methods work for some research questions and not for others.

Memory Card: Summary Part 1

61. In summary, gender and census data are linked in many ways: Gender advocates need robust and reliable data to sustain their claims and produce more convincing advocacy materials. Data producers need to understand

gender issues to make sure the data they generate is fully representative of the entire population, including of vulnerable women such as widows and disabled girls, and of the entire spectrum of issues pertaining to both sexes. While census data have some limitations as a basis for gender analysis, due to the limited number of questions questions asked, they also have advantages due to their geographical coverage and the completeness of population coverage. The following chapters will discuss gender issues that can be analysed with census data.

Figure 1: Gender Equality: Normative Ideal and Development Objective



Source: DLPI, Course 3, module 3

PART TWO

Ten Key Gender Issues Analysed with Census Data

62. Having laid the groundwork concerning the importance of gender-responsive data and gender analysis, the following chapter provides concrete examples of how gender issues can be analysed on the basis of census data.

63. Ten topics were selected for inclusion on the following grounds:

a. Census data are available on the topic
b. The topic has a clear gender-dimension
c. The gender issue is of global relevance or of extraordinary relevance to at least two regions (i.e. the issue of 'sex ratios' was included due to its all-encompassing relevance in Asia and growing relevance in other regions)
d. A large number of countries are obligated under international law to report on the gender issue in question. This implies that
    i. Cooperation between national mechanisms for gender equality and National Statistical Offices is needed on the issue
    ii. International Human Rights standards and national legislation are available that indicate how the gender issue should be approached; e.g. child marriage should be banned, migrants should have access to education and health services regardless of their regular/irregular status, etc.

64. Each chapter follows the same structure, investigating what the subject is, why it is important from a gender and human rights perspective, and what data concerns exist. It

then turns to suggested tabulations, suggested indicator and further, more complex analyses that can be carried out around the gender issue at hand. Each chapter closes with some pointers on advocacy around the gender issue in favour of greater gender equality and empowerment of women.

CHAPTER 3

Fertility

1. What is it?

65. Fertility is the childbearing performance of individuals (usually women), measured for particular groups or populations. It is contrasted with fecundity, the theoretical capacity to reproduce, which may or may not lead to fertility.[5] Sometimes the term natality is used to refer to the most general analysis of childbearing. Measures of fertility normally refer only to live births. Several qualifiers may be applied to fertility to specify more exactly the focus of analysis, such as marital fertility or fertility by birth order (e.g. the fertility for birth order can be used to describe the proportion of women by age who have ever had a live-born child). Male fertility, which does not fit neatly into the categories above, has also occasionally been of interest. Conventionally, fertility is investigated only in relation to the age and other characteristics of women, but for some purposes it is relevant to know how fertility rates vary by the fathers' characteristics.

5 Note that in French and Spanish, the usage of the terms is the opposite: fécondité or fecundidad for actual reproductive outcomes and fertilité or fertilidad for biological capacity.

66. Three types of data are commonly collected in censuses in developing countries: 1) The number of Children Ever Born alive (CEB); 2) Children born during the past 12 months before the census; and 3) Survival of children ever born and/or children born in the past 12 months. There is less need for these types of census data in more developed countries, because they can be more reliably and frequently obtained from civil registration sources. Applying a variety of analytical techniques, census data on these topics can be converted into estimates of fertility and infant and child mortality. Although the details of these procedures are beyond the scope of this manual, a general idea is provided in Methodology Box 4. For more information, see Manual X of the UN Population Division (United Nations, 1983), which has recently been updated by an independent group of researchers, with financial support from UNFPA (Moultrie et al., 2013).[6] It should be pointed out, however, that even with these conversions and adjustments, fertility data collected from censuses are less detailed and of lower quality than the fertility data typically collected in specialized surveys such as the Demographic and Health Surveys (DHS).[7]

6 The update was undertaken to incorporate new developments, take account of new trends such as those brought about by the advent of AIDS, and adapt the older techniques to the possibilities created by more modern computational tools such as EXCEL.

7 Nevertheless, omission and displacement of births in DHS data are not trivial, and of course, as in any survey, one has to account for sampling errors, which limits the possibility of using DHS data for small sub-groups.

67. Infertility/Childlessness: Demographers define infertility as childlessness in a population of women of reproductive age, as opposed to infecundity, the biological incapability of conceiving. The epidemiological definition, on the other hand, is based on "trying for" or "time to" a pregnancy, generally in a population of women exposed to a probability of conception. The time that needs to pass (during which the couple has tried to conceive) for that couple to be diagnosed with infertility varies from country to country The WHO defines infertility as the inability to conceive a child, clarfying that a couple may be considered infertile if, after two years of regular sexual intercourse, without contraception, the woman has not become pregnant (and there is no other reason, such as breastfeeding or postpartum amenorrhoea).

68. Primary infertility is infertility in an individual (usually in a woman) who has never had a child. Secondary infertility is failure to conceive following a previous pregnancy. Infertility may be caused by infection in the man or woman, but often there is no obvious underlying cause. Infertility increases with age. A study on Hutterite women (who do not use birth control) carried out in the 1950s (Tietze, 1957), found the following progression: By age 30, 7 per cent of couples were infertile, by age 35, 11 per cent of couples, by age 40, 33 per cent of couples and by age 45, 87 per cent of couples were infertile. Infertility is of particular concern in Africa because of the extent of the problem and the social stigma attached to it. The

highest prevalence of infertility in Africa occurs south of the Sahara, but some 5 to 8 per cent of couples are estimated to experience infertility at some point in their reproductive lives (50-80 million people worldwide). The average infertility in Africa is 10.1 per cent of couples, with a high of 32 per cent in some countries, and certain tribes have high infertility rates.

2. Why is it important?

69. Fertility decisions (including the decision not to have children) are part of the key principles of the International Conference on Population and Development (ICPD) Programme of Action. Principle 8 states: "All couples and individuals have the basic right to decide freely and responsibly the number and spacing of their children and to have the information, education and means to do so." Even though the right to "found a family" is protected by the Universal Declaration of Human Rights (United Nations, 1948), women's reproductive freedom remains less than full. Fertility stands as an important area to examine, monitor and understand women's position in society. From a human rights point of view, one therefore needs to ask: Do current fertility patterns reflect the free choices of couples and individuals? Do individuals and couples have sufficient information to formulate and sufficient means to realise those choices? Are there factors that systematically hinder certain people from being able to make fertility decisions freely and responsibly, such as

by ethnicity, religion, disability or migratory status? How do fertility decisions relate to marital status and how do these relationships change over time (see Chapter 6) ?

70. As dicussed in the ICPD PoA, fertility patterns have key consequences for the lives of both women and men. The number of children one has may be an important indicator of status, for both women and women. And particularly for women, marriage and childbearing at very young ages and/or bearing large numbers of children can limit their opportunities for education and employment as well as putting them at increased risk of morbidity and mortality. .

71. Fertility is therefore a key variable for gender analysis, as it may reveal situations of vulnerability for women. Gender norms may be a factor in explaining fertility behavior both at the individual (e.g. marital status, education) and the societal (e.g. son preference) level. High fertility rates in turn often limit women's opportunities suggesting a complex causal relationship between fertility outcomes and gender norms. In this way, women's lower status shapes fertility outcomes at the same time that fertility may also adversely affect women's and girls' status *vis-a-vis* their male counterparts in society.

72. There are several factors worth taking into account when analysing fertility patterns.

a. **Status of women:** The status of women is

recognized as one of the main determinants of fertility. This is the case of both academic studies on the effect of, for example, female education or of female disadvantage in inheritance systems in Sub-Saharan Africa on fertility rates (e.g. Cosio-Zavala, 2002; Jejeebhoy, 2001; Mason et al., 1995; Presser, 1997; Sathar, Callum and Jejeebhoy, 2001) and of the political consensus of the ICPD. It provides a leading rationale for the prominent role that gender issues play in the ICPD Plan of Action.

b. **Marital status:** Women in polygamous and common law marriages may have fertility levels different from those of women in formal monogamous unions, whereas the instability of informal unions, associated with changes in partners, may cause women to have more children than they otherwise would, due to the perceived need to have a child with a new partner.

c. **Son preference:** In societies where there is a strong preference for sons, couples will, on average, have higher fertility than they would have in the absence of son preference because they tend to continue having children until at least one of them is a boy (e.g. Chu, Xie and Yu, 2007). Conversely, the transition to very low fertility may exacerbate the manifestations of son preference, such as sex selection before birth.

d. **Desired and undesired fertility:** Research in recent decades has examined the fertility desires of women and, to a lesser extent, men, to determine how much of their actual fertility is wanted and how much is caused by lack of access to fertility control methods or other factors. Studies have also examined the degree to which unwanted fertility

is the result of women and men having different fertility desires; in particular, whether men have higher fertility goals than women (e.g. Andro and Hertrich, 2001), so that large numbers of children correspond to the desires of men, rather than women. Although this issue cannot be investigated with the use of census data, it will be briefly taken up in the Interpretation section.

73. In addition, gender analysis can examine the consequences of fertility for the health and quality of life of men and women, including childbearing at young ages, labour force participation, and differences in birth and death rates by sex.

a. **Childbearing at a young age:** Early childbearing has been shown to have a negative impact on the health outcomes and educational attainment of women and men, which,in the latter case, particularly in the case of young women, has implications for their earning potential.

b. **Labour force participation:** Women's labour force participation is often limited, particularly when they have multiple children. Having children generally has the opposite impact on male labour force participation, since prevailing gender norms lead to an expectation that women will specialize in reproductive labour while men become income earners.

c. **Childlessness:** In many societies, the inability of a woman to marry and have children can negatively affect her standing in the family and in the wider society. In many communitiies, infertility may also be considered a legitimate motive for divorce (Ola, 2009; Inhorn & Van Balen, 2002). Even

if the reason for a couple's childlessness lies with the man, the consequences of this situation may be more severe for the wife than for her husband. In modern societies, on the other hand, childlessness is clearly on the rise, as is discussed in some detail in the results of the 2010 census of Finland, where as many as 21 per cent of all women aged 40 had never given birth to a child, up from 15 per cent in 1990 (UNECE, 2012 b). Two thirds of these women were unmarried. In Germany, as many as 28 per cent of women born in 1967 remain childless, a figure that rises to 40 per cent among university graduates. In Japan, childlessness is projected to reach 30 per cent for the 1970 bith cohort of women and 37.4 per cent for women born in 1985 (Hara, 2008). There is some evidence that the reasons for voluntary childlessness in developed countries are different for men and for women (Waren and Pals, 2013). By comparison, in the Cambodian census of 2008, 9.9 per cent of women aged 40 were childless, whereas the Ethiopian census of 2007 enumerated 7.0 per cent of childless women of that age.

3. Data Issues

74. Censuses provide some basic information to investigate the the link between fertility behavior, marital status, and employment status, as well as in terms of differences in infant birth and death rates by sex, including the ability to discern differences by geography or social strata. Fertility patterns, such as the mean number of

children ever born or the mean age at childbearing can be analysed by women's level of education and other socio-economic characteristics that censuses usually include. The Principles and Recommendations for Population and Housing Censuses, Rev. 2 (United Nations, 2008 a) recommend that tabulations of children ever born should be disaggregated by sex. Not all censuses follow this practice, but the ones that do can be put to good use for analyzing differences in sex ratios at birth.[8] In the case of the 2009 census of Viet Nam, for example, this information was used for an in-depth study of sex ratios at birth and their variation by background characteristics (UNFPA, 2010 c) (see Chapter 5).

75. Data on fertility should be gathered for all females of child-bearing age, regardless of their marital status. In reality, it is often not feasible to collect information on childbearing from never-married women. The Indian census, for example, links the fertility question to marital status (only currently married, widowed, divorced or separated women). Similarly, Indonesia, Mauritius the Occupied Palestinian Territories, Sudan (northern part of the country) only ask the question to ever-married women and the Republic of Korea and Nepal only to currently married women. Asking fertility questions to girls under age 15 may also be problematic and the results

8 For example, Argentina, Azerbaijan, Bahamas, Costa Rica, Kazakhstan, Mexico, Palau, Peru, the Seychelles and Thailand ask the traditional fertility and child survival questions, but do not disaggregate them by sex.

tend to be unreliable. Botswana, Bulgaria, Burundi, Cabo Verde, Cameroon, Colombia, Congo, Costa Rica, Djibouti, Ecuador, El Salvador, Ghana, Guatemala, Guinea Bissau, Kenya, Lesotho, Liberia, Malawi, Mali, Mexico, Mozambique, Peru, Sudan, Swaziland, Togo and Zambia use a lower limit, of 12 years. Nicaragua uses a lower limit of 13. Aruba, Sint Maarten and Trinidad and Tobago 14, whereas Brazil Burkina Faso, Ethiopia, Indonesia, and Iran ask the question to girls as young as 10. Cook Islands, French Polynesia, Guam, Ireland, and Thailand do not specify an age limit.

Methodology Box 4: Measurement of Fertility from Census Data

Unlike specialized fertility surveys, which usually collect the detailed fertility histories of each woman, the censuses of most developing countries summarize this information in three or sometimes four questions:

- How many live-born children[9] have you had during your entire life time?
- How many of these children are currently alive?
- What was the date of the last live-birth or how many children did you have during the past 12 months?

Depending on the particularities of the census, more details can be provided. For example, most censuses disaggregate the births by sex, but some don't. Some censuses divide the children currently alive by whether they live in the household or elsewhere, in order to avoid the erroneous classification of children living elsewhere as deceased. In addition, some censuses[10] ask if the last-born child or the child born during the past 12 months is still alive.

However, even with these added details, census fertility data suffer from systematic problems. On the one hand, older women

9 For a common definition of live birth, see: http://unstats.un.org/unsd/demographic/sconcerns/natality/ natmethods.htm.

10 Brazil, Botswana, Burundi, Cayman Islands, China, Djibouti, Dominican Republic, Ecuador, El Salvador, Fiji, Iran, Liberia, Malawi, Maldives, Occupied Palestinian Territories, Republic of Congo, St. Lucia, Samoa, Sudan, Swaziland, Tokelau, Trinidad and Tobago.

tend to omit some of their children, especially children that were born long ago and did not survive. On the other hand, women of all ages may have difficulty in correctly identifying the reference period of 12 months for the most recent births. Rather than declaring births during the past 12 months, they may declare children born during the current calendar year, the previous calendar year or both. Finally, if fertility levels in the country have changed, the question about children ever born provides data on historical levels of fertility and questions about the date of the last live birth or the number of children born in the past 12 months provides data on current levels of fertility.

The most common correction that demographers apply to census fertility data is the so-called P/F ratio correction method, in which it is assumed that current fertility data (F) provide the correct pattern of fertility by age of the woman, but may be systematically over- or under-stated at all ages, due to errors in the reference period. It assumes that over- or under-reporting of births does not change with age. The cumulative fertility data (P) are assumed to be more reliably reported for younger women (especially the 20-24 age group) than in current fertility data. The method consists in assessing the correct age pattern based on F and adjusting its level based on the reported cumulative fertility (P) of women aged 20-24 and/or 25-29. It should also be noted that the reported fertility data for women of ages 15-19 is usually ignored in indirect estimation techniques because of data quality concerns: underreporting of (out-of-wedlock) births or age-shifting of young mothers often affect the data for this age group.

In practice, this involves some additional complications. For example, the current fertility of women aged 20-24 does not really refer to ages 20-24 because it captures fertility during the past year when these women were, on average, half a year younger. Hence it is necessary to devise a mathematical adjustment to transform these data from the (19.5-24.5) to the (20-25)

interval. It may also be necessary to apply a correction to take account of the fact that the cumulative fertility of women aged 20-24 may actually refer to a period 2-4 years before the census, when (at least in a context of declining fertility) it was still slightly higher than at the date of the census. There is also a variant of the method which uses information on the duration of marriage instead of the age of the woman. In contexts where almost all births occur to married women, this method is considered more accurate. In situations where this is not the case, the date or age of the woman at the time of the first birth is sometimes used as a proxy. In any case, the number of censuses that ask for either of these data is relatively small.

While the P/F correction method based on the latest census is the most common technique used by demographers, there are other ways to analyse census fertility data, such as the comparison of average numbers of children ever born to women in different age groups in successive censuses. The Own Children Method is also a common method used with census data. It matches children to mothers at the household level and makes it possible to link the characteristics of mothers and fathers to those of their children. Although the method is labour-intensive, it results in more robust estimates. Interestingly, the Own Children Method, while mainly intended as an alternative fertility measurement method for developing countries, has sometimes been applied in developed countries because it allows analysis of characteristics of the mother (e.g. race or religion) that are not often included in data from civil registration systems. See United Nations (1983) for more details on fertility adjustments and Cho, Retherford and Choe (1986) for the Own Children Method.

76. A major advantage of census data is that they can provide precise estimates for relatively small geographic areas, which other data sources, such as fertility surveys, cannot. Even in countries with complete civil registration, some of the topics addressed in the census, such as the woman's religion, or job status provide valuable background data on her fertility history that are not available from registration data. This is particularly the case for some of the additional questions that censuses sometimes ask on fertility. Apart from the standard questions on children ever born alive and children currently surviving, these additional questions may include:

a. Date of birth of the last live-born child (instead of or in addition to the number of children born during the last 12 months);

b. Age of the mother at the time of birth of the last live-born child;

c. Date (year) or age of the mother at the time of birth of the first live-born child (e.g. Cape Verde, Colombia, Ecuador, Kazakhstan, Peru, Russia, South Africa and six countries in the Caribbean);[11]

d. Date or age of the woman at the time of first marriage (see Chapter 6).

Some censuses go even further and ask for the dates (or at least years) of birth of all children, as in the 2011 censuses

11 The 2011 census of Jamaica is among the few that ask for the age of the mother at the time of birth of both the first and the last-born child (that is, bith b and c).

of Hungary and Serbia.

77. The 2007 census of the Republic of Congo had an unusual format for the question on recent births in that it asked for births occurred during the past 12 months in the household and then linked the children to their mothers, rather than asking each individual woman for her live births during the past 12 months. This format may take away some of the embarrassment of having to ask this question to very young or single women, but it increases the risk that children will be attributed to the wrong mothers or that belong to mothers that currently do not reside in the household.

78. For estimating age-specific fertility rates and other fertility measures, data on "date of birth of last child born alive" are theoretically more accurate than information from questions on the number of births to a woman during the 12 months immediately preceding the census because the latter information may be affected by time reference errors. In practice, however, it has been established that these data too can be quite error-prone.

79. Some censuses ask whether the father and/or mother of each respondent is still alive and, if so, if he/she resides in the household, i.e.:

a. If the father/mother of the person is still alive (paternal/maternal orphanhood);
b. If the father/mother of the person resides in the

same household (e.g. Aruba, Barbados, Cape Verde, South Africa); and

c. If so, the identification of the person's father/mother.

While these questions are primarily intended for adult mortality analysis, through the so-called orphanhood method (see Chapter 4), they can also be useful in the study of fertility, in particular for the application of the Own Children Method. In addition, they can be useful for residential pattern analysis (see Chapter 7).

80. A limited number of countries (i.e. Bhutan, Cambodia, Samoa) also ask what kind of assistance the woman received during her last childbirth, which is quite useful, since the skill level of the birth attendant is an important indicator of the quality of care received. This information is usually only collected through fertility surveys and the number of countries that have it in their censuses is too small to develop specific methodologies for its analysis based on census data. The Bermudan census of 2010 and the Croatian and Hungarian censuses of 2011 are unusual in that they ask for the number of children ever born not only of women, but also of men. In addition, the Hungarian census asks for the dates of birth, not only of the last child, but of all children.

81. Measuring the fertility of men ideally requires good vital statistics that register not only data on the mother, but also on the father of the child, but few countries ask men about the children they have fathered. Some countries,

such as Norway and Sweden, collect and publish information in their administrative censuses on number of children for both men and women. Even in the case of Norway, which has vital registration data that address the issue, there is still a significant percentage (1.9-4.5 per cent in the period 2000-09) of cases in which no data on the father exist. In the case of developing countries (Bledsoe, Guyer and Lerner, 2000; Zhang, 2011), most of the work that has been done on male fertility is based on DHS data (e.g. Ezeh, Seroussi and Raggers, 1996; Schoumaker, 2013). It is possible to approximate male fertility with census data, but the results are less reliable and the methods for doing this are not well developed, particularly in the context of polygamous relationships (e.g. Blanc and Gage in Bledsoe, Guyer and Lerner, 2000).

82. The problems of measuring male fertility through the census are basically two:

a. It would require two additional questions for all men above age 15 (or 12), regarding 1) All children fathered during the man's life (as mentioned above, a few censuses actually do ask this, e.g. the 2010 census of Bermuda and the 2011 censuses of Croatia and Hungary, but it is not common); and 2) Idem during the past 12 months or some other recent period, or alternatively the date of birth of the last child.

b. Even in the case of women, the information on children ever born is often not reliably reported, especially in the case of children that died while still young or that do not live with the mother. In

the case of men, these problems are likely to be much more severe. Both men and women may want to hide children had with previous partners from their current spouses, but this problem is likely to be much more common in men, both because they are more likely to have had previous spouses and because the children born out of such relationships are less likely to live with them. In some cases, they may even be unaware of the existence of these children. However, Schoumaker (2013) suggests that, despite its potential sensitivity to the omission of children, reasonably accurate male fertility estimates may be obtained using the Own Children Method on DHS data, which alternatively could be done using census data.

Country Example 1: Male Fertility in Norway

Below are male and female age-specific fertility rates (per 1,000) in Norway (2009):

Ages	Women	Men
15-19	9.5	2.5
20-24	61.4	27.7
25-29	128.1	86.3
30-34	127.2	117.6
35-39	58.3	76.7
40-44	10.2	30.1
45-49	0.5	9.4
50-54	0.0	3.2

Source: Vital registration data from Statistics Norway

Inspecting the table above, the main difference between the fertility of men and women is that men have children at older ages than women. Even for women, fertility in Norway is already quite late (mean age of 30.0), but the fertility of men, on average, is almost three years later than that of women (mean age of 32.9). Moreover, whereas the fertility of women becomes negligible after age 45, some men still continue to have children in their fifties.

However, if male fertility rates are needed and none are available

through the civil registration system, a reasonable proxy can be obtained by shifting the female fertility curve up by a number of years. The difference between the Singulate Mean Ages at Marriage (SMAMs) of women and men may be a good initial value for this age shift, although it does not take account of successively larger age differences in later unions. A better approximation may be the mean age differences between women aged 15-39 and their spouses (if they live with a spouse). This procedure will not work well in contexts with a high incidence of polygamy.

Below are male and female age-specific fertility rates (per 1,000) based on the Own Children Method applied to the 2006 DHS of Niger where polygamy is an important issue and where male fertility is much higher and later than female fertility:

4. Tabulations

83. Differences in fertility levels and trends between two or more subgroups of the population are particularly useful for insights about gender issues. The differences may be between socioeconomic groups, geographical groups or the same group at two different points of time. Differences can be categorised as compositional differentials, spatial differentials or temporal differentials.

84. The *Principles and Recommendations* suggest three basic tabulations for fertility analysis:

Recommended tabulations for population censuses:

- Female population 10 years of age and over, by age and number of children ever born alive by sex;
- Female population 10 years of age and over, by age and number of children living (or dead) by sex;
- Female population … to 49 years of age, by age, number of live births, by sex within the 12 months preceding the census, and deaths among these live births, by sex.

The dots in recommended Tabulation 3 indicate an age which may vary among countries, generally 15 years or 12 years, sometimes 10 years. These tables can obviously only be generated in countries that have this information in their census (see the Text Box preceding Section 3).

85. The *Principles and Recommendations* also include the following additional tabulations for population censuses:

- Female population 10 years of age and over in their first marriage/union or married only once, by five-year duration of marriage/union group and number of children ever born alive by sex;
- Female population, by age at first birth, by current age and place of residence;
- Median age at first birth, by current age of women, place of residence and educational attainment;
- Mothers 10 years of age and over with at least one child under 15 years of age living in the same household, by age of mother and by sex and age of children;
- Female population … to 49 years of age, by age, number of live births by sex within the 12 months

preceding the census and educational attainment.

Of these, only the last two can be compiled in most censuses as the first three require information that relatively few censuses collect.

86. The table below, generated from the 2008 census of Cambodia, illustrates the cross-tabulation of fertility data by educational levels. Rather than using live births by sex within the 12 months preceding the census, the table shows the number of children ever born. The ideal procedure is to combine both (children ever born and children born during the past 12 months) to compute actual accumulated fertility rates, but because the number of children ever born is easier to understand, the table has been left in this format. What it shows is that in Cambodia fertility levels are fairly uniform for women with up to lower secondary education, but that fertility levels decline substantially as women complete their secondary education.

Table 3: Cambodia (2008)—Average numbers of children ever born classified by current age of the mother and highest level of education completed by the mother

Phnom Penh	Highest grade completed					
Age Group	No Education	Incomplete Primary	Complete Primary	Lower Secondary	Secondary/ Technical	Beyond Secondary
15 – 19	0.07	0.04	0.03	0.02	0.02	0.01
20 – 24	0.40	0.28	0.26	0.20	0.09	0.07
25 – 29	0.98	0.87	0.85	0.76	0.62	0.41
30 – 34	1.65	1.56	1.59	1.49	1.37	1.11
35 – 39	2.28	2.24	2.21	2.06	1.70	1.60
40 – 44	2.86	2.80	2.63	2.41	1.98	1.71
45 – 49	3.40	3.22	3.08	3.02	2.37	1.99
50 – 54	3.49	3.38	3.33	3.20	2.67	2.22
55 – 59	3.52	3.44	3.42	3.13	2.45	2.28
Rest of Country						
Age Group	No Education	Incomplete Primary	Complete Primary	Lower Secondary	Secondary/ Technical	Beyond Secondary
15 – 19	0.16	0.09	0.05	0.03	0.03	0.04
20 – 24	0.94	0.74	0.56	0.32	0.13	0.10
25 – 29	1.82	1.60	1.40	1.07	0.72	0.55
30 – 34	2.74	2.55	2.33	1.99	1.69	1.48
35 – 39	3.51	3.36	3.04	2.67	2.18	2.09
40 – 44	4.18	4.01	3.52	3.20	2.53	2.47
45 – 49	4.65	4.45	3.98	4.16	2.96	2.55
50 – 54	4.57	4.64	4.36	4.33	2.95	2.88
55 – 59	4.66	4.74	4.43	4.31	3.01	2.95

Source: Computed based on REDATAM data base, ECLAC/CELADE

87. Beyond the additional tabulations suggested by the Principles and Recommendations, there may be others of potential relevance for gender issues. In countries where a significant proportion of unions are informal, consensual or polygamous, it may be relevant to tabulate the basic

fertility data by type of union. Ideally, this information should be compiled by duration of the union, if available, rather than only by the woman's age. Consensual unions, of the kind that are common in Latin America, are usually associated with higher fertility than formal marriages (Henriques, 1979), even after controlling for other factors. Marital instability may play a role in increasing fertility rates as women feel the need to have at least one child with each new partner (Chen, Wishic and Scrimshaw, 1974). The latter, however, may be difficult to investigate using census data because the census generally does not provide any information on marital histories or even information on whether a woman has been married or in union before her present union.

88. Fertility levels vary by income in ways that are gender-specific. Paternal income tends to be positively associated with fertility, whereas maternal income is generally inversely correlated with income. This is generally due to the fact that poor women have more children, and because women who have more children are more challenged in terms of their participation in paid work. This analysis is also further complicated by the fact that education is a major factor that determines wages, and women with more education are likely to have fewer children for a number of reasons.

89. Given the social consequences of childlessness for women, it is recommended to prepare a table of women

by number of children (or, at a minimum, women with children or without children) by 5-year age groups and marital status. Apart from the fact that such a table may identify the women at risk of social ostracism, it may allow the detection of actual trends, such as the higher incidence of divorce among women without children. The latter must be interpreted with caution, however, because the relationship may also go the other way, as women who divorced at an early age have had less time to become mothers.

90. Polygynous unions generally have lower female fertility rates than monogamous unions, due to lower coital frequency, especially older spouses, but they tend to have higher male fertility rates (Anderton and Emigh, 1989; Garenne and Van de Walle, 1989; Lardoux and Van de Walle, 2002). There are, however, certain forces that work in the opposite direction and that may bring about different results in some cases. For example, polygyny may be associated with women's low status and inequality within marriage, which can be further exacerbated if there are large age differences, particularly between husbands and their second or third wives. One consequence of male dominance and unequal husband-wife interaction within a polygynous marriage is lower contraceptive use, mediated by the husband's disapproval of and lack of spousal communication about family planning (Hogan et al., 1999). It has also been observed that fertility may vary considerably between the first and later wives (Bean and

Mineau, 1986). In addition, mothers depend on their children in later years, while fathers can receive support from younger wives. The number of children ever born, cross-tabulated by age and marital status (monogamous vs. polygynous union) should show which way these differences end up going.

91. Traditionally, a significant proportion (40-60 per cent) of polygynous unions in the Arab countries involve widows and divorced women who find it difficult to remarry as a first wife and therefore accept the status of second wife (Chamie, 1986). Unfortunately, census data normally do not contain information about the marital status of women before their present union, so that this relationship cannot be investigated. What can be investigated is the percentage of polygynous unions by level of education of the husband. Less educated men are more likely to be in polygynous unions, but some caution is called for as the relationship is partly explained by age effects. Older men are more likely to be in polygynous unions and they are also more likely to have a lower level of education. This could be because the practice is declining or because older men can afford more wives. Polygyny may also be a solution to the problem of female fertility. Therefore, it is best to tabulate the relationship by age groups, to separate the age effect from the educational effect.

92. Early marriage creates the conditions for early pregnancy and higher fertility rates. In societies where

premarital childbearing is not socially and culturally accepted, a rising age at first marriage may play a crucial role in the transition from high to low fertility levels (Maitra, 2004). A study by UNICEF found that high levels of fertility were associated with the prevalence of child marriage in 50 countries (UNICEF, 2005). Women who had several children were significantly more likely to have been married before age 18 than women with no children. The relation between early marriage and fertility can be studied by cross-tabulating the age at first marriage, if available, with the number of children ever born, by age group or cohort. This will show the differences of fertility for women of the same age, or age group. In addition, the effect of early marriage on early pregnancy can be measured by tabulating the number of children ever born for young married women, by age.

Table 4.A: Cambodia (2008)—Average numbers of children ever born classified by current age of the mother and major religious groups

Phnom Penh	Religion			
Age Group	Buddhist	Islam	Christian	Other
20 – 29	0.47	0.70	0.46	0.40
30 – 39	1.85	2.55	1.55	0.93
40 – 49	2.86	4.14	2.28	1.50
50 – 59	3.30	4.54	2.70	2.76
Rest of Country				
Age Group	Buddhist	Islam	Christian	Other
20 – 29	1.10	1.18	1.10	1.88
30 – 39	2.88	3.24	2.99	4.22
40 – 49	4.19	4.81	4.21	4.81
50 – 59	4.58	5.01	4.76	4.21

Table 4.B: Cambodia (2008)—Average numbers of children ever born classified by current age of the mother and economic activity status

Phnom Penh	Economic Activity Status					
Age Group	Employed	Unemployed	Never worked / Student	Home maker	Retiree / Rent Holder	Other
20 – 29	0.42	0.44	0.20	1.15	0.49	1.01
30 – 39	1.69	1.60	1.56	2.31	1.32	1.85
40 – 49	2.70	3.02	2.53	3.23	2.32	2.78
50 – 59	3.14	2.84	3.33	3.59	3.09	3.16
Rest of Country						
Age Group	Employed	Unemployed	Never worked / Student	Home maker	Retiree / Rent Holder	Other
20 – 29	1.12	1.13	0.24	1.42	0.44	1.27
30 – 39	2.94	2.93	2.25	3.02	1.51	2.29
40 – 49	4.21	4.20	3.70	4.26	2.49	3.19
50 – 59	4.63	4.67	4.24	4.66	3.29	3.73

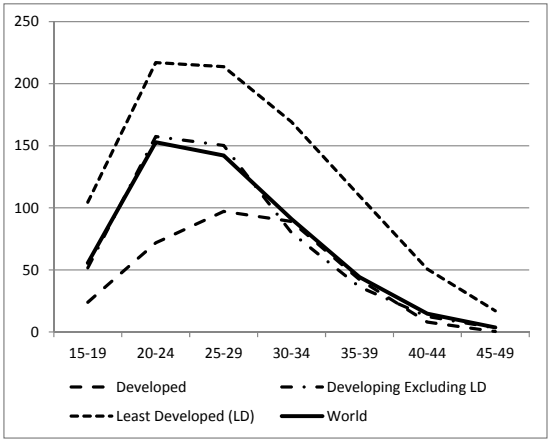
Source: Computed based on REDATAM data base, ECLAC/CELADE

93. Another tabulation of potential interest is the association between religion (when available) and fertility. Segments of all religions promote pronatalist ideologies, which may contribute to higher fertility among some religious communities. Census data only provide a crude proxy of religiosity, since in most countries this term is used to distinguish communities, rather than measure individual beliefs, but an analysis of fertility and religion may help in identifying whether religion is a variable worth exploring in more detail. One needs to be careful, however, when inserting religion simply as a dummy variable as it is often not a measure of piety or practice and it may often be a proxy for class etc. if certain religious groups face discrimination. For an example of this, see Section 6 of this chapter.

94. The data for Cambodia, for example, indicate that while in rural areas fertility rates are quite similar across religious communities, in urban areas Muslims have higher fertility outcomes. This then raises questions about whether religion itself is shaping this outcome, or whether this outcomes results from a lack of family planning services being available in Muslim communities or alternatiely, whether Muslims have more recently migrated to urban areas. Verifying whether religious affiliation is associated with fertility rates and family size helps to understand cultural values with respect to gender, moral communities and social constraints toward women's reproductive rights. The precise influence of religion is subject

to a certain amount of controversy. Jejeebhoy (1995) has collected a lot of evidence that shows a negative relationship between the autonomy of women and fertility levels. Obermeyer (1992), on the other hand, does not accept the notion that Muslim women have less autonomy than women of other religions in similar contexts or that, due to this lesser autonomy, they have higher fertility. Religion is sometimes used as an explanatory variable for contraceptive use (e.g. Addai, 1999 in Ghana; Adsera, 2006 in Spain), but because the census does not contain any information on contraceptive use, such studies are limited to data from the DHS or other types of fertility surveys and cannot be replicated with census data.

Figure 2: Age-specific fertility rates (2011)



Source: United Nations, World Population Prospects, 2010 Revision

5. Indicators

95. There is no shortage of fertility indicators and a basic understanding of their meaning is important for gender analysis. Some common indicators are discussed first and then specific indicators that may be more useful for gender analysis. Most of the indicators discussed here do not follow directly from the tabulations discussed earlier and need some further computations.

96. **Age-Specific Fertility Rates:** The Age-Specific Fertility Rate (ASFR) is the number of births to women of a given age group per 1,000 women in that age group:

$$ASFR(x,x+n) = \frac{Births\ during\ the\ year\ to\ women\ aged\ (x,x+n)}{Women\ aged\ (x,x+n)\ at\ mid-year} \times 1000$$

One needs data on the total number of live-born children by current age of the mother, the numbers of children born during the past 12 months and some amount of model-based computations, as explained in the Text Box at the beginning of this sub-chapter. A graph of the ASFRs helps analyse the fertility pattern of a country compared to other countries or over time. For example, the following graph shows the ASFR in 2005-2010 globally, for the more developed countries and the least developed countries. It shows that the maximum of fertility is reached at aged 20-24 for the least developed countries, with 225 children per 1,000 women in that age group, but for the more developed countries the peak of

fertility is at 25-29 years, with 99 children per 1,000 women in that age group.

97. **Total Fertility Rate:** The Total Fertility Rate (TFR) summarizes the information given by the ASFRs. It is defined as the number of children that a woman would have over her childbearing years if, at each age, she experienced the current ASFRs. If the ASFRs are defined by single ages, it is simply the sum of all of them. If the ASFRs are defined by 5-year intervals, it is the sum of the ASFRs multiplied by 5. The TFR is a synthetic indicator (it uses women who live at this moment as members of a fictitious cohort), to compare the level of fertility over time, and among countries or within a country. In the period 1950–2010 the TFR in the world decreased from around 5 children per woman to around 2.5, with major regional differences. In Central America, Eastern Asia and Northern Africa, the TFR drastically declined (from 6.7 to 2.3, 5.6 to 1.6 and 6.9 to 2.8, respectively), whereas in some parts of Africa, especially Western and Middle Africa, the decline was relatively modest and the TFR remains above 5 children per woman. Part of the explanation is that contraceptive use in Africa was in 2007 considerably lower than elsewhere, with only 28 per cent of women of reproductive age who were married or in union using any method (United Nations, 2011 a).

98. The TFR is different from the life time fertility of a cohort, which represents the average number of children

of all the women born in a given year (who constitute a cohort) and having survived until the age of 50 at least. In theory, this figure can be directly estimated from census data from the question on number of children ever born alive. Of course, this indicator can be calculated only for generations having completed their reproductive life, that is to say women aged 50 or over. Yet older women often underestimate the number of children that they have had during their life time, as they tend to omit children that died while still very young. In the more developed countries, there has been a major divergence between TFRs and the life time fertility of women in recent decades as younger women, who were increasingly active in the labour market, postponed childbearing until they were in their thirties. The short term effect of this was to depress the fertility of younger women, while the higher fertility of women in their thirties was to materialize only later. Consequently, Europe passed through a period of extremely low TFRs in the 1990s, even though the life time fertility of women later turned out to have changed much less.

99. **General Fertility Rate:** Closely related to the Total Fertility Rate is the General Fertility Rate (GFR). But unlike the TFR, which is an index, rather than an actual rate, the GFR is a true rate, defined as the number of births that occur during a year, divided by the average number of women of reproductive age (15-49 years) during the year. In other words, it is the proportion of

women of reproductive age that will have a childbirth during a given year.

100. The **Parity Progression Ratio** at parity n is the proportion of women who already have n children who will go on to have n+1. It can also be refined, to reflect not only the number but also the composition of existing children (see Chapter 5). In practical terms, it is computed in the same way as the TFR, but limited to women who have had exactly n live-born children, regardless of whether they are currently alive or not. It is usually computed from DHS data. Computing it based on census data requires special care, due to the limitations of census data explained in Methodology Box 4. A reasonable approximation is to compute the ratio as described above, based on children born during the past 12 months, and then multiply the result by the same correction factor that was applied to obtain the corrected TFR from the apparent overall ASFRs (not specific by birth order) of the census. Alternatively, one may compute the percentage of women aged 45-49 years who have more than n children among those that have at least n. The disadvantage of the latter method is that it reflects the fertility experience of older women, which may not be entirely representative of current fertility. The following table from the 2000 census of Cape Verde was computed using this latter procedure.

Table 5: Cape Verde (2000) – Urban and rural parity progression ratios

Parity	Urban	Rural
0	0.947	0.955
1	0.925	0.964
2	0.904	0.953
3	0.874	0.939
4	0.847	0.908
5	0.810	0.865
6	0.758	0.825
7	0.694	0.770
8	0.648	0.701
9	0.648	0.642
10	0.566	0.546

Source: INE, Cape Verde

Given the way the computation was carried out, this means, for instance, that 70.1 per cent of the rural women in Cape Verde who had at least 8 children actually had more than 8, whereas 29.9 per cent had exactly 8.

101. **Adolescent Birth Rate:** The adolescent birth rate is the ASFR for women aged 15-19. Fertility levels among women in this age group are relevant to the status of women, since women who bear children early in life often forego the opportunity to study or find employment outside the home, in addition to consequences for health and human rights noted earlier. Maternal mortality increases steeply for progressively younger mothers under age 18. The proportion of school leavers among young mothers is also higher than among adolescents who do not have

children and are not pregnant, even though the direction of the cause-effect relationship in this case is not clear.

102. Because of its potential negative effect on the education and employment of young women, the adolescent birth rate is one of the indicators for the monitoring of Millennium Development Goal 5.B. It is also the only fertility-related indicator in the Minimum Set of Gender Indicators approved by the UN Statistical Commission in February of 2012 that can be computed from census data. In the more developed regions, the average adolescent birth rate in 2005-2010 was 24.0 births per 1,000 women aged 15-19. In developing countries the range of variation of the adolescent birth rate is considerably larger: from below 5 to over 200 births per 1,000 women aged 15-19. The highest rates are recorded in Niger (207.1), the Democratic Republic of the Congo (201.4), Mali (186.3), and Angola (171.1) (United Nations, 2011 b).[12]

103. As was mentioned in Chapter 2, an alternative indicator sometimes used for quantifying adolescent fertility is the proportion of all births that occur to adolescent women. Unless the purpose of this indicator is to plan services, to make them more adequate for the age profile of the typical client, this indicator is not recommended because it can convey seriously misleading impressions

12 Note, however, that the adolescent birth rates used for monitoring MDG 5.B are estimated independently and not based on the UN population projections.

with respect to the time trend of adolescent fertility.

104. The 2010 *Human Development Report* of UNDP uses the adolescent birth rate as one of the five indicators of the Gender Inequality Index (GII). One drawback is that no attempt was made to measure to what extent early fatherhood affects adolescent boys and what consequences this may have for their future. While it is known that adolescent fatherhood is less common than adolescent motherhood, as many of the fathers of these children are older than 20, omitting the information makes it impossible to draw meaningful comparisons with the situation of men. The GII, therefore, presents adolescent fertility as an exclusively female problem.

105. In agrarian societies, where children are valued for their labour, family continuity and as an insurance against the risks of old age, women are valued for their ability to bear children. Hence, a woman who is unable to bear children is stigmatised as being inadequate and having failed the husband's family and clan. Such women are very likely to end up in a polygamous union as the husband procures another wife who can bear children, or may end up divorced altogether. Either situation is not desirable for a woman, as it communicates her lower status in relation to a man's. In the 2008 census of Malawi, infertility was used to refer to women who had not had a child by the age of 45 years. In this census, infertility was observed to be on the decline, from the 4.1 per cent recorded in

1987 to 3.6 per cent recorded in 2008. A DHS study by Rutstein and Shah (2004) used a stricter criterion, limited to women aged 40-44 who had been married for at least five years. Consequently, they found a lower figure, of 1.6 per cent. It is recommended that census analyses should at least exclude women who are not currently married or in unions. In some African countries, such as Chad, the incidence of infertility, according to the DHS criterion, can be much higher (7.3 per cent). It can also be substantially higher among some specific ethnic groups.

106. **Percentage of women aged 40-44 or 45-49 who are childless**. As was indicated earlier, childlessness can carry a major social stigma in many developing countries. In other countries, childlessness may be an indicator of female independence, particularly if it is associated with a high incidence of women that remain single. Determining the incidence of this phenomenon with census data is relatively easy, but a limitation of the measure is that it refers to older women (age 40-44 or 45-49), who may no longer be representative of current trends.

107. **Time spent caring for dependent children**. One of the major implications of high fertility is that it ties one of the adult household members, usually the mother, to the home for many years, to care for dependent children. How many years of care each child needs depends on the circumstances of each country. In countries where education is universal and starts at the pre-school level, women

will often be able to take on responsibilities outside the home as soon as their children reach age 3. In other countries, where pre-school education is non-existent and primary school education deficient in its coverage, they may have to care for them full-time until the child is age 8 or 9. Apart from the number of children, the spacing between children matters. If fertility is concentrated in a relatively short age range, the time during which there are dependent children in the home is compressed. If fertility is spread out over a longer age range, women will spend most of their reproductive years caring for dependent children. Finally, time spent caring for children depends on infant and child mortality. Ronald Lee (2003) has estimated that in countries that have completed their demographic transition, women went from spending 70 per cent of their adult lives bearing and rearing children before the demographic transition, to spending only 14 per cent of it in more recent times.

108. A measure of the number of years spent caring for dependent children can be computed from census data. To this end, one needs to determine for each woman whether she has children of her own, below the typical age after which they are no longer considered predominantly dependent on the mother. One may assume, for example, that children going to school are no longer (completely) dependent on their mothers. In more complex households there may be problems in establishing

which children belong to each potential mother.[13] Once this has been established, one determines the proportion of women at each age who are caring for (their own) dependent children. Summing these proportions over all ages yields the mean number of years spent caring for dependent children. This assumes both that women are the ones caring for their dependent children and that they only care for their own children. One may refine the method by applying it not only to the mothers of children, but to all adult women in the household who do not work or study, assuming that adult males, even if they do not work or study, generally do not have a major role in this respect. Except for a few censuses (Australia, Republic of Korea) that ask questions about this topic, there is usually no way to avoid such assumptions.

109. The following data from the 2007 census of the Occupied Palestinian Territories provide some idea about the data needed to construct this indicator.

13 The same problem affects the Own Children Method for fertility estimation.

Table 6: Occupied Palestinian Territories (2007) – Ever married women by age group (15-59), number of children under age 15 in the household and presence of another woman, over age 60 in the household

	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59
No children < 15	8,617	13,267	6,928	4,255	3,848	6,561	11,757	17,987	21,328
Children < 15 and Women ≥ 60	273	2,193	4,190	4,953	4,486	3,473	2,016	841	205
No Women ≥ 60, 1 Child < 15	5,361	16,477	8,186	3.043	3,633	8,758	12,608	10,230	3,576
No Women ≥ 60, 2 Children < 15	1,834	19,438	17,102	7,079	8,181	12,947	11,365	5,323	670
No Women ≥ 60, 3+ Children < 15	215	15,339	55,867	73,377	59,582	38,139	14,387	3,149	318
Prop. with Child, no Women ≥ 60	.454	.768	0.880	0.901	0.895	0.856	0.736	0.498	0.175
Idem with 2+ Children	.126	.521	0.791	.868	.850	.731	.494	.226	.038

Source: PCBS, Special Tabulation of the 2007 Census

The last two lines of this table show the proportion of ever married women with at least 1 or at least 2 children under age 15 to care for who cannot count with the help of a co-resident woman (mother or mother-in-law) over the age of 60. Summing these proportions and multiplying by 5, one obtains the total numbers of years between the ages of 15 and 60 during which ever-married women have to care for at least 1 (30.8 years) or at least 2 (23.2 years) children under age 15, without the help of a co-resident woman over the age of 60. Of course, the indicators, constructed in this manner, have some arbitrary elements. In most cases one would want to use a lower cut-off age (maybe 6 or 7, instead of 15) and instead of limiting the potential helpers to women over age 60, one might also consider other categories.

110. Apart from the Adolescent Fertility Rate, the Minimum Set of Gender Indicators approved by the UN Statistical Commission in February of 2012 contains three other fertility-related indicators. However, none of these can be computed from census data:

- Contraceptive prevalence among women who are married or in a union, aged 15-49;
- Ante-natal care coverage; and
- Proportion of births attended by a skilled health professional.

6. Multivariate and further gender analyses

111. Caveats for fertility correlates of geographical/subnational units. If subnational estimates are available for basic gender data, such as various gender inequality measures, these can be correlated with fertility levels to show the relationship between gender inequality and fertility. Fertility can also be related to the percentage of female-headed households or women that participate in the labour force, at the level of different geographical units. This is not fundamentally different from some of the tabulations shown in the previous section, except that the objective is not only to show the difference between population groups but to propose some sort of systematic quantitative relationship between the characteristics of those groups (e.g. that groups that exhibit greater gender

inequality tend to have higher fertility). There are, however, some caveats with respect to correlating different indicators across population groups:

a. Care must be taken to avoid using gender inequality measures which already contain fertility as one of their components, which would result in a tautological relationship. For this reason, the Gender Inequality Index of the 2010 Human Development Report is not recommended, as it is already partly based on the Adolescent Birth Rate. In the example below, two other indicators from the same report have been used, namely the female/male ratio of population with at least secondary education and the female/male ratio of shares in Parliament, both applied to countries, rather than subnational population groups. Note that the indicator of shares in Parliament may not be applicable to subnational analyses; it is included only for illustrative purposes.

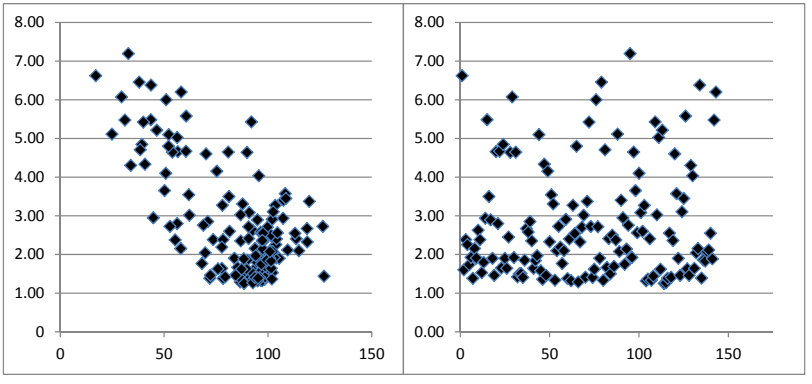
b. The choice of the particular gender indicator is important. In the example shown in Figure 3, the female/male education ratio shows a moderately strong negative relationship with the Total Fertility Rate across 143 countries (r = -0.69). The female/male ratio of Parliamentary representation has a very weak relationship with the Total Fertility Rate (r = -0.11).

c. One has to be alert to the possibility that the relationship found may be due to the fact that both indicators are perhaps determined by a third one, rather than being the result of any direct causal relationship between them. This issue will be taken up in the next sections.

112. In examining gender issues, the researcher begins

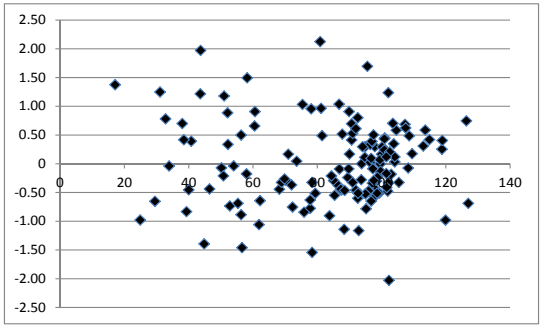
with univariate and bivariate analyses to define a potential issue or problem as it may relate to a patterned relationship across women and men, girls and boys. Then, multivariate data analysis can be useful to differentiate correlations with causations, and to pinpoint what specific variable or variables may be the causes for a differential status or level of opportunity by sex. The primer box on multivariate analysis provided in Box 1 within chapter 2 of part 1 of this manual, entitled Multivariate Analysis to Disentangle Intra-Group Variability and Interrelationships, may be useful to review prior to considering the following cases.

Figure 3: Scatter plot of the Total Fertility Rate as a function of the female/male ratio of the population with at least secondary education (x100)



Sources: UNDP Human Development Report 2010 and UN Population Division World Population Prospects, 2010 Revision

Figure 4: Scatter plot of the Total Fertility Rate as a function of the female/male ratio (x100) of population with at least secondary education after removing the joint association with the HDI



Sources: UNDP Human Development Report 2010 and UN Population Division World Population Prospects, 2010 Revision

113. Bivariate analyses of statistical relationships can be misleading if they are interpreted to show a causal relationship. This is illustrated by the example above of the correlation between the female/male ratio of population with at least secondary education and the Total Fertility Rate. Although this relationship is moderately strong (r = -0.69), it is weaker than the correlation of the overall Human Development Index (HDI) with the Total Fertility Rate (-0.84). The correlation of the HDI with the female/male education ratio is not quite as strong (0.72), but nevertheless considerable. This begs the question whether the moderately strong relationship between the first two variables is not simply due to the fact that

both are reflections of the general level of development of the country, as measured by the HDI, rather than to a specific relationship between the two of them. This indeed turns out to be the case. To show this, the TFR was estimated as a quadratic function of the HDI. The residuals of this HDI-based TFR with respect to the actual TFR were then plotted as a function of the female/male education ratio. The results in the graph below show that, once the association of the TFR with the HDI is removed, the residuals display an almost completely random pattern ($r = -0.04$). This does not mean that the basic idea that greater gender inequality is associated with higher fertility is incorrect; it just means that the association cannot be statistically demonstrated in this manner.

114. Another illustration of the importance of using multivariate analysis, rather than simple cross-tabulations, for drawing conclusions on causal links is a study by McKinnon, Potter and Garrard-Burnett (2008) on differentials in fertility and family formation among adolescents in Rio de Janeiro. At first sight, the data from the 2000 census used in this study conveyed the impression that adolescent fertility among young women without religious affiliation was more than twice that of Catholics and that Pentecostal Protestants also had higher adolescent fertility rates than Catholics. However, interpreting this finding as an indication of different religious dispositions towards adolescent fertility would be quite misleading. As it turned out, Pentecostal Protestants also

have higher rates of having lived with a spouse or partner, have proportionally more non-white members and reside in areas with lower overall mean household incomes. Therefore, the researchers used a regression model in which the probability of giving birth was a function of ever having lived with a partner, migrant status, educational level, age, race, religious composition, mean income and other indicators to characterize the relative prosperity level of the place of residence. Once all of these explanatory factors were considered, Pentecostal Protestants actually had a 23 per cent lower adolescent fertility than Catholics with similar socioeconomic characteristics. Young women without religious affiliation continued to have a higher fertility than Catholics, even with these controls, but the difference fell considerably, from more than double to only 29 per cent.

115. In the 2001 census of Nepal, 43.5 per cent of divorced women aged 15-49 had never had children. A likely explanation of this high percentage is that childless women had a higher than normal probability of being divorced by their husbands. However, it is also possible that it is the result of the fact that many divorces occur at an early age, before the woman has had an opportunity to bear a first child. To get some idea about the likelihood of either explanation, the following approximate procedure, illustrated with data from the 2007 census of the Occupied Palestinian Territories, computes the percentage of childless women by age and marital status as

observed in the census, but also based on the hypothesis that divorced or separated women stopped having children after their divorce or separation. To this end, the analysis is limited to women who are currently married, divorced or separated, i.e. excluding single women and widows.

Table 7: Occupied Palestinian Territories (2007) – Observed and expected number of divorced or separated women who are childless, by age groups

	Percentage Divorced or Separated	Percentage Childless		
		Married	Divorced or Separated	
			Observed	Expected
15-19	0.93	55.26	68.00	55.26
20-24	1.39	21.39	51.84	49.59
25-29	1.61	7.68	42.87	44.83
30-34	1.87	4.05	35.82	39.55
35-39	1.99	3.37	31.73	37.38
40-44	2.35	3.76	29.19	32.16
45-49	2.79	4.00	23.68	27.65
50-54	3.30	3.97	21.90	24.02
55-59	4.34	3.75	21.66	19.20
60-64	5.02	3.66	19.41	17.09
65+	6.33	2.67	15.70	

Source: PCBS, Special Tabulation of the 2007 Census

116. To illustrate how the percentages in the last column are computed, consider all numbers in the table as reflecting the life experience of a cohort. Of the women aged 30-34, 1.87 per cent are divorced or separated. Assuming that divorced or separated women do not remarry, this percentage is the result of (0.93+1.39)/2 = 1.16 percent of women who divorced or separated before age 20, (1.61-0.93)/2 = 0.34 per cent who divorced or separated

between the ages of 20 and 25, (1.87-1.39)/2 = 0.24 per cent who divorced or separated between the ages of 25 and 30, and 0.13 per cent who divorced or separated between the ages of 30 and 35. Therefore, the expected number of chilless women is

(1.16 * 55.26 + 0.34 * 21.39 + 0.24 * 7.68 + 0.13 * 4.05) / 1.87 = 39.55

Most of the expected percentages are higher than the observed ones, suggesting that the childlessness was a result of the divorce or separation, rather than the other way around. The only possible exception are divorced or separated women over age 50, where childlessness is more common than would be expected based on the hypothesis of independence.

117. Finally, one can return to the initial observation of the previous paragraph and compute the percentage of divorced or separated women who are childless. In the case of women aged 15-49, adding the number of divorced or separated women by age group (which is not listed in the table above), this comes out to

Observed: (241 * 68.00 + 1174 * 51.84 + 1611 * 42.87 + 1723 * 35.82 + 1521 * 31.73 + 1551 * 29.19 + 1349 ^ 23.68) / 9170 = 36.4 per cent

Expected: (241 * 55.26 + 1174 * 49.59 + 1611 * 44.83 + 1723 * 39.55 + 1521 * 37.38 + 1551 * 32.16 +

1349 ^ 27.65) / 9170 = 38.8 per cent

This confirms the same pattern. Although the percentage of divorced or separated women who are childless is high (36.4 per cent, compared to 10.6 for all women aged 15-49), it is in line (even slightly lower) with what one would expect based on the idea that divorced or separated women have a high probability of having done so before they had had enough time to bear children.

118. Note that the procedure is not entirely conclusive in proving that the high percentage of childless divorcees is due to the discrimination of childless women. There are at least three other factors that need to be considered in this context:

1. The computation of the age-specific divorce rates is based on cross-sectional observations and does not reflect the life experiences of true cohorts, which may bias the results.
2. The higher childlessness of divorced women may not reflect discrimination against the woman because of her childlessness but the fact that many of these marriages were unhappy ones in which intercourse rarely took place.
3. The procedure also assumes that childbearing is terminated after a divorce, which may not be entirely justified in societies where informal unions are common.

119. Other gender-relevant contextual factors that have been related to fertility include the household structure.

Moultrie and Timaeus (2001), for example, studied how the household composition influences the fertility of women of twenty years or older in South Africa. For these women, they hypothesised that living arrangements mediate between their socio-economic and cultural characteristics and the number of children that they have borne. The focus was on whether women lived with a husband, or with relatives of their parents' generation, or with relatives of their own generation. Living with relatives from the previous generation was found to have a negligible net impact on the lifetime fertility of mothers. However, women who lived with relatives from their own generation had borne about 20 per cent fewer children than other women of the same age after controlling for the impact of household income, the woman's schooling, regional differentials and urban-rural residence. Unmarried and separated mothers had about 20 per cent fewer children than married mothers of the same age.

7. Interpretation, policy and advocacy

120. Two types of data that can almost never be obtained from censuses are the contraceptive prevalence rate and data on fertility preferences. Both of these require specialized interviewer training that can be provided in fertility surveys, but that would be too cumbersome for

a census.[14] Yet both the contraceptive prevalence rate and fertility preferences can have major gender implications. "The ability of women to control their own fertility is absolutely fundamental to women's empowerment and equality. When a woman can plan her family, she can plan the rest of her life. When she is healthy, she can be more productive. And when her reproductive rights—including the right to decide the number, timing and spacing of her children, and to make decisions regarding reproduction free of discrimination, coercion and violence—are promoted and protected, she has freedom to participate more fully and equally in society." (UNFPA web page on Gender Equality).

121. Conflicting preferences between husbands and wives can affect aggregate fertility outcomes (Voas, 2003). Note the following table that compares the desired family sizes of men and women in DHS surveys in different parts of the world:

14 In the 2010 census round, however, two censuses have asked a question how many additional children women intended to have, namely Republic of Korea (2005) and Kazakhstan (2009).

Table 8: Mean ideal family sizes for men and women in the DHS

	Women	Men		Women	Men
Armenia (2005)	2.7	3.1	Lesotho (2004)	3.5	4.1
Azerbaijan (2006)	2.6	3.0	Liberia (2007)	5.4	6.3
Bangladesh (1996-97)	2.5	2.4	Malawi (2004)	4.3	4.3
Benin (2006)	5.2	6.9	Mali (2006)	6.4	8.4
Bolivia (2008)	2.6	3.0	Namibia (2006-07)	3.7	4.7
Burkina Faso (2003)	5.8	7.0	Niger (2006)	9.1	12.6
Chad (2004)	9.2	13.7	Nigeria (2008)	6.7	8.8
Republic of Congo (2005)	5.4	5.9	Philippines (2003)	3.2	3.8
Dem. Rep. of Congo (2007)	6.8	8.2	Rwanda (2005)	4.5	4.2
Ethiopia (2005)	5.1	6.4	Senegal (2005)	5.7	8.3
Ghana (2008)	4.6	5.3	Sierra Leone (2008)	5.3	6.8
Guinea (2005)	5.9	8.8	Swaziland (2006-07)	2.7	3.6
Haiti (2005-06)	3.2	3.3	Tanzania (2004-05)	5.4	5.9
Indonesia (2007)	2.8	3.0	Ukraine (2007)	2.0	2.1
Kenya (2008-09)	5.5	4.6	Zambia (2007)	5.1	5.7

Source: DHS Statcompiler

122. The large differences found in some countries, particularly in Subsaharan Africa, may be one of the reasons why fertility in these countries remains high, although the table above indicates that women themselves in Sub-Saharan Africa also have high fertility preferences. Having little property right and being treated essentially as a form of property to be exchanged for material goods between families, women in the polygamic system of sub-Saharan countries are especially vulnerable when they become spouseless or childless. Without the right to inherit the property of her husband, a wife in this system is motivated to maintain high fertility, hoping that at least one of the surviving children is a son on whose inherited field she can continue farming after her husband's death (Boserup, 1970).

123. On the other hand, fertility preferences in some developed countries are significantly higher than actual fertility levels and the literature suggests that gender factors may play an important role in the explanation of these disparities (Sobotka, Goldstein & Jasilionine, 2009). Note also that in some countries (Bangladesh, Haiti, Indonesia, Malawi, Peru, Rwanda, Turkey, Ukraine) the differences are negligible or even reversed. Depending on the particular application of these data, it may be possible to construct proxies that work reasonably well for certain purposes. This is particularly the case if the objective is to combine information on fertility preferences from a DHS with other kinds of information that are only available or can only be disaggregated at the desired level by using census data. For some further explanation of how this may be done, see section 6.

124. In order to ensure that "all couples and individuals have the basic right to decide freely and responsibly the number and spacing of their children and to have the information, education and means to do so" (ICPD, principle 8), two main advocacy strategies have been found to be successful:

a. Tackling unwanted early pregnancy by providing reproductive health information and youth-friendly services to young people;
b. Investing in girls' education and empowerment more generally, in order to benefit the young women themselves, their future families, their

communities, and their countries. Both strategies can lead to informed reproductive decision-making and delayed childbearing.

125. Using census data in the areas of education and fertility, advocacy material may be able to show educational disparities in who has children at young ages, thus making the case for investments into girls' education on demographic grounds. Using census and DHS data on women's exposure to pregnancy and child birth health risks, contrasted with information on government funding for reproductive health care, advocates can lobby Ministries of Health and other government decision-makers to change their budgeting decisions to improve women's health.

CHAPTER 4:

Mortality

1. What is it?

126. Mortality is the one major demographic variable in which men are almost universally at a disadvantage compared to women. The one major exception to this is the Indian sub-continent (specifically, India, Bangladesh and Nepal) where, prior to the 1990s, the life expectancy at birth of males exceeded that of females. Up to this day, the male-female life expectancy difference in this part of the world, although now favourable to women, is still relatively small by world standards. The opposite situation exists in the countries that make up the former Soviet Union, some of which (e.g. Belarus, Russia and Ukraine) have life expectancy gaps of more than 10 years between men and women.

127. **Life expectancy** (at birth) refers to the number of years that an average person can expect to live, provided that at each age he or she is exposed to the current age specific mortality rates for that age. For the world as a whole, it is currently about 72.3 years for women and 67.8 years for men. The **Age-Specific Mortality Rate** or **Age-Specific Death Rate**, in turn, is the number of

person of a given age that die during a year, divided by the average population of that age during the year. The most significant age-specific mortality rate is the **Infant Mortality Rate**, which differes from other age-specific mortality rates in that it uses the number of births, rather than the average population under age 1, as its denominator. For the world as a whole, its present value is 38.6 (per 1,000 births) for boys and 34.8 for girls. The **Under-5 Probability of Death** (sometimes erroneously called the Under-5 Mortality Rate) is analogous to the infant mortality rate, but measures the probability that a child will die between birth and age 5. The **Crude Death Rate**, finally, is the total number of deaths divided by the average population during the year, regardless of age. It is basically a measure of how much populations diminish as a result of mortality, but it is not a good measure of risk as it is greatly affected by the age structure of the population. Finally, mortality can be analysed by cause. The most common cause-specific mortality measures are analogous to the crude or age-specific death rates, but limited to a specific cause. Because of the smaller numbers, they are generally expressed as fractions of 100,000, rather than 1,000.

128. **Maternal mortality** refers to the phenomenon of deaths caused by pregnancy-related factors. It is typically measured by three indicators:

The Maternal Mortality Ratio—the number of women

who die while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes, per 100,000 live births.[15] This is the indicator used with MDG goal 5B.

The Maternal Mortality Rate – this indicator uses the same numerator, but measures it per 1,000 women of reproductive age in the population. One important implication of this definition is that this indicator is sensitive to the level of fertility in the population, unlike the MMRatio.

129. Less commonly used is a third indicator called Lifetime Risk of Maternal Mortality. This indicator refers to the probability of maternal death, conditional on survival to age 15 years (Wilmoth, 2009).

15 definition adapted from WHO website: http://www.who.int/healthinfo/statistics/indmaternalmortality/en/index.html

Maternal Mortality Rates and Ratios

There is widespread confusion about the difference between the Maternal Mortality Ratio and the Maternal Mortality Rate, and often these terms are used interchange-ably.

In terms of statistical practice, a ratio is a division of things that have the same unit of measurement: for instance, the sex ratio divides the number of men by the number of women. A rate, on the other hand, measures the relationship of two things that have different units of measurement: for instance, the Infant Mortality Rate measures the relationship between number of infant deaths and numbers of births. According to this convention, the Maternal Mortality Ratio is actually a rate. Nevertheless, it is called a ratio to distinguish it from the existing concept of Maternal Mortality Rate, as defined above.

130. Although the best and most detailed mortality information depends on civil registration data, censuses can measure mortality in a number of ways. The most common census questions are part of the same cluster that is used to measure fertility (see the previous chapter). It consists in asking women between the ages of 15 (sometimes 12) and 50 about: 1) Their number of Children Ever Born alive (CEB); 2) Children born during the past 12 months before the census; and 3) Survival of children ever born and/or children born in the past 12 months. Combining the information from 1) and 3)—and more rarely 2) -, it is possible to derive estimates of

infant and child mortality by using indirect estimation techniques (United Nations, 1983; Moultrie et al., 2013). Some censuses also ask for the survival of the last birth or the children born during the past 12 months, in addition to the survival of all Children Ever Born. Other common census questions regarding mortality include orphanhood questions, questions about members of the household that died in the recent past and questions about the survival of the sisters of adult household members, to measure maternal mortality.

2. Why is it important ?

131. Apart from aggregate differences between the mortality of men and women, there are also major differences in the structure of mortality by cause. To do this requires death registration data which are not available from censuses, but it may be worthwhile to show where the major differences are found. Table 9, which is based on global WHO estimates for 2002, summarizes the causes of death in which female death rates (per 100,000 population, not standardized by age) were at least 20 per cent higher than male death rates or, conversely, in which male death rates exceeded female death rates by at least 20 per cent.

132. The most important causes in which women face a disadvantage are those that, by definition, are exclusive (or almost exclusive) to women: maternal mortality (16.5 per 100,000 in 2002), breast cancer (15.3), cervical

cancer (7.7), ovarian cancer (4.4) and uterine cancer (2.3). Because women live longer, they are also more prone to develop diabetes (17.7, compared to 14.1 per 100,000 in men), and Alzheimer's disease and other dementias (8.1, compared to 4.7 per 100,000 in men). Maybe less obviously, because women spend more time at home, in constructions that are often unsafe, they are at greater risk to die in fires (6.2, compared to 3.8 per 100,000 in men). Finally, women have higher mortality due to some nutritional deficiencies, especially iron deficiency anemia, and also endocrine/nutritional disorders, rheumatic heart disease, musculoskeletal diseases, and skin diseases.

133. Men, on the other hand, have considerably higher mortality rates due to most cancers, especially lung cancer, stomach cancer, liver cancer and – of course – prostate cancer. Together, these types of cancer are associated with a male death rate of 67.3, compared to a female death rate of 28.1 per 100,000. In addition, men are much more likely to die of most types of injury, both intentional and non-intentional. Road traffic accidents, falls, drowning and poisoning jointly represent a male death rate of 50.9, compared to a female rate of 23.3 per 100,000. The male suicide rate in 2002 was estimated at 17.4 per 100,000, compared to 10.6 for women. Acts of war and violence resulted in 19.2 male, compared to 4.2 female deaths per 100,000. Finally, male death rates are significantly higher in the case of tuberculosis (32.9, compared to 17.3 per 100,000 in women), alcohol-induced conditions and drug

abuse, perinatal conditions, hepatitis B and C and some tropical diseases (not including malaria).

Table 9: Estimated global male and female death rates (per 100,000) by cause of death in 2002

Female disadvantage		Male
–	Diabetes mellitus	14.1
–	Maternal conditions	0
J	Nutritional deficiencies	6.9
J.2	Iron deficiency anemia	1.5
C.5	Breast cancer	0.1
H.1	Alzheimer's disease and other dementias	4.7
A.5	Rheumatic heart disease	4.4
E.5	Fires	3.8
–	Endocrine/nutritional disorders	3.4
C.11	Cervical cancer	0
C.14	Ovarian cancer	0
–	Musculoskeletal diseases	1.2
C.15	Uterine cancer	0
–	Skin diseases	0.8
Male disadvantage		
C	Malignant neoplasms (cancers)	126.9
C.1	Lung cancers	28.4
C.2	Stomach cancer	16.7
C.4	Liver cancer	13.6
C.6	Esophageal cancer	9.1
C.8	Oral and oropharynx cancers	7.1
C.9	Prostate cancer	8.6
C.10	Leukemia	4.7
C.13	Bladder cancer	4.0
E	Unintentional injuries	73.7
E.1	Road traffic accidents	27.8
E.2	Falls	7.5
E.3	Drowning	8.4
E.4	Poisoning	7.2
–	Perinatal conditions	43.7
F	Digestive diseases	34.9
F.1	Cirrhosis of the liver	16.1
F.2	Peptic ulcer disease	5.0
G	Intentional injuries (Suicide, Violence, War, etc.)	37
G.1	Suicide	17.4
G.2	Violence	14.2
G.3	War	5.0
B.4	Tuberculosis	32.9
B.9	Tropical diseases excluding malaria	2.5
B.9.1	Leishmaniasis	1.0
B.9.2	Trypanosomiasis	1.0
H.2	Epilepsy	2.2
B.10	Hepatitis B	2.3
H.4	Alcohol use disorders	2.5
H.5	Drug use disorders	2.2
B.11	Hepatitis C	1.1
I.2	Benign prostatic hyperplasia	1.0

Source: WHO (2004): Annex Table 2

134. Out of all of the differences that stand out from the previous listing, two have been of special concern: violence and accidents, as a major cause of male over-mortality, and maternal mortality as a cause of mortality that is specific to women. Worldwide, intentional injuries make about 750,000 more male than female victims annually; the difference with respect to unintentional injuries (accidents) is 1.2 million. Male disadvantage with respect to violent deaths is particularly evident in the countries of the former Soviet Union and in much of Latin America. Gavrilova et al. (2000) comment, for instance, on the overall rise of mortality that took place in Russia between 1991 and 1994 as a result of the tumultuous transition from a socialist to a market economy and the devastating effect that this had on male mortality rates from violent causes. Female mortality from these causes also increased, but to a lesser extent, thereby exacerbating a male-female difference which was already among the largest in the world at the time. In particular, male suicide rates increased from 47.7 in 1991 to 76.9 per 100,000 in 1994, as the corresponding female rates increased from 11.2 to 13.6. What this suggests is that men were more psychologically affected by the uncertainties surrounding the economic transition than women. Similarly, deaths due to alcohol poisoning—always a problem in the former Soviet Union (see Simpura et al., 1998, for an account on the Baltic states)—multiplied, from 19.4 to 61.2 per thousand, in the case of men, and from 4.2 to 15.8 in the case of women, whereas male homicide rates increased

from 25.1 to 52.8 per thousand, as female rates went up from 6.9 to 13.6.

135. Male over-mortality from violent causes, particularly homicides, has also been a major issues in some Latin American countries, such as Brazil. In 2007, there were 45,554 registered homicides in Brazil, 92.1 per cent of which were of male victims, especially men between the ages of 15 and 40 (Isfeld, 2010). In some more developed countries (Croatia, Germany, Hungary, Japan, Republic of Korea, Slovenia, Switzerland), on the other hand, the number of male and female victims is roughly equal. There is a moderately strong positive relationship between the level of the overall homicide rate in a country and the percentage of victims that are male. In those countries in which data exist, there is also evidence that the majority (about 90 per cent globally) of perpetrators of homicides are males (UNODC, 2011: Fig. 5.12). Homicides in which both the victim and the perpetrator are female are quite rare, e.g. 2.6 per cent in the US (UNODC, 2011: 72). Whereas men are likelier to be killed in a public place, female victims are murdered mainly at home, as is the case in Europe, where half of all female victims were killed by a family member. The overwhelming majority of victims of violence committed by partners and family members are women. In Europe, for example, women accounted for almost 80 per cent of the total number of persons killed by a current or former partner in 2008. There is a general sense in the literature

that the gender determinants of violent cause of death are under-studied and that they are too easily attributed to the innate aggressiveness of males. However, advancing in this area based on census data is difficult due to the fact that censuses provide no or only minimal cause-specific mortality data.

Table 10: Strength and significance of trends calculated using polynomial regression analysis for all variables in the study

Variables	Number of observations with all variable data	R-squared value	P
Infant mortality rate	1	77.0	0.002
Total fertility rate	1	65.4	0.424
Female literacy rate	1	48.6	0.039
Combined enrollment ratio	1	48.0	0.004
Year of suffrage	1	18.1	0.574
Seats in parliament held by women	1	2.0	0.750
Female professional and technical	6	16.5	0.111
Ratio of estimated female to male	6	7.6	0.075
Female economic activity	1	4.6	0.634
Human development index	1	81.2	0.000
Gender-related development index	1	82.9	0.000
Gender empowerment measure	6	25.0	0.187

Source: McAlister and Baskett (2006)

136. Studying maternal mortality based on census data, while not ideal, is more viable. Globally, an estimated 287,000 maternal deaths occurred in 2010 (WHO/UNICEF/UNFPA/World Bank, 2012). Although maternal mortality is only the 20th most common cause of death for women of all ages worldwide, it is the most important cause of death for women of reproductive age (usually taken as the age range 15-49) in many developing

countries. In addition, like violent causes of death, it is eminently amenable to prevention. Maternal mortality by itself is not considered a gender indicator. That does not mean that it has no linkages with gender, but rather that it is an outcome to which gender factors contribute.[16] One publication on UNFPA's website states: "Preventable maternal mortality occurs where there is a failure to give effect to the rights of women to health, equality and non-discrimination. Preventable maternal mortality also often represents a violation of a woman's right to life" (Hunt and Bueno de Mesquita, 2007). Yet, there is little empirical evidence on the extent to which gender factors contribute to maternal mortality. A detailed discussion on this subject is beyond the scope of this manual, but one set of results may serve to illustrate the nature of the relationships.

137. The element to note in the above table is the relatively poor performance of "pure" gender indicators as predictors of maternal mortality, as compared to indicators that reflect overall level of development. Of particular note is the finding that the Human Development Index scores very high, with an R2 of 81.2, and that this improves to 82.9 with the Gender-related Development Index. Thus, gender is shown to be a dimension of maternal mortality, but not the principal one.

16 It is quite easy to show a strong correlation between maternal mortality and selected gender indicators but this does not imply a causal relationship, as both are correlated with the overall level of development.

138. A different perspective, but resulting in similar conclusions, is provided by the "Three Delays" model. This model proposes that pregnancy-related mortality is overwhelmingly due to delays in:

1. Deciding to seek appropriate medical help for an obstetric emergency;
2. Reaching an appropriate obstetric facility; and
3. Receiving adequate care when a facility is reached.

Out of these three delays, it is mainly the first one where gender plays an important role, the other two are more dominated by factors of general development (transport issues) and development of the health care system (quality and availability of obstetric care).

139. In a number of reports produced by WHO, the follow-ing trends are shown:

- Overall rates of mental illness are similar for men and women. There is no significant gender difference in rates of schizophrenia and bipolar depression. Women are more likely to suffer from unipolar depression, anxiety, eating disorders, and post-traumatic stress disorder. Men are more likely to suffer from alcoholism and antisocial personality disorder, as well as developmental psychiatric disorders such as autism spectrum disorders and Tourette syndrome.
- Women are more likely to suffer from depression, biologically explained by the serotonin levels of men being 52 per cent higher than women.

- While men are more likely to suffer from alcoholism, women are more prone to addiction. This is because estrogen boosts the release of dopamine in brain regions important for regulating drug-seeking behavior, making women more vulnerable to dependence.
- Schizophrenia does not show prevalence differences of significance among sexes, but there is a difference in the brain structures related. Women naturally have a higher orbitofrontal-to-amygdala ratio (OAR) than men, but not schizophrenic women (lower OAR), which makes sense. Men with schizophrenia however, have a higher orbitofrontal-to-amygdala ratio than that of healthy men, which does not make sense, but is a difference found in the human brain nonetheless.
- Before menopause, women are less likely to suffer from cardiovascular disease. However, after age 60, the risk for both men and women is the same.
- Overall, men are more likely to suffer from cancer, with much of this driven by lung cancer. In most countries, more men than women smoke, although this gap is narrowing especially among young women.
- Women are twice as likely to be blind as men. In developed countries, this may be linked to higher life expectancy and age-related conditions. In developing countries, women are less likely to get timely treatments for conditions that lead to blindness such as cataracts and trachoma.
- Women are more likely to suffer from osteoarthritis and osteoporosis. The density of bones depends upon the stresses that are put on them through

exercise. Exercise and activity in childhood helps to build up higher density bones. Although in Britain women's bones are less dense even before menopause, in some African societies, men and women are equally susceptible to osteoporosis.

140. Infectious disease prevalence varies—this is largely due to cultural and exposure factors. In particular the WHO notes that:

- Worldwide, more men than women are infected with HIV. The exception is sub-Saharan Africa, where more women than men are infected.
- Adult males are more likely to be diagnosed with tuberculosis.

Some other sex-related health differences include:

- Anterior cruciate ligament injuries, especially in basketball, occur more often in women than in men.
- From conception to death, but particularly before adulthood, females are generally less vulnerable than males to developmental difficulties and chronic illnesses. This could be due to females having two X chromosomes instead of just one, or in the reduced exposure to testosterone.

3. Data issues

141. As was indicated in the first section, censuses can measure mortality in a variety of ways. The first and most common is through questions to women of reproductive age about

1. Their number of Children Ever Born alive (CEB);
2. Children born during the past 12 months before the census (or date of birth of the last-born child); and
3. Survival of Children Ever Born alive.

If this is the only information asked for, infant and child mortality is estimated based on 1) and 3), whereas 2) is used for fertility estimation. Some countries, however, also include a follow-up question to 2), namely how many of the children born during the past 12 months are still alive or, alternatively, if the last-born child is still alive. While in theory this should provide a more accurate approximation of recent mortality, in practice the experiences with the use of this kind of information have not been encouraging because of inaccuracies in establishing the date of birth of the child.

142. As was indicated in the previous chapter, most countries ask for this information disaggregated by sex of the child, but there are still a few countries where this information is not available. In countries that disaggregate the basic fertility and mortality data by sex, important information can be obtained about the sex ratio at birth and on differential mortality between young girls and boys. This issue, although directly related to fertility, will be discussed in the next sub-chapter. Typically, the information from questions 1) and 2), disaggregated by the age of the mother, is combined to estimate fertility, whereas 1) and 3) (more rarely 2) are combined for the purpose

of mortality estimation. In addition, some censuses ask about the survival of the last child born or children born in the past 12 months.

143. A limitation of this method is that it can only provide information for mortality levels up to age 15 or 20. That means that mortality levels at higher ages (including the life expectancy) have to be estimated based on extrapolations, using typical relations between the mortality under age 20 and at higher ages. Such extrapolations contain a good deal of uncertainty and consequently the life expectancy estimates for many developing countries (including the sex differential) need to be treated with caution.

144. Some censuses have additional questions that serve primarily to complement the information on early mortality by adult mortality estimates. One such question is the orphanhood question, which asks members of the household whether their mother, father or both are still alive. Based on the age of the respondent and typical fertility patterns in the country, this allows the estimation of probabilities of death for the parents. A limitation of this method is that the estimates obtained in this manner refer to deaths that occurred at any time during the birth of the respondent and the present. Especially in the case of older respondents, these estimates can be quite distinct from current mortality levels. There is also the possibility that parents live in unspecified areas different from the current residence of the respondent, thereby

making it difficult to use the information for sub-national mortality estimates. This limitation also applies to the infant and child mortality estimates of the previous paragraph, but the potential bias is more serious in the case of adult mortality. For all of these reasons, the questions on orphanhood are generally not considered very effective and only about 25 countries currently include them in their censuses.

145. Rather than asking about the parents, another option is to ask about the survival of sisters of adult members of the household. There are two variants if this method. In the **direct sisterhood method**, which is the standard method used in the DHS, the detection of deaths of sisters is followed up by more detailed questions about the year in which the date occurred and the age of the sister at the time. This method, however, is too laborious for most censuses which use the **indirect sisterhood method**, in which only the age of the respondent is used and the remaining information is attributed based on averages. This makes the indirect variant much less efficient than the direct variant. Although the sisterhood method can be used to estimate adult (female) mortality in general, its more typical use is the estimation of maternal mortality, in which it has to be combined with follow-up questions about the likely cause of death. However, as will be explained below, its use in censuses for this purpose is generally not recommended.

146. The other major type of question that can be used to measure adult mortality is the one that asks about the age and sex of members of the household that died during the past 12 months or another appropriate reference period. The most common problem with this question is that it tends to systematically under or (more rarely) overestimate mortality due to factors such as the following:

- Confusion about the reference period (e.g. current calendar year, rather than past 12 months);
- Confusion about the meaning of "household", as opposed to "family" or "community"; or
- Confusion about the meaning of "belonging to this household", especially in the case of prolonged hospitalization prior to death.

However, to the extent that these errors affect all age groups more or less equally, the results can still be used to determine a mortality pattern. In addition, there are methods (see Hill et al., 2011) to estimate correction factors, based on the observed population sizes by age and sex, to correct for the systematic errors in estimated mortality levels. By asking appropriate follow-up questions (see below), this question can also be used to measure maternal mortality. In the 2010 census round, this method for measuring maternal mortality has been followed in more than 30 countries that do not have reliable registration data.

147. As was observed above, censuses normally provide no

or only minimal information on cause of death. Censuses that did attempt to obtain some level of cause-specific mortality data include the 2008 census of Cambodia, the 2009 census of Djibouti, the 2010 census of Ghana, the 2011 census of Jamaica and the 2010 census of Zambia. The latter included the following cause categories: a) Accident; b) Injury; c) Suicide; d) Spousal violence; e) Other violence; f) Sickness/disease; g) Witchcraft; and h) Other. The census of Bhutan included a question on the type of illness that the deceased had at the time of death.

148. Measurement of maternal mortality through a population census is recommended for countries where other sources of maternal mortality information such as the vital registration system are deficient. In practice this recommendation only applies to countries with at least 500,000 population because of the need to have sufficiently large denominators to reliably measure this event. In this context it is important to realize that maternal deaths are relatively rare events and in order to measure them through a sample survey the sample size needs to be very large, often resulting in prohibitive costs.

Recommended census questions to estimate maternal deaths:

Q1: Have any residents of this household died during the last 12 months?

For each deceased:
Q2: Sex of the deceased;

Q3: Age of the deceased;

Q4: Date of death;

For female deceased between the ages of 15 and 49:
Q5: Was the deceased pregnant at the time of death or did the death occur within 42 days after delivery

150. The recommended questions to measure maternal mortality in a census are placed in the household module, and extend the "standard" questions on deaths (by age and sex) in the household over the past 12 months by one additional question: whether the woman was pregnant at the time of death, or the death occurred within 42 days after delivery.

151. Some countries (e.g. Dominican Republic, Lesotho, Malawi, Swaziland) ask about the survival of the sisters of the respondent, either in addition to the question on deaths occurred within the household or in substitution of it. A variant (direct sisterhood) of this so-called sisterhood method is also used in the DHS, but the difference

is that the DHS asks for additional information on ages and times of occurrence, making the resulting information much more accurate. The census data, however, is used for indirect estimation of maternal mortality using the indirect sisterhood method (see above). This method results in estimates of maternal mortality that refer to approximately 10-15 years before the date of the census. Its validity is contested by WHO and others as it relies on too many assumptions and the reference period is too long in the past. Some other countries, like Jamaica and Samoa, use non-standard formats in which the respondent needs to make a direct assessment of whether a death that occurred in the household was maternal or not.

152. Some countries (e.g. Bhutan) also include a question on who attended the birth, in the case of a maternal death, whereas others (e.g. Burkina Faso) require additional information on the number of days of puerperium at the time of death of the woman, in case it occurred after childbirth. Other countries (e.g. Bangladesh, Democratic People's Republic of Korea) ask about the possible association of the maternal death with an abortion, even though this issue is too controversial to expect that reliable data can be obtained this way. As a further element to identify maternal deaths, the Democratic People's Republic of Korea also asks about children born during the year before the woman's death.

153. The conversion of these census data into actual

estimates of maternal mortality requires a number of specialized techniques that are beyond the scope of this manual. For more details, see Hill et al. (2011).

154. Smoking is one of the health behaviours in which men and women display the greatest differences. Worldwide men smoke about 4 times as much as women, with particularly large differences in Southern and Eastern Asia. In Europe and Latin America, the smoking bahaviour of men and women is more similar, but yet a significant difference remains. Even in Europe, however, smoking cigarettes accounts for about half of the difference in the mortality of men and women, although it is expected that this particular gap will diminish in coming decades (WHO, 2010). In the US, for example, the difference in male and female life expectancy has narrowed in recent years, from at least 7.7 years from 1972-1979 to 5.2 years in 2004, according to the U.S. National Center for Health Statistics. Changes in smoking patterns tend to affect men more than women, because more men have smoked and because smoking has elevated death rates more for men than for women. As smoking becomes even less common, mortality rates will probably decline further. Censuses provide relatively little information to shed light on these issues, but specific questions on the issue are included in the census of New Zealand, Sint Maarten and some countries in the Pacific, such as Cook Islands, Kiribati, Niue, Tokelau, Tonga and Vanuatu. Some countries (e.g. the UK) also ask the respondent to make an

overall assessment of his/her health status (e.g. very good, good, fair, bad, very bad).

4. Tabulations

155. The *Principles and Recommendations* suggest four basic tabulations for mortality analysis and list another six additional possibilities:

Recommended tabulations for population censuses:

- Female population 10 years of age and over, by age and number of children ever born alive by sex;
- Female population 10 years of age and over, by age and number of children living (or dead) by sex;
- Female population … to 49 years of age, by age, number of live births, by sex within the 12 months preceding the census, and deaths among these live births, by sex;
- Household deaths, by sex and age within the 12 months preceding the census; and total population, by age and sex.

In addition, they suggest the following tabulation, in those cases where the maternal orphan-hood question is asked:

- Population with mother alive (or dead), by age.

Most censuses in developing countries allow the computation of the first two tables, but the others depend on whether the relevant questions were asked.

5. Indicators

156. The standard mortality indicators that can be derived from census data include:

1. Infant Mortality Rate by sex;
2. Under-5 Probability of Death by Sex; and
3. Life Expectancy by Sex.

Depending on the amount of information available, it may also be possible to estimate:

4. The probability of dying between the ages of 15 and 60, by sex; and
5. The Maternal Mortality Ratio.

All of these indicators require specialized methods and models in their computation which are unfortunately beyond the scope of this manual. The last two indicators depend on the question about household deaths occurred during the past 12 months, by age and sex. The latter also allows the computation of another indicator, namely the proportion of deaths that occur above a certain age (e.g. age 50). Although this proportion is still occasionally used in the public health literature, it is not recommended as an indicator to express the level of adult mortality because it depends very much on the age structure of the population.[17]

17 This discussion is somewhat similar to the one on births to mothers under age 20 in Section C of Chapter 2.

157. The most common differential mortality measures are the difference between male and female life expectancy (typically about 4.5 years, but less in the Indian sub-continent and more in Eastern Europe) and the ratio of the male and female probabilities of death up to age 1 or 5. A simpler measure is the ratio of the proportions of surviving male and female children, which can be directly computed from the census data, possibly limited to a particular age range (e.g. 20-34 years) of the mothers. Depending on the particular age range of mothers chosen, this ratio may or may not allow a specific interpretation in terms of the mortality differential between boys and girls of particular ages, but it does provide a valid measure of the mortality differential between sexes in childhood, if one can accept that the latter concept is somewhat loosely defined.

158. Of the health and mortality-related Minimum Set of Gender Indicators approved by the Statistical Commission in February of 2012, the following can be computed from census data:

- Under-5 probability of death by sex;
- Maternal mortality ratio (in censuses that ask the appropriate question);
- Life expectancy at age 60, by sex; and
- Adult mortality by age group (but not by cause).

The following indicators, which are related to health, rather than mortality, cannot usually be computed from

census data:

- Smoking prevalence among persons aged 15 and over, by sex (even though some censuses in the Pacific region do ask about individual smoking habits);
- Women's share of the population aged 15-49 living with HIV/AIDS; and
- Proportion of adults who are obese, by sex.

6. Multivariate and further gender analyses

159. An issue that has important policy implications in some countries is that of sex differentials in mortality. Male mortality is almost universally higher than female mortality, for reasons which are thought to be mostly biological in nature. An important exception, however, is the Indian sub-continent, where historically female mortality has been higher. At present this is no longer the case in most age groups. Female mortality in India, at least at higher ages, is now lower than male mortality, even though the difference in life expectancies (i.e. 61.3 for women and 59.7 for men in 1995-2000) is still relatively small in comparison to other countries at similar levels of development. However, female mortality in India continues to be higher from the second to the 60th month of life (Jha et al., 2011). The discussion of this issue in the Indian sub-continent has often been cast in terms of the number of "missing women" (Kynch

and Sen, 1983; Sen, 1990; Yi et al., 1993), thereby mixing it with problems of differential abortion, infanticide, sex-specific fertility stopping behaviour, and differential enumeration of women (see the next chapter). There is, however, a real issue of female excess mortality among children under age 5 which should be analyzed in those terms as much as possible. Much less publicized, there is also a problem of particularly high male mortality at ages over 35 (see Dyson, 1984), possibly due to high incidence of tuberculosis.

160. In the specific case of child mortality (1-4 years of age), Figure 5 shows that the incidence is not only higher for girls in India, but also in China, Nigeria, Ethiopia, Turkey and a number of other countries. Conversely, excess male mortality was found in Russia and Central Asia, Finland, Hungary, the Czech Republic, Tunisia, Namibia, Madagascar, Colombia and Paraguay. According to United Nations (2011 d: 66), newborn girls enjoy a genetic and biological advantage in survival over newborn boys due to a lesser vulnerability to perinatal conditions, but beyond early infancy, they do not enjoy the same advantage in relation to certain infectious diseases, which are the primary causes of death in later infancy and early childhood when overall mortality is high. Girls may in fact be more vulnerable to some infectious diseases, particularly measles (Garenne and Lafon, 1998). As living conditions improve, an "epidemiological transition" occurs whereby infectious diseases recede as a

cause of death. Among infants, perinatal and congenital causes form an increasing share of total mortality, while external causes, more typically affecting boys, form an increasing share of mortality for children between ages 1 and 5 (Tabutin and Willems, 1998). Hence, as overall levels of mortality fall, female advantage in infant and child mortality would normally increase assuming no sex-specific changes in behaviour (Tabutin and Willems, 1998; Hill and Upchurch, 1995). The female advantage in survival, however, can be eroded if girls are deprived relative to boys in access to health care or to proper nutrition.

161. As will be further explored in Chapter 9, there is an important correlation between maternal education and markers of child health. To some extent, mother's education acts as a proxy for the economic level of the family and geographic area of residence. However, Desai and Alva (1998) find that maternal education remains statistically significant as a predictor of children's immunization status, net of control variables. Several studies have also established a negative relationship between increased mother's education and decreased child mortality in Latin America (Haines and Avery, 1978), Africa (Caldwell, 1979) and Asia (Cochrane, 1980). One of the important questions in this context is to what extent the higher female education is an indicator of greater authority and better gender relations within the household. The latter interpretation is taken, for instance, by Ahmmed and Chakraborty (n.d.).

162. When using multivariate methods to analyze mortality data, e.g. to assess the importance of maternal education or other characteristics of the mother, one needs two kinds of information from the census:

1. The proportion of children that died, by age of the mother; and
2. An indication of the age pattern of fertility, to get a sense of the age distribution of the children, both those that are alive and those that have died.

When using aggregate data, on specific population groups, the best way to combine these elements is to apply the standard methodology for estimating mortality in population groups, as described in Manual X or its recent updates (see the previous chapter for more details). When using individual data on mothers, this becomes more complicated because the procedure requires some information on the timing of births for that particular mother. Some censuses have a question on the age of the mother at the time of her first childbirth which can be used to anchor the timing of the woman's entire fertility history. In order to do analysis on the death or survival of individual children, one needs complete data on the date of birth and the survival of each child, which is normally not available from the census.[18]

18 As was pointed out in the previous chapter, the 2011 censuses of Hungary and Serbia are exceptional in that they ask for the date of birth of each child and not only the last-born.

Table 11: Burkina Faso (2010) – Proportions of deceased children in families with 6 children where the mother is 25-34 years old, by religion

Muslim	Proportion of deceased girls	Proportion of deceased boys
1 girl, 5 boys	0.136	0.181
2 girls, 4 boys	0.181	0.191
3 girls, 3 boys	0.199	0.176
4 girls, 2 boys	0.193	0.194
5 girls, 1 boy	0.167	0.136
6 girls, no boys	0.192	
Christian		
1 girl, 5 boys	0.200	0.207
2 girls, 4 boys	0.187	0.185
3 girls, 3 boys	0.158	0.165
4 girls, 2 boys	0.195	0.147
5 girls, 1 boy	0.145	0.189
6 girls, no boys	0.160	

Source: Based on the 10 per cent sample of the 2010 census of Burkina Faso, processed on-line using the IPUMS on-line tabulator

163. The following example from the 2010 census of Burkina Faso sidesteps the mortality estimation problem by comparing the proportions of male and female children that have died without actually computing their death rates. Just as an illustration, Table 11 shows the proportions of deceased children for families with a total of 6 children where the mother is between 25 and 34 years old, cross-classified by religion. Because the focus is on the mortality of girls, the families with 0 live-born girls and 6 live-born boys have been omitted. The same computations were also made for families with different total numbers of children, but they are not displayed in Table 11.

164. Assuming that families don not use any sex-related stopping rules, such as stopping childbearing after the birth of the first boy (which is not likely in a population with little deliberate fertility control), one may compare the proportion of deceased boys and girls within the same category of total live-born children (e.g. as in Table 11), but not across different size categories because children with fewer siblings tend to be younger, on average, than children with more siblings. By doing this systematically in all the size categories, the following pattern was found:

- Marginally (1.5-2 per cent) lower proportions of female deaths compared to male deaths, as one would expect;
- No variation in the male-female difference across the Muslim-Christian religious categories; and
- An unfavourable impact of having many siblings of the same sex, i.e. higher male mortality in families with many boys and higher female mortality in families with many girls.

This seems to indicate that families do not necessarily value boys more than girls, but that they do tend to invest less care in the children of the sex that is most numerous in the household.

7. Interpretation, policy and advocacy

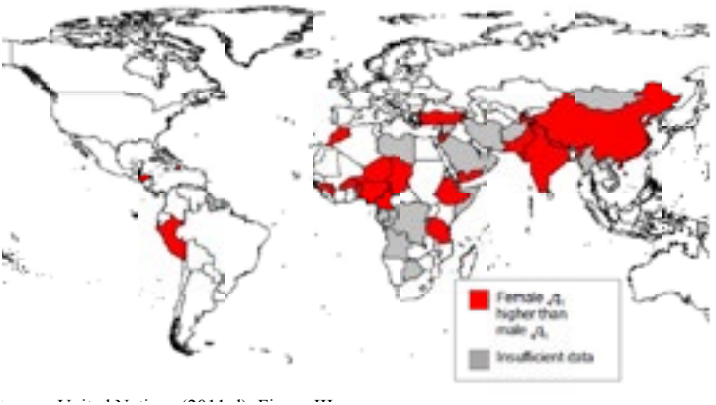
165. One of the issues that continues to be the subject

of some debate is how to interpret the higher mortality of men, i.e. as an innate biological characteristic or as a socially determined gender difference. Figure 5 shows that there are several countries – and not only in South Asia – where the risk of death between ages 1 and 5 is larger for girls than for boys. But arguably this list should be expanded by including those countries in which the risk, even when favourable to girls, is closer than one would typically expect given the level of overall mortality. Hill and Upchurch (1995) argue, for example, that at a level of overall mortality of 50 per 1,000 between birth and age 5, one would expect, on average, a 25-30 per cent difference in infant mortality and a 15-20 per cent difference in mortality between age 1 and 5. For higher overall mortality levels these differences tend to be somewhat smaller. It is not clear, however, if what is "average" can necessarily be interpreted as "gender-neutral". Nevertheless, it is probably wise to exert some caution in interpreting very small mortality differences favourable to girls over boys as a sign of absence of gender discrimination.

166. In India, where excess mortality of girls has traditionally been a problem, there are several attempts at policy intervention to correct this situation. Many poor families with girls in India have been given financial incentives in the name of the infant girls. But like the "cradle baby" scheme, "girl protection schemes" were more the result of political plotting and, therefore, were short-lived even though girl child lives were spared because of

those measures. On a more positive note, the Indian State Chief Minister declared 2006 the Year of the Girl Child. He introduced an innovative incentive program called "Ladli" or the "adored one", carrying an incentive of Rs 5000 (USD 100) per year for five years on the birth of a second daughter in a family. If a family has one daughter or only daughters, the parents would be entitled to get old age allowance of Rs300 (USD 6) per month after the age of 55. Financial incentives indeed seem to have an effect. Where NGOs accompany young mothers and their baby girls from birth to the age of 2 months, giving them food and support, mothers become attached to their daughters and in some places infanticide has decreased up to fifty percent within 10 years. That is why organising "Support groups" with mothers from different backgrounds or ages (mothers in law, young brides, grand-mothers...) to discuss about the issue of the girl child appears to have a very positive impact. Because differences in immunization rates explain much of the mortality difference between boys and girls (Arokiasamy, 2004), investments in raising the immunization coverage of young girls may also be an effective way to tackle the problem. Sex differentials in the treatment of illnesses such as fever, cough and diarrhoea and in nursing care are also part of the explanation.

Figure 5: Countries where female excess child mortality (ages 1-4) was found in the 2000s



Source: United Nations (2011 d): Figure III

167. Similarly, in China, the programme "Care for Girls" was launched by the State Population and Family Planning Commission in 2003 in 24 pilot counties. It provides social benefits, including cash payments, to families with only girls in order to enhance the status of girls and women. Through such measures, some Chinese families have come out of poverty as they are entitled to accommodation and pensions when they get old. These families begin to feel more confident in the future and become less afraid of having girls.

168. Even in circumstances where no specific bias against girls was found in terms of provision of food, health and emotional care, increasing numbers of girls born in

a family may also face a number of other disadvantages, as a result of the family's poor economic condition and patriarchal norms. It has been suggested (Arokiasamy, 2004) that female children, in families with son preference, may tend to grow up with more siblings than male children. Couples with strong son preference will continue childbearing in order to achieve their ideal number of sons (see the next chapter). Girls growing up in such circumstances may have to suffer from several social disadvantages in terms of education and marriage costs, all of which may compound to deny them better living conditions. Policy goals of female empowerment have to address these wider issues of gender inequalities, which are still pervasive.

169. Specific policy measures to address male excess mortality, particularly in Eastern Europe, have been less publicized and tend to be implicit in the overall combat of health problems such as smoking, alcoholism, and violence that are responsible for much of the male mortality disadvantage. Ironically, even though worldwide smoking is more than 4 times as prevalent among men as among women, a recent WHO (2010) publication on the issue chose to focus on the dangers of smoking for women. In this case, this focus may be partly justified by the fact that smoking in women, particularly during pregnancy, endangers not only their own health, but also the health of their children.

CHAPTER 5

Sex Ratio at Birth and throughout the Life Cycle

1. What is it?

170. The **sex ratio at birth** (SRB) is defined as the ratio of male to female births in a population[19], multiplied by 100. The census variables to be analysed to calculate de SRB are the date of birth and sex of the last live-born child. On this basis, one can compute the number of girls and boys born over the last 12 months.[20] Although this ratio can vary somewhat due to biological factors, its natural value is normally not smaller than 104 and not larger than 106[21], although some would still accept 102

19 Note that in India the sex ratio is computed the other way around, as the number of girls over the number of boys.

20 Where "date of birth of last live-born child born" is not disaggregated by sex, one needs to look at the age and sex of the youngest child in the household and – if under 1 year old – verify if its age/birthday is compatible with the declared date of last birth.

21 Some anomalies in sex ratios at birth can be explained in biological terms. For example, a study by the Arctic Monitoring Assessment Program in 2007 found abnormally low sex ratios, in the order of 50, in some arctic communities in Russia, Greenland and Canada, which it attributed to high levels of endocrine disruptors in the blood of inhabitants, particularly PCBs and DDT. Other studies (e.g. Rocheleau et al., 2011), however, have contested the effect of PCBs on human sex ratios at birth. There is also some discussion among geneticists as to whether sex ratios vary naturally according to race, maternal and paternal age and birth order (e.g. Erickson, 1976; Imaizumi and

and 107 as normal. The recent inter-agency publication on preventing gender-based sex selection (OHCHR; UNFPA; UNICEF; UN Women and WHO, 2011) puts the normal range at 102-106, to take account of the very low sex ratios found in some African countries. Where observed sex ratios at birth are greater than 106 (or 107) in census data, this departure from the biological norm may be due either to under-reporting of female births, or to prenatal sex selection practices and feticide linked to son preference, or to a combination of the two. The opposite applies if sex ratios at birth are lower than 104 (or 102). If the difference is real, rather than due to differential under-enumeration, it is called **sex ratio imbalance** (at birth). Sex ratio imbalances arise in several countries

Murata, 1979; Ruder, 1985; Chahnazarian, 1988). Historical data from Europe suggest considerable heterogeneity between families, with boys predominating in some and girls in others, in proportions that differ from what one would expect if the process were purely random (Garenne, 2008 b). In the case of Africa, Garenne (2008 a) found that sex ratios declined with maternal age and birth order. Due to the fact that he used DHS data, no information on paternal age was available. He concluded that these findings are consistent with James's (1989, 1996) theories about the biological factors of the sex ratio, in particular, the effect of concentrations of sex hormones (e.g. progesterone, gonadotropin, estrogen, testosterone). Higher levels of gonadotropin and progesterone were found to be associated with more female births (lower sex ratios). Conversely, higher concentrations of male hormones (e.g. testosterone) seem to favour high sex ratios. The African data do not seem to suggest any deliberate sex selection. Oster (2005) has argued, based on existing medical literature and analysis of cross country data and vaccination programmes, that parents who are carriers of hepatitis B have a higher offspring sex ratio (more boys) than non-carrier parents. Since China and some other countries have high hepatitis B carrier rates, she suggested that hepatitis B could explain up to 50 per cent of Asia's "missing women". However, Lin and Luoh (2008), using data from a large cohort of births in Taiwan, found only a very small effect of maternal hepatitis carrier status on offspring sex ratio, a conclusion which was later endorsed by Oster as well (Oster et al., 2008).

that have strong sex preferences – usually for boys – and where prenatal sex screening and selective abortions have now led to significant distortions due to the elimination of female fetuses. This is commonly referred to as the problem of the missing girls (Das Gupta, 2005).

171. The current global average in the sex ratio at birth is about 107 per 100 (United Nations, 2011 b; UNICEF, 2011 b) but regional differences are significant. In Sub-Saharan Africa, sex ratios at birth are generally low (as low as 102 in Kenya, Malawi, Mozambique and South Africa), with a regional average of 104. However, some countries in Africa, notably Nigeria and Ethiopia, stand out for having rather high sex ratios, in the order of 107 (Garenne, 2002, 2008 a). In Latin America and the Caribbean, Northern America and Oceania the average is 105, although low sex ratios, in the order of 103 are commonly found in the Caribbean. In Europe it is 106, while in South Asia it reaches 107 (and in Eastern Asia and the Pacific 113).

172. China is the country with the highest sex ratio at birth (117.8) in 2011, with values of over 125 in some provinces (e.g. 128.7 in Anhui Province, 125.6 in Fujian Province and 125.5 in Hainan Province, according to the 2010 census). Tibet, however, has a very low sex ratio, of 102. In India, the sex ratio at birth was computed at 904 girls for every 1,000 boys (or, in more conventional terms, 111.6 boys per 100 girls) in 2006-08 (UNFPA India,

2010). Based on this information, UNFPA estimated the number of missing girls in India for the 2001-07 time period to be in excess of 6 million. The more commonly used child sex ratio was 976 girls per 1,000 boys (102.5 per 100) in 1961, but had changed to 927 (107.9 per 100, in conventional terms) in the 2001 census. According to the preliminary results of the 2011 census, there are now about 83.9 million boys under age 7, compared to roughly 75.8 million girls, implying a child sex ratio of 109.4 per 100, a deterioration with respect to the 2001 census (Jha et al., 2011).

173. Apart from India and China, where the imbalance has been known for a long time (in China, the sex ratio was more skewed in 1953 than in 2000), in recent years there have also been increases in the sex ratio in countries like the Republic of Korea (1980s), Albania, Armenia, Azerbaijan, Georgia (1990s), and most recently Viet Nam. So far the Republic of Korea is the only country where the sex ratio has returned to normal in the 1990s, after a period of imbalance (Guilmoto, 2009; Villa, 2006). Chung and Das Gupta (2007) argue that the trend is due to fundamental changes regarding social norms, but the most recent data for the country indicate another rise, to 109 in 2010.

Table 12: Sex Ratio – at birth, age-specific, and overall – by region

Regions	At birth	0-4 years	5-14 years	15-24 years
Sub-Saharan Africa	104	103	102	101
Middle East and North Africa	105	105	105	105
South Asia	107	108	108	108
South Asia excluding India	105	105	105	104
East Asia and Pacific	113	114	114	109
East Asia and the Pacific excluding China	105	105	105	104
Latin America and Caribbean	105	104	104	102
CEE/CIS	106	106	105	103
Developing countries	107	107	108	106
World	107	107	107	106

Source: United Nations (2011). World Population Prospects. The 2010 Revision, CD-ROM, cited in UNICEF (2011 b): Figure 1

174. The **child sex ratio** is the ratio of boys compared to girls in the 0-6 year age group. It is often used as a proxy for the sex ratio at birth because it is easier to compute from census data, particularly if the census does not disaggregate births by sex. Defining a natural value for this ratio is more difficult than in the case of the sex ratio at birth because it is affected not only by the latter, but also by differential infant and child mortality. One would expect the number of boys over girls to decline gradually after birth, as a consequence of higher male mortality. Depending on the life expectancy at birth, the number of males and females should equalize among young or older adults, but then it should decline among the elderly as consequence of lower survival rates among old men.

175. The **age-specific sex ratio** is the sex ratio that characterizes specific age groups, including the 0-6 year age group of the child sex ratio. The **overall sex ratio** refers

to all men in the population, divided by the number of women and multiplied by 100. This is the most difficult to interpret because it can be influenced by a wide range of phenomena, including migration. Alternatively, the terms **primary**, **secondary** and **tertiary** sex ratios are sometimes used. The primary sex ratio is the ratio at the time of conception. The **secondary sex ratio** at time of birth and the **tertiary sex ratio** is the ratio among mature organisms.

2. Why is it important?

176. Looking at the sex ratio at different stages of the life cycle reveals how it is shaped by the different underlying demographic processes. The sex ratio in the total population depends on the sex ratio at birth, migration patterns and the conditions of mortality throughout the life-cycle. For instance, many countries in the Arab States have a significant foreign labour force, mostly composed of men. As a consequence, their sex ratio is very high. Table 13 lists the age-sex distribution for Qatar (2010), which suggests a normal sex ratio up to age 15, but extremely high ratios in the typical working ages. The opposite situation exists, for example, in the 2006 census of the Maldives, where the sex ratio is abnormally low in the 20-34 year age group. In Estonia, Latvia and Lithuania, the male/female ratio is normal at birth, but declines sharply among 30-40-year olds. Such an imbalance skewed towards women may be symptomatic of armed conflict or, as is the case in the Baltics, alcoholism in males. As women

live longer than men in most places, a sex ratio of roughly 90 for the age group 60 and over is not uncommon. As a consequence of large differences in male and female life expectancies (more than 10 years) and differential migration, countries like Belarus, the Russian Federation and Ukraine also registered very low over-all sex ratios (below 90) in their 2010 censuses (UNECE, 2012 c).

177. Several South and East Asian countries, such as China, India and the Republic of Korea, have long struggled with the phenomenon of the missing women (Kynch and Sen, 1983; Sen, 1990; Yi et al., 1993). Using sex ratios in countries particularly affected by gender inequalities (India, China, Pakistan, Bangladesh, Nepal, Egypt, Syria, Turkey), Sen (1990) calculated that 107 million more women would be alive in these countries in the absence of excess female mortality, particularly of infant girls. While the figure has been challenged and recalculated various times (mostly due to problems of undercounting, e.g. of unmarried women), it is clear that the number of missing women is substantial. Based on typical infant and child mortality patterns in the country, Jha et al. (2011) estimate that 4.53 million sex-selective abortions took place in the country between 2000 and 2010. In some states, the sex imbalance is much worse (e.g. 120.5 in Haryana, 118.2 in Punjab, 116.5 in Jammu and Kashmir, and 115.4 in the national capital of New Delhi). These are some of the richest states of the country, which shows that sex imbalances are not a consequence

of poverty and ignorance, but – to the contrary – show up in places where people have access to the technology that makes it possible to implement sex selection choices.

Table 13: Qatar (2010) – Age-sex distribution and age-specific sex ratios

	Men	Women	Sex Ratio
0-4	19,246	18,345	104.9
5-9	16,891	16,269	103.8
10-14	14,265	13,618	104.8
15-19	14,469	10,990	131.7
20-24	69,878	15,202	459.7
25-29	100,556	27,403	367.0
30-34	104,190	23,366	445.9
35-39	94,620	17,459	542.0
40-44	74,195	14,519	511.0
45-49	48,885	12,071	405.0
50-54	26,775	8,052	332.5
55-59	16,384	4,135	396.2
60-64	6,508	2,013	323.3
65-69	2,140	1,135	188.5
70+	1,815	1,553	116.9
Total	610,817	186,130	328.2

Source: Census of Qatar (2010): Table No. 6

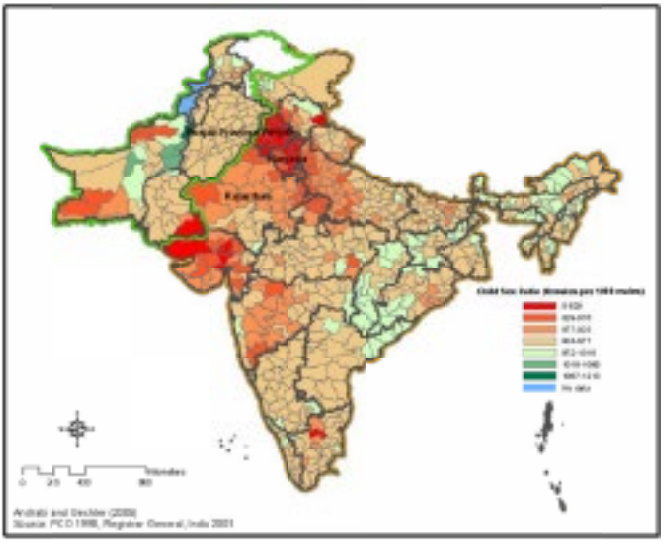
178. Klasen and Wink (2002) revised Sen's methodology. To determine each country's predicted sex ratio at birth, they run a regression of sex ratios at birth from around the world as given in the UN Demographic Yearbooks (omitting the problematic Sub-Saharan African data) on life expectancy. The estimates coincide almost perfectly with the stated sex ratios at birth for countries with low levels of sex-based discrimination (Sri Lanka, for example). However, they differ significantly from those of Pakistan

and India. The estimated ratios of girls divided by boys (0.9594 for Pakistan and 0.9626 for India) are likely to be more accurate in these cases, since official figures may be skewed by sex-biased underreporting and sex-selective abortion. The greater dependability of Klasen and Wink s predicted sex ratio at birth is underscored by the fact that Pakistan's official sex ratio at birth, as given by the sex ratio for individuals under the age of one, changed from 1.0134 in 1981 to 0.9530 in 1998. This is a far greater fluctuation than one would expect from the modest increase in life expectancy from 55 to 62 over the same period and casts doubt on the official statistics. Klasen and Wink's final estimate (101 million) is close to Sen's, but only after including additional countries (Taiwan, Republic of Korea, Afghanistan, Iran, Algeria, Tunisia, Sub-Saharan Africa).

179. A recent study from Nepal aptly identifies the core of the problem as "a deeply rooted preference for sons, which leads parents across cultures and geographic locations to decide against allowing a girl to live, even before her birth, and the increasing availability of technology that enables them to do so with ease" (UNFPA, 2007: 2). The most pronounced and well-known case is China (UNICEF, 2011 b), where the "one child policy" in place since 1979 has discouraged fertility. Most observers agree that the one child policy exacerbates the problem, as it is consistently associated with higher ratios of male to female births (Zeng et al., 1993; Ebenstein, 2010), but it

is not the only cause (for the classical model of causation, see Gu and Roy, 1995), More broadly, early detection of the sex of a foetus since the 1980s in many countries has led to increased numbers of sex-selective abortions.

Figure 6: India and Pakistan child sex ratio (0-6) by Pakistani district standard deviations



Source: Gechter (2006): Figure 7

180. The sex ratio in infancy is important to monitor because female infanticide and neglect of new-born girls through differential access to food, vaccination and care has resulted in higher mortality for girls. In this way, the sex ratio can inform policy by defining a problem and may also be used to monitor progress toward a solution

(e.g. addressing sex imbalances in vaccination campaigns, free curative care for infants, etc.).

181. A statement recently issued by OHCHR, UNFPA, UNICEF, UN Women and the WHO (WHO, 2011) reviews the evidence behind the causes, consequences and lessons learned regarding "son preference," and concludes: "Sex selection in favour of boys is a symptom of pervasive social, cultural, political and economic injustices against women". On the other hand, it points out that it is also women who have to bear the consequences of giving birth to an unwanted girl child. These consequences can include violence, abandonment, divorce or even death. Son preference can, however, be embedded in wider societal norms and practices. For instance, in societies where the maintenance of elderly parents falls primarily on the sons, as married daughters come to belong to the family of their husbands, it is understandable that parents will want to guarantee a male heir, for the sake of their own sustenance in old age. This becomes particularly critical in low fertility contexts. The pressure on women to produce sons also puts women in a position where they in turn perpetuate the lower status of girls through son preference. As a consequence, various forms of gender-based violence and discrimination and heightened vulnerability of women and girls are associated with sex ratio at birth imbalances skewed towards boys (UNFPA, 2007, 2010b).

182. Where men of marriageable age are faced with a dramatic shortage of potential brides, human trafficking, crime and other adverse social consequences are on the rise (Guilmoto, 2007). As the country example highlights just below, men also are likely to suffer social consequences, such as depression, isolation and poverty, as illustrated by the example below. Part of the shortage of brides on the marriage market, which arises from the lack of young women at marriageable ages, may also lead to changes in the age difference at marriage between women and men. In the same way that polygamy often operates in a system where men are considerably older than women at the time of marriage, imbalances in the sex ratio—because of son preference—may lead to older men marrying younger women. Son preference also affects the stability of unions. Zeng et al. (2002) show for instance that divorce rates among women with three or more daughters, without a son, are 2.2 times higher than among women with three or more children with at least one son.

3. Data issues

183. While analysis of the sex ratio at birth is most reliable when based on data from efficient vital statistics, the census can provide an estimate if the number of children born during the last 12 months is differentiated by sex, which is usually the case. Both vital statistics and census data have the advantage of universal coverage which is

important because establishing the difference between a sex ratio of—say—108 and a normal ratio of 106 requires at least 33,000 cases in order to obtain statistically significant results, which is too much for most surveys. Even in the census of a small country such as Vanuatu, the reported high sex ratio at birth of 111 boys per 100 girls (Vanuatu, 2011) may be based on too few births (about 5,000 per year) to allow solid conclusions.

184. In those countries where the census does not differentiate the number of children born during the past 12 months by sex (Argentina, Azerbaijan, Bahamas, Costa Rica, Kazakhstan, Mexico, Palau, Peru, the Seychelles and Thailand), an alternative is to use the child sex ratio (0-4 or 0-6 years) or the ratio of children under age 1 as proxies. The main methodological problems associated with this solution are:

a. Children under age 1 are typically poorly enumerated in censuses and under-enumeration or the misdeclaration of ages are sometimes more pronounced for one sex than for the other; and

b. By defining "at birth" sex ratios as sex ratios in children less than 1 year old, sex-selection effects are conflated with sex-specific mortality during the first year of life, in particular with infanticide and higher perinatal mortality among boys.

The latter will obviously grow more serious as wider age groups are used. In India, for example, the 2001 census found a sex ratio of 107.1 for the 0-4 age group, while

the sex ratio at birth for 2000-02 was estimated to be 112.1 boys per 100 girls (Kulkarni, 2007). One can also estimate the sex ratio at birth by taking the sex of the youngest child in the household and verifying if its age is compatible with the declared date of birth. This analysis, however, is more complex and there may be difficulties in case where the child has died or no longer lives with the mother. If there are different mothers in the household, there may also be problems in identifying who a particular child belongs to.

185. Census reporting on children aged 0-6 is typically more reliable, but this age group is already more exposed to other causes of sex imbalance, such as differential mortality. For example, it was mentioned earlier that the child sex ratio in India increased from 107.9 to 109.4 per 100 between the 2001 and 2011 censuses. But data from the Indian Sample Registration System suggest that the sex ratio at birth actually improved somewhat, from 112.1 per 100 in 2000-02 to 111.6 per 100 in 2006-08. If these data are reliable and can be generalized to the country as a whole (which may not be the case, as they are based on a sample), the conclusion would have to be that infant and child mortality, rather than sex selection at birth, was the cause for the deterioration of the child sex ratio between 2001 and 2011. This could be verified using census data collected in 2011 on children born during the past 12 months by sex, however, this information has not yet been published.

186. As noted above, differential under-enumeration is another complicating factor. In many societies, such as Libya previously in Iran (but apparently not in the most recent censuses), under-enumeration of girls and women is known to be widespread in censuses. This may be due to the respondent (e.g. 'forgetting' about girls who do not have a birth certificate) or enumerator (e.g. taking greater care and time to write down all boys and men in the household). On the other hand, the Post-Enumeration Survey of the Indian census of 2001 actually found a marginally smaller extent of under-enumeration (2.31 per cent) among women (of all ages) than among men (2.35 per cent), particularly in urban areas (3.79 compared to 4.15 per cent). In rural areas, however, female under-enumeration was somewhat more common (1.75 compared to 1.62 per cent). A recent study of China (Goodkind, 2011) indicates that about 19 per cent of children at ages 0-4 went unreported in the 2000 census. From this, the author concludes that, since under-enumeration is much more pronounced for girls than boys, the reported child sex ratio at birth imbalance is likely to be inflated. Similarly, Cai and Lavely (2003) applied reverse survival to boys and girls aged 10, 11, ... , 14 enumerated in the 2000 census of China, to estimate the expected number of children aged 0, 1, ... , 4 in the 1990 census. By comparing these estimates to the actual numbers of the 1990 census, they found 6.2 per cent under-enumeration of boys and 7.5 per cent under-enumeration of girls aged 0-4 in 1990. The difference between boys and girls accounts for

just under a third of the sex ratio imbalance (sex ratio of 109.8 for ages 0-4) found in the 1990 census. However, as the authors indicate, as sex ratio imbalances soared in 2000, 2005 and 2010, it is likely that differential under-enumeration accounts for a smaller proportion of the sex ratio imbalance in these later years.

187. Differential under-enumeration is not limited to children under age 1 or aged 0-6. The declared number of births during the past 12 months, even when disaggregated by sex, may also contain differential under-enumeration errors. This is illustrated by the case of Malawi, where the 2008 census counted 268,876 female births, but only 247,753 male births, implying a sex ratio at birth as low as 92.1. The corresponding numbers of children under age 1 were 255,576 and 247,809, respectively. The latter implies a sex ratio of 97.0, which is actually more balanced. Because there is no plausible reason to assume that such deviant sex ratios could be caused by the differential abortion of male foetuses, the only acceptable explanation is differential under-enumeration of male infants and particularly male births. What could be causing this phenomenon is a puzzling question that should be reason for concern for the census authorities. The 2007 census of Ethiopia enumerated 897,827 boys and 877,627 girls under age 1, implying a sex ratio of 102.3, which is more in line with expected results than the data from Malawi, but still rather low, especially considering the results obtained by Garenne (2002, 2008a),

cited earlier, according to which the sex ratio at birth in Ethiopia was found to be relatively high.

4. Tabulations

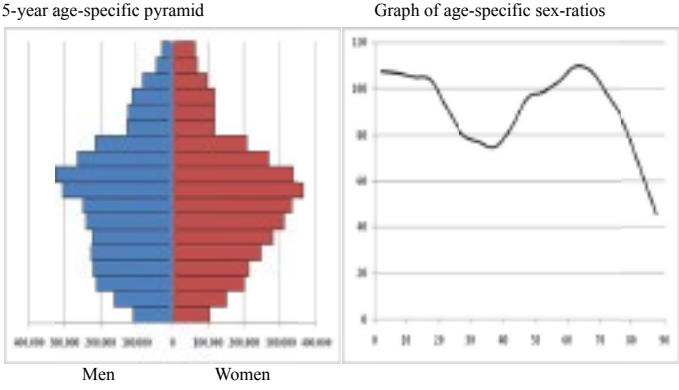
188. The Principles and Recommendations for Population and Housing Censuses Rev. 2 (United Nations, 2008 a) suggest to tabulate population by single years of age and sex. From this tabulation, one can calculate sex ratios for various age groups and geographical areas. One should bear in mind, however, what was noted in the previous section, about the possibility of age-specific differences in under-enumeration or age misdeclaration by sex, particularly under age 1.

189. This recommended tabulation can also be represented by 5-year age groups in the form of a population pyramid. However, if the objective is specifically to represent sex ratios, the population pyramid may be hard to interpret and it may be better to depict the age-specific ratios directly. As examples, just above are a conventional age pyramid by 5-year age groups with men on the left and women on the right for the 2006 census of Hong Kong and on the right, the age-specific sex ratios graphed with the same data.

190. Preferably, sex ratios at birth need to be separated by birth order as the perceived need for sex-selection increases with birth order and the sex composition of the

other siblings. This procedure can be further improved by separating the previous births by sex. For example, families with one girl and one boy rarely apply sex selection to the third birth, but if both of the previous children are girls, the sex ratio among the third births tends to be very high.[22] If the census differentiates the surviving children and children born during the past 12 months by sex, the procedure is straightforward; otherwise it may be necessary to obtain the sex composition of the children by analysing the children with the appropriate relationship to the head of household.

Figure 7: Hong Kong, 2006 Census – Population Pyramid and Age-Specific Sex-Ratios



191. If the information is available, it can be revealing to

22 Although overall sex ratios at birth in the Republic of Korea have now returned to normal levels, the ratio for third and higher births in 2010 was still as high as 113.

compute the number of male and female births or the number of male and female children by ethnic group. In the case of the Vietnamese census of 2009, for example, the sex ratio of children aged 0-6 was 111.6 for the majority Kinh population, but only 106.9 for the minority populations in the mountains. The latter is almost normal, whereas the ratio for the majority population reveals a clear sex bias. Unfortunately, many countries, especially in Africa, are wary of publishing data on ethnicity because of the potential of competition for political influence between ethnic groups that may be reinforced by publishing data on the relative numerical importance of individual groups.

Country Example 2: Generating Vulnerable Elderly Men in China

In 2000 the total number of excess boys and young men up to 20 years of age in China was almost 21 million. The lack of young women has negatively affected the formation of families. Poston and Glover (2005) estimate that more than 23 million young men born between 1980 and 2001 will not be able to find brides in China. If the overall growth of the young population were positive, this imbalance might be solved by men marrying younger women, but this is not sustainable in a context of diminishing numbers of young people.

Due to this so-called "marriage squeeze", some projections indicate that, even if sex ratios at birth were to return to normal levels by 2020, the proportion of male bachelors at age 50 in

2050 would be 14.6 per cent in China and 10.0 per cent in India (UNFPA, 2012 a).

As Judith Banister (2004) points out, sex ratio at birth imbalance was almost eliminated during the Mao years. That means birth cohorts born up until 1982 were normal, and women would come of marriageable age 23 years later on average (men 2-3 years later) – in 2005 onwards. So there has been no squeeze until recently – the ones marrying now were born in the late 1980s. Das Gupta (2010) argues that the abnormally high sex ratios that have characterized China since the 1980s will ultimately lead to a situation in which older men, who did not marry when they were younger, will have no children to support them, so that during the later years of their lives they will be particularly vulnerable to poverty and social isolation.

Poston and Glover (2005) foresee the formation of "bachelor ghettos" in Beijing, Shanghai, Guangzhou, Tianjin and other big cities in China, where commercial sex outlets will be prevalent. They also speculate about the possibility of criminality, as men who do not marry have a higher probability of turning to crime.

On the other hand, the resulting involuntary delayed marriage and increasing competition among bachelors may favour longer education and training. Similarly, the accumulation of wealth and assets necessary to marry in a demographic environment of serious sex ratio imbalance may also affect the national economy through higher income and savings levels (Wei and Zhang, 2009; Du and Wei, 2011).

Country Example 3: Sex Ratios at First, Second and Third Births in Viet Nam and China

The 2009 census of Viet Nam asked all women of reproductive age how many sons and daughters they had given birth to during their last delivery. Combined with the information on when this last birth took place, this allowed the computation of the number of girls and boys born during the last 12 months. This yielded a sex ratio at birth of 110.6, well above the expected range of 104-106. However, the analysis went further by combining this information with the data on "children ever born." This provides a classification of the births by sex and birth order, which is an important

covariate because the perceived need for sex selection tends to increase with birth order.

Couples without sons among their first two children tend to be highly motivated to have a third child and to want to make sure that it is a boy. In the case of Viet Nam, the sex ratio for first births found in the census was 110.2, second births 109.0, but among third births it increased to 115.5. Another interesting finding of the Vietnamese study is that sex selection is almost non-existent among the poor, while among the medium and higher strata, which have access to the necessary technology, sex ratios increase to 112 or 113 (UNFPA, 2010 c). This finding also underscores how income or a proxy for income, such as educational attainment, is important to consider when interpreting findings.

The same type of analysis was done by Lin and Zhao (2010) on the Chinese censuses of 1982, 1990 and 2000 and the national 1 per cent sample survey of 2005. They show that the SRBs for

first-born children during that period was actually rather low, varying between a minimum of 100.1 in 2000 and a maximum of 103.6 in 1982. For higher order births, however, the SRB has increased both by birth order and over time. In 2005, it was 132.7 for second-order, 152.2 for third-order and 170.6 for fourth-order births, compared to 107.9, 112.9 and 115.1, respectively, in 1982. It should be noted, however, that the 2005 data are not strictly comparable to the previous ones because they were based on a survey. The sex ratios found in the 2010 census are lower, maybe because the government ban on sex determination of unborn fetuses is having some effect, but maybe also because of the imperfections of the 2005 data.

192. Another useful tabulation for sex ratio analysis, is the total number of births by sex during the past 12 months, disaggregated by the sex composition of the preceding surviving children (e.g. M, F, MM, MF, FF, MMM, MMF, MFF, FFF). This disaggregation may allow the differentiation between deliberate sex selection and other causes.[23] If the children born during the past 12 months are not specified by sex, an alternative is to use children by sex under age 1 in the household instead of children born during the past 12 months, and the total

23 When sex ratios began to rise in Armenia in the 1990s, for example, at first the tendency was to attribute this to the aftermath of conflict in the region. It was not until further analysis established that the imbalance was limited to second and third birth orders that the sex selection process was recognized for what it was.

number and sex composition of the other children with the correct relationship to the head of household that live there. Jha et al. (2011) show, for example, that there is a clear difference in sex ratio trends for second births in India, depending on the sex of the first-born child, with no change in cases where the first-born was a boy and a clearly deteriorating sex ratio over time in cases where the first-born was a girl. This type of analysis, applied to the sex of the last-born child, will be illustrated in the next section.

5. Indicators

193. The transition to very low fertility may exacerbate the manifestations of son preference, such as sex selection at birth. The clearest example of this is the Chinese one-child policy, but the tendency for sex ratios at birth to become more unequal as fertility goes down is a more general phenomenon that has also been noted in India (Das Gupta and Mari Bhat, 1995).

194. Some researchers have argued, therefore, that the sex ratio at birth as such is not an adequate indicator of son preference because it has to be interpreted in the context of the Total Fertility Rate (Singh and Singh, 2007). A country with higher fertility and a more equal sex ratio at birth may actually have higher son preference than

another country, with lower fertility and a more unequal sex ratio at birth. The authors also note that the distribution of fertility may affect the results, with higher disparities in fertility levels leading to more unequal sex ratios at birth, given a certain level of son preference. However, formulating a better indicator of son preference, that is not affected by these intervening factors, is no trivial task, both because of the variety of factors involved (e.g. fertility preferences in terms of total numbers, their distribution in the population, cost of sex selection procedures, perceived cost of childlessness, of having no surviving son, of having no surviving daughter) and because the relationships between them are relatively complex.

195. Probably the best strategy to control the intervening effects is the one suggested in the previous section, namely to control the sex ratio at birth for the number and composition of existing children. Even then, sex ratios across different countries or regions may not be strictly comparable due to the fact that they reflect both the strength of son preference and the cost of early sex detection and abortion.

196. With respect to the sex ratios for the 0-4, 0-6 age groups and others, the general recommendation is to compute these figures in relation to the "normal" values that one would expect based on a standard or model life table for the population with the life expectancy of the country. This procedure is discussed in the next section.

The same goes for the estimation of the number of "missing women."

6. Multivariate and further gender analyses

197. To illustrate how age-specific sex ratios can be analysed, Table 14, from the 2001 census of India, may serve as an example. The simplest kind of analysis that one can carry out is to compare the sex ratio by age in India to that of other countries where presumably female over-mortality and sex selection are not a problem. Thus, the table below compares the Indian sex ratios with those of Mexico (2005) which is an example of a country where male sex selection and female over-mortality should not be problems. Clearly the Mexican sex ratios are substantially lower in all age groups. A similar kind of comparison can be made with the Coale and Demeny Model Life Tables, in this case Model West (Coale and Demeny, 1966). These are theoretical life tables constructed out of the historical experience of a number of western countries, such as the UK, USA, Australia, New Zealand, etc. For the purposes of the table, the sex ratio at birth has been set to 105 boys per 100 girls. The expected sex ratios for particular age groups vary somewhat, depending on the (female)

life expectancy, but on the whole they are fairly stable. India probably conforms best to the middle one (e0(f) = 55), which is representative of mortality as it was during the early 1980s. Again, the expected sex ratios are substantially lower than those of India, with the exceptions of the 25-29 and 30-34 age groups.

Table 14: Sex ratios compared between India, Mexico and the Coale & Demeny West Model

Age Group	India (2001)		Ratio	Idem Mexico (2005)	Model Coale and Demeny West			Cross-Multiplied		
	Males	Females			$e_0(f)=40$	$e_0(f)=55$	$e_0(f)=70$	India	Mexico	C&D $e_0=55$
0-4	57,119,612	53,327,552	107.1	103.3	101.4	103.5	103.9			
5-9	66,734,833	61,581,957	108.4	103.2	101.3	102.8	103.6	0.988	1.001	1.007
10-14	65,632,877	59,213,981	110.8	102.6	101.5	102.8	103.5	0.978	1.006	1.000
15-19	53,939,991	46,275,899	116.6	97.7	101.8	102.8	103.3	0.951	1.050	1.000
20-24	46,321,150	43,442,982	106.6	90.3	101.8	102.7	103.0	1.093	1.082	1.001
25-29	41,557,546	41,864,847	99.3	88.6	101.7	102.5	102.7	1.074	1.020	1.002
30-34	37,361,916	36,912,128	101.2	89.4	101.5	102.4	102.5	0.981	0.990	1.001
35-39	36,038,727	34,535,358	104.4	90.1	101.0	102.1	102.3	0.970	0.993	1.003
40-44	29,878,715	25,859,582	115.5	91.3	99.7	101.4	101.9	0.903	0.987	1.007
45-49	24,867,886	22,541,090	110.3	90.9	97.5	100.2	101.3	1.047	1.004	1.012
50-54	19,851,608	16,735,951	118.6	92.0	94.6	98.3	100.2	0.930	0.988	1.019
55-59	13,583,022	14,070,325	96.5	92.5	91.2	95.8	98.3	1.229	0.994	1.026
60-64	13,586,347	13,930,432	97.5	90.2	87.5	92.5	95.3	0.990	1.026	1.036
65-69	9,472,103	10,334,852	91.7	89.1	83.3	88.4	91.2	1.064	1.013	1.046
70-74	7,527,688	7,180,956	104.8	88.6	78.5	83.5	86.3	0.874	1.005	1.059
75-79	3,263,209	3,288,016	99.2	88.0	73.2	77.9	80.6	1.056	1.007	1.072
80+	3,918,980	4,119,738	95.1	78.2	66.1	68.7	69.1			

198. One indicator that can be constructed out of the table above is the number of "missing women" implied by the sex-specific census data and the theoretical numbers of men and women expected based on the survival ratios derived from a model life table. Comparing the expected number of women with the number

actually enumerated, there is a difference of 31,606,111 (computed as 57,119,612/1.035 + 66,734,833/1.028 + 65,632,877/1.028 + ... + 3,918,980/0.687—53,327,552—61,581,957—....—4,119,738) women, representing 6.0 per cent of the total number expected. Note, however, that the results of analyses of this kind can be somewhat distorted by migration if the sex ratio of the migrants is highly unbalanced. This may significantly affect the results in some parts of India, especially in the South, where many women migrate to the Gulf States as nannies and maids.

Table 15: Comparing actual and expected counts to estimate "missing women"

Age Group	India (2001)		Expected Ratio	Expected Women
	Males	Females	$e_0(f)=55$	
0-4	57,119,612	53,327,552	103.5	55,188,031
5-9	66,734,833	61,581,957	102.8	64,917,153
10-14	65,632,877	59,213,981	102.8	63,845,211
15-19	53,939,991	46,275,899	102.8	52,470,808
20-24	46,321,150	43,442,982	102.7	45,103,359
25-29	41,557,546	41,864,847	102.5	40,543,947
30-34	37,361,916	36,912,128	102.4	36,486,246
35-39	36,038,727	34,535,358	102.1	35,297,480
40-44	29,878,715	25,859,582	101.4	29,466,188
45-49	24,867,886	22,541,090	100.2	24,818,250
50-54	19,851,608	16,735,951	98.3	20,194,922
55-59	13,583,022	14,070,325	95.8	14,178,520
60-64	13,586,347	13,930,432	92.5	14,687,943
65-69	9,472,103	10,334,852	88.4	10,715,049
70-74	7,527,688	7,180,956	83.5	9,015,195
75-79	3,263,209	3,288,016	77.9	4,188,972
80+	3,918,980	4,119,738	68.7	5,704,483

199. Although the comparisons described in the previous paragraphs indicate substantial excess mortality of women compared to expected patterns, the age specific numbers, as well as the number of missing women, are otherwise somewhat difficult to interpret because differentials in the higher age groups are attributable not only to the current situation in each age group, but to the entire life history of each age cohort since birth. This makes it difficult to separate the current situation from

historical differences dating much further back in time. For example, the high sex ratio in the 40-44 age group in India may be due to mortality differentials dating back 45 years. A technique to pinpoint more clearly where the female over-mortality is concentrated consists in the cross-multiplication demonstrated in the last three columns. These have been computed by applying the formula:

Index(5-9) = PF(5-9) * PM(0-4) / (PF(0-4) * PM(5-9)) =

= 61,581,957 * 57,119,612 / (53,327,552 * 66,734,833) = 0.988

200. The advantage of this method is that it provides a clearer picture of differential mortality in specific age groups in the recent past, because it filters out accumulated historical differences between age groups. It also corrects for differential migration and under-enumeration of women, as long as this pattern does not vary too much by age. If the index is larger than 1, it indicates that male mortality in the age group in the recent past has been higher than female mortality. If it is smaller than 1, the mortality differential is favourable to men. Normally one would expect the index to be larger than 1, especially in the earliest ages and after age 50. The Mexican indices are all quite close to 1, mostly slightly larger, but in some age groups slightly lower. The Indian ratios, on the other hand, display a rather erratic oscillating behaviour, with rather low values in the 40-44, 50-54, 60-64 and 70-74

age groups and much higher values in the 45-49, 55-59, 65-69 and 75-79 age groups. This is likely to be due to errors in the age declaration. It also suggests that it may be somewhat misleading to accept the earlier sex ratios by age at face value, even if the conclusion that their values are suspiciously high is not likely to change. In order to obtain more realistic results, it may be necessary to apply some smoothing. On the whole, however, the indices for India are not markedly lower than those for Mexico: the average for India is 1.0086, versus 1.0110 for Mexico.

201. Because of the nature of the indicator, sex ratios tend to be analysed at the macro-level (i.e. in terms of their variations between geographic or socio-economic groups). This, however, need not necessarily be so. Like is often the case, the analysis tends to be more revealing as it becomes more disaggregated. It would be possible to formulate logistic regression models at the level of individual children, in which the probability of being male (or female) is formulated as a function of characteristics such as birth order or – better – the number and composition of elder siblings by sex (i.e. a categorical variable, using the categories outlined in Section 4), education of the head and/or wealth index of the household, rural/urban residence, education of the child's mother and whether she works outside the home.

202. One way to look at sex ratios as a gender discrimination indicator is through the use of the sex ratio at last

birth. The logic is simple. In a regime, where the total number of children a woman gives birth to is not governed by nature alone but also by some type of fertility control, couples will have the tendency to stop having additional children after a child is born of the preferred sex. Through fertility control people try to maximize their preference for the number and sex composition of their offspring. In societies with a strong son preference, it can therefore be expected that the sex ratio at last birth will be high. The measure obviously works best for women who have passed their reproductive period in life, as their 'last birth' really marks the end of their reproductive career. However, also for women below age 50 the sex ratio at last birth can be used as an indicator of sex preference. In this case 'last birth' will be a mix of concluded and non-concluded fertility. If the sex ratio at last birth is higher than the overall sex ratio at birth, it can be considered a sign that son preference is present, even in the absence of sex-specific abortion.

203. The sex ratio at last birth as a measure of son preference is examined here on the basis of the 2009 Vanuatu Population and Housing Census. The sex ratio of all 'Children Ever Born' among all women aged 15 and over, stood at 1.088 in Vanuatu; for women 15 – 50 years of age this was 1.084. However, the sex ratio at last birth stands at 115.1 for all women 15 years of age and older. Among women who are past their reproductive age (50 years and over) the sex ratio at last birth is 120.2, whereas

for women 15-49 years it is 113.6. These figures are higher than the overall sex ratio at birth and proof that in Vanuatu son preference is clearly a motive to stop or to continue having additional children.

204. More detail can be brought into the picture by linking the sex ratio at last birth to the number of older male and female siblings of this last child. These figures are restricted to 4 older brothers and 4 older sisters, because very few cases were available beyond these numbers. Only children of women between 15 and 50 were considered, to exclude events that took place too far in the past. The results of this analysis are presented in Table 16.

Table 16: Vanuatu (2009)—Sex ratios of last child by distribution of number of older siblings for women aged 15 -50 years

		Number of girls ever born by the mother, before birth of last child				
		0	1	2	3	4
Number of boys ever born by the mother, before birth of last child	0	116.0	128.6	154.5	165.9	139.6
	1	96.2	117.0	134.6	127.6	111.6
	2	89.0	101.8	100.5	123.4	133.1
	3	99.3	106.8	102.3	99.5	159.7
	4	82.9	85.2	127.0	91.6	130.0

Source: Census of Vanuatu (2009)

205. The table clearly shows that the sex distribution of previous children has an important effect on the sex ratio of the last birth. If the last birth was in fact the first birth (0 older sisters, 0 older brothers) the sex ratio is 116. As this figure is higher than the overall sex ratio at birth of 108.4, it indicates that some parents are more eager to stop at one child if that child is a boy. The sex ratio at last birth for women who have had 2 daughters, but no sons is as high as 154.5. Many if the women who had 3 children will have continued having another child. But a far larger proportion of women who had two girls and got a boy as a third child decided to stop than those who gave birth to a girl after two girls. It is interesting to see that the sex ratio at last birth indicates that women also have the tendency to stop having more children when they get a baby girl after having only sons before. The figures in the first column (except for the first line) of the table show sex ratios which are considerably lower than 108.4. This means that some women also want a baby girl after they had only sons. However, looking at the sex ratio at last birth for women who had 2 sons and no daughters, one

notes that this value (112.3) is considerably lower than the value for the corresponding category for boys (154.5). Note that analyses of this kind and those of the following paragraphs make use of the concept of Parity Progression Ratio, i.e. the proportion of women who will go on to have additional children, given that they already have a certain number or (in this case) a certain composition of children. This concept is discussed in the Indicator section of Chapter 3.

206. To look whether these patterns of sex preference are different among various groups in society, one may set up a logistic regression model with the sex of the last child as the dependent variable. Earlier it was shown that the number and composition of elder siblings by gender plays an important role in the sex ratios at the last birth. To bring this variable into the equation, the number of older male siblings of the last birth was subtracted from the number of older female sibling. Obviously, this number could be negative, zero or positive. A number of other predictors were tested in the logistic model (education of mother, urban/rural, work status of the mother, religion, and ethnicity). In the end only the urban/rural variable was retained, as all other predictors proved inconclusive. This result is in itself important because it shows that the pattern of sex preference, described above, exists among the various subgroups of society. Table 17 shows the results of the logistic regression. Next to the main effects the interaction between urban/rural and the difference

between older brothers and sisters was included.

207. Rosenblum (2013) also investigated the influence of fertility stopping rules, based on the sex of the last born, in India. His analysis produces empirical evidence using the sex outcome of first births as a natural experiment to show that stopping rules can exacerbate discrimination, causing as much as a quarter of excess female child mortality. Another implication of the research is that the use of sex-selective abortion may lower female mortality, but raise male mortality.

Table 17: Vanuatu (2009)—Logistic regression of the probability that the last-born child is a boy

		Number of girls ever born by the mother, before birth of last child				
		0	1	2	3	4
Number of boys ever born by the mother, before birth of last child	0	116.0	128.6	154.5	165.9	139.6
	1	96.2	117.0	134.6	127.6	111.6
	2	89.0	101.8	100.5	123.4	133.1
	3	99.3	106.8	102.3	99.5	159.7
	4	82.9	85.2	127.0	91.6	130.0

Source: Census of Vanuatu (2009)

208. The results show that for each unit difference between 'older sisters minus older brothers' the odds ratio for the last child being a boy increases by a factor 1.147. This confirms our earlier conclusion that son preference is operating in Vanuatu. Controling for this sibling difference, the odds ratio for rural areas over urban areas is 0.958. This means that in rural areas chances of the last birth being a male is lower than in urban areas. Also, the

odds ratios of the interaction term (0.945) indicate that with each extra unit difference between older brothers and sisters, the gap between the chances of the last birth being a boy for urban and rural increases. The fact that in rural areas the odds for the last child being a boy are smaller than in urban areas is not necessarily a proof that son preference in urban areas is higher than in rural areas. It is well possible that women in rural areas follow a more natural fertility regime than women in urban areas and that regardless of the sex of their latest child, they will simply go on to have another child. For more details on this methodology, one may consult the article by Dalla Zuanna and Leone (2001).

209. Mutharayappa et al. (1997) looked at Indian couples who had two or three living children and analysed their subsequent fertility based on the sex composition of the existing children. To this effect, they controlled for rural/urban residence, literacy, religion and other socio-economic variables. After applying these controls, they looked at the fertility decisions of couples, depending on whether the existing children were boys or girls. Their conclusion was that fertility in India would be 8 per cent lower if son preference did not play a role in the decision to have another child. Although their data came from the National Family Health Survey, it would be possible to carry out a similar analysis with census data, provided that the information on Children Ever Born and Children Surviving is disaggregated by the sex of the

children and that it is possible to identify the last-born child, which is the case in India. The main limitation of using census data for this type of analysis is that it may not be feasible to obtain the dates of birth of all the surviving children. This has to be done based on the listing of household members, but this listing may only provide ages, rather than exact dates of birth, and some children may not live in the same household as their mothers.

210. In addition to demonstrating the effect on the last-born, several studies have attempted to quantify the effect of son-preference on fertility decisions in other ways. Research by Tu (1991) in Shaanxi Province, for example, showed that the chance of having a second birth for a woman whose first child was a girl was 1.5 times that of a woman whose first child was a boy, and the chance of having a third birth for a woman whose first two children were girls was 2.9 times that of a woman whose first two children were a boy and a girl. The chance of having a third birth for a woman whose first two children were boys was slightly higher than that of a woman whose first two children were a boy and a girl (indicating a slight preference to have at least one girl, rather than just boys), but the difference was not statistically significant. In Taiwan, Chu, Xie and Yu (2007) showed that there is a positive relationship between the proportion of girls in the household and the total number of children. This suggests that parents continue to have children until they have at least one boy. Similar studies have been carried

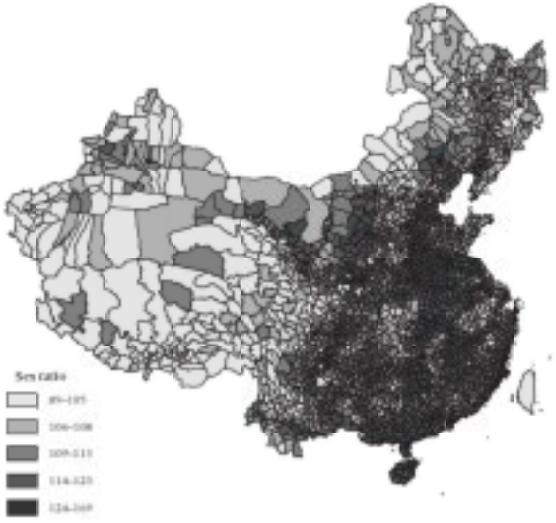
out in other countries, such as the Republic of Korea (Park, 1983), based on World Fertility Survey data.

211. By representing sex ratios spatially, especially for relatively small units, certain patterns may emerge that may correlate with certain determinants. The following figure shows the sex ratios for the 0-9 year age group by canton for the 2000 census of China. There is a clear tendency for sex ratios to be highest in the South and East of the country, with more normal patterns in the western half of the country, as well as in the north. One also notes a number of contiguous areas in Anhui, Shanxi and western Hubei Provinces where the ratios are closer to normal. In their article, the authors of the map correlate such variations with the availability of rural pension systems.

212. Further analysis may also be carried out with respect to the determinants of imbalances in the sex ratio at birth. One line of analysis that was suggested earlier is the disaggregation of births by birth order and by the composition of older siblings. It may be possible to investigate other determinants. For example, it was mentioned earlier that parents in some countries need a male heir, to ensure their sustenance in old age. This suggests that parents who have access to institutional pension systems may have less unbalanced sex ratios among their offspring than those who depend entirely on their (male) children (for an example of this kind of analysis see the above study by Ebenstein and Leung, 2010). In some censuses, it may be

possible to differentiate between these situations, either through specific census questions or indirectly, by looking at the status in employment of the head of household and his/her spouse.

Figure 8: Sex ratio for age group 0-9 years, by county, in China's 2000 census



Source: Ebenstein and Leung, 2010: Figure 2

213. Some of the first regression analyses (e.g. on India: Kishor, 1993 and Murthi et al., 1995) show that sex ratio imbalances are a function of female economic valuation (using female labour force participation as a proxy), development level (income/wealth or human development), male and female educational attainment, cultural factors (using religion and ethnicity as measures) and

urbanization. In accordance with the argument made in Section 4, one should add to this the effect of overall fertility levels and their distribution in the population. Recent research suggests that greater attention should be paid to comparing sex ratios at different age groups, to sex-biased migration as an explanation for rural-urban differences in sex ratios, and to the existing sex composition of the family into which girls are conceived (Das Gupta, 2005).

214. Gechter (2006) did an ordinary least squares regression of the child sex ratios (ages 0-6) of 106 districts that had full information in the 1998 census of Pakistan, using several ecological variables to explain the variations.

Table 18: Pakistan (1998) – Child sex ratios (ages 0-6) (here defined as 100*number of girls / number of boys) for 106 districts of Pakistan with complete

census information

Variable	Coefficient	t-Score
% Households permanent housing	0.053	(1.96)
% Population 0-6 vaccinated	-0.084	(1.67)
% Males Literate	-0.137	(1.89)
% Females Literate	0.033	(0.45)
% Exogamy	0.067	(0.28)
% Muslim	0.194	(1.47)
% Urban	0.015	(0.44)
Punjab dummy	0.012	(1.36)
Sindh dummy	0.010	(0.80)
Balochistan dummy	0.002	(0.10)
Islamabad dummy	0.019	(1.54)
Constant	0.837	(6.12)**

Source: Gechter, 2006: Table 15

The coefficients shown below explained 25 per cent of the variation and none of them are highly significant. The most significant are the ones suggesting more favourable sex ratios in areas with predominantly Muslim populations and higher proportions of permanent housing, whereas less favourable sex ratios were associated with high vaccination ratios and high percentages of male literacy. It is not immediately clear how to interpret these associations.

215. The importance of religion as a determinant of the sex ratio is also emphasized by Kim and Song (2005), in their study (not based on census data) of regional variations of the sex ratio at birth in the Republic of Korea, in 1994 and 2000. Although the sex ratio at birth generally decreased during this period, it was still higher in districts with a Buddhist majority, with an influence

of Confucianism, than in districts with larger Catholic or Protestant poulations. This determination stood out more clearly than other that associated with other socio-economic determinants, such as the percentage of high school graduates, tax revenue or hospital infrastructure.

7. Interpretation, policy and advocacy

216. The examination of sex ratios at birth and for different age groups should be contextualized by more qualitative analyses. In order to develop an adequate policy or advocacy response to sex ratio at birth imbalances, gender analysis needs to unearth what gender inequality or human rights violation is underlying the disparity.

a. Is it differential under-reporting ?
b. Is it sex-selective abortion, based on son preference ? And if so, what is the legal context of sex-selective abortion in the country ?
c. Is it neglect of newborn girls ?

Although differential under-reporting would the least serious of the three alternatives, it is not without negative consequences. Under the one child policy, parents in China may be more likely not to report the birth of a girl than a boy, so as to maintain the option to have another child, but by doing so they make it impossible for the girl to attend school or have access to a series of other public

benefits that require an official identity. Although under-registration is not the same as under-count and girls that were never registered may still be counted in the census, it is likely that parents will keep never registerd girls away from census enumerators as well, especially if the enumeration involves the presentation of identity documents for all household members.

217. Any effective strategy for dealing with son preference should be based not only on the subjective preferences of parents—and how to change them -, but also consider the fact that parents take rational decisions based on the objective disadvantages that their daughters—and by extension they themselves—face in a society where women are less valued and where the ability of women to care for their parents is limited both by economic realities and social customs. Ebenstein and Leung (2010: 66) express this viewpoint when they consider how male or female offspring affect the access of parents to care in old age: "The Chinese government has both re-affirmed the one-child limit and declared that reducing the sex ratio at birth by 2016 is a national priority (....). Such goals may be in conflict with each other if economic conditions making sons valuable to parents are not addressed. We find that parents who fail to produce a son are more likely to participate in old-age pension programmes and that the number of children in a family is negatively related to pension programme participation. We also find evidence that the rural old-age pension programme mitigated the

increase in the sex ratio in the areas where the programme was available."

218. In some countries, the sex ratio seems to start decreasing after the age of 20, only to equalize around the age of 60. This reflects the high level of maternal mortality. According to UNICEF (2011 b), based on the analysis of DHS, MICS and Reproductive Health Surveys for 80 countries, under-5 mortality for girls is typically 4 per cent lower than for boys, except in East Asia and the Pacific and in South Asia, where it is 5 per cent and 3 per cent higher, respectively. In Latin America and the Caribbean and in the Central and Eastern Europe/Commonwealth of Independent States (CEE/CIS) countries, on the other hand, the mortality of girls is much lower (14 per cent and 22 per cent, respectively) than that of boys under age 5. It is important to distinguish sex differentials in mortality, especially infant and child mortality, from sex ratio imbalances at birth because their policy implications are very different. Oster (2009) argues that differential mortality, rather than sex ratio imbalances at birth, are responsible for the high child sex ratios in India. In practice, however, it is difficult to disentangle these factors.

Country Example 5: the 2011 Census of India

In India the 2001 census revealed a substantial increase (or decrease, as it would be reported according to the Indian convention for computing sex ratios) in the child sex ratio of the 0-6 age group, compared to the previous census. This finding was publicized by the media and a major campaign ('Save the Girl Child') to control and monitor female foeticide was launched, along with a number of remedial measures at national and state levels (UNECE, 2010).

In the 2011 census of India, UNFPA concentrated its support to the government in the area of gender (see UNFPA India, 2011). Based on the results of the 2001 census, three indicators were identified to characterize districts with particular gender problems. These were:

- The overall sex ratio (with a ratio of less than 900 women per 1000 men indicative of a problem);
- Low female literacy (30 per cent or lower); and
- Low female labour force participation (20 per cent or lower).

Likewise, analysis with a different cut-off was done for cities/towns. Based on the results of the 2001 census, this led to the identification of 260 gender-critical districts (including cities/towns) out of the 593 districts across the country, for focused attention. These districts were singled out for additional training of the enumerators, through a special gender module.

More in general, interviewer training focused on seven critical gender elements of census enumeration:

1. Full coverage of population, to ensure the inclusion of females (elderly, infants, disabled, etc.);
2. Proper netting of female headed households;
3. Appropriate netting of female work in all economic activities, including informal and unpaid;
4. Adequate capture of the date of birth, particularly among elders, girls, and illiterates;
5. Adequate capture of mother tongues, especially of married females and non-family members;
6. Adequate capture of fertility, particularly children born and died in the year before the census;
7. Instructions to probe the reasons for migration, especially in the case of females.

In order to prevent the misuse of technology, India has institutes the Pre-conception and Pre-natal Diagnostic Techniques (Prohibition of Sex Selection) Act, which was adopted in 1994 and amended in 2003, but few convictions have been made so far, due to the difficulty of demonstrating conclusively that the offense was conducted with the consent of the parents and the service provider (UNFPA India, 2009).

219. Some authors consider the term "sex ratio" (to say nothing of "masculinity ratio", as it is called in some Romance languages) too slanted towards biology and thus unclear about the role of cultural differences. While

some Australian feminists propose replacing the term "sex ratio" by "gender ratio" (Lucas, 1985: 7), this usage is not encouraged, for the reasons discussed in previous chapters regarding the difference between "sex" and "gender."

220. Sex selection technology providers generally argue that sex selection is an expression of reproductive rights pursued by women, as well as a sign of female empowerment that allowed couples to make well-informed family planning decisions, prevented occurrences of unintended pregnancy and abortion and minimized intimate partner violence and/or child neglect. In contrast, primary care physicians question whether women could truly express free choice under pressure from family and community. They voice concerns that sex selection led to invasive medical intervention in the absence of therapeutic indications, contributed to gender stereotypes that could result in child neglect of lesser-desired sex, and was not a solution to domestic violence (Puri and Nachtigall, 2010).

221. Advocacy efforts to reduce sex ratio imbalances should lobby with legislators, the executive, traditional and religious leaders for enhanced monitoring of technologies that allow for sex-selective abortions and their application and spread in the private health sector. More importantly, however, the long-term solution for the problem lies in counterbalancing the effect of women's undervaluation in patriarchal systems. This requires

various empowerment measures, tackling the societal level (questioning and reforming systems of dowry transfers, patrilocal residence and extended patrilineal families, old-age support, ritual duties, inheritance though sons, etc.) and, where feasible and affordable, the individual level (support girls and/or all-girls-families through direct subsidies at the time of birth, through scholarship programmes, and through gender-based quotas or financial incentives aimed at improving their economic situation and at offsetting the impact of the economic undervaluation of girls in society).

222. Most important from the viewpoint of this manual, the need for knowledge needs to be addressed and knowledge needs to be shared. In Viet Nam, a country that has fairly recently become aware of increasingly skewed sex ratio at birth as a consequence of son-preference and induced abortions, the following advocacy recommendations were made in this regard (UNFPA Viet Nam, forthcoming: 7ff):

"To enhance the basis for policy development and dialogue on the forces behind the increasingly skewed SRB in Viet Nam, there is a need for data of both a quantitative and a qualitative nature, and for dissemination and public discussion of this evidence."

The regular analysis of population and birth registration data on sex ratios should be continued in order to

establish and extend the evidence on sex ratios and monitor relevant trends over time. Further, analyses should be carried using other data sources, such as the annual Population Change Survey, the Inter-census survey and the 2019 Population and Housing Census.

CHAPTER 6

Marital Status, Polygamy, Widowhood and Child Marriage

1. What is it?

223. **Marital status** is "the personal status of each individual in relation to the marriage laws or customs of the country" (United Nations, 2008: 159). As they reflect culture, marital status categories are not universal across censuses and categories in a country may change over time. However, census data generally allow distinguishing between at least five categories: a) single, never married; b) married; c) widowed and not remarried; d) divorced and not remarried; e) married but separated. In some countries, it is necessary to take into account consensual unions, or socially recognized stable unions that may not have full legal force. In others, polygamous unions exist that are not always legally recognized or acknowledged by the census. Some countries join categories d) and e) and thus distinguish only 4 marital status categories. On the other hand, the Bahamas, in its 2010 census, distinguishes as many as 9: a) Not in a union; b) Legally married; c) Common-law-union; d) Visiting partner; e) Married but not in a union; f) Legally separated

and not in a union; g) Widowed and not in a union; h) Divorced and not in a union; and i) Not stated.

224. Marital status is a key variable for gender analysis. It reveals situations of vulnerability such as polygamous unions, widowhood and child marriage. Wherever possible, marital status should be considered in tandem with household composition in order to capture some of the complexities of household composition.

Text Box 9: Types of Socially Recognised Stable Unions Captured in Population and Housing Censuses

Marriages: Unions recognized by civil and/or religious authority:

- Monogamous
- Polygamous
- Same sex marriages

Consensual Unions: Unions recognized by custom or "common-law", consensual unions or "companionate marriages," free unions, temporary unions, visiting unions or cohabitations:

- Monogamous
- Polygamous

- Same sex unions

In recognition of the distinction between these categories, some censuses, particularly in the Caribbean countries, distinguish between the "marital status" and the "union status" of individuals.

Source: Elaborated on the basis of Census Questionnaires of the 2010 Census Round and the UNDESA Multilingual Demographic Dictionary, 2nd edition 1982.

225. For gender analysis, the category of "married," in particular, needs to be clear. Monogamous unions should be distinguished from polygamous unions, and unions recognised by law (i.e. generally marriage) should be distinguished from consensual unions, which are recognised by tradition. Examples of consensual unions are customary or "common-law" marriages in much of Africa, visiting unions in the Caribbean and elsewhere, and cohabitation in de facto unions in Europe. Some countries (e.g. Brazil, Croatia, Germany, United Kingdom) allow marriage or registered partnerships for homosexual couples that may be counted with census data with the categories of marriage, consensual union, or a separate category.

226. **Polygamy** is a marriage which includes more than two partners. Its most frequent form is polygyny where a husband has two or more wives. In a census, the term 'polygamy' is generally used in a de facto sense (i.e. regardless of whether the relationships between the spouses are recognized by the state). Thus, several African

censuses distinguish between "married – monogamous marriage" or "married – polygamous marriage" and ask for the number of wives or co-wives (e.g. Benin, Burkina-Faso, Burundi, Côte d'Ivoire, Egypt, Gambia, Kenya, Lesotho, Niger, South Africa, Togo, Uganda, but not Saudi Arabia). More generally, there are complexities in gathering information on marital status where marriage is a process, rather than a single event, as is often the case in Southern Africa. The Data Section discusses some of these complexities of gathering valid polygamy data in greater detail.

227. **Widowhood** refers to the marital status of a person whose spouse has died and who has not remarried. Widowhood affects women disproportionately; in every region of the world, at least one-third of women age 60 and over are widowed. In Africa, women over age 60 are over six times more likely to be widowed than men of the same age (United Nations, 2009 a).

228. **Child marriage** is defined as marriage before age 18 (regardless of national legislation on the minimum age at marriage, if different), for both girls and boys, which is the minimum legal age of marriage according to international human rights conventions, notably the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) (United Nations, 1979), the Convention on the Rights of the Child (CRC) (United Nations, 1989). In practice, because women marry at

younger ages than men, child marriage concerns mainly girls.

229. **Arranged marriage** is the practice where marriage contracts are decided upon not by the marriage partners, but by a third party, usually the parents. These decisions can be taken at any time before the actual marriage, in some cases even before the children are born (e.g. traditionally among the Thanu tribe of Nepal). Although this need not be the case, arranged marriages are usually prevalent in the same areas as child marriages, because child marriages are less likely to be based on the free choice by the partners themselves.

2. Why is it important?

230. Marital status greatly affects the socio-economic status of women and men and shapes their experiences in society. One way in which this happens is through the legal or customary practices that determine the property rights of married women. In many African countries, for instance, married women can only inherit property from their husbands, even if accumulated by common labour, through their children. Women in polygamous unions are most likely to see their economic rights violated due to unequal property rights. In Uganda, it was found that women considered themselves co-owners of property acquired during marriage because of the economic importance of their agricultural labour, but men

viewed the property as theirs to use to marry a second wife (Khadiagala, 2002).

231. In addition, women's marital status may influence their participation in the labour force and their educational enrollment, with consequences for their risk of dependency and poverty. For instance, child marriages have a greater impact on the educational career of women than of men, often leading to school drop-out, early pregnancy and the impossibility of ever entering the labour market. All other things being equal, married women may also be less likely to work and acquire economic independence. Consequently, divorced or widowed women are more vulnerable and exposed to the risk of poverty if they did not work while they were married and have no other personal source of income. When analysing this relationship, however, it is important to consider other factors, besides marital status, that may account for the woman's economic activity or inactivity. It may be, for instance, that for women of a certain educational level, it is the number of dependent children, rather than marital status per se, that accounts for their labour force participation.

232. Polygamy has several negative impacts on co-wives, e.g. adverse economic and inheritance consequences, such as loss of property and land ownership, health consequences, such as an increased risk of contracting HIV/STIs, and psycho-social consequences mediated by culture, such as disempowerment, low sense of self-worth,

and personal betrayal. Even where culturally or economically accepted by women, it may be experienced as undesirable and burdensome. For example, in a survey conducted in Cameroon (Cheka, 1996), 66 per cent of women in polygamous unions did not want their husbands to take another wife. They gave many reasons for this, most often linked to jealousy and the central role occupied by children. While other types of relationships (e.g. extra-marital relationships in Western countries) may have similar impacts, polygamy adds a human rights dimension by legally and socially sanctioning unequal treatment of men and women. Polygamy also has negative consequences on families and children, including child poverty and lower educational attainment. In Swaziland, for instance, polygamy is an important factor in family disruption as conflicts frequently arise among husband and wives or among co-wives. It also contributes to school drop-out (Poulsen, 2006).

233. Child marriage has negative physical and mental health consequences for the married child and her children, and is often closely connected with forms of sexual exploitation and social isolation. According to Jenson and Thornton (2003), women who married young are more likely to be beaten or threatened, and more likely to believe that a husband might be justified in beating his wife. Child brides suffer health risks associated with early sexual activity and childbearing, leading to high rates of maternal and child mortality as well as sexually

transmitted infections, including HIV, as older spouses may have had multiple sexual partners before the girl bride.

234. In many societies, widows are socially disadvantaged. Not only do they face several forms of social, economic, psychological and cultural deprivation, they also lack attention from policy makers and public interest. For a number of reasons, more females than males are affected by widowhood. On the one hand, in most countries men suffer higher mortality (e.g. from chronic life-style diseases or accidents, and violence). In addition, women tend to marry men slightly older than themselves and not to remarry once widowed. The reasons why men are more likely to remarry vary from culture to culture, but often include beliefs about a person's attractiveness (e.g. linked to virginity), practical considerations (e.g. the need for a partner that can run a household) and the skewed sex ratio among older adults in many countries (Carr and Bodnar-Deren, 2009). See the next section, for an actual example.

235. While in developed countries widowhood is experienced primarily by elderly women, in developing countries it also affects younger women, many of whom are still rearing children. For example, in the 2004 census of Timor Leste, 19.2 per cent of women were found to be widows by the time they reached age 50, whereas this was only the case of 3.4 per cent of the women in the Hong Kong census of 2011. Most of this is due

to higher mortality, although in some countries difficulties of remarriage for widows may also play a role. Discrimination in inheritance, including land or property grabbing, loss of social status, stigma and exclusion are a few of the human rights violations associated with widowhood in many societies. Interestingly, in Western countries, research suggests that older men are often more emotionally affected by widowhood than older women, as they are more dependent on their spouse for social and emotional support (Lee et al., 1998).

236. Widowhood and polygamy are interlinked because in societies where widowhood or singlehood is socially discredited, polygamy may be perceived as a practical alternative. For instance, Surtees (2003) found evidence of an increased prevalence of polygamy in Cambodian society, a practice which was not traditionally widespread. In the context of adult sex ratios skewed by civil war (1970-1975) and ensuing turbulence, many women were forced to choose between being a second wife or remaining unmarried.

237. Child marriage is a harmful traditional practice and one of the most pervasive human rights abuses worldwide. In some countries in Southern Asia and Sub-Saharan Africa, half of the girls are married before they turn 18 (UNFPA, 2012 b). It violates article 16 of the Universal Declaration of Human Rights (UDHR) (UN, 1948) which stipulates that "marriage shall be entered into only

with the free and full consent of the intending spouses" as boys and girls lack the maturity to make an informed and free decision and, worse, are sometimes married off by their families without being consulted. The UN Convention on Consent to Marriage, Minimum Age for Marriage and Registration of Marriages (1962) reiterates the right to free and full consent at marriage and holds duty-bearers accountable for specifying a minimum age for marriage and making sure that all marriages are officially registered. CEDAW goes further by stating that "[t]he betrothal and the marriage of a child shall have no legal effect" (Article 16.2). In addition, child marriage is linked to several rights explicitly stated within the Convention on the Rights of the Child (CRC) (United Nations, 1989), specifically to express their views freely, to be protected from all forms of abuse and from harmful traditional practices.

Country Example 6: Widowhood Practices in Nigeria

In Nigeria, family law permits certain widowhood practices that discriminate against women, particularly those married according to customary rather than statutory law. Some of the negative practices derive from the belief that "the beauty of a woman is her husband." At his death, she is seen as unclean and impure, and her health may be undermined by the customs she must observe in the weeks after her husband's death. If she has no male adult children, she may be ejected from her husband's house as both it and his land will have been inherited by his oldest brother. In most cases,

the husband's kin do not provide the widow with any economic support, particularly if she will not accept the status of being an additional wife to one of her husband's brothers. In a study in Imo State, Nigeria, interviews and discussions were held with traditional rulers, leaders of women's organizations and widows. Five factors that have an impact on the health and economic status of widows were identified: a long period of incarceration during mourning; an obligatory poor standard of hygiene; deprivation of the husband's property and maltreatment by his relatives; the enforcement of persistent wailing; and the practice of demanding that a widow sit in the same room with her husband's body until burial.

World Health Organization (1998). Women, Ageing and Health

238. Globally, one-third of women currently aged 20–24 were married or in union before they turned 18 (UNICEF Child Info, http://www.childinfo.org/marriage_country-data.php; accessed 5 May 2011). While the proportion of married girls aged 15 years or less is low, in some countries it ranges from 1 to 5 per cent – such as El Salvador, Ghana, Malaysia, Nepal, Nicaragua, Uganda and Zambia – while in Niger the share of very young girls that are married is above 20 per cent. Married adolescents generally have characteristics such as

- Large spousal age gaps;
- Limited social support, due to social isolation;
- Limited educational attainment and no schooling options;
- Intense pressure to become pregnant;
- Increased risk of maternal and infant mortality;

- Increased vulnerability to HIV and other STIs;
- Restricted social mobility/freedom of movement;
- Little access to modern media (TV, radio, newspapers);
- Lack of skills to be viable to the labour market.

Country Example 7: Determinants of Gender Inequality in India

In 1983, Dyson and Moore proposed that North India's cultural bias favoring exogamous marriage and South India's bias favoring endogamous marriage between close kin, which ensured a wife's lifelong access to the kinship network of her birth, went far to explain the greater degree of autonomy enjoyed by women in the South. In 2004, Rahman and Rao reexamined this thesis. Their results do not support Dyson and Moore's contention that consanguinity and village exogamy are the major determinants of differences in gender equity between North and South India. They found that village exogamy, although more prevalent in Uttar Pradesh, is practiced by a majority of communities in Karnataka and that the distance wives live from their natal family in the two states is essentially the same. Whereas Dyson and Moore posit strong negative effects from village exogamy across the board, Rahman and Rao find little impact on women's mobility and a weak but positive association with their increased authority in making decisions. They also found that South Indian women pay dowries that are just as high as those of their North Indian counterparts, suggesting that the factors determining dowries in both regions do not contribute directly to the divergent observations regarding gender equity. As Dyson and Moore suggest, however, the practice of "purdah" and "gunghat", which is more prevalent in the North, is strongly correlated with restrictions on women's agency.

3. Data issues

239. Marital status data gathered from censuses may not capture the complexity of human experiences and processes that make up the living and union characteristics of women and men. In some of these cases, persons may fit more than one category at the same time. For instance, in some European countries couples may live together, but for legal or fiscal reasons maintain separate addresses. It is not always clear whether to classify persons as "single" or "consensual union" if indeed these categories exist. In Indonesia, women with children and living with a partner are automatically considered married, even though they may not be. Persons who have been in a union, especially an informal union, but who are currently unattached may be classified as "single", which is different, therefore, from "never in a union". On the other hand, in many emigration countries, couples may not be legally separated or divorced, but de facto live separate lives as they work in different countries. It is unclear whether to record them as "married" or "married but separated." In some African countries (e.g. Angola), polygamy is illegal, but men often take informal additional wives. It is not clear whether the informal wife's marital status, under these circumstances, should be tallied as "single" or "married." Finally, child marriages may not be formalized due to legal reasons, yet the arrangements are binding between families. Should informal child brides then be recorded as "married" or "single"? It is difficult to provide standard answers on how these situations should

be handled, but researchers should be aware of them, particularly in making international comparisons, and make appropriate adjustments to account for them.

240. Few countries ask questions about the previous marital status of individuals. Some, like Mauritius and Nepal in their 2011 censuses and Maldives in its 2006 census[24], ask whether the person has been married more than once. One country that includes more detailed information is Ireland. The 2006 census of Ireland distinguishes seven marital status categories, namely a) Single (never married); b) Married (first marriage); c) Remarried following widowhood; d) Remarried following divorce/annulment; e) Separated (including deserted); f) Divorced; and g) Widowed. This allows some interesting analyses, such as quantifying the propensity of widowed or divorced men and women to remarry. According to the Irish data, 9.04 per cent of women over the age of 15 had been widowed and of those only 2.89 per cent had remarried. In the case of men over age 15, only 2.78 per cent had been widowed, but of those a much higher percentage (11.29 per cent) had remarried. To some extent, these results are affected by the age structure, but even if this is taken into account, men are still more likely to remarry. Of the widows aged 40-49, for example, 12.4 per cent had remarried, but the

24 In the case of the Maldives, this has to do with the traditional practice of multiple marriages. Among the younger generations, this practice is disappearing, but among women over the age of 50, the 2006 census found that 25.5 per cent of ever married women had been married to 2 different men, 17.8 per cent to 3 different men, and 22.2 to 4 or more different men.

equivalent figure for widowers was 21.2 per cent. Men were also more likely to remarry after a divorce, although here the difference was much smaller. Of those that had been married before, 39.67 per cent had remarried, compared to 30.08 per cent in the case of women. These data confirm the common perception that divorced women and particularly widows are less likely to remarry than men in similar situations.

Country Example 8: Marital Status Categories in Côte d'Ivoire

In Côte d'Ivoire, an effort was made for marital status categories in the census to capture social reality rather than the legal status quo. Legally speaking, only marriages performed by a registry are valid. The law further prohibits the payment and acceptance of a bride-price, polygamy is outlawed and the marriageable age is 18 for women and 20 for men. However, according to the 1998 DHS, 35 per cent of women lived in a polygamous marriage and traditional marriages are commonly performed, even with girls as young as 14, in conservative communities in the North.

In order to adequately capture social reality, the Côte d'Ivoire census of 1998 offered "consensual/free union (union libre)" and "polygamous marriage with 1, 2, etc. co-wives" as answer categories for marital status. It also included the following "types of marriage": legal marriage, customary marriage, religious marriage, legal and customary marriage, legal and religious marriage, religious and customary marriage, legal, and customary and religious marriage.

241. In countries where consensual unions are frequent

and not condemned by social norms, the census is an invaluable tool to report on them, as they are generally not registered. However, it is likely that undocumented/customary marriages and consensual unions will be under-reported in the census, especially in countries where they are socially stigmatized.

235. A marital status category that may be relevant from a gender viewpoint but that has to be constructed from the census data, rather than being directly obtained from the standard options, is that of married women who are not living with their partners. This status may reflect a variety of situations. In many cases, it will refer to women whose spouses are living abroad or elsewhere in the country for work-related reasons. It may also reflect a situation in which spouses are living apart but do not yet consider themselves permanently separated. In censuses taken based on the "de facto", rather than the "de iure" criterion, it may also indicate that the husband was temporarily absent on census night, even though he normally lives in the household. It is important to be aware of the enumeration criterion as this third situation is obviously very different from the other two.

236. The validity of marital status data is compromised by misreporting and various forms of census editing. False information may be given on marital status for reasons of social desirability (e.g. in societies where divorce or separation is not socially acceptable). Estimates by age

may also be affected by age misreporting. Also, underage spouses are often not asked marital status questions. Where they are asked and report to be married, marital status is in some countries set to "single" to conform to national legislation. Question wording and answer categories on consensual unions and polygamy are not harmonised internationally. Thus, extensive recoding is necessary to make data comparable.

237. Regarding polygamy in particular, there are two important challenges to gender analysis. First, in many Muslim-majority (e.g. Iraq, Kuwait, Qatar, Mauritania) and some African countries (e.g. Togo, Uganda), only husbands are asked how many wives they have while wives are only asked whether they are married, without mention of the number of co-wives. To identify women living in polygamous marriages, one has to select households where a man declared to be in a polygamous union. Then, if the man is head of the household, one can identify the women whose relationship to the head of household is declared as "spouse". This does not work in situations where the various wives live in different households. Second, in some African countries, polygamous consensual unions, although frequent, may be underreported when answer categories do not explicitly include unions involving persons who are cohabiting or married by customary marriage.

238. Text Box 10 below shows census questions on

polygamy that a) ask about polygamy for men only, b) include answer categories for women married with men who have several wives c) include polygamous consensual unions.

Text Box 10: Census Questions on Polygamy

Qatar Census, 2010

Marital Status

- Never married
- Married
- Divorced
- Widowed

For married males only: Number of wives

Burundi Census, 2008

Is … married? (Est-ce que …est marié ?)

8. Single (Célibataire)
9. Man married monogamously or woman in monogamous marriage (Homme marié monogame ou femme en mariage monogamique)
10. Man married to two wives or woman married to a man having two wives (Homme marié à 2 épouses ou femme marié à un homme ayant 2 épouses)

11. Man married to three or more wives or woman married to a man having three or more wives (Homme marié à 3 épouses ou plus ou femme mariée à un homme ayant 3 épouses ou plus)
12. Free union (Union libre)
13. Divorced (Divorcé)
14. Separated (Séparé)
15. Widowed (Veuf)

Uganda Census, 2002

What is NAME's marital status?

1. Never married
2. Currently married (monogamous)
3. Currently married (polygamous)
4. Widowed
5. Divorced
6. Separated
7. Cohabiting (Monogamous)
8. Cohabiting (Polygamous)

Source: UNFPA Census Portal

239. Deficiencies in enumerator training and census editing may further affect the validity of data on polygamy. The

2001 South African Census, for instance, used question wording of type c) above. However, Table 19 shows that even though marital status included the item "polygamous marriage" for both sexes, not a single woman was reported in category 3. Enumerators were instructed that a man with more than one wife should be recorded as 'polygamous' rather than civil or customary marriage, and that their wives were to be classified in categories 1 or 2 (married civil/religious or traditional/customary). Either because of this enumerator instruction or as a consequence of subsequent data cleaning the category of women living in polygamous unions disappeared from the census records.

Table 19: South Africa (2008)—Population by sex and marital status

Male	Married civil/religious	3,603,016
	Married traditional/customary	1,458,342
	Polygamous marriage	31,380
	Living together like married partners	1,161,375
	Never married	14,627,092
	Widow(er)	253,148
	Separated	117,474
	Divorced	182,210
Female	Married civil/religious	3,766,062
	Married traditional/customary	1,668,682
	Polygamous marriage	0
	Living together like married partners	1,228,330
	Never married	14,601,746
	Widow(er)	1,550,031
	Separated	200,824
	Divorced	370,058

Source: Report of the Census Sub-Committee to the South African Statistics Council on Census 2001, reproduced at http://www.statssa.gov.za/extract.htm

240. To some extent, polygamy may be assessed by looking at the number of women in unions, compared to the number of men. In the case of South Africa, 1,668,682

women were in traditional/customary unions, compared to 1,458,342, suggesting that 14.4 per cent of these unions were polygamous. In the case of the census of the West Bank of Palestine in 2007, there were 386,895 married women, compared to 377,947 married males. The difference has been interpreted as a sign that 2.4 per cent of these marriages were polygamous. However, such estimates must be interpreted with great care. The finding that there are more married women than married men is common even in situations where polygamy is not a likely cause, possibly because women feel more committed to their marriages than men. Note, for instance, that in South Africa, according to the figures above, there were 3,766,062 women in civil/religious unions, compared to 3,603,016 men. The other problem is that, according to what was pointed out in the section on Data issues, some of the co-wives may have been classified as single, even though they are, in fact, living in polygamous unions, particularly in countries where polygamy is largely unofficial.

241. Censuses can reveal patterns of widowhood in a country. Indeed, often widows are enumerated as heads of households in census data. Remarriage, on the other hand, cannot be determined as censuses normally do not ask if a person has been married before. While some censuses ask about the data of first marriage and current marital status, the "married" category is not split into "married to 1st, 2nd, 3rd, …, spouse". The 2006 census of the Maldives is one of the few that asked how many

times each individual had been married and to how many people, but the quality of the information obtained was not very good. This is a major obstacle for the identification of gender differences in marriage behaviour.

242. To measure child marriage, "age at first marriage" is the key census variable to analyse. However, relatively few censuses include it (e.g. Algeria, Azerbaijan, Bermuda, China, Democratic People's Republic of Korea, Guinea-Bissau, India, Israel, Kazakhstan, Lesotho, Malta, Maldives, Occupied Palestinian Territories, Republic of Korea, St. Lucia, Sudan, Swaziland). Romania asks for both the age at women first entered a union and their age at the time of the present union. Where age at first marriage is not collected in a census, a proxy that can be used in the aggregate, called Singulate Mean Age at Marriage (SMAM), can be calculated from the population distribution by marital status (see the Indicators section below for details). It is also possible to compare successive censuses, to see how the distribution of marital status among individuals aged (x,x+n) years in the first censuses has changed t years later, when these same individuals are aged (x+t,x+n+t).

243. A somewhat unexpected finding regarding the importance of marital status is that the quality of demographic information on women may depend on it. Using historical data from European and Northamerican censuses, Földvári, Van Leeuwen and Van Leeuwen-Li

(2012) show that, on the whole the quality of age declaration (measured by the so-called Whipple or Myers indices of age heaping at certain preferred final digits like 0 or 5) in these data does not differ markedly by sex[25]. Among women, however, there is a major difference by marital status. Married women heap significantly less than unmarried women. This is still true after correcting for possible selection effects. A possible explanation is that a percentage of women adapted their ages to that of their husbands, hence biasing the Whipple index. The same effect is found to a lesser extent for men. The authors suggest that, since this bias differs over time and across countries, a consistent comparison of female age heaping should be made by focusing on unmarried women.

4. Tabulations

244. Marital status should be tabulated for persons of all ages, irrespective of the national minimum legal marriageable age. In this way, persons who were married below the minimum age, persons who married in another country with a different minimum marriageable age and persons who were permitted to marry below the legal minimum age because of special circumstances are not excluded. Even then, there is still a risk that child marriages will be

25 This may be different in other contexts. The 2008 census of Liberia and the 2002 census of Uganda, for example, do show more heavy age misreporting in women than in men, but other developing countries do not necessarily reproduce this pattern.

underdeclared or even purged from the data by the census authorities.

245. The Principles and Recommendations for Population and Housing Censuses Rev. 2 (United Nations, 2008 a) recommends basic and additional tabulations with regard to marital status. The latter can only be applied where the relevant information is available. The most important basic table is the one that shows the population, by marital status, age and sex.

246. Marital status by sex and age should also be tabulated in combination with religion, school attendance, educational attainment, fertility levels, life expectancy, migratory status, employment status and disability status. The Principles and Recommendations – while not explicitly endorsing the above tabulations for religion, fertility, life expectancy and educational variables – suggest the following four as "additional" under the respective chapter headings:

- Foreign-born population, by marital status, age and sex;
- Usually (or currently) active population, by main occupation, marital status and age;
- Usually (or currently) active population, by main status in employment, marital status and age;
- Total population 15 of age years and over, by disability status, cross-classified by marital status, urban/rural residence, age and sex.

247. The following table, on the marital status of literate and illiterate women in Burkina Faso, is interesting in that it disaggregates married women by the kind of union that they are in: monogamous unions, polygamous unions with one co-wife, or polygamous unions with various co-wives.

Table 20: Burkina Faso (2006) – Percentages of women over age 15 by age, literacy and marital status

Illiterate							
	Single	Married			Separated/ Divorced	Widowed	N
		Mono-gamous	1 Co-Wife	More Co-Wives			
15-19	53.8	32.9	9.5	3.1	0.4	0.2	534,270
20-29	6.3	54.5	26.8	10.3	1.1	0.9	819,450
30-39	1.8	43.0	32.2	17.5	1.5	4.0	553,970
40-49	1.1	35.4	28.0	20.6	1.5	13.4	379,280
50-59	1.0	27.9	21.9	18.2	1.6	29.4	281,190
60+	1.4	15.7	10.5	9.8	1.2	61.4	329,610

Literate							
	Single	Married			Separated/ Divorced	Widowed	N
		Mono-gamous	1 Co-Wife	More Co-Wives			
15-19	87.1	10.3	1.7	0.7	0.2	0.1	216,180
20-29	42.5	46.4	7.4	2.1	1.1	0.4	251,500
30-39	15.1	64.2	11.3	4.0	2.4	3.0	101,170
40-49	6.2	59.8	12.5	6.3	4.0	11.3	43,870
50-59	3.7	53.3	11.2	5.9	4.2	21.6	16,840
60+	5.9	34.9	7.8	4.5	3.1	43.8	5.760

Source: Based on the 10 per cent sample of the 2010 census of Burkina Faso, processed on-line using the IPUMS on-line tabulator

What Table 20 shows is that literate women typically marry considerably later than illiterate women and that, when they do, they are much less likely to enter into polygamous marriages. They are also less likely to be

widowed, possibly because the age difference with their husbands is smaller. They do, however, have a slightly higher probability of divorce.

248. When compiled for successive censuses, this table can help to detect important trends. In the case of several East and South-east Asian countries, for example, there has been a dramatic increase in the proportions of women remaining single in their 30s and 40s, especially in the big cities. In 2000, 17 per cent of women aged 45-49 in Bangkok remained single, 13 per cent in Singapore and 10 per cent of Chinese women in Kuala Lumpur. The 2000 census data also show sharp increases in the proportions of non-married among women in their 30s in some countries where non-marriage rates were traditionally low, notably the Republic of Korea and Indonesia (Jones, 2003). The following table illustrates this with data from the 1960-2000 censuses of several countries in the region.

Table 21: Percentages of never married women by age group for consecutive censuses in East and Southeast Asia

	1960	1970	1980	1990	2000
Thailand					
30-34	6.7	8.1	11.8	14.1	16.1
35-39	4.2	5.2	7.3	9.6	11.6
40-44	3.1	3.9	5.3	7.0	9.3
45-49	2.6	3.0	4.1	5.2	8.0
Peninsular Malaysia Chinese					
30-34	3.8	9.5	13.3	15.8	18.2
35-39	2.7	5.7	7.6	9.1	10.5
40-44	2.6	3.4	5.8	6.4	8.4
45-49	2.5	2.4	4.6	5.7	7.2
Peninsular Malaysia Malays					
30-34	1.1	3.3	7.9	10.2	9.7
35-39	0.8	1.9	3.8	5.8	6.0
40-44	0.6	1.1	2.2	4.1	4.4
45-49	0.6	0.7	1.7	2.3	3.2
Japan					
30-34	9.6	7.2	9.1	13.9	26.6
35-39	5.6	5.8	5.5	7.5	13.8
40-44	3.1	5.3	4.4	5.8	8.6
45-49	1.9	4.0	4.4	4.6	6.3
Republic of Korea					
30-34	0.5	1.4	2.7	5.3	10.7
35-39	0.2	0.4	1.0	2.4	4.3
40-44	0.1	0.2	0.5	1.1	2.6
45-49	0.1	0.1	0.3	0.6	1.7
Singapore Chinese					
30-34	4.7	11.1	17.8	22.4	21.9
35-39	4.3	5.8	9.3	15.6	16.2
40-44	5.2	3.8	6.7	12.3	14.1
45-49	6.2	3.3	4.6	7.9	12.6
Hong Kong					(1996)
30-34	6.0	5.6	11.0	24.8	26.5
35-39	5.0	3.0	4.5	11.6	14.6
40-44	5.9	2.9	2.7	7.3	9.0
45-49	7.4	3.8	2.3	3.9	5.9

Source: Jones (2003): Tables 1 and 2

Non-marriage has also increased among males, although the age pattern and the timing of the increase in the various countries have been different from the patterns found in women. Note that there are several possible

explanations for this phenomenon, including the increase of the number of women preferring a career over the role of spouse and mother, the increase of informal living arrangements that do not lead to formal marriages, and the possibility that women stay single in order to care for their ageing parents.

249. Very high percentages of single women aged 35-39 can be found not only in East Asia, but also in Europe, Australia and the Caribbean region. In these cases, the reason is that women in this part of the world often do not marry, but live together with their partners without a formal marriage contract. In Jamaica (2001), according to the World Marriage Data Base of the UN Population Division (2008), 64.5 per cent of women aged 35-39 had never been formally married; in Dominica, this was 58.1 per cent. In Sweden (2006), the number was 40.6 per cent. Compared to these percentages, the number of older single women in East Asia seems relatively low, but it must be borne in mind that its interpretation is quite different as unmarried women in East Asia are unlikely to be cohabiting with their partners.

Table 22: Cambodia (2008)—Age of the (male) head of household and the (female) spouse

	Age of the Female Spouse													
Head	10-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80+
10-19	2097	1528	251	44	23	8	16	14	13	9	8	8	2	2
20-24	15167	60134	16788	1755	473	151	79	52	12	13	13	7	6	15
25-29	7217	92931	139040	19499	4679	1042	306	221	59	102	25	67	15	89
30-34	1177	18613	93559	77755	25428	5297	1288	302	79	88	18	50	23	124
35-39	577	7764	42841	90813	132391	32201	6511	1203	393	172	94	45	28	78
40-44	356	2403	9760	23988	94998	116058	26801	4803	1147	231	96	27	23	48
45-49	298	1164	3393	7720	27692	84674	103909	19138	3135	496	200	55	37	39
50-54	183	551	1264	2065	5612	16899	63412	63449	9607	1346	300	56	34	31
55-59	127	341	747	901	2482	6608	20807	56889	41017	4988	829	127	37	23
60-64	47	173	495	468	993	2212	5177	19072	38487	22418	3077	447	128	47
65-69	30	103	279	266	605	1159	2635	7127	16688	22330	14011	1727	301	75
70-74	27	79	183	138	286	491	1006	2495	4525	8975	13721	7657	960	176
75-79	13	35	102	69	172	275	491	952	1893	2835	5336	6429	3720	385
80+	13	64	151	92	142	137	199	403	635	900	1228	2181	3092	1998
Mean	24.70	26.72	30.68	35.45	39.59	44.04	49.04	54.73	60.09	65.00	69.55	73.52	77.20	75.55

Source: Computed based on REDATAM data base, ECLAC/CELADE

250. Table 22 shows the simultaneous distribution of the ages of heads of household and their spouses, in the case where the head of household is a man, for the 2008 census of Cambodia. An analogous table can be constructed for the opposite case, where the head of household is female and the spouse male. On the whole, this particular table does not show any major age differences between heads and their spouses, with the possible exception of the first column (spouses under age 20), whose husbands are, on average, 24.70 years old. The mean ages of the husbands (head of households) for the other age categories are remarkably close to those of the spouses. On the whole, the difference even tends to diminish with age, which indicates a relatively low incidence of remarriages

of older men with (much) younger women. Spouses over age 75 tend to have husbands slightly younger than themselves, due to the higher mortality of men compared to women at higher ages. There are, of course, exceptions (the numbers most distant from the diagonal), but 82.4 per cent of the spouses have ages within the same 5-year age bracket as their husbands or the one adjacent to that. Cases of young women living with much older men (the lower left corner of the table) do occur, but are not very common. The results in other countries may, of course, be quite different.

251. The study by Teachman, Tedrow and Crowder (2000) in the Country Example below illustrates the usefulness of census data for investigating long-term trends and change in marriage and divorce.

252. Marital status by sex, age, religion and/or ethnicity can indicate a relation between belief and nuptiality, which reflects attitudes towards marriage and divorce as well as different legal provisions, especially in countries where a "Personal Status Law"—and not a civil code—regulates marriage, divorce, custody, inheritance and so forth (Israel, most Muslim-majority countries, with the notable exception of Tunisia). Such tabulations have been used to diffuse stereotypes, e.g. to show that in the US 'born-again' Christians, despite their emphasis on family values, actually have similar divorce rates as other Christians or non-affiliated persons (Lehrer et al., 1993).

The same information can also be used to determine typical differences in the age at marriage between men and women according to religion, using the concept of SMAM referred to earlier.

253. To understand the impact of education in a context culturally favourable to polygamy, one may further disaggregate table P4.2-R above, i.e. "Population, by marital status, age and sex," by educational attainment and/or literacy. If this does not yield clear results on polygamy, one may select areas where polygamy is prevalent and compare, for women of the same age group, ethnic group and religion, if the proportion of women polygamously married is negatively related to educational attainment/literacy. Past research suggests that women who have received no formal education are more likely to be in polygamous unions than women who have received primary or secondary education. Where both spouses have not received formal education, polygamy is most widespread (UNICEF, 2005). Comparing the educational level of women in polygamous unions to women in monogamous unions can confirm these findings in-country. It is necessary to compare women of the same age group to control for the effect of changes in education.

254. Understanding widowhood can contribute to explaining certain social phenomena such as poverty. The widowed population can be tabulated by age and crossed with variables such as household headship,

socio-economic level (using the Basic Needs Approach) and receipt of state benefits (where such data are available). In addition to their larger numbers, widows are more likely than widowers to co-reside with their children. In Vanuatu (2011), for example, 33.9 per cent of widowed women over age 60 are living with their children, compared to 23.9 per cent of widowed men and 18.5 per cent of women over age 60 who are not widowed. It is important to remember that marriage data uncontrolled for age will give a distorted image. While there are usually many more widows than widowers this is partially due to the fact that there are, numerically speaking, more older women than older men in a population. When cross-classified by age, the proportions are less disparate.

255. Although there is a statistical relationship between the age at first marriage or the marital status of women at any given age and their level of education, it is generally impossible to demonstrate the causal direction of this relationship, at least with census data. It may be that early marriage is an obstacle to further schooling, but it is equally possible that the early marriage is a consequence of having dropped out of school at an early age. It takes longitudinal data of a kind that is normally not available in censuses to disentangle the causality of the relationship. At the very least one should know when the woman got married and when she left school, but not many censuses ask the former and almost none ask the latter. One could try to estimate the age of leaving school from the

highest grade attended, but this can be deceptive as it is exactly those women who are most delayed in their education who are most likely to drop out.

256. The 2008 census of the DPR of Korea is among the ones that collected data on the age at first marriage. This age is actually quite high in the country, with a mean of 28.4 years for men and 25.5 years for women. Nevertheless, there is some association between the age at first marriage and the level of educational attainment. Only 15.7 per cent of women currently aged 30-39 who married at age 20 or below had post-secondary or higher education. For those who married between age 21 and 24, the percentage was 18.3 per cent; for those married between ages 25 and 29, it was 20.9 per cent; for those married between ages 30 and 34, it was 21.5 per cent and for those married after age 35 it was 22.4 per cent. The corresponding percentages for men currently aged 30-39 were 23.2 per cent, 25.1 per cent, 25.2 per cent, 27.1 per cent and 30.4 per cent, respectively. As was observed earlier, these data do not allow a strictly causal interpretation. It is difficult to imagine, however, that marriage between ages 25 and 29 would have had any direct effect on women's (or men's) ability to complete their post-secondary or higher level studies. Therefore, the higher post-secondary or higher education completion rates of those who married later are more likely to have a different explanation, like the lower propensity to marry of those who are still investing in their studies or early post-university careers,

perhaps due to the difficulty of saving for marriage while still in the university. The other conclusion that emerges from these data, of course, is that, regardless of the age at first marriage, there was still a gap of about 8 per cent between male and female completion rates of post-secondary or higher education.

257. Child marriage may result in difficulties entering the labour market, especially where child brides are taking care of their families. A first step to understanding this issue could be to study whether among women of a given age group, for example 25-29 years old who married before 15, or before 20, are economically active (or employed) in lower numbers than those from their cohort who married later. Obviously, this is only possible if the age at first marriage is declared in the census. It is important to conduct the analysis by age group, because behaviours change from one generation to the next due to changes in social norms and beliefs over time. Adding the number of children, presence of children, or educational attainment may also further explain labour market participation. The unemployment rate across women who married as children compared to women who did not marry as children, with similar background characteristics, can then serve as a measure of women's status in society that can be monitored over time with future census data. In addition to the problems associated with the age at first marriages, one limitation to keep in mind with this analysis is the possible under-reporting of unemployment

for young women, as they are more likely than young men to be classified as not economically active.

5. Indicators

258. **Proportion of ever-married (and never-married) men and women**. Differences in women's and men's behaviour towards marriage can be analysed by looking at the proportion of ever-married women and men and its complement, the proportion of never married women and men. The proportion of ever married and never married women and men, and their trend, can reveal important gender differences. In the situation referred to in Country Example 3, for example, where the sex ratio at birth is considerably imbalanced, the proportion of women and men ever married and never married below a certain age is skewed since men have fewer opportunities to find a spouse as women are less numerous. Polygamy can have this same effect, especially among men of lesser means. Note that, in some countries, it is necessary to take into account consensual unions and same-sex partnerships to have a complete picture.

259. **Proportion of men and women in polygamous unions (prevalence and evolution)**. The proportion of men/women (global or by age group) living in polygamous unions should be interpreted with caution as there is important underreporting of polygamy for women. Often, analysts therefore chose to look at the marital

status of men only to determine the prevalence and trend of polygamy. The evolution of polygamy can be studied on the basis of successive censuses, as long as the definitions and questionnaire are comparable. If not, it is possible to estimate the trend by comparing the behaviour of successive generations, bearing in mind the limitations of this approach that were commented on in the Box on Visualization of Spatial Data.

260. **Age at first marriage**. The Principles and Recommendations do not recommend any tabulations specifically to measure age at first marriage. Where age at first marriage is included as a census question (e.g. Algeria, Azerbaijan, Bermuda, China, Democratic People's Republic of Korea, Guinea-Bissau, India, Israel, Kazakhstan, Lesotho, Maldives, Malta, Occupied Palestinian Territories, Republic of Korea, St. Lucia, Sudan, Swaziland; the 2000 census of Switzerland asked how long people had been in their current union), misreporting may be widespread, to conceal illegal early marriage. Household surveys are generally believed to be better suited to analysing child marriage, but face the same underreporting limitation. Censuses can provide complementary information on girls and boys, who are under the age of 18 and reported as currently married, at the time of the census. However, in some countries marital status is not collected for household members under the minimum legal marriageable age. The Minimum Gender Indicator Set approved by the UN Statistical

Commission in February of 2012 contains one marriage indicator, which can be computed from census data if the relevant question was asked, namely the percentage of women aged 20-24 years old who were married at or in a union before age 18.

261. **Singulate Mean Age at Marriage**. As noted above, when age at first marriage is not collected in a census, it is advisable to calculate Singulate Mean Age at Marriage as a proxy. The SMAM is the average length of single life, expressed in years, among those who marry before age 50. It is calculated from the proportion of single persons (not including persons separated, divorced or widowed) by age. The main disadvantages of the SMAM in comparison to individual data on age at marriage are the following:

1. It is an aggregate indicator that can be broken down by major population groups, but it cannot be related to individual characteristics;
2. It does not function well in circumstances where there are a lot of informal unions and where those leaving such unions tend to declare themselves as "single", rather than "separated", "divorced" or "widowed";
3. Because it is based on the experience of different birth cohorts, with some having married a long time ago, it does not adequately capture recent changes in marriage behaviour.

Methodology Box 5: Calculating the SMAM

The steps for calculating the Singulate Mean Age at Marriage are the following

The following illustrates the computational steps with the proportion of never-married women by age group, in the 2008 census of Malawi:

15-19	70.6 per cent
20-24	17.4
25-29	6.7
30-34	3.0
35-39	1.9
40-44	1.5
45-49	1.2

- Step 1. Calculation of the person years lived in a single state: 15*100+5*70.6+5*17.4+5*6.7+5+5*3.0+5*1.9+5*1.5+5*1.2 = 2004.5 (A).
- Step 2. Estimation of the proportion remaining single at age 50: 0.9 per cent.
- Step 3. Estimation of the proportion ever marrying by age 50: 99.1 per cent (C).
- Step 4. Calculation of the number of person-years lived by the proportion not marrying:
  50*0.9=45 (D).
- Step 5. Calculation of Singulate Mean Age at Marriage (SMAM):
  SMAM = (A—D)/C = (2004.5—45)/99.1 = 19.77.

262. In some countries, mostly in Africa, the age at first marriage for women is below 20, such as in Niger, where the SMAM was 17.6 in 2006. At the other end of the spectrum, Northern European countries have the highest age at first marriage for women, as in Sweden where the SMAM was 32.2 in 2006. The analysis of the trend is also necessary to understand the dynamic: in Niger, the age at first marriage for women has increased from 16.2 in 1977 to 17.6 in 2006 (United Nations, 2009 a).

263. Proportion of women married below the legal age, by age. To answer the question of whether child marriage is decreasing in a country or not, a graph can be presented showing the proportion of women married below the legal age, by their current age. If the curve is increasing with age, it means that younger women get married less early than their elders. If only marital status is available in the census questionnaire, it is necessary to combine successive censuses to analyse the trend. Attention should be paid to the comparability of these censuses, in terms of age, marital status reporting (definition and methodology), and coverage.

Country Example 10: Using the Singulate Mean Age at Marriage to Examine Early Marriage in Malawi

Table 23 shows how the general proportionate SMAM increased over time for all age categories and for both sexes in Malawi. For women, the SMAM increased from 17.8 in 1977 to 19.8 in 2008, while that for males increased from 22.9 in 1977 to 23.9 in 2008, indicating that generally, more women still marry younger than their male counterparts. Consequently, the proportion of the population staying single increased, with that of males aged 15-19 increasing from 93.8 per cent in 1977 to 95.2 per cent in 2008, while that of females aged 15-19 years increased from 48.9 per cent in 1977 to 70.6 per cent in 2008.

Nonetheless, the proportion of females getting married early is still much higher than that of their male counterparts and requires addressing. For example the proportion of females aged 15-19 getting married was 29.4 per cent while that of their male counterparts was 4.8 per cent. Similarly, the proportion of females aged 15-19 getting married was 29.4 per cent while that of their male counterparts was 4.8 per cent. Simi larly, the proportion of females aged 20-24 years and 25-29 years (17.4 per cent and 6.7 per cent respectively) staying single is still much lower than that of their male counterparts (54 per cent and 21.2 per cent respectively). These trends suggest that girls are still marrying young and strategies to prevent this, such as retaining girls in school, especially secondary school, would go a long way in keeping girls in school longer, increasing the age at which they marry and reducing their fertility rate.

Table 23: Malawi—Proportion single and Singulate Mean Age at Marriage: 1977, 1987, 1998 and 2008

Age Group	Percentage Single							
	Male				Female			
	1977	1987	1998	2008	1977	1987	1998	2008
15-19	93.8	91.1	91.7	95.2	48.9	55.1	61.8	70.6
20-24	49.3	51.4	53.0	54.0	7.4	11.5	14.6	17.4
25-29	13.3	17.4	18.0	21.2	2.2	3.5	4.8	6.7
30-34	4.9	6.3	6.0	7.7	1.3	1.6	2.1	3.0
35-39	2.9	3.4	3.4	4.1	1.0	0.9	1.3	1.9
40-44	2.3	2.3	2.6	2.7	1.0	0.8	1.1	1.5
45-49	1.8	1.7	1.7	2.1	0.9	0.7	1.0	1.2
SMAM	22.9	23.2	23.4	23.9	17.8	18.4	19.0	19.8

Source: Malawi. Gender in Malawi. Analytical Report 3 of the 2008 Census: Table 4.5

Table 23 confirms the earlier statement that females generally entered marriage at a younger age than males, regardless of residence and educational attainment. It shows that rural women entered marriage 2.1 years earlier than urban women, while women with no education entered marriage 8 years earlier than those who had post secondary education. This suggests that being rural and being uneducated or less educated renders a young woman more vulnerable to early marriage. It confirms previous assertions that education and residence have an impact on a women's entry into marriage and consequently their fertility.

Table 24: Malawi—Singulate Mean Age at Marriage by residence and educational attainment

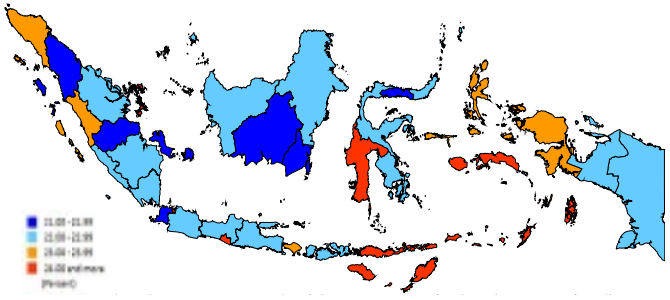
Characteristics	SMAM	
	Male	Female
Residence		
Urban	25.9	21.9
Rural	23.4	19.8
Educational Attainment		
No Education	23.0	18.2
Primary	23.0	19.5
Secondary	25.2	22.1
Post-Secondary	28.5	26.2

Source: Malawi. Gender in Malawi. Analytical Report 3 of the 2008 ensus: Table 4.6

264. Age at first marriage of women and men, by age group. Comparing the age at first marriage of men and women, by age group or cohort, is important for understanding the scope of early marriage.

265. Figure 9 illustrates the geographical distribution of the SMAM in the case of the 2010 census of Indonesia. This geographical distribution may then be correlated with other characteristics, such as ethnicity, religion or average levels of education.

Figure 9: Indonesia (2010)—Singulate Mean Age at Marriage for women



Source: Based on the 10 per cent sample of the 2010 census of Indonesia, processed on-line using the IPUMS on-line tabulator

266. Analogously to the SMAM, other measures can be defined for the timing of events. It has been suggested, for example, to define a Mean or Median Age at Widowhood and to compare this measure between men and women. Although this measure can be constructed from most census data, it has the following limitations:

1. Women may remarry, so that the mean/median age will be over-stated. In Ireland (2006), for example, the mean age of widowhood for ever-married women was 55.9 years if remarriage was taken into account and 56.2 if not.
2. Most women marry or start living in a union at some point, but a lot of women (and particularly men) never become widow(er)s. In the Ethiopian census of 2007, for example, widowhood in the highest age group (75+) was 62.1 per cent for women and only 11.2 per cent for men.

3. Because widowhood is most prevalent in the very highest age groups, the results will be sensitive to where the cut-off point for the last age group is placed.
4. The concept of widowhood is problematic in contexts where a high proportion of unions is informal.
5. If there is differential mortality of widows, the results will be distorted, especially in the highest age groups.

267. **Mean difference in the age at first marriage of the spouses**. An indicator that can be derived from the mean age at first marriage (measured directly through the relevant census question or indirectly through the SMAM) is the mean difference in age at first marriage of the spouses. This is relevant from a gender perspective because women who are much younger than their husbands generally have less autonomy and authority in the marital relationship. By and large, differences in age at first marriage between the spouses have been diminishing, but they remain large in some countries in West Africa, such as Mauritania (7.6 years in 2001) and Sierra Leone (6.8 years in 2004) (United Nations, 2009a). The indicator is less adequate in societies in which remarriage is frequent or where polygamy is widespread because it does not measure the age differences in these later unions. In second and third unions or marriages, age differences between the spouses tend to increase as men often remarry with substantially younger wives. Consequently, the gap between the mean ages of husbands and wives

tends to widen as they grow older, which increases the probability of widowhood and its economic and social consequences for women, as discussed earlier.

268. A simpler measure to compute is the difference between the mean age of married men and married women. This measure can be compared to the SMAM or to the average age at first marriage if these data are gathered. In the 2008 census of Mozambique, for instance, the SMAM was 18.1 years for women and 22.4 years for men, a difference of 4.3 years. But the average age of women that were married or living in consensual unions was 33.4 years, compared to age 40 for men, which means a difference of 6.6 years (NSO Mozambique website, accessed 8 April 2011). It should be pointed out, however, that these two indicators measure different things. The SMAM only refers to first marriages, but the average age difference of married persons mixes first marriages with remarriages. Further national level interpretation on this issue can be found in the CEDAW Committee concluding comments for its countries, at http://www2.ohchr.org/english/bodies/cedaw/cedaws.

All of these indicators should be analysed by region within a country and by religious/ethnic group, if available, as the prevalence of child marriage will be higher where a culture of gender inequality prevails, as well as in regions prone to conflict or natural disaster.

6. Multivariate and further gender analyses

269. An obvious use of logistic regression is to analyse the marital status of women based on certain explanatory variables such as age, educational attainment and/or literacy of both spouses, religion/ethnicity, and place of residence (rural/urban). Where available (the SMAM will not do in this case), the age at first marriage should also be used. Widowhood, for example, is associated with early marriage, male over-mortality, and social norms regarding remarriage. Where female age at marriage increases, levels of widowhood decline (UNICEF, 2005).

270. Measuring the scope and frequency of early marriage and its trend over time is essential for developing national policies and legislation. In particular, knowing what individual-level characteristics are associated with child marriage may be useful to plan policy interventions to prevent it. In multivariate analysis, age at marriage (where it is available) could then be treated as a dependent variable in order to model the factors that affect age at marriage. Taking this line of analysis, Maitra (2004) finds that ethnicity, religion and parental education all are significantly associated with age at marriage. In a cross-country study with 50 countries, UNICEF (2005) found that the educational level of girls was significantly associated with higher ages at marriage. The spousal age gap was negatively associated with the woman's age

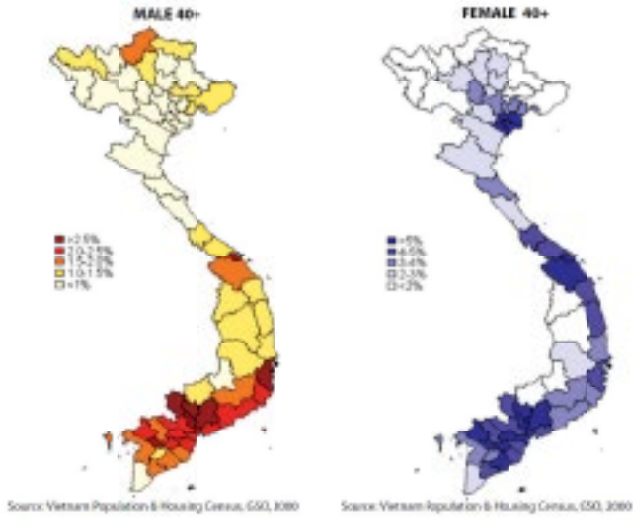
at marriage: women more than four years younger than their partners were more likely to be married as children.

271. An excellent example of the use of these kinds of methods for the analysis of marital status comes out of the 2009 census of Viet Nam (Viet Nam, 2011), which performed a series of logistic regressions of different marital status categories. As an illustration, the following reproduces the table with regression coefficients and the comments of the report on the probability of never marriage among population aged 40–69.

272. In this analysis, based on social norms and distribution of marital status by age in Viet Nam, delayed marriage is defined as the situation of individuals who delay marrying till after the age of 40 or will never marry. Delaying marriage does not necessarily correspond to the level of SMAM in the population. According to estimates from the Census sample survey data, by the time of the 1999 Census in Viet Nam, there were more than 84,000 males and 371,000 females aged 40 and older who had never been married, accounting for 1.1 per cent and 3.8 per cent of males and females respectively in this age cohort. By the time of the 2009 Census, the corresponding numbers had increased to 210,000 males and 635,000 females, with the proportions at 1.7 per cent and 4.4 per cent, respectively. From 1999 to 2009, the proportions never-married among males aged 40–49 and of both sexes aged 50–59 and 60–69 had all increased.

Only the proportion never-married among females aged 40–49 had decreased (from 6.2 per cent to 5.7 per cent). However, in general, the numbers and proportions delaying marriage among females are much higher than among males, as a consequence of the low sex ratio in the last several decades.

Figure 10: Viet Nam (2009)—Maps of the proportion never married among the popula-tion aged 40 and older by province



273. From the birth cohort perspective, the size of the never-married population has decreased during the period 1999-2009. In 1999, about 58,000 males aged 40–49 were never-married, accounting for 1.6 per cent of

the cohort. In 2009, this cohort now aged 50–59 years had only 42,000 never married males, accounting for 1.2 per cent of this birth cohort. The numbers declined not only because of marriage, but also because of mortality and international emigration. However, if mortality and international migration rates are not much different by marital status, the decline of about one third (from 1.6 to1.2 per cent) would be close to the proportion getting married in this cohort over the 10 years between the Censuses. For other cohorts (except the cohort 70+ because of the strong effects of mortality), the probabilities of getting married in the ages 40 and older for males (about 25 per cent after 10 years) are higher than for females (less than 15 per cent after 10 years).

274. Delayed marriage is more frequent in urban areas than in rural areas in all four age groups of both sexes. The proportion never-married among males in the age group 40–49 in urban areas is about three times higher than in rural areas (5 versus 1.7 per cent), and the proportion never-married among females in urban areas is about 1.7 times higher than in rural areas (7.9 versus 4.6 per cent). This corresponds to the general pattern that delayed marriage or never marriage is becoming more common in regions with higher levels of economic development and industrialization. Figure 10 presents the maps for the proportion never married for both sexes among people age 40 and older in all provinces in Viet Nam in 2009. The proportion never married among the population aged

40 and older is highest in more industrialized provinces such as Da Nang, Ho Chi Minh City, and Binh Duong. In the North, the situation is different when the highest proportions delaying marriage are not found in Hanoi or Hai Phong, but in Ha Giang (for males) and Thai Binh, Ha Nam, Nam Dinh, and Ninh Binh (for females). Thus, it can be concluded that delayed marriage in Viet Nam is not only related to the level of industrialization but also depends on other socio-cultural factors.

275. Table 25 presents the regression model of probability of never-marriage among the population aged 40–69 in Viet Nam in 2009. The age group 70+ is excluded from the model because of the small proportions never married and strong influence of mortality. The dependent variable is delayed marriage status of individuals (never-married=1, ever-married=0). The results show that among males and females aged 40–69, the probability of never-marriage is higher than the Northern Midlands and Mountains for all five remaining regions, especially for the Southeast and Mekong River Delta. Only the regression coefficient for females in the Central Highlands is negative. Thus, holding constant the other independent variables in the model, females in the Central Highlands and males in the Northern Midlands and Mountains are most likely to be married by age 40 in comparison with other regions. On the other hand, for both males and females, the probability of delayed marriage in the Southeast was significantly higher than in other regions.

Table 25: Viet Nam (2009)—Logistic regression of probability of never marriage among population aged 40–69

	Male	Female
Region		
Northern Midlands and Mountains	-	-
Red River Delta	0.714	0.718
North and South Central Coast	0.519	0.563
Central Highlands	0.446	- 0.185
Southeast	1.545	1.080
Mekong River Delta	0.944	0.688
Urban (Rural =0)	0.917	0.438
Age Group		
40-44	-	-
45-49	- 0.556	- 0.045
50-54	- 1.216	- 0.136
55-59	- 1.794	- 0.309
60-64	- 2.446	- 0.709
65-69	- 3.044	- 1.495
In-migrant	0.216	0.147
Ethnic minority	0.141	- 0.077
Religious adherent	0.220	0.321
Educational Attainment		
Below Primary	-	-
Below Lower Secondary	- 1.314	- 0.608
Below Upper Secondary	- 1.518	- 0.712
Upper Secondary	- 1.443	- 0.651
Post-Secondary	- 1.573	- 0.564
Working	- 1.238	- 0.038
Vision Disability	0.399	0.722
Hearing Disability	0.087	0.166
Walking Disability	0.084	0.363
Memory Disability	1.676	1.150
Constant	- 2.279	- 3.081

Source: Viet Nam (2011): Table A.20

276. Regarding urban and rural areas, the regression model one again confirms the results analysed earlier. Population aged 40–69 in urban area is more likely to be never-married than in rural areas, and the difference is

clearer for males than for females. Third, regarding age, the probability of being never-married decreases quickly as age increases, especially for males. That means as age increases, the proportion delaying marriage decreases because many individuals get married after they turn 40 (not because old people can get married more easily than the young). Only for females, the difference between the age group 40–44 and 45–49 is not statistically significant. Forth, regarding migration status, the results show that for males and females aged 40–69, in-migrants have a higher probability of delaying marriage than non-migrants. Combined with the results in the regression model in Table 25, it can be concluded that migration is relevant to both early and delayed marriage of females in contemporary Viet Nam.

277. Regarding ethnicity, it is interesting that, the probability of delayed marriage among ethnic minority males is higher than among Kinh males. In contrast, the probability of delaying marriage among ethnic minority females is lower than for Kinh females, holding other variables constant. The difference is small but it is statistically significant. One of the possible reasons is that the sex ratio among the young and middle-aged people in the ethnic minorities is lower (more balance) than in the Kinh population. Concerning religion, the probability of being unmarried among both males and females who are religious adherents is higher than in the non-religious groups. This seems reasonable as some people do not marry

because they are religious adherents, while some people become religious because they are unable to get married.

278. Regarding educational attainment, people with higher educational levels are less likely to delay marriage compared to those with less than primary education, and the difference is stronger for males than for females. Thus, low educational levels may be the direct or indirect cause of delaying marriage for people aged 40–69, especially for males. However, the regression coefficients do not vary much between the level at "less than lower secondary school" and the higher levels, especially for females. This shows that the probability of delaying marriage among people aged 40–69 is not significantly related to educational achievement, except for the group "less than primary school" that are more likely to be married at the age 40-69. If high educational attainment leads to later marriage, it must be very high educational achievement such as post-university, not the educational levels considered in the regression.

279. The results on working status show that there is a significant difference between males and females. The probability of delaying marriage among working males is significantly lower than for nonworking males. However, the working status of females aged 40–69 is not significantly related to their probability of being unmarried. This result corresponds with the general view that working males can more easily get married than unemployed

males and vice versa, married males are more responsible than unmarried males so they find jobs in order to be the breadwinners for their families.

280. People with disabilities have a higher probability of delaying marriage than people without disabilities. The highest probability of delaying marriage is for people with memory disability (difficulty with memory and concentration), followed by people with vision disability (difficulty in seeing even with glasses). Males with walking disabilities (difficulty in moving around) and hearing disabilities (hard of hearing) are more likely to delay marriage than people without disabilities, but the differences are small. Compared to the female model, the male model reports a higher coefficient for memory disability, lower coefficients for vision and walking disabilities, and a similar coefficient for hearing disability.

281. In short, delayed marriage (defined as being unmarried among the age group age 40 to 69) is most correlated to low educational attainment, disability (especially memory and vision disability), religious adherence, inmigration status, and residence in the Southeast and the Mekong River Delta."

282. By using appropriate multivariate regression techniques, one may underpin the marital status-education-work relationship for women. The basic question in this relationship is whether the marital status of a woman

has a direct effect on her labour force participation, after controling for other intervening factors. The following logistic regression, based on the Aruba 2010 Population and Housing Census, was used to study the relationship. The dependent variable in the analysis was a dichotomy: whether the woman worked or not. The analysis was restricted to women aged 25-50 years, because below age 25 many women are still in school and above age 50 many women on Aruba withdraw from the labour market and most mothers have grown up children. The predictors used in the analysis were: age, number of children ever born (CEB), household income excluding that of the women in question, country of birth, educational attainment, marital status and a variable which indicated if the woman was living together with a partner or not. Country of birth was included in the analysis as many foreign women come to work in the Aruban hotel sector. Next to marital status, the variable indicating if the woman was living together with a partner on a durable basis was added, because on Aruba, consensual unions are very common. The variable on household income (excluding that of the women in question) is included to control for the economic necessity of the female respondent to work or not.

283. The results of the analysis are presented in Table 26. As the analysis is based on census data – and not a survey—the standard errors and significance levels of the regression coefficients are irrelevant and left out of

the table. Among the categorical variables, the following reference categories were used: Aruba (country of birth), less than primary/no education (educational attainment), never married (marital status) and living together. The values in the exp(B) column show the odds ratios. These ratios are computed by raising e to the power of the regression coefficient.

Table 26: Aruba (2010)—Logistic regression of the probability of working for women aged 25-50, by selected explanatory variables

Explanatory variable	Category	B	exp(B)
Constant		-0.114	0.892
Age		0.021	1.021
Number of children ever born		-0.067	0.935
Total income of other household members		0.000	1.000
Country of birth	Aruba		
	Colombia	-0.294	0.746
	USA	-0.899	0.407
	Dominican Republic	0.196	1.217
	Venezuela	-0.804	0.447
	Curaçao	-0.100	0.905
	Netherlands	-0.273	0.761
	Other	-0.101	0.904
Educational attainment	None/Less than primary		
	Primary	0.490	1.633
	Lower vocational	0.765	2.150
	High school (4 year cycle)	1.089	2.971
	High school (5 year cycle)	0.978	2.659
	High school (6 year cycle)	0.697	2.008
	Intermediate vocational	1.401	4.059
	Higher (Bachelor)	1.656	5.236
	Higher (Master's)	1.474	4.368
	Higher (PhD)	-0.142	0.867
Marital status	Never married		
	Married	-0.426	0.653
	Divorced/legally separated	0.147	1.158
	Widowed	-0.352	0.704
Living together	Yes		
	No	0.077	1.080

Source: Population and Housing Census Aruba 2010

284. The logistic regression shows some interesting results in terms of the position of women and their labour force participation. First, the odds ratio for CEB (0.935) shows that on Aruba the odds of being at work for a woman is 6.5 per cent lower for each additional child she gave birth to. Second, participation in the labour force varies quite

significantly by country of birth. The highest participation is among women from the Dominican Republic and the lowest among women from the USA. Note that no coefficient is entered for Aruba, as this is the residual category against which all the others are measured. Also, the higher a woman's educational attainment, the higher her chances of being at work. Note the very low value of women with a PhD, which group consists only of a few women. Living together with a partner has some effect on the chances of having a job, but not substantially (1.08). However, marital status plays a much more important role to determine the work status of a woman. The odds of being at work for married women on Aruba is only 0.653 that of never-married women, after controlling for all other predictors. Divorced women, on the other hand, have higher odds (1.158), while widowed women score lower (0.704).

7. Interpretation, policy and advocacy

285. When interpreting data on marital status for the purpose of gender analysis, it is important to remember that "being married" may not mean the same thing to women and men in terms of lived experiences. Particularly in countries where laws governing married status differ by religious denomination, "being married" diverges even in its legal meaning. For instance, the level of difficulty involved in passing on religious denomination and

nationality or securing custody for their children differs for Muslim, Christian and Druze women in Lebanon.

Text Box 11: Marriage and Divorce from a Gender Perspective

Gender advocates have struggled for decades to make divorce an option for women. While one reason for this is the possibility to escape an abusive relationship, another is that the mere possibility of divorce provides women with leverage to gain a more equal status within marriage (Yodanis, 2005).

One example in support of this view (i.e. the possibility of divorce leads to better marriages) is Indonesia: Here, divorce rates have been declining not as a consequence of conservative gender ideologies, but due to increased free choice in marriage, educational expansion, delayed marriage, urbanization, increasing employment before marriage, and legislative change (Heaton et al, 2001).

This example also illustrates the importance of contextual information in analysing the data. Thus, a decline in divorce rates can be interpreted in different ways. Additional research and qualitative studies are often useful to correctly interpret the findings. At the time of writing, divorce is legal in all countries globally, except for Filipino non-Muslims. However, in many Muslim-majority countries, obtaining a divorce is significantly more difficult for women than for men.

286. Polygamy is a contentious issue in many societies, with all countries influenced by Islamic law, except Tunisia, permitting polygamy. However, some countries

restrict polygamy by requiring court permission (Syria, Morocco, Iraq), or, in the case of Pakistan, the permission of an arbitration council. Also, Jordan has enacted legislation permitting a wife at the time of marriage to include a stipulation in her contract that gives her the right to divorce her husband if he marries another woman (Mashhour, 2005). Polygamy, typically polygyny by nature and practice, confers power, status and privilege to a man over and above that of a woman. Hence, the CEDAW Committee in its General Recommendation 21 notes, "Polygamous marriage contravenes a woman's right to equality with men, and can have such serious emotional and financial consequences for her and her dependents that such marriages ought to be discouraged and prohibited."

287. A high prevalence of girls married under the age of 18, when their male peers remain single, is an indicator for gender inequality in that country. Of note, many countries set legal marriageable ages that differ from the internationally agreed benchmark of age 18 for both women and men. Moreover, governments set different marriageable ages for females and males (e.g. Senegal, 20 for men and 16 for women; state of Ohio in the US, 18 for men and 16 for women; Bangladesh, 21 for men and 18 for women) and some countries still set the minimum age for marriage below 18 years for both sexes.

288. Child marriage takes place almost exclusively

within the context of poverty and gender inequality and has important social, cultural and economic dimensions. While impoverished rural parents may believe that child marriage will protect their daughters, it in fact results in lost development opportunities and limited life options. Often, child brides are pulled out of school, depriving them of an education and meaningful work, and increasing their dependency on their husbands (Manda and Meyer, 2005). Early widowhood is also associated with child marriage as many girls are married to older men, and men's life-expectancy is lower than that of women in most countries.

289. As is always the case, ultimately the reduction of child marriage can be brought about by providing better alternatives to women. For example, the Government of Malawi has decided to enhance educational spending on girls nationwide in order to curb the negative social and economic consequences of child marriage. In parallel, Malawi has introduced targeted programmes in some regions to boost women's employment and support family planning services (Manda and Meyer, 2005). For countries with important ethnic cleavages, the targeting of child marriage prevention efforts might be refined to focus on girls from communities most at risk of marrying their girls as children, be they majority or minority groups.

290. Uganda recently unveiled its long awaited proposed revisions to the Marriage and Divorce Bill. Seems the

updates have been about 4 decades in the making. The bill, which gives women the right to divorce an impotent husband, also establishes equitable distribution of property between spouses upon divorce, providing co-habiting couples with the same rights to property as married people. For the first time in Uganda, it also establishes marital rape as a crime. The wide ranging piece of legislation outlaws the practice of widow inheritance and makes it an offense to demand the return of bride price upon dissolution of a marriage. The most important thing is that the laws in Uganda finally recognize the "non-monetary" contributions of aggrieved women to a broken marriage, i.e. childrearing, and finally gives them means of redress in a divorce. It prohibits widow inheritance, in conformity with Article 32(2) of the Ugandan Constitution stating that laws, cultures, customs and traditions which are against the dignity, welfare and interest of women or which undermine their status, are prohibited by the Constitution. It reforms and consolidates the law relating to civil, Christian, Hindu, Bahai and customary marriages in terms of marital rights and duties, separation and divorce legislation. Data from the Ugandan Bureau of Statistics (UBOS) was used to show how the principles of equality and non-discrimination are violated with the current state of affairs: Women from certain backgrounds (less educated, certain ethnic groups) are affected by polygamy more than others.

291. Showing the effect of child marriage on girls'

education, economic status and other indicators of women's wellbeing can help highlight the loss for a national economy and the consequences on public health. All of the tabulations and multivariate analyses described above can be reproduced at local geographical level, which allows identifying areas such as rural areas or regions in the country that should be targeted by specific measures or campaigns.

CHAPTER 7

Households and Families

1. What is it?

291. Household and family compositions are core topics in censuses. As the household is based on the arrangements of people to provide them with food, shelter and other essentials, it is the basis to study the position of each member within the group. The Principles and Recommendations for Population and Housing Censuses, Rev. 2 (United Nations, 2008 a) define household and family as follows:

Household: 'A household may be either:

- A one-person household, that is to say, a person who makes provision for his or her own food or other essentials for living without combining with any other person to form part of a multi-person household; or
- A multi-person household, i.e. a group of two or more persons living together who make common provision for food or other essentials for living. The persons in the group may pool their resources and have a common budget; they may be related or unrelated persons or a combination of persons both related and unrelated. This arrangement exemplifies the "housekeeping" concept.'

292. Family nucleus: 'The family within the household, a concept of particular interest, is defined as those members of the household who are related, to a specified degree, through blood, adoption or marriage. The degree of relationship used in determining the limits of the family in this sense is dependent upon the uses to which the data are to be put and so cannot be established for worldwide use (United Nations, 2008 a).

A family nucleus may take one of the following forms consisting of persons living in the same household:

A married couple without children;

a. A married couple with one or more unmarried children;
b. A father with one or more unmarried children;
c. A mother with one or more unmarried children.

In countries were consensual unions are common; two additional categories may be added:

d. Partners in consensual with child(ren)
e. Partners in consensual without children

293. Unfortunately, the Principles and Recommendations for Population and Housing Censuses do not provide a clear advice how family nuclei should be mapped in households consisting of persons living in polygamous unions. In principle, countries are left to make their own decisions in this respect. The Principles and

Recommendations for Population and Housing Censuses suggest classifying households at least in four categories, i.e. one-person household, nuclear household, extended household and composite household. A nuclear household consists of a family nucleus, but no other persons. A household can be defined as either extended or composite, when next to the family nucleus other persons are present. The difference between extended and composite households lies in the fact that in an extended household all members are related to each other, while in composite households one or more members are not related to at least one of the other members of the household. Next to the four main household categories, countries can decide to subdivide nuclear, extended and composite households further into a number of subcategories.

294. Head of household: Traditionally in population censuses the type of household and family composition is determined on the basis of each member's relationship to the reference person or head of household. At the onset of the census interview, the enumerator identifies the reference person (or head of household) on the basis of pre-defined specific criteria. For all other remaining persons in the household their relationship to the reference persons is then recorded.

295. Head of family: In many cases, the head of the family nucleus will be the same as the head of the household, but in situations where women in polygamous unions are

living in separate households, the absent husband will generally be considered the head of the family and may also (erroneously) be declared as head of the household. The latter can happen more easily in de iure censuses which do not require the head of household to be present at the time of enumeration.

296. Housing unit: The concept of 'housing unit' is closely related to household. A housing unit is a separate and independent place of abode intended for habitation by one household. As women and girls generally spend more time in domestic consumption work than men and boys, the condition of the living quarter is an important aspect to determine their well-being and health.

2. Why is it important?

297. The International Conference on Population and Development (IDPD) Programme of Action (United Nations, 1994) recognizes the importance of understanding the implications of household composition when it declares (in Par. 5.6) that "Governments should maintain and further develop mechanisms to document changes and undertake studies on family composition and structure, especially on the prevalence of one-person households, and single-parent and multi-generational families." Moreover, it stresses (in its Par. 5.9) that governments must "develop the capacity to monitor the impact of social and economic decisions and actions

on the well-being of families, on the status of women within families, and on the ability of families to meet the basic needs of their members." In this context, censuses become a crucial data source for evidence-based policies and interventions. Finally, according to par. 3.70 of the Principles and Recommendations, "the household, a basic socio-economic unit in all countries, is often central to the study of social and economic development."

298. The number, size and structure of households and changes in the rate of household formation are useful for planning and for developing special policies formulated for vulnerable population segments. Roughly speaking, the issues can be broken down according to three criteria, namely:

a. To identify changes in the size, structure and characteristics of family nuclei and households and determine the stages in the life cycle of families and households (e.g. families with young children, households with one or more retired members...).

b. To indicate the presence of members of the household with specific key characteristics, for instance: young dependent children, adult income earners other than the head, elderly persons with special needs, household members with disabilities and domestic servants

c. To look for the possibility to debunk certain ideological conceptions about what constitutes a "normal" household composition, by confronting such notions with what is actually observed.

299. The characteristics of households then may highlight potential needs and problems, specifically in the areas of income and poverty, the education of children, and the ability of some household members -such as women- to work outside the home. Families with children present a higher likelihood of vulnerability and poverty than families without children (OECD, 2011). Other research finds enormous variations in poverty across female-headed households with specific compositional, residential and racial characteristics (Snyder, McLaughlin and Findeis, 2006). The World's Women 2010 (United Nations, 2010 a) notes that while generalizations between "female-headed households" and "male-headed households" are not ideal, in Latin America and other developing regions, households of lone mothers with children have higher poverty rates than those of lone fathers with children, and that poverty rates for women living in one-person households are higher than the corresponding rates for men. In addition, the analysis of household composition may help in understanding other phenomena, such as fertility, differential remarriage of men and women, and son preference.

300. The Beijing Platform for Action (Par. 22) recognizes, for example, that "female-maintained households are very often among the poorest because of wage discrimination, occupational segregation patterns in the labour market and other gender-based barriers." Moreover, the Beijing Platform for Action (Par. 46) adds, "Many women encounter specific obstacles related to their family status,

particularly as single parents." Monitoring the situation of the most vulnerable families such as female-headed or female-maintained households is crucial for the advancement of more effective policies, not only regarding the promotion of gender equity – such as the elimination of the 'feminization of poverty' or the phenomenon in which women experience poverty at far higher rates than men – but also regarding general social and economic development.

301. Household and family composition and structure may also be associated with gender inequalities in employment and education. In most cultures it is still predominantly women's responsibility to perform daily family tasks. In the same vein, girls are more likely than boys to perform household work (e.g. care-giving, cooking and cleaning). The care-taking activities of girls in the household may impair their school attendance and social life. Depending on household composition, such tendencies may be intensified and jeopardize women's and girls' life opportunities. In several countries, high fertility limits women's opportunities for education and employment (United Nations, 2010 a; see also Chapter 3).

302. Different living arrangements often imply different needs. For example, lone parents may have needs that are substantially different from married parents, and the needs of lone mothers may differ from those of lone fathers (e.g. economics, employment, social support,

education, and parenting). Censuses may provide information on the diversity within family types across gender, and also by factors such as race/ethnicity, education, and age. Indeed, in-depth analyses of household composition, based on census data may be fundamental for policies designed to address the growing diversity of families and their specific circumstances, characteristics and needs, including the most vulnerable family arrangements (e.g. mother-only families in minority groups and families of teenage mothers).

303. Population and Housing Censuses may also provide valuable information about the quality of the environment that families live and work in. For example, a topic of serious concern is indoor air pollution. According to WHO, indoor air pollution is responsible for an estimated 1.6 million deaths per year (http://www.who.int/heli/risks/indoorair/indoorair/en/). About half these deaths are among small children under the age of 5. Indoor air pollution is mostly caused by burning biomass fuels (wood, crop waste or dung) in badly ventilated kitchens and rooms for cooking or heating purposes. Women spend a considerable time of the day inside the house preparing food and performing other household chores. They are –next to small children- most at risk for adverse health effects of indoor air pollution. The problem is most severe among the poorest segments of society, as they are more likely to live in poorly ventilated housing units and use biomass fuels. As many Population and Housing

Censuses gather data on fuel for cooking, kitchen facilities and the physical characteristics of the housing unit, they are an important source of information on this issue.

304. Census data on household and family composition can be useful to define poverty and vulnerability and to plan policies targeting these areas, despite the fact that poverty measurement based on census data has its limitations (see Chapter 8). Household composition characteristics, such as sex, age and number of family members, may also influence the risk of poverty and vulnerability. As an example, poverty risks are often highest in single-earner families and lowest in dual-earner families (OECD, 2011). Using "dual" or "double" earner families, similarly to a family structure type, may allow for the analysis of women's participation in the labour market, and to consider the possible overlap of women's roles and their status at home. In this way, the double burden of women's work can be considered.

305. In addition, grandparents, especially grandmothers, can have an important impact on the wellbeing of children (see Aubel, Pandey and Rijal, 1999; Aubel et al., 2000a; Aubel et al., 2000b, 2003; Bedri, 1995). Research shows that the presence of a grandmother in the household is associated with 1) mothers of children working outside the home, 2) improving the school attendance of children, and 3) improving the reproductive health of both mothers and children. Nevertheless, the presence of

a grandmother is not always a positive sign. If the grandmother is the father's mother, or if the father's father also lives in the same household and particularly if the latter is the head of household, it characterizes a situation in which the mother of the children may have little autonomy because she is subject to the authority of the parents-in-law. This limits not only the woman's choice, but may also have negative consequences for the health of her children. Gÿrsoy-Tezcan (1992), for example, found these kinds of living arrangements to be one of the explanations for relatively high infant mortality in Turkey.

306. The prevalence of co-resident domestic servants, who tend to be predominantly female, provides additional information on gender and family relations within national contexts, as well as on the provision of care institutions by the government. Recent ILO estimates, based on national surveys and/or censuses of 117 countries, placed the number of domestic workers at around 53 million. However, experts say that due to the fact that this kind of work is often hidden and unregistered, the total number of domestic workers could be as high as 100 million. In developing countries, they comprise from 4 per cent to 12 per cent of wage employment. Around 83 per cent of these workers are women or girls, and many are migrant workers (ILO Convention on Domestic Workers, 2011). Because domestic servants often are in vulnerable situations (e.g. the lack of labour inspection and legislation enforcement – see Ramírez-Machado,

2003), data on co-resident domestic servants may be useful for policies addressing gender inequalities in the labour market. Unfortunately, only 20 to 25 per cent of censuses allow the identification of domestic servants; in others they are simply lumped together with other non-family household members.

307. Finally, analyses based on different time measurements, such as comparisons between successive censuses, may not only indicate changes in the social structure of the households but also changes in gender relations. Increases in the number of women living alone, for example, may be related to increasing numbers of female university students and female workers. This was noticed in urban areas of several, especially developed countries.

Country Examples 11: Co-Resident Domestic Servants in Kuwait and Colombia

In some countries, such as Kuwait, co-resident domestic servants correspond to a considerable proportion of household members, as indicated by the study conducted by Shah et al. (2002). Using data from a nationally representative survey on households, they found 17.3 per cent of the 14,835 individuals residing in the investigated households were domestic servants who were unrelated to the Kuwaiti residents. The prevalence of co-resident domestic servants was particularly high in households with elderly persons; about 90 per cent of all households with an older adult had at least one co-resident domestic servant. These numbers, however, are exceptionally high and owe a lot to the availability of cheap domestic servants from abroad. By comparison, in the 2005 census of Colombia only 0.40 per cent of all household residents were found to be co-resident domestic servants. The percentage was somewhat higher in larger households, with a maximum of 0.55 per cent in households with 5 members and a minimum of 0.30 per cent in households with only 2 members.

Country Example 12: The Changing Nature of Household Composition and its Link to Changes in Gender Roles in France

Ogden and Hall (2004) studied household change in France during the 1990s, using data from the 1999 French population census and comparing them with data from earlier censuses. Their results indicate a decline in the mean household size and a rise in the number and proportion of people living alone. These observations may be associated, among other factors, with changes in gender roles and sexual norms (e.g. fertility trends, feminization of the labour force, growing student population). The tendency for women to be heads of one-parent households goes along with the fact that men during young adulthood and early middle age (25-49 years) are more likely to live alone. Nevertheless, the rise in the number of young women in their twenties and thirties who live alone is also remarkable. From 1975 to 1999 the number of men aged 25-39 who were living alone rose by a factor of 1.7, while the number of women living alone rose by a factor of 2.0. At older ages, the overwhelming predominance of women in one-person households was found to be due to earlier male deaths. Of the 1.7 million people living alone over the age of 75 in 1999, 81 per cent were women. Another finding was that of the 57 million people recorded as living within households in the 1999 census, just a little over 30 million were living as 'traditional' families (i.e. as a couple with children), whereas almost 27 million did not fit that description.

3. Data issues

308. The use of census data for gender analysis has both strengths and weaknesses with regards to household and family composition and structure. In terms of strengths, censuses are perhaps the most complete source of information on household and family composition, because they enumerate the highest number of people in a population or country. Related to this, due to the universality of coverage, family structures can be divided into much finer categories than would be possible with most surveys. Also, because of the same universality, the census is less susceptible to the sampling biases that may affect surveys such as the Demographic Health Surveys (DHS), which are designed to capture women living in unions. Finally, another advantage is that censuses allow for international comparability of household and family composition on a regular basis for gender issues when the internationally agreed upon recommendations on definitions and classifications are used (e.g. the Principles and Recommendations).

309. Censuses collect data by enumerating all the individuals that normally live in households (i.e. de iure census) or that happen to be there at the time of enumeration (i.e. de facto census). In addition, the census collects data on the physical structure of living quarters and on the people living in institutional or collective-household arrangements, such as army barracks, prisons, hotels or pensions or on the street. Among the weaknesses, differences in

methodologies of census taking, notably between de facto and de iure censuses, may affect the definition of a household and who is considered to be a member of it or not. In a strictly de facto census any person who did not spend the night of the census with the household would be considered to be a member of another household. In de iure censuses absentee household members continue to be considered as part of the household for up to six months. Interviewers often have difficulties with household membership in the face of recurring absences of persons that may stretch over several years (e.g. students). Another limitation of census data for gender analyses is that the relationships between members are usually only described with respect to the head of household or reference person. This limits the extent to which all the relationships between household members can be mapped. For instance, in a household where there are two daughters of the reference person, each in their twenties, and one man described as "son-in-law," it may not be possible to determine to whom this son-in-law is married. The marital status of the daughters may give a clue, but this will not always work, especially if the marriage is consensual.

310. To organize household data, almost all censuses require that one of the household members be selected as the "head of household" or "reference person." There are a number of reasons why this is done:

a. To assign a person as primary informant, responsible for providing information on all household

members, including those who are not present at the time of the interview;

b. To detect the relations within the household, i.e. to identify family nuclei, and describe the household structure (one-person household, nuclear household, extended or composite household));

c. As a key informant, to ensure that all household members are enumerated ;

d. As a source person to check information pertaining to other household members; and

e. To "summarize" the characteristics of the household by identifying them with those of the head of household, e.g. to analyse the living conditions of household members according to the occupation or the income of the head or reference person. This last use of the head of household concept is quite controversial, because there is no guarantee that the characteristics of the head of household or the reference person will adequately represent those of the household.

311. Using headship of household—female against male headed households—to analyse gender issues is hampered by a number of theoretical shortcomings and practical problems. Even though statistics differentiated by female or male household head can be useful for defining and planning policies for vulnerable population segments, statisticians and gender researchers note that this type of analysis may have its limitations, and these limitations should be taken into account when interpreting data results and planning policies. The following describes five problems related to the use of female/male

headship to study gender differences.

1. The first problem lies in the fact that the definition and operationalization of the notion 'head of household' is vague and in no way uniform. Contrary to many other variables that are strictly defined, the Principles and Recommendations leave the definition and appointment of the head of household wide open: 'Countries may use the term they deem most appropriate to identify this person (household reference person, head of household, householder, among others) as long as the person so identified is used solely to determine relationships between household members. It is recommended that each country present, in published reports, the concepts and definitions that are used'. Appendix 1 illustrates the variety of definitions of head of household that a number of countries used in the 2010 round of censuses. As Hedman et al. (1996: 6) rightly state, the term 'head of household' "is used to cover a number of different concepts referring to the chief economic provider, the chief decision maker, the person designated by other members as the head". Despite the diversity of approaches that may be assumed, questionnaires often do not properly inform which of the term of household head is specifically referred to. At least five different concepts of head of household can be found in censuses: 1) main breadwinner, 2) householder, 3) main authority, 4) reference person, and 5) questionnaire respondent. These concepts are discussed below in points a) through e), also the relative advantages and disadvantages of each possibility are discussed.

    a. **Main breadwinner**. This economic approach to household headship may be useful for

gender analysis if clear definitions are presented in the census taking process and in data tabulation and dissemination. It identifies the primary person responsible for the economic maintenance of the household, so data could be presented on the main contributors to the household's economy, by sex. Further cross-tabulations could include marital status, family composition, owning or renting house, number of family nuclei, and other socio-economic characteristics of the head of the household (e.g. job sector). One country that used the notion 'main breadwinner' was Anguilla in the 2001 census, in which the head of the household was the major economic provider. Using the breadwinner metric allows the analysis to avoid under-representing women's household contributions in practice, as may be the case if relying on authority and traditional gender stereotypes. However, one disadvantage to the breadwinner option is that the question about an economic head may not be adequate for societies where spouses share economic responsibilities more or less equally. In such cases, the Principles and Recommendations recommend the use of the term 'reference person,' with no implication of headship or, alternatively, that provision be made for designation of joint headship. A second disadvantage of using the breadwinner definition is that a gender bias may underlie this definition as it does not capture women's hidden household economic contributions; as female labour is often unpaid, they may not be defined as "breadwinner" even in

cases where the market value of their labour exceeds that of their male partners or if her activities are the main source of family livelihood. Additionally, female respondents may answer that they have no 'occupation' or 'work' although they have been working on craft activities at home or in agriculture. Also, using the breadwinner or economic head for identifying economic conditions in the household may be a pitfall, because household members may not equally share resources and may present different socioeconomic characteristics (Hedman et al., 1996). Finally, ownership of resources does not necessarily imply access to and use of resources (United Nations, 2008).

b. **Householder**. This term refers to the person who owns or pays the rent of the home, and may be defined as the person in whose name the household dwelling is registered, adding that "this approach is more objective than household head and may relate in some ways to power relationships in the household" (UNECE/World Bank 2010: 16). Australia, New Zealand and American Samoa use some of the countries that use the concept of householder. In terms of advantages, the householder option is similar to the breadwinner criterion, but offers greater specificity. In terms of disadvantages, the householder concept may be ambiguous in the context of developing countries, where homes are often rented without formal contracts, where occupants pay no rent at all, or where people live in homes that have been temporarily

borrowed or that are makeshift temporary accommodations. Also, the person paying the rent may not always be the one earning the money with which the rent is paid.

c. **Main authority**. This approach identifies the person that the other household members recognize as the main authority for all sorts of household decisions. This approach has become quite popular, particularly because it is viewed as an indicator of decision-making (UNECE/ World Bank, 2010). In terms of advantages, the main authority approach can provide a measure (i.e. using sex ratios) on the main authority in the household. This can also be used in gender analysis to identify the ways in which power relations are featured in the household structure. In terms of disadvantages, the main authority approach carries the assumption that a hierarchical relationship exists between household members that may not represent reality. Related to this, authority and decision-making typically are not formal but continually negotiated processes. Further, in practice, the census taker may confuse the decision-maker with breadwinner, and decision-making may differ by the type of decision being made (UNECE/ World Bank, 2010). Another limitation to the main authority approach is that authority, responsibilities and decision-making may be shared, especially considering the changes in gender and family relations in the last decades. Decision-making power may be shared by a couple or even several household members. Finally, household members may not

have the same opinion on who is the main decision-maker or who exercises the authority to run the household. Moreover, because authority is defined as "perceived authority," it may not be possible to come up with an objective criterion. The Brazilian country example below illustrates how the main authority approach can be used in practice and how some of these perceived disadvantages can be surmounted.

d. **Reference person**. The reference person approach implies selecting an adult household member at random. It has the advantage of making the process explicit in the sense that it does not allow any undue interpretations of what the headship criterion actually represents. Because it is random, it is not necessarily the main income earner, nor the person taking the major decisions regarding the household or the person that owns or pays the home. This concept focuses on the second function of the household head assignment, a reference for mapping family relationships, more than the third, a breadwinner or person in authority who can represent the household. The 1996 census of New Zealand, for example, did not use the term 'household head,' but replaced it by a sentence which referred to the person responsible for the answers. In the census form, it stated: "In every dwelling, one person must take responsibility for this form. An adult who lives here would be best, but any person can be the one who must: fill in this form; make sure that everyone fills in an

individual form (the blue one); and have all the forms ready for the enumerator to collect." The 2001 and 2006 census forms also used similar expressions. In some cases, this interpretation is made explicit by choosing the reference person randomly among the adult household members. This practice is currently used in Denmark, the UK, Canada, and several other countries. In terms of disadvantages, the reference person approach may generate confusion. Further, choosing a reference person randomly increases the chance that this person may not be related to the other household members, in which case, information on related persons and family nuclei will be lost.

e. **Questionnaire respondent.** This conceptual approach means that the 'household head' is the person responsible for answering the census form no matter what his/her status may be within the household. For instance, in the United Kingdom Population Census of 2011 a 'householder' is defined in order to indicate who is responsible for the completion of the questionnaire. It is not defined to produce any outputs as there is nothing on the questionnaire to identify this person. The advantages and disadvantages of the 'questionnaire respondent' are roughly the same as just discussed for the 'reference person' concept, i.e. the notion may be confusing and chances are that the person is not related to other members of the household.

This conceptual vagueness or ambiguity of the

headship concept may lead to divergences between census workers' assumptions and the responses given by household members. Each one will tend to define the head according to their own cultural representations and, naturally, there is a great risk that premises differ substantially from one another, or may not adequately reflect household realities. A census may supposedly use a "breadwinner" definition, but household members/enumerators may decide simply to put down the oldest male, without questioning the situation. As enumerators, respondents and analysts may not be talking about the same concept, and there is no guarantee of what is being measured. Without a clear definition, would two census workers define the same head? And would household members designate the same person as the head? Without adequate orientation and interview training, internal/external reliability becomes quite unlikely. Indeed, if the concept is vague or ambiguous, it is very likely that data and analysis will not adequately represent reality or provide accurate and consistent evidence for policy-making.

2. A second problem of using the female/male headship dichotomy in gender studies is that gender inequality may take place at the intra-household level (e.g. unequal distribution of earnings and consumption among members of the household). Therefore, focusing on female-headed households may not

capture these inequalities and be misleading. The shortcoming of using female/male headship of household is well illustrated in a study on 11 Latin American countries by Deere, Alvarado and Twyman (2010). Drawing on the recent Living Standard Measurement Studies for Latin America and the Caribbean, they present baseline indicators of the degree of gender inequality in individual asset ownership. Disaggregated data on housing ownership suggests that the distribution of asset ownership by sex within households is much more equitable than a headship analysis would suggest. The authors estimate that in Nicaragua women own 36-41 per cent of household physical wealth. However, if the analysis of household wealth were conducted by sex of the head, female-headed households would own only 20 to 23 per cent of household wealth, significantly less than the share of female-headed households in that country. This different vision of relative female poverty is largely due to the fact that women in male-headed households often own property, either in their own right or as joint property with their spouses. As will be argued in more detail in the Chapter 8, the differences in poverty rates between male and female-headed households, if not broken down into finer categories, are typically small and tend to be associated with other demographic differences between these households, such as the number of children and adult male and female household members.

3. A third problem has to do with the limited possibilities for analysis and cross-country comparisons. Obviously, if the researcher is not sure of what the 'household head' variable of a given census is

actually measuring, this may put into question how the results should be interpreted. Further confusion arises when census data on household headship from different countries are compared, with a high likelihood of putting side by side different measurements in cross-national comparisons.

Even when the concept is clear in the original questionnaire form, the definition may not be presented in census tables or other census reports. In this case, particularly when making use of secondary sources, analysis and comparisons must thus be conducted with caution to ensure that assumptions made by data users correspond to the respondents' approach. Sometimes, misguidedly vocabulary changes also do take place. The original questionnaire form may have used the term 'reference person', while in tabulations or in analyses this was replaced by 'household head'. This may lead to biased interpretations. In this regard, UNDESA warns that:

'It is important to recognize that many countries use the concept of reference person in listing household members and that this person may or may not be the "household head". Where this is the practice, the "household head" identified in tabulations is, in reality, the reference person and should be treated with caution'. (United Nations, 2005: 135)

4. Focusing on female-headed households may lead

to biased policy priorities. In the words of Sylvia Chant (2003: 30), "Placing excessive emphasis on the economic disadvantage of female heads misrepresents and devalues their enormous efforts to overcome gender obstacles." The 'feminization of poverty' thesis "...precludes an analytical consideration of the social dimensions of gender and poverty..." and "tends to translate into single-issue, single-group policy interventions." These narrow policy interventions may in turn fail to affect and reshape the embedded structures of gender inequality found in the home, the labour market and other institutions.

5. A fifth consequence of the methodological bias is the reproduction or reinforcement of gender stereotypes. Stereotypes may not only be guiding questionnaire formulation and census execution, but also respondents' answers, and the researcher's analysis.

   Participants of the Second Global Forum on Gender Statistics expressed concern that "using the conventional classification of household headship (i.e. whether household is female or male-headed) implies a kind of hierarchy within the household that suggests subordination" (United Nations, 2009 b: 17). Questionnaires may also be designed under the assumption that gender norms naturally place men as the 'head;' in this case, it is quite possible that questions are formulated in a way that leaves little room for respondents to indicate a female-headed household. Even if the questionnaire was well formulated, the training of enumerators may

not adequately address this topic, allowing for biased interview approaches.

As Budlender (1997: 4) points out, in many African cultures "the household head will be the oldest male," adding that "in a multi-generational household, he will often not be the highest income-earner, or even control the resources of the household." He is recognized as the 'head' in terms of respect, but it would be inappropriate to say that he is the economic head.

The First World Conference on Women (1975) had already pointed out, in its Plan of Action, the risk of methodological bias relating the operationalization of the concept of household head: "among other data biased by preconceptions are those on heads of households or families, when it is assumed that a woman can be the head only in the absence of a man" (Par. 164). These concerns were further incorporated in census manuals. The Principles and Recommendations (Pars. 2.118, 2.119), for instance, state that "the most common assumption that can distort the facts is that no woman can be the head of any household that also contains an adult male. Enumerators and even respondents may simply take such an assumption for granted". It is also argued that this gender stereotype "often reflects circumstances that may have been true in

the past but are true no longer, insofar as the household and economic roles of women are changing." The Principles and Recommendations recommend, in their paragraph 2.119, that "It is important that clear instructions be provided as to who is to be treated as the head of the household so as to avoid the complications of enumerator or respondent preconceptions on the subject. The procedure to follow in identifying a head when the members of the household are unable to do so should be clear and unambiguous and should avoid sex-based bias."

Nepal provides an example of a country which is currently making efforts to avoid gender bias regarding household headship. In the 2001 census questionnaire, illustrative examples in the census instruction manual were revised in order to move away from the traditional type of responses: "descriptive examples like 'female or male' in place of 'male or female' in earlier census manuals or the example of 'female name' as the household head in place of only 'male name' in earlier census manuals were included". Additionally, women were shown as household heads in specific publicity materials (posters), which also presented women performing various non-marketed economic activities, such as "food processing, agricultural cropping, fetching water and fuel wood collection" (UNFPA, 2004: 17).

312. An illustrative example of divergent data outcomes regarding different definitions of household headship is found in a study based on the 1997 LSMS (Living Standard Measurement Study) data for Panama (Fuwa, 2000). Here, female-headed households were classified according to three criteria:

a. Self-reporting of a woman as the head;
b. A "potential" female head, if no working-age male was present; and
c. A "working head" definition, in cases where more than half of the total hours worked were contributed by a single female member.

The corresponding poverty rates were different: 29 per cent for the self-declared female-headed households; 23 per cent for the "potential" female-headed households; and 21 per cent for the households headed by a "working female" (United Nations, 2010 a: 164). The overlap between these three sets of households was low, around 40-60 per cent. In this case, different definitions in fact measured different social situations.

Country example 13: Brazilian Census Using Decision-maker to Designate the Household Head

The 2010 Brazilian census included the possibility of more than one household head ("one person"/"more than one person") which could be considered as shared responsibilities in the household – but without using the term 'household head', as this term has been considered increasingly inappropriate. In the early 90's, surveys conducted by the NSO (IBGE) started using the term "reference person"; later, after pilot tests, it was replaced with the term "responsible person", which was widely accepted by respondents. The 2000 and 2010 censuses incorporated this change but didn't establish a criterion to the selection of household "responsible person". In the 2010 census of Brazil, the "responsible person" is chosen among the household residents. Preliminary results of 2010 Census show that 70.4% of the households have only one "responsible person". The questionnaire of the 2011 census of South Africa provided a definition of the household head as "the person who is the main decision-maker in the household". It considered the possibility of joint responsibility, in which case it instructed census interviewers to take the oldest person.

313. Despite these limitations, the head of household measure has been used frequently in gender studies to document the erosion of male exclusive providers, and has given new meaning to this aspect of domestic living. An example of this ambivalence is illustrated in the World's Women 2010 (United Nations, 2010 a), which cautions that generalizations between "female-headed

households" and "male-headed households" are impossible because of the contextual differences in women's and men's statuses as well as the variety of headship definitions and the households that may be included under these labels. Therefore, researchers must proceed cautiously to compare across households headed by women and men, in order to understand patterned poverty and vulnerability in different types of household structures. This caution often translates into additional precision in the analysis and household specification, as the World's Women 2010 then reports that Latin American households headed by lone mothers with children have higher poverty rates than those of lone fathers with children, and that poverty rates for women living in one-person households are higher than the corresponding rates for men.

Methodology Box 6: Mixing Different Levels of Analysis

Like many social relationships, gender issues can be analysed at different levels: individual, household, community, geographical, and cross-country. While each of these levels of analysis may have their own legitimacy, the interpretation of the results will differ. A relationship between households or geographical units does not always translate directly into a relationship between individuals. When the units are geographical, this problem is known as the ecological fallacy. A typical finding is that in US elections districts with a higher proportion of Afro-Americans in their population often vote more strongly for white supremacist candidates (e.g. George Wallace, in 1968). Obviously, this does not mean that Afro-Americans are likely to vote for white supremacist candidates, but rather that race relations are more conflictive in districts that have a high percentage of Afro-American voters, so that white voters in these districts are more inclined to vote for these kinds of candidates. Something similar may happen at the household level. The greater poverty or vulnerability of households with female heads or high proportions of female members may not be directly related to the characteristics of these women, but reflect that these are special kinds of households where some of the male members are either incapacitated or absent. This may still be a worthwhile phenomenon to investigate, as long as it is kept in mind that the results characterize households, rather than individuals.

314. Because of the problems involved, the household head concept should be clarified, and perhaps it should be replaced by several concepts to provide a better understanding of household structure and processes. Statisticians and scholars alike have made the case to

clarify the concept of head of household. Although most censuses seek to define one concept of household head, it would actually help the analysis if the different concepts were treated separately. As Budlender (1997: 15) states:

Instead of insisting on one definition, one could several questions so as to get at multiple definitions of household and multiple axes of household headship, and then leave it to users/analysts of the data to pick up the particular definitions they find useful in addressing a specific question. Multiple questions would also allow for cross-tabulation and comparison of the definitions, to see where they differ, why they differ and by how much. These questions are not only of academic interest. They are also of interest to policy-makers who are eager to target their programmes where they will be most effective, and at those most in need, while avoiding the allocation of scarce resources to less 'appropriate' beneficiaries'.

Failure to clarify the concept of head of households has a number of potentially undesirable consequences for the presentation and interpretation of results – specifically in the areas of 1) what is being measured; 2) problems for analysis and cross-country comparisons; and 3) gender stereotypes.

315. Some countries, like Ireland and Aruba, have replaced the simple relationship with the household head by a more complex matrix of relationships between household members. This can be time-consuming to fill out, even though the matrix is limited only to relationships

with the first four household members, as follows:

Relationship of person 5 (or 6, 7, etc.) to persons	1	2	3	4
1. Husband or wife	_	_	_	_
2. Partner (including same-sex partner)	_	_	_	_
3. Son or daughter	_	_	_	_
4. Step-child	_	_	_	_
5. Brother or sister	_	_	_	_
6. Mother or father	_	_	_	_
7. Grandparent	_	_	_	_
8. Step-mother or father	_	_	_	_
9. Son or daughter-in-law	_	_	_	_
10. Grandchild	_	_	_	_
11. Other related	_	_	_	_
12. Unrelated (including foster child)	_	_	_	_

In the Serbian census, a simpler mechanism is used in which the name of one of the parents and the name of the married/consensual partner are identified, which helps to define the family relationships within the household. Note that matrices of this kind could be particularly useful to disentangle the kinship relations in polygamous unions, where all children will be classified as belonging to the head of household, but have different mothers.

316. Aruba came up with an alternative approach to classify family nuclei and household types in its 2010 population census. Through a set of questions it was possible to identify the categories and sub-categories of household type and family type. Moreover, the questions allowed making a household classification using both a formal approach (married couples) as well as a sociological approach (married + consensual unions). The

questions used to make this classification were:

- Is the person related (also by marriage) to everyone in this household?
- Does the father of this person live in this household? If yes what is the person number of the father?
- Does the mother of this person live in this household? If yes what is the person number of the mother?
- What is the marital status of this person?
- Is this person currently living on a durable basis with a partner (married or not)? If yes, what is the person number of this person?

If living together, is person married to this partner?

This approach worked well, especially with digital questionnaires, where the person number of related people could be chosen from an answer box containing the names of all eligible candidates. However, Aruba is a small country and it is doubtful whether the same technique could be used on a larger scale in censuses in much bigger countries.

317. The lack of detail, and inconsistency between countries among the relationship with head categories in the census presents another limitation. International recommendations support the collection of detailed information on relationships, with a sufficient number of pre-coded categories. Nevertheless, in some countries the number

of options is extremely limited (e.g. only 5 relationship categories in Malawi and Bangladesh). As was mentioned in Chapter 3, some censuses ask about the father and mother of each person residing in the household, i.e. a) If the father/mother of the person reside in the same household (e.g. Aruba, Barbados, Cape Verde, South Africa); and b) If so, the identification of the person's father/mother. This information can be quite helpful to analyse residential patterns, e.g. by providing an indicator of the likely distribution of unpaid care work, because in many countries, more children live with their mothers than with their fathers. The 2006 census of the Maldives went even further and asked for each child under the age of 18 whether he/she lived with:

1. Both parents (71.4 per cent);
2. Mother and stepfather (2.0 per cent);
3. Father and stepmother (0.6 per cent);
4. Mother only (6.2 per cent);
5. Father only (0.7 per cent);
6. Other relatives (4.3 per cent);
7. Only unrelated household members (1.8 per cent).

Unfortunately, the usefulness of the information was negatively affected by the high percentage (13.1 per cent) of missing data.

Similarly, for people over age 65, it asked whether they were living with:

1. Children;
2. Spouse;
3. Stepchildren;
4. Other relatives;
5. Unrelated individuals;
6. Without guardian.

4. Tabulations

318. The Principles and Recommendations consider household and family characteristics as an essential topic to be investigated and suggest that NSOs should construct the following tabulations relevant for gender analysis:

Recommended tabulations for population censuses:

- Population in households, by relationship to head or other reference member of household, marital status and sex, and size of institutional population (i.e. persons who are not members of households);
- Head or other reference member of household, by age and sex; and other household members, by age, sex and relationship to head or other reference member.

Additional tabulations for population censuses:

- Population in households, by household status (or type of household), age and sex, and institutional population by age and sex;

- Household population under 18 years of age, by age and sex and by whether living with both parents, mother alone, father alone, or neither parent;
- Households and population in households, by sex, by size and type of household and number of persons 60 years of age and over.

319. To illustrate (part of) the first kind of table, one may take the 2004 census of Timor Leste as an example, as displayed in Table 27. Among other things, this table shows that a surprisingly high percentage of female heads of households (38.1 per cent) are actually married; only the number of widowed female heads of household (48.5 per cent) is larger. Most of the remaining female heads of household are single, with very few cases of divorce or separation. Note also that couples are about as likely to live with the parents of the woman (1,385) as with the parents of the man (1,410). Surprisingly, in almost half of the former (602) cases, the couple is not formally married and in 113 cases the man continues to live with his parents-in-law even after the wife has died. The latter construction is even more common in the case of widowed daughters-in-law (379). Mothers live with their children much more often (7,008 cases) than fathers (1,994).

Table 27: Timor Leste—Population in private households by marital status according to sex and relationship to the head of household

Males	Total	Never Married	Married	Widowed	Divorced	Separated
Head	158,063	10,107	139,371	7,822	416	347
Wife/Husband	4,590	0	4,590	0	0	0
Daughter/Son	237,881	236,731	722	339	52	37
Stepchild/Adopted Child	12,024	11,870	106	28	16	4
Daughter/Son-in-Law	1,385	602	657	113	5	8
Mother/Father	1,994	136	738	1,092	9	19
Sister/Brother	18,628	16,798	1,165	524	80	61
Grandchild	10,109	10,018	70	11	7	3
Grandparent	482	65	116	285	7	9
Other Relative	20,009	17,676	1,652	579	53	49
Non-Relative	1,798	1,331	434	21	8	4
Females	Total	Never Married	Married	Widowed	Divorced	Separated
Head	36,899	3,317	14,054	17,882	843	803
Wife/Husband	134,207	0	134,207	0	0	0
Daughter/Son	218,046	215,168	1,610	760	282	226
Stepchild/Adopted Child	10,323	10,051	124	95	340	19
Daughter/Son-in-Law	1,410	405	610	379	70	9
Mother/Father	7,008	327	1,670	4,890	55	66
Sister/Brother	15,628	12,479	1,444	1,426	159	120
Grandchild	9,119	8,957	103	35	17	7
Grandparent	1,343	87	292	946	8	10
Other Relative	16,459	12,839	1,723	1,689	115	93
Non-Relative	1,053	858	124	51	15	5

Source: Population and Housing Census of Timor Leste (2004): Table 3.1

320. The following is an illustration of another kind of table that can be extracted from a census (in this case, the 2008 census of Cambodia) by combining information about the sex and age of the head of household with information on the relationship of the household members with the head of household.

Table 28: Cambodia (2008)—Average numbers of household members classified by age and sex of the head of household and by relationship to the head of household (all numbers multiplied by 100)

Male Head	Head	Spouse	Child	Parent	Grand Child	Other Relative	Other Non Related.	Total
0-14	100	2	1	6		101	31	240
15-19	100	54	35	6		53	42	290
20-24	100	90	104	6		25	20	344
25-29	100	94	167	8	0	24	13	406
30-34	100	96	247	9	0	24	9	485
35-39	100	96	298	9	1	24	9	537
40-44	100	96	328	8	6	24	7	568
45-49	100	96	324	6	15	27	8	575
50-54	100	94	295	5	28	30	8	559
55-59	100	93	257	4	41	29	7	530
60-64	100	90	208	2	57	28	7	492
65-69	100	88	169	2	70	27	8	463
70-74	100	84	130	1	80	26	10	431
75-79	100	80	110	1	81	23	15	409
80+	100	71	98	1	74	19	40	404
Total	100	93	247	7	15	26	10	498
Female Head	Head	Spouse	Child	Parent	Grand Child	Other Relative	Other Non Related	Total
0-14	100	1	0	10		114	18	243
15-19	100	20	28	9		81	80	319
20-24	100	37	94	9		52	46	338
25-29	100	40	160	12	0	44	24	380
30-34	100	37	225	15	0	31	11	419
35-39	100	32	250	14	2	30	10	439
40-44	100	25	250	13	11	32	5	437
45-49	100	20	229	10	28	36	5	427
50-54	100	14	195	8	49	39	5	410
55-59	100	10	159	5	71	38	4	387
60-64	100	8	129	3	92	34	4	369
65-69	100	6	106	1	105	28	3	350
70-74	100	5	88	1	106	23	2	325
75-79	100	3	79	0	98	19	3	303
80+	100	3	73	1	88	19	4	287
Total	100	21	179	9	38	36	11	394

Source: Computed based on REDATAM data base, ECLAC/CELADE

321. Some of the conclusions that can be drawn from this table – at least for the case of Cambodia – are the following:

- Female-headed households with young heads have about the same size as male-headed households, but as the age of the head increases, female-headed households become progressively smaller with respect to male-headed households.
- Roughly the same pattern is observed with respect to the number of children, although at higher ages there is a slight recovery of the relative number of children among female-headed households.
- The highest percentage of female heads of household with spouses (35-40 per cent) is found among those aged 20-34; after age 35, the percentage declines quickly.
- Female-headed households have a slightly higher tendency to have parents, other relatives and especially grandchildren living with them.
- Especially among households with older heads, the percentage of household members in female-headed households that are children or grandchildren tends to be higher than among male-headed households.

322. The 2010 census of Mongolia published extensive data on household composition in its census monograph on gender equality, which it systematically disaggregated by type of household (single-person, nuclear, extended, composite). Female-headed households were found to be most common in the single-person category (44.3 per

cent), followed by composite households (29.1 per cent), extended households (28.6 per cent) and least common in households with a nuclear structure (14.5 per cent). As in Table 28, the analysis also found that female-headed households tend to be smaller than male-headed households, regardless of the type of household and area of residence.

Table 29: Mongolia (2010) – Average size of households by household types, sex of household heads and area of residence

Household type		Total	Urban	Rural
Nuclear	Total	3.6	3.5	3.7
	Male	3.7	3.6	3.8
	Female	2.8	2.8	2.8
Extended	Total	4.6	4.6	4.3
	Male	4.8	4.9	4.5
	Female	4.1	4.1	3.7
Composite	Total	4.6	4.6	4.4
	Male	4.7	4.7	4.5
	Female	4.2	4.3	3.8

Source: Census Monograph 6 of the 2010 Census of Mongolia, Table 3.2

323. As was mentioned before, much use has been made of the criterion of whether the head of household is male or female. Some of the limitations of this distinction were discussed earlier in this sub-chapter. Tabulating census data on the basis of male/female headship only gives a first impression of the social and economic position of women, but should be complemented by the comparison

of the structure of households. Sometimes the percentage of women in the household is used as a criterion. For example, The World's Women 2010 (United Nations, 2010 a: 159) mentions that "households with an overrepresentation of women might be more likely to be found below the poverty line", but immediately points out that this may be due to two rather different causes, namely: 1) in some types of households where the share of women is higher, the earnings per capita tend to be lower because women's participation in the labour market and their earnings are lower than men's; and 2) as the ratio of women to men increases with age, the presence of non-earning older persons in extended households may depress per capita household income. While the first explanation points to a genuine gender disparity, the second is a demographic composition factor that one would like to control for, rather than confounding it with the first.

324. When using household information for gender analysis, special attention should be dedicated to the situation of elderly women compared to elderly men. The situation of elderly household members varies considerably among countries. In Brazil, for example, the presence of an elderly person with a retirement pension or allowance was found to reduce the likelihood of family vulnerability to poverty, and having an elderly person in the family was even strategically more effective in reducing vulnerability than having a spouse (Lavinas and Nicoll, 2007). The structure of gender imbalances at older ages

may be different from the typical pattern at younger ages and care must be taken not to assume automatically that all of them will favour men over women. As Knodel and Ofstedal (2003: 693) point out,

In many settings, perhaps even in most, older women may be disadvantaged relative to older men on some or most dimensions of well-being. Clearly, too, there are numerous exceptions as indicated by the examples presented above. A major hindrance to making a more definitive statement about gender and aging is that systematic empirical assessments comparing the situation of older men and women are inadequate for drawing a firm conclusion-especially for the developing world, where the large majority of older persons live. Most broad statements asserting a generalized female disadvantage in old age appear to be based on presumptions and an incomplete allowance for the full set of influences over the life course, including later stages, that determine well-being in old age. In any event, generalizations about which sex is more disadvantaged are of limited value. To more fully understand the effects of gender on the well-being and support of older persons and their families, research must move beyond assumptions of universal gender inequality and the disadvantaged situation of older women to examine the experiences of older men and women within the contexts in which they live. Such research should recognize that well-being at older ages is multidimensional and that gender differences may go in either direction or, for that matter, be largely absent, depending on the aspect of well-being under consideration.

325. Migration is another significant factor that has to be controlled, for any comparisons to be meaningful. Klasen, Lechtenfeld and Povel (2010), found, for example, that in Thailand and Viet Nam households with female headship that had a male family member residing elsewhere were, on average, better off than the general population, whereas female-headed households without such external remittances were poorer and more vulnerable than average. In countries with significant emigration, therefore, household statistics on poverty should be disaggregated by whether they have members residing abroad.

Methodology Box 7: Kinship classification

One way to organize a more detailed classification is to compare across different household structures, first organizing across those with and without other adults in the household, then by male or female head, and finally by meaningful comparisons across different family nuclei. See the classification structure just below, illustrated with data from Cambodia (2008) and El Salvador (2007).

Table 30: Household composition by headship for Cambodia (2008) and El Salvador (2007)

Cambodia (2008)	Without Other Adults		With Other Adults	
	Male head	Female head	Male head	Female head
Head without spouse or children	30,274	68,377	52,970	174,078
Couple without children	121,031	10,135	256,785	19,225
Couple with 1-2 children under 15	485,038	38,463	568,448	45,617
Couple with 3+ children under 15	246,319	18,834	288,206	22,632
Lone parent with 1-2 children under 15	12,286	81,563	32,561	173,868
Lone parent with 3+ children under 15	2,835	25,275	9,601	49,643
Other structure or unknown	5,204	2,629		

El Salvador (2007)	Without Other Adults		With Other Adults	
	Male head	Female head	Male head	Female head
Head without spouse or children	69,568	52,601	38,872	108,311
Couple without children	85,439	9,687	112,138	14,037
Couple with 1-2 children under 15	214,715	16,282	178,165	22,952
Couple with 3+ children under 15	88,305	7,301	83,394	10,522
Lone parent with 1-2 children under 15	6,358	54,673	26,867	123,728
Lone parent with 3+ children under 15	1,578	22,474	9,479	47,289
Other structure or unknown	1,222	528		

Source: Computed from REDATAM data base, ECLAC/CELADE

326. The proposed division by number of children is merely a suggestion. Depending on the level of fertility in a country, it may be more appropriate to divide parents by whether they have 0, 1 to 3, or 4 children or more. In other cases, a mere classification in terms of whether the family nucleus does or does not have children may be sufficient. Note that lone female heads of households with children and no other adults in both of the tables above account for only about 15 per cent of all female-headed households. About double that percentage is made up by female heads of household without spouse, but with children and other adult household members. However, about half or slightly over half of all female-headed households consist of women living alone, with a spouse or a spouse and children, or with other adults and no children under

age 15. In particular, note the large number of female household heads living without spouse or children under age 15, but with other adults. In El Salvador these make up about 22 per cent of the female-headed households and in Cambodia almost 24 per cent.

327. In Cambodia, about 40 per cent of these households have people over 60 living in them, compared to the average of 23.5 per cent for all households (not shown in Table 30). These can consist of older women without spouses and with adult children, or younger women without spouse or children caring for elderly parents. Overall, there are 33,724 households where one woman between the ages of 15 and 50 lives together with older adults, without any children under age 15 or other adults. This is about 5 per cent of all households that have people over age 60 living in them. The number of households where one man between the same ages lives with adults over the age of 60, without children under age 15 or other adults, is smaller, namely 23,274. This suggests some tendency for the care of older persons to fall disproportionally on women, although the absolute size of the numbers and the difference between them is not as large as one might expect. In countries where this is an issue, especially in Eastern and Southeast Asia, it is recommended to produce tables that elaborate on these kinds of household compositions.

328. The age of the heads of household and possibly their marital status may be taken into consideration,

as well as the existence of household members living abroad, which may indicate that the household is receiving remittances. One may also wish to further subdivide the households with "Other adults", to allow the inclusion of structures that may be of particular interest, such as those that include the parents of the head of household or the spouse. Households headed by grandmothers that care for their grandchildren are a group of growing importance, not only in Sub-Saharan Africa (due to the impact of AIDS), but even in the United States, where they now comprise more than one fourth of all female-headed households with children (US Bureau of the Census, 2003). The "Other structures" in the above tables include households of several unrelated individuals living together and grandparents or aunts/uncles with grandchildren or nephews/nieces, without the parents.

329. Obviously, if all the relevant distinctions are made, the resulting table will end up being quite complex. The actual decision on how detailed the table should be will require some compromise between comprehensiveness and relevance of the possible subdivisions. For some purposes, it may be sufficient to disaggregate by broad age categories (e.g. less than 25, 25-49, 50-64, 65+) of the head of household or to omit the age disaggregation altogether. In countries with little international migration, the distinction between households that do or do not have members residing abroad may not be important. In other countries, where extended households are rare, it may

not pay off to go into much detail about the identity of the "other adults" co-residing with the basic family nucleus.

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330. Vanuatu (2011) provides an example of a country that did extensive tabulations of household composition by headship. Among others, it also disaggregated the data by rural-urban residence and by main source of income. The classification of household structures is different from the ones used above. Next to the number of male and female-headed households a detailed classification of household type is made (see Table 31). For nuclear households consisting of mothers and children and fathers and children, a sub-division was made according to the number of children under 15 belonging to the household (0 children, 1 – 3 children and 4 or more children). Also, the mean number of persons in the household per household type and sex of the head is given. Finally, the sex ratio (i.e. the number of males/females times 100) for the heads of households of each household type is presented. For nuclear, single parent households, the sex ratios refer to the corresponding class: e.g. 100*(number of fathers with 0 children under 15)/(number of mothers with 0 children under 15).

Table 31: Vanuatu (2009)—Mean number of persons by type of household and sex of head

	Sex of head of household			No. of persons in household, by sex of head			Sex ratio
	Male	Female	Total	Male	Female	Total	
One person household	1,887	1,110	2,997	1.0	1.0	1.0	170.0
Nuclear, Couple, no children	2,563	191	2,754	2.0	2.0	2.0	1341.9
Nuclear, Couple with children	18,065	1,259	19,324	4.8	4.6	4.8	1434.9
Nuclear, mother without children under 15	0	610	610	.	2.5	2.5	47.9
Nuclear, mother with 1-3 children under 15	0	1,735	1,735	.	3.5	5.8	29.6
Nuclear, mother with >3 children under 15	0	298	298	.	5.8	5.6	11.1
Nuclear, father without children under 15	292	0	292	2.5		2.5	47.9
Nuclear, father with 1-3 children under 15	513	0	513	3.3	.	3.3	29.6
Nuclear, father with >3 children under 15	33	0	33	5.8	.	5.8	11.1
Extended family	13,615	4,587	18,202	6.4	5.3	6.1	296.8
Composite household	434	77	511	7.0	4.5	6.6	563.6
Cannot determine	40	64	104	6.5	6.7	6.6	62.5
Total	37,442	9,931	47,373	5.0	4.2	4.9	377.0

Source: Population and Housing Census of Vanuatu (2009)

331. The sex ratios of head of household show that in nuclear families where a couple is present, males are 13 to 14 times more likely to be chosen as head of households than women. Because women are more likely than men to be a lone parent, sex ratios are very low. Note that there are almost ten times more women with more than 3 children under 15 than men (sex ratio = 11.1). Also among extended and composite households the sex ratios show that men or much more likely than women to be chosen as head. However, this chance is much lower than among nuclear household containing a couple. While the number of persons in household headed by males and females is more or less the same among nuclear households, extended and composite household headed by women are smaller.

332. The information on main source of income of Vanuatu households (not shown here) suggests that male-headed households are somewhat more likely to depend on wages or salaries (81.5 per cent in urban areas and 18.8 per cent in rural areas) than female-headed households (79.2 and 16.0 per cent, respectively). This is particularly the case for lone heads of households with children and extended households. In the case of couples in nuclear households with female heads are actually slightly more dependent on wages or salaries. Households that depend predominantly on remittances are relatively few (1-3 per cent), but increase to 5-8 per cent in the case of a few household categories, such as rural grandfathers or grandmothers caring for grandchildren, lone male household heads in rural areas living with parents or in-laws, and women living by themselves.

333. Although a more in-depth investigation of the househo-ld determinants of female labour force participation and the school attendance of children requires multivariate methods, there are some basic tabulations that one may produce in order to get at least an idea on how these characteristics vary between different types of households. These tabulations might include the following:

School attendance of young girls and boys (e.g. ages 6-11) by

a. Presence of a grandmother (i.e. the head's mother or mother-in-law) in the household;

b. Presence of a live in domestic servant;

c. Presence of one or both parents (father and mother, father only, mother only, neither);

d. Number of older- younger siblings in the household.

Women's labour force activity status by

a. Household size;

b. Household composition (see next section);

c. Presence of elderly household members, particularly grandmothers (of the children in the household);

d. Presence of a live-in domestic servant.

334. As a final example of the importance of always considering possible disaggregations and standardizations that may explain observed gender differences, consider the finding of the 2006 censuses of Egypt and Iran that illiteracy was much higher among female heads of households than among male heads of households. However, care must be taken to eliminate the effect of age. The majority of female heads of household in the Middle East are older women, especially widows. Because illiteracy increases sharply with age, this ends up being a major determinant of the higher illiteracy rates of female heads of households. If the results are disaggregated or standardized by age, the difference between male and female-headed households becomes much smaller. In the case of Iran, the unstandardized illiteracy of female

heads of household was 78.9 per cent in urban and 95.1 per cent in rural areas, compared to 19.7 and 41.9 per cent, respectively, for male heads of household (Rabiee, Mirzaei and Mohamadi, 2011). But once the age structure is accounted for, by standardizing on the ages of male heads of household, the female rate falls considerably. Nevertheless, a substantial difference with the male rate remains, so there is indeed a real socioeconomic disadvantage associated with female headship, beyond the mere age effect.

5. Indicators

335. There are a number of conventional indicators of household composition that may be relevant for different kinds of gender analysis. Several of these go back to the household classification schedule introduced in the previous section. Rather than making comparisons in terms of male and female-headed households in the aggregate, which mix all of these distinct categories, it is much better to make comparisons between equivalent household composition categories. The comparison can be made both in terms of how much more common the female-headed households are represented in the relative incidence of poverty or vulnerability. Most census reports, however, still limit themselves to the conventional division of households into male-headed and female-headed, despite the known limitations of these categories. Figure 11 below illustrates the kind of maps that can be

constructed with this information, based on the 2007 census of Swaziland.

336. Another household composition indicator, with more conventional applications, is the so-called headship ratio, i.e. the percentage of men or women of a given age that are heads of their households. It is useful primarily for household projections, as the population by age and sex at any given time, multiplied by the respective projected headship ratios, yields the number of households. Obviously, it also allows the comparison of the percentage of men and women of any particular age that are heads of their households. Again, as discussed earlier, the use of the sex of the head of household has some serious limitations for analytical purposes. Results obtained by comparing male/female heads of household should be backed up by more detailed analysis in which type of household is brought in as an additional explanatory variable.

337. The concept of headship ratio can be extended to other categories of household status, allowing the construction of descriptive indicators such as the percentage of women of a certain age who may be the following:

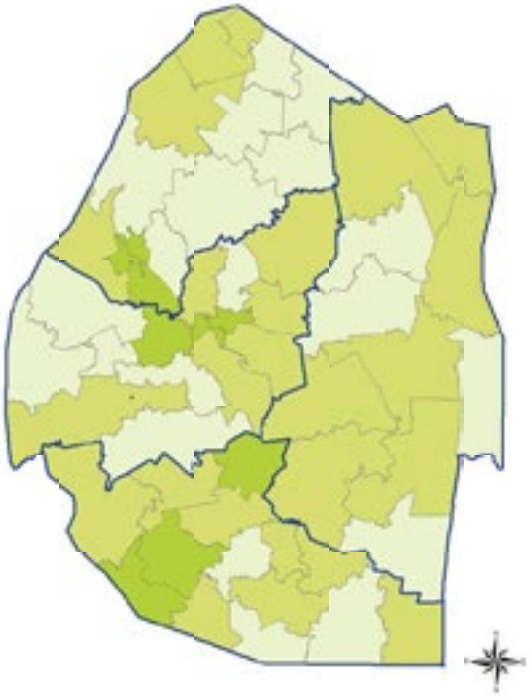
a. Living in their parental household;
b. Living by themselves in a one person household;
c. Living with a husband or partner, without children;
d. Living with a husband or partner, with children;
e. Living without a husband or partner, but with

children; or

f. Living with unrelated household members, as a domestic servant.

Comparing the evolution of these indicators between successive censuses can provide interesting information about changes in gender relations, e.g. an increase in the percentage of women aged 20-24 who are living alone or with a husband or partner, without children, which might indicate that young women are having greater opportunities to extend their education or to work, prior to forming families, than in the past. Obviously, these comparisons only make sense if the concept of head of household, and the operationalization of this concept (e.g. the response category, or who decides to designate the head) have not changed over time. Many countries have adapted their strategies to appoint the head of household.

Figure 11: Swaziland (2007) – Percentage of female-headed households by tinkhundla (from lightest to darkest, the colour gradations indicate 6-11, 12-18 and 19-34 per cent)



Source: Map 2.0, Census Atlas of the 2007 Population and Housing Census of Swaziland

338. In section 2, co-residing domestic servants were mentioned as a particularly vulnerable group. This suggests compiling data on the following indicators:

a. Percentage of households (possibly divided by type, such as one-person, couple without children, or couple with children –preferably by broad age category) that have co-residing domestic servants, by sex of the domestic servant; and

b. Percentage of working women that make their living as domestic servants (co-residing and not).

Even if domestic servants are not identified in the census as a separate category, it is sometimes possible to show the differences between children who belong to the head of household and those who do not and therefore are presumably the sons and daughters of domestic servants. Chapter 9 contains an interesting example from the census of Burkina Faso which shows how enrolment rates between boys and girls depend on whether they are the sons and daughters of the head of household or not.

339. In recent decades many countries have seen a steady growth in the number of one-person households. Especially in Europe the rate of one-person households increased rapidly between 1970 and 1990. Sweden had the highest rate of one-person households (39.6 per cent) in 1990. The growth of one-person households has some important consequences for policy making. Energy consumption per person, for example, is higher for one-person households than for households with more members (Hanssen; Scherg and Christensen, 2009). Living costs (per person) for one-person households are generally higher than for multi-person households. Also,

a single person may be more vulnerable, as there is no back-up in case of unemployment or other mishaps. The 'Worlds Women 2012 (United Nations, 2010 a) showed that women run a higher risk than men when living in a one-person household. Therefore, ample attention should be given to this category when studying gender issues in poverty research.

340. An interesting perspective on household composition is that of the children. Here one may compute the percentage of children under age 15 (or another relevant age limit) that live:

1. With both parents and no other adult household members;
2. With the mother only;
3. With the father only;
4. Without their parents, cared for by grandparent(s) or other family members;
5. With both parents and a grandmother and/or domestic servant; and
6. With the mother and a grandmother and/or domestic servant.

341. Another, potential source of useful information has to do with the physical characteristics of the housing unit, in addition to the characteristics of the household as such. These may provide useful information on the level of comfort and housekeeping chores. For example, the proportion of girls/women living in a dwelling without

easy access to water or which uses firewood for cooking is a good indicator of the burden they assume to fetch water and cooking fuel for the household, which may have adverse consequences for girls' school attendance and women's labour market participation. The proportion of women living in dwellings without a proper kitchen, especially if cooking is done using firewood or charcoal, is an indicator of the health conditions to which women are exposed in preparing food. The size of the household may be used as a further qualifier of the amount of work involved in these household chores.

342. The following indicators from the Minimum Gender Indicator Set approved by the UN Statistical Commission in February of 2012 can whenever the data are available be computed from census data:

1. Proportion of population using the internet, by sex (asked, for example, in the 2010 census of Qatar, in addition to computer use);
2. Proportion of population using mobile/cellular telephones, by sex; and
3. Access to mass media and information and communications technology.

6. Multivariate and further gender analyses

343. Household composition, in combination with other explanatory variables, can be an important explanatory

variable for various types of multivariate analyses. As was already indicated in other parts of this document, the concept of household headship, as implemented in most censuses, is riddled with ambiguities. It is possible, however, to gain a better understanding of what factors determine household headship, by decomposing conventional headship rates by age and sex (particularly female headship rates by age) in terms of some potential determining factors. Handa (1996) used these methods to look at the determinants of female household headship in Jamaica. Joshi (2004) used Matlab data to analyse household headship of widows and married women in rural Bangladesh; her results cannot be easily replicated with census data.

344. In fact, this kind of analysis involves answering two different questions simultaneously, namely why the composition of the household is as it is and why, given this composition, a given person has been selected as head. Therefore, it is best to do this kind of analysis by type of household. In order to explain the incidence of female headship in one person households, for example, the question is really why this particular person is living alone, rather than with others, and the relevant characteristics those of the household head him/herself and those of the geographical setting (e.g. urban/rural residence). In households with more than one adult member, on the other hand, the characteristics of the other household members may be at least as important as those of the

household head him/herself.

345. One way to carry out the analysis is as a logistic regression, in which the dependent variable is female headship and the independent variables are household characteristics such as the number of adult male and female household members, the number of children, the number of economically active male and female household members, per capita household income, etc. A more refined, but more complex procedure is to use a multinomial regression model with explanatory variables such as the age, sex, marital status, economic activity, level of education and (if available) personal income of each adult household member. The outcome of such a model is a headship probability for each individual (adult) household member, rather than just the probability that the head of household will be female.

346. In addition to its greater complexity, one of the problems of the multinomial approach is that not all of the relevant variables can be easily determined in many censuses. For example, one of the likely determinants of household headship is how many children a given candidate for headship has living in the household. But given the way family relationships are determined in most censuses, this can be hard to establish. It is easier in the case of women because women over age 15 or between the ages of 15 and 50 are usually asked for their number of surviving children. Some censuses, like the one of

Vanuatu (2009), even ask whether each person's mother lives in the household. But in the case of fathers, such questions are less common and only the children of the actual head of household can be easily determined.

347. To avoid such problems, the following analysis of headship in Vanuatu takes a more limited approach, by looking only at nuclear families with children and trying to determine which characteristics of both of the partners determine whether the choice fell upon the woman, rather than the man. Nuclear households without children were not considered, because the intention was to look at the effect of the number of children (both sons and daughters) on the probability that the mother would be chosen as head of household. Instead of separate regression equations for males and females, the analysis uses the joint characteristics of both partners, based on household records. The sex of the head was used as dependent variable. Only explanatory variables which describe the combined characteristics of both spouses were included. The results of this analysis are shown below, in Table 32.

Table 32: Vanuatu (2009)—Logistic regression to predict the choice of a female head of household in nuclear households with children, depending on the characteristics of the couple

Variable	Category	B	exp(B)
Education male versus female	Both less than primary	.	.
	Male less than primary, female primary	0.907	2.477
	Male less than primary, female more than primary	0.921	2.513
	Male primary, female less than primary	0.660	1.934
	Both primary	0.594	1.812
	Male primary, female more than primary	0.548	1.730
	Male more, female less than primary	0.688	1.989
	Male more than primary, female primary	1.021	2.776
	Both more than primary	0.800	2.226
Worked Male versus Female	Male worked, female worked	.	.
	Male worked, female did not work	-0.043	0.958
	Male did not work, female worked	0.317	1.374
	Male did not work, female did not work	-0.075	0.928
Urban/Rural	Urban	.	.
	Rural	-1.091	0.336
Age difference (Husband - wife)		-0.007	0.993
Number of sons in household		0.004	1.004
Number of daughters in household		-0.062	0.940
Citizenship Male versus Female	Both male and female Vanuatu by birth	.	.
	Male, Vanuatu by birth, female by naturalization	-0.330	0.719
	Male Vanuatu by birth, Female foreign	0.486	1.625
	Male Vanuatu by naturalization female by birth	1.103	3.012
	Both male and female Vanuatu by naturalization	-1.214	0.297
	Male Vanuatu by naturalization, female foreign	-18.791	0.000
	Male foreign, female Vanuatu by birth	0.538	1.712
	Male foreign, female Vanuatu by naturalization	0.344	1.410
	Both male and female foreign	0.007	1.007
Constant		-3.151	0.043

Source: Population and Housing Census of Vanuatu (2009)

348. An even simpler way to analyse the same data is a logistic model in which the characteristics of both sexes are analysed separately. Although the previous analysis is preferable from a theoretical viewpoint, the results are actually quite similar. In this second approach, a logistic regression model was used in which the dependent

variable was '0' if the husband was chosen as head of the household and '1' if the wife was selected. In Vanuatu, only 6.5 per cent of nuclear households with children had a female head. The regression was run separately for males and females. This was done to see if the impact of each of the explanatory variables was different for males and females. A number of models were tested, next to characteristics of the respondents; also some predictors of both spouses combined were included. For instance, an explanatory variable was created which incorporated the educational attainment of both spouses. In this variable, three educational attainment categories of the respondent (less than primary, primary and more than primary) were linked to the same categories for the respondent's spouse. The same strategy was followed for the variable 'worked/did not work'. The values in the exp(B) column present the odds ratio for women in that particular category to be selected as head compared to the reference group.

Table 33: Vanuatu (2009)—Logistic regression to predict if men or women with certain individual characteristics will be chosen as heads of household in nuclear households with children

Variable	Category	Male		Female	
		B	exp(B	B	exp(B
Education partners	Partners both less than primary	.	.	.	.
	Less than primary, partner primary	-0.616	0.540	0.863	2.370
	Less than primary, partner more than idem	-0.627	0.534	0.822	2.275
	Primary, partner less than primary	-0.873	0.418	0.621	1.861
	Both partners primary	-0.536	0.585	0.560	1.750
	Primary, partner more than primary	-0.982	0.375	0.482	1.619
	More than primary, partner less than idem	-0.791	0.454	0.638	1.893
	More than primary, partner primary	-0.456	0.634	0.999	2.714
	Both partners more than primary	-0.651	0.521	0.719	2.052
Age 10 year age-groups	15 - 24 yrs.	.	.	.	.
	24 - 34 yrs.	-0.278	0.757	0.124	1.132
	35 - 44 yrs.	-0.206	0.814	-0.132	0.877
	45 - 54 yrs.	-0.070	0.932	-0.172	0.842
	55 - 64 yrs.	0.317	1.372	-0.360	0.697
	65 - 74 yrs.	-0.136	0.873	-0.075	0.928
	75 - 84 yrs.	-0.181	0.834	-0.812	0.444
	85+ yrs.	0.188	1.207	-	0.000
No. of sons in hhold		0.046	1.047	0.050	1.052
No. of daughters in hhold		0.107	1.113	-0.026	0.975
Urban/Rural	Urban	.	.	.	.
	Rural	1.276	3.582	-1.215	0.297
Religion	Anglican	.	.	.	.
	Presbyterian	0.478	1.613	-0.546	0.579
	Catholic	0.009	1.009	-0.116	0.890
	SDA	0.227	1.255	-0.222	0.801
	Church of Christ	-0.353	0.702	0.174	1.190
	Assemblies of God	0.336	1.400	-0.459	0.632
	Neil Thomas Minsitry	0.395	1.484	-0.517	0.596
	Apostolic	0.028	1.028	-0.087	0.917
	Customary beliefs	0.671	1.957	-0.972	0.378
	No religion	0.758	2.133	-0.856	0.425
	Refuse to answer	0.745	2.107	-0.518	0.596
	Others	0.159	1.172	-0.290	0.748
Citizenship	Vanuatu by birth	.	.	.	.
	Vanuatu by naturalization	-0.288	0.750	-0.609	0.544
	Other countires	-0.175	0.840	0.181	1.198
Age husband - age wife		0.006	1.006	-0.014	0.986
Working status of couple	Both partners worked	.	.	.	.
	Worked, partner did not work	-0.384	0.681	-0.037	0.964
	Did not work, partner worked	0.015	1.016	0.402	1.495
	Both partners did not work	0.035	1.035	-0.032	0.969
Constant		2.063	7.873	-2.075	0.126

Source: Population and Housing Census of Vanuatu (2009)

349. Table 33 presents the results of this logistic regression. Compared to couples who have both less than

primary education, all other educational combination categories score significantly higher, i.e. women in these educational groups are much more likely to be heads of household. For instance, if a woman has more than primary education and her husband has primary, her odds to be head of the household are 2.7 times higher than in the case where both spouses have less than primary education. The largest effect of all variables in the equation is urban/rural. In rural areas the odds for a male to be selected as head of the household are 3.6 times higher than for a female to be selected, after controling for other intervening factors. For women, each extra son increases her likelihood slightly to be selected as head (odds ratio 1.05), while each additional daughter diminishes her changes (odds ratio .975). It should not come as a surprise that women who practice a traditional religion have a much lower likelihood of becoming head of household (odds ratio 0.378). Women who belong to a traditional religion will most probably live in households that are more conservative in terms of the position of women within the family. 'No religion' also scores very low (.425). However, it is possible that interviewers interpreted traditional beliefs as 'no religion'. Finally, it is interesting to see that men who worked, but whose wife did not, have much lower odds of being selected as head of the household. This may show that enumerators did not always use strict rules to assign a head but perhaps made a person head who was readily available (or that women selected themselves as head when an enumerator showed up when

their husbands were out to work).

350. Based on data from the 1982, 1990, 2000 and 2005 Chinese censuses, Lin and Zhao (2010) investigated the effect of the sex of the first-born child on his/her chances of living with the mother, the father or both. They decomposed this probability by the different events that affect it: whether the parents got married, whether either of the parents migrated, whether the couple divorced/separated and, if so, who got child custody. Parental mortality was not considered as it is hard to imagine how the sex of the first-born child might affect it. They found a small but significant tendency for first-born boys to live with either or both parents more often than first-born girls. The decompositions indicated that: 1) When unmarried, having a first-born son increases the probability of subsequent marriage; 2) When married, having a first-born son decreases the probability of parent migration and reduces the probability of divorce; 3) When divorced, having a first-born son increases the probability of custody by the father. They also found that all these effects have become stronger over time, particularly in the 2005 census. Again, a likely explanation is the preference by parents of sons over daughters, but other, more subtle possibilities cannot be entirely ruled out. It may be, for example, that parents, knowing that a first-born girl objectively decreases their chances for sustenance in old age, regardless of their own preferences in the matter, take certain compensatory actions (additional children, migration, job changes)

that affect their subsequent chances of staying together as a couple.

351. Type of household is an important predictor for most of the topics covered in this manual. Below, some examples from the literature are presented in which the type of household is used as an explanatory variable in the gender study of fertility, mortality and education. As mentioned in the box above, Chu, Xie and Yu (2007) showed in the case of Taiwan that there is a positive relationship between the proportion of girls in the household and the total number of children. This suggests that in countries with marked son-preference parents continue to have children until they have at least one boy. In such countries, computing this correlation coefficient is recommended as a standard practice, together with the sex ratios at birth by parity, to be discussed in the next sub-chapter. Note, however, that this makes sense only for one-family households. Other ways in which household composition data can be used to study fertility behaviour include the Own Children Method, which was briefly mentioned in the sub-chapter on fertility

352. Households may vary in terms of poverty, health status or school attendance of the children, depending on whether certain kinds of household members are present or not. There is a lot of public debate on whether the absence of a father, a mother or both parents has a negative impact on the development of the children.

One-parent families, particularly families consisting of a mother without husband and several dependent children, are thought to pose greater risks for the health of children. In fact, the health indicators of such families are often more unfavourable, but so are their socioeconomic characteristics, so that it is not clear if it is the latter or the former that increases the risk. Blakely et al. (2003) have carried out multivariate analyses on data from the 1991 census of New Zealand, which were linked to mortality records in order to control for the socioeconomic determinants. Their conclusion is that there does not appear to be notable variation in relative risk terms of socioeconomic differences in child mortality by age or cause of death and that any association of one-parent families with child mortality is due to associated low socioeconomic position. It may be appropriate to replicate this kind of study in other contexts, to see if similar results are obtained in developing countries.

353. A similar issue that has come up in the literature is whether children are better cared for in female-headed households than in households with male headship. The argument is that mothers will usually make household decisions based on the best interests of their children, but may not be in a position to do so if they are subject to the authority of a male head of household (e.g. Castle, 1993). However, female-headed households are different from male-headed households in a variety of ways and many factors have to be controlled for in order to conclude

that this is indeed the determining factor. One study that attempted to do this, for example, is the one by Adhikari and Podhisita (2010), on household headship and child deaths in Nepal, based on the 2006 Demographic and Health Survey of that country. Using a binary logistic regression model which contains the age at first marriage, children ever born, place of residence, ecological zone, literacy status, religion, wealth status, use of family planning methods, visits to a health facility, and antenatal care for the last pregnancy as predictors. Controlling such factors, the authors found that deaths among children born during the last five years were 31 per cent less common in female-headed households than in male-headed households. Basing studies of this kind on DHS, rather than census data has certain advantages because the information on dates of birth and certain potential determinants of child health is more extensive in the DHS than in the census. Nevertheless, to the extent that the census contains the basic data on children ever born and surviving, it should be possible to carry out similar analyses using census data.

354. In some national contexts, the number of siblings and the presence of a grandmother have been identified as having an impact on girls' school attendance. Parker (2005) used 16,000 aged 6-14 sampled by the 2001 Lesotho Demographic Survey to look at the relationship between residence with a grandmother and current school enrollment for children, ages 6-14, in Lesotho. Logistic regression was used to establish whether having a

grandmother living in the household was associated with school attendance. The results showed this association to be positive. Taking this analysis, which is equally feasible with census data as with DHS data, one step further, one might differentiate between 16 categories, depending on the presence of the father, the mother, the maternal grandmother and the paternal grandmother, controlling perhaps for urban/rural residence and the level of education of the head of household to investigate school attendance of boys and girls by age in each category.

Table 34: Vanuatu (2009)—Logistic regression for whether the head of household conforms a one-person household or not, by selected explanatory variables

Predictors	Categories	Model I		Model II		Male only		Female only	
		B	Exp(B)	B	Exp(B)	B	Exp(B)	B	Exp(B)
Age		-.062	.940	.004	1.004	.016	1.016	.034	1.034
Age^2		.001	1.001	.000	1.000	.000	1.000	.000	1.000
Marital status	Never married								
	Legally Married			-3.357	.035	-3.980	.019	-1.547	.213
	Defacto			-2.841	.058	-3.387	.034	-1.431	.239
	Divorced			-.436	.647	-.323	.724	-.115	.892
	Separated			-.762	.467	-.597	.551	-.663	.515
	Widowed			-1.209	.298	-1.106	.331	-.729	.482
Citizenship	Vanuatu by birth								
	Vanuatu by naturalisation	.412	1.510	.360	1.433	.315	1.371	.340	1.405
	Other countires	1.437	4.207	1.396	4.038	1.405	4.074	1.124	3.077
Urban/Rural	Urban								
	Rural	-.018	.983	.070	1.072	.101	1.107	.170	1.185
Sex	Male								
	Female	.802	2.229	-.121	.886				
Education (3 categories)	Less than primary								
	Primary education	-.268	.765	-.161	.851	.019	1.019	-.604	.547
	More than primary	.110	1.117	.124	1.132	.210	1.234	-.019	.982
Worked week before census	Worked								
	Did not work	-.142	.867	-.116	.890	-.212	.809	-.111	.895
Residence 5 years ago	Sample place as census								
	Other place	.593	1.809	.522	1.685	.591	1.806	.391	1.479
Children Surviving								-.200	.819
Constant		-2.189	.112	-1.279	.278	-1.186	.305	-2.518	.081

Source: Population and Housing Census of Vanuatu (2009)

355. The importance of studying one-person households was mentioned earlier. The basic question is what type of persons live in such households. The 2009 Vanuatu Population and Housing Census was used to investigate the factors that determine whether a person lives in a one-person household or not. A logistic regression was set up in which the dependent variable was whether the person was head of a one-person household or living in another type of household (with multiple persons). The results of this analysis are presented in Table 34. To show the importance of setting up the right multivariate equation, two models were constructed. In model I, next to sex the following predictors were included: Age, Age2, Citizenship, Urban/rural residence, Education (3 categories), Residence 5 years ago and whether the person worked the week before the census. This model shows that the two categories with the highest odds for a person to be found in a one person household are: 'being born outside Vanuatu' and 'female'. A person who is born outside Vanuatu and who is not naturalized is about 4 times more likely to live in a one-person household than a person born in Vanuatu. Women have a 2.2 larger odds ratio to live alone than men. This finding confirms the results obtained by using a simple cross tabulation between sex and one person/multiple person household. In model II, Marital status is introduced. The results show that this now becomes the most discriminatory variable in the equation. Compared to never married persons, all other marital statuses have much lower probabilities of living

alone. Somebody who is in the married state has an odds ratio of almost 0.034 of living alone compared to a never married person. However, the effect of sex becomes relatively minor and is even less than 1 (0.886), which means that, after controling for marital status, the likelihood that a woman lives in a one-person household is less than that of a man.

356. There is a good chance that the likelihood to live alone is less for men and women who have children with whom they could go and live at an older age. The census provides data on the number of children ever born (CEB) and on the number of children who have deceased, although only for women. To measure the effect of having children on the likelihood of living alone, the number of surviving children of woman was calculated. Then two logistic regressions were carried out – one for each sex—with the same set of explanatory variables as before, but including the number of surviving children in the regression for women (see last two columns of Table 34). The results clearly show that having surviving children, the likelihood to live alone becomes considerably smaller. With each additional surviving child, the odds ratio of living in a one-person household decreases by about 18 per cent.

7. Interpretation, policy and advocacy

357. Advocacy efforts to reduce gender inequalities regarding household and family composition should include some or all of the following elements.

a. Addressing diverse living arrangements

As the ICPD Programme of Action notes (Par. 5.1), when policies and programmes that affect the family ignore the existing diversity of family forms, or are insufficiently sensitive to the needs and rights of women and children, parents may face great difficulties in reconciling work and family responsibilities. The Beijing Platform for Action (Par. 46) also stresses that since "many women encounter specific obstacles related to their family status, particularly as single parents," policies must pay special attention to address their needs and to support family stability.

Special attention must also be paid to the needs of widows and orphans (ICPD Programme of Action, Par. 5.13).

b. Addressing the burden of household and family activities

Promotion of changes in traditional notions of gender-based division of parental and domestic

functions, in order to reduce the burden of care and household activities that women and girls frequently face and that jeopardize their educational and professional opportunities.

Along with this, governments should promote quality and comprehensive sexual and reproductive health services in order to ensure women and men the opportunity to balance the size of their families with their needs, desires, and goals. Affordable and physically accessible care facilities (e.g. child-care facilities, kindergartens, care services for those who are ill, disable, elder, etc.) must also be provided to support the different types of families in their efforts to reconcile productive and reproductive roles. Another important action to be taken is the promotion of family-friendly work environments, including the right to flexible working hours and schedules, paid parental and maternal leave, maternal protection, health insurance and social security (Beijing Platform for Action, several articles).

Regarding education, increase enrollment and retention rates of girls may also be supported "by allocating appropriate budgetary resources and by enlisting the support of parents and the community, as well as through campaigns, flexible school schedules, incentives, scholarships and other means to minimize the costs of girls' education to their

families and to facilitate parents' ability to choose education for the girl child" (Beijing Platform for Action, Par. 80 f.).

The ICPD Programme of Action (Par. 5.2.b) emphasizes the importance of establishing social security measures that address the social, cultural and economic factors behind the increasing costs of child-rearing.

c. Addressing family poverty risk

According to ICPD Programme of Action (Par. 5.4), "when formulating socio-economic development policies, special consideration should be given to increasing the earning power of all adult members of economically deprived families, including the elderly and women who work in the home, and to enabling children to be educated rather than compelled to work". The text also adds that "particular attention should be paid to needy single parents, especially those who are responsible wholly or in part for the support of children and other dependants, through ensuring payment of at least minimum wages and allowances, credit, education, funding for women's self-help groups and stronger legal enforcement of male parental financial responsibilities."

CHAPTER 8

Income, Poverty and Living Conditions

1. What is it?

358. Despite some recent setbacks, caused by the ongoing global economic, financial and food crises, many countries in the developing world have made significant progress in the reduction of poverty during the last decade. According to the 2011 UN Millennium Development Goals Report, it is expected that the world will move below its target level of 23 per cent poverty by 2015. Despite this progress—which to some degree is guided by a continued rapid growth in Eastern Asia (China)—many countries continue to struggle to provide the basic needs for their populations. To monitor this progress, it is important that high quality information is provided to intensify actions to combat poverty. The United Nations does not provide a standard definition of poverty that applies to all countries. However, the World Bank poverty limit of USD 1.25 (which is computed based on Parity of Purchasing Power – PPP[26]) per capita is still generally used as a numeric

26 PPP refers to purchasing price parity, which measures the relative purchasing power of different countries' currencies over the same types of goods and services, adjusting for inflation. PPP helps provide an accurate com-

measure of absolute poverty, despite its limitations. This measure is also used for the purpose of measuring progress in the achievement of Millennium Development Goal I: 'Eradicate extreme poverty and hunger. (Target: Halve, between 1990 and 2015, the proportion of people whose income is less than USD 1 a day)'.[27]

359. Going beyond a pure financial notion of poverty, the Report of the World Summit on Social Development in Copenhagen (1995) differentiated between two levels of poverty: absolute poverty and overall poverty.

a. *Absolute poverty* is defined as "severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information," and depends on income and/or access to services.

b. *Overall poverty* is defined as "lack of income and productive resources to ensure sustainable livelihoods; hunger and malnutrition; ill health; limited or lack of access to education and other basic services; increased morbidity and mortality from illness; homelessness and inadequate housing; unsafe environments and social discrimination and exclusion." Overall poverty is found as pockets of poverty amid wealth in richer countries and as mass poverty in poorer countries (United Nations, 1995 a).

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parison of standards of living across countries (World Bank, 2011).

27 The change from USD 1 to USD 1.25 was introduceed to correct for inflation of the US dollar.

At the Copenhagen Summit, 117 countries adopted the commitment to eradicate absolute poverty and reduce overall poverty. Countries were urged to develop national strategies to reduce overall poverty substantially and to eradicate absolute poverty before a fixed point in time.

360. The Beijing Platform for Action of the Fourth World Conference on Women describes poverty as "multidimensional" and as a relative lack of income or productive resources to ensure adequate food, shelter and housing, or through the human conditions associated with poverty such as hunger and malnutrition, ill health, limited access to education, increased morbidity and mortality, inadequate housing and homelessness, unsafe environments, and social discrimination and exclusion (United Nations, 1995 b).

361. After the World Summits in Rio, Cairo, Copenhagen and Beijing, various expert groups were installed under the auspices of the United Nations Statistical Commission to follow up and evaluate the progress made in the implementation of the action plans and provide advice on the recommendations agreed to at these summits. As part of this process, in 1997 an Expert Group on Poverty Statistics (Rio Group) was set up, chaired by the Brazilian Institute for Geography and Statistics (IBGE), with its Secretariat at the UN Economic Commission for Latin America (ECLAC). The Compendium produced by the Rio group presents a set of poverty measurement

approaches and methodologies.

362. Based on the preceding paragraphs, one can distinguish between two broad approaches to measure poverty. In the first approach the income of individuals or households is compared to a given poverty line. 'The poverty line represents the aggregate value of all the goods and services considered necessary to satisfy the household's basic needs' (Expert Group on Poverty Statistics Compendium of best practices in poverty measurement. Rio Group, 2006: 12). Two different perspectives exist within this approach. The 'absolute' poverty view only uses the basic necessities to guarantee the subsistence of the members of a household. The 'relative' poverty perspective takes into account a person's need to actively take part in society and transcends the use of mere subsistence needs.

363. The second approach to measure poverty, usually called the Unmet Basic Needs approach, makes use of a set of deprivation factors, which are established in advance, as minimum conditions to be met to fulfill the basic needs of individuals and households. Individuals and households are identified as poor if they do not meet the minimum in terms of one or more of the deprivation factors. This second approach looks into the real satisfaction of needs, while the first one looks at the availability of financial resources to meet these needs. The second approach has been widely used, especially, in Latin America (ECLAC, 2006 b: 101). The advantage of this

methodology in the context of this manual is that, while censuses do not always have income information, they do provide a wealth of data to measure poverty using Unmet Basic Needs, including characteristics of the housing unit, education and ownership of assets.

364. The monetary approach and the Unmet Basic Needs approach do not measure exactly the same poverty dimensions. In particular, it is thought that Unmet Basic Needs change more slowly than monetary poverty. Bearing this in mind, one can combine both criteria to define a more dynamic poverty concept. For instance, those who are poor according to the Unmet Basic Needs criterion, but whose current income/consumption places them above the poverty line are sometimes referred to as the "inertially poor", meaning that their current income would be sufficient to rise out of poverty, but that they will need more time to overcome the deficiency of basic needs that they carry with them from the past.

365. Apart from such objective approaches, poverty can also be seen as a state of mind, which depends on individual perceptions of one's position relative to others. The 'subjective' approach, therefore, leaves the determination of poverty in the hands of the respondent. It is also possible to combine such subjective perceptions with income data, to generate subjectively defined poverty lines. In general, countries that introduced direct questions on income level in their censuses are able to use the 'absolute'

or 'relative' approach. However, censuses generally do not provide information for the subjective approach.

2. Why is it important?

366. The right to social protection is enshrined in Article 22 of the *Universal Declaration of Human Rights* (United Nations, 1948), which states that "everyone, as a member of society, has the right to social security." Although social security is often linked to employment, the Universal Declaration makes it clear that this is not a right associated with employment. This is particularly important in the case of women who are less likely to participate in paid employment, and are more likely to be vulnerable to poverty for a variety of reasons. The preface to the *World Social Security Report 2010/11* (ILO, 2010 b) notes that women are particularly vulnerable, not just because of their different employment patterns, as well as the importance of social security maternity benefits being key to addressing MDG 5 as well as the link between maternal deaths and high rates of poverty

367. Protection from poverty, which in turn is linked to equal access to social security is considered requisite for gender equality. The Plan of Action of the first World Conference on Women (1975), for instance, explicitly referred to the need of ensuring women the provision of social security protection, equal in all aspects to that of men. Other human rights treaties, such as the ICPD

Programme of Action, have also expressed concern with the increasing numbers and proportions of elderly people in the world and emphasized the need of developing and ensuring quality systems of economic and social security in old age.

367. In 2005, 1.4 billion people from developing countries were living below the World Bank international poverty line of USD 1.25 a day (United Nations, 2010 a). Gender differences in the incidence of poverty are widespread. Overall in less developed regions, fewer women than men have access to cash income, and in most countries in Africa and about half of all countries in Asia fewer women have access to land and property. In more developed countries, older women are more likely to be poor than older men. Also, single mothers with young children are more likely to live in poverty than single fathers with young children (United Nations, 2010 a), especially in the absence of public transfer programmes.

368. The Beijing Declaration of the Fourth World Conference on Women (United Nations, 1995 c) affirmed the international commitment to eliminate the burden of poverty for women by addressing the structural causes of poverty and by providing equal access for both rural and urban women to productive resources, opportunities and public services. The inclusion of poverty-related questions in censuses is important to support policies focused on poverty reduction and gender equality. The Millennium

Development Goals set forth within the Millennium Declaration (United Nations, 2000) to halve, over the period 1990 to 2015, the proportion of people whose income is less than one dollar a day. The Declaration's focus on poverty eradication has created a need for regular and timely collection of data to monitor and evaluate levels of poverty. Some censuses provide income data, but many others offer information related to poverty and economic well-being such as health status, ownership of assets, educational attainment, living and housing conditions and morbidity and mortality.

3. Data issues

The following paragraphs will first elaborate on the first approach (poverty line) and next deal with the 'unmet basic needs' approach.

369. The level of personal and/or household income plays a crucial role in determining whether a household falls below the poverty line or not. According to the *Principles and Recommendations for Population and Housing Censuses. Revision 2* (United Nations, 2008 a), income may be defined as:

a. Income, in cash or kind, received by each household member;
b. Total household income in cash and in kind from all sources.

The preferred reference period for income data should be the preceding 12 months or past year. The income could be classified as income from paid employment, self-employment, property and other investment, transfers from governments, other households and non-profit institutions'.

370. Census data on income can be used in many fields of interest. However, the use of income data from censuses does not come without problems. Several shortcomings are present that may jeopardize the quality of income information from a census.

1. Income is probably the most private question in the census, which can provoke a lot of resistance and is therefore often placed at the end of the questionnaire to avoid a premature end of the interview. Respondents are often very suspicious about any government agency showing too much interest in the level of their earnings. Consequently, many respondents refuse to give information about their income or, even worse, provide false information. Specifically, people with high non-salary earnings have the tendency to underreport their true level of income.
2. Questions on income are often gathered at the household level. This may pose problems because in many societies household members may not know exactly what others earn. This is certainly the case in composite household were one or more members are not related to each other.
3. Incomes may be made up of a lot of different

components, some of which may not be readily remembered by the respondent, especially if they refer to occasional or informal activities that imply benefits in kind or in cash money, on which no taxes are paid.

4. People may simply not know the exact amount they earn. For instance, shop keepers may not know at the end of the month what their 'net gain' is.

371. To minimize these problems, censuses often rely on the use of income bands. These bands reduce respondents' burden and allow simple tabulations with other contextual social and demographic variables. However, a drawback of this approach is that it becomes very difficult to calculate household income from individually gathered information. Some counties have taken measures to reduce problems of non-response for the income questions. For instance, in Aruba, two direct questions (without bands) on income from main job and other sources of income were asked to each member of the household. In the case a respondent refused to (or could not) give exact information on his/her level of income, a flash card was shown in which the respondent could indicate in what income category his/her income fell. During the editing stage, data from the persons who answered the direct, detailed income questions were then used to make hot deck[28] imputations for those who had only

28 In a hot deck imputation information from other respondents with similar characteristics is used to make imputations that are best suited for the missing information. See: United Nations, (2008 a) Principles and Recommendations for Population and Housing Censuses Revision 2: 70.

given their income in a category. This allowed the calculation of the household income, while taking away a lot of resistance against the direct question on income.

372. The first step to measure the proportion of persons or households below the poverty line is, obviously, to establish a cutting point below which individuals or households are considered to be poor. Many countries have established poverty lines which are used in their social and economic planning. It lies outside the scope of this manual to go into the methodology used to establish poverty lines. The interested reader is referred to the publications by the World Bank[29] or the UN Statistics Division[30]. Countries where no official poverty line has been established can rely on the poverty limit of USD 1.25 per day set by the World Bank and used to measure the progress in the MDGs. The UN 2011 *Millennium Development Goals Report* indicates that in developing countries the proportion of persons living on less than USD 1.25 has dropped significantly from a level of 45 per cent in 1990 to 27 per cent in 2005. All regions, except the Caucasus and Central Asia have currently lower levels than in 1990.

373. Usually poverty lines are determined at the household

29 http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTPOVERTY/EXTPA/0,,contentMDK: 20242879~menuPK:435055~pagePK:148956~piPK:216618~theSitePK:430367~isCURL:Y~isCURL: Y,00.html.

30 http://unstats.un.org/unsd/methods/poverty/chapters.htm.

level, rather than at the individual level. Because of the large variety in the size and composition of households, it is necessary to apply equivalence scaling to enable household income to be tested to a given poverty line. This is usually done by assigning different weights to different persons in the household. Weighting is important because of two reasons: 1) Different members of households have different needs; e.g. an adult member's nutritional needs are higher than a child's; and 2) There are economies of scale operating. For instance, ceteris paribus, a family of three will spend less on energy costs per person than three individual persons. The OECD proposes an equation for weighting that is commonly used for this purpose (Haughton and Khandker, 2009: 29):

$$AE = 1 + 0.7\ (Nadults - 1) + 0.5\ Nchildren$$

where AE stands for 'Adult Equivalent', 'Nadults' for the total number of adults and 'Nchildren' for the number of children. A person living alone would have an AE of 1, while a household of two adults would have an AE of 1.7. A nuclear household consisting of a mother, father and 2 children would have an AE of 2.7. By using these AE's it is possible to compare households of each possible composition and size to an established poverty line, but also to other households.

374. In gender research on levels of poverty one may compare income to a pre-set poverty line, but it is

also possible make direct comparisons in income and poverty levels between males and females Ideally, a gendered research would seek to examine differences in intra-household level of income, resources allocation, and ownership of assets or appliances, between women and men. For persons living with others in the same household, the information on personal income should generally not be used to measure individual poverty, as income is usually shared within the household. A real limitation of census data (where income information is gathered at the household level) is that at the individual level, only persons living in a one-person household can be compared. In most countries, women living in a one-person household have higher poverty rates than men. Previous analyses have shown, for example, that divorced or widowed women, living alone or as lone mothers, have a higher prevalence of poverty than married women (United Nations, 2010 a).

375. As in most surveys, censuses do not inform in detail how household income is spent or consumed at the individual level within the household or how resources are distributed to each household member. Therefore, to address this data limitation, it is important to collect individual income data and cross-tabulate them with household or family characteristics to analyse both individual and household patterns. Some censuses allow this (see the last paragraph of this section). But even this is not a guarantee that the distribution of resources within

the household will be accurately captured, as all too often the income of some household members is appropriated by others

376. Below two country examples examining female-headed households in Mozambique and Brazil are presented. These examples find different outcomes using the female-headship variable, indicating that while female-headed household may be a useful measure of gender inequality in some cases, findings and their interpretations may differ depending upon context.

Country Example 13: Female-Headed Households and Poverty Risk in Mozambique and Brazil

Mozambique. Fox et al. (2005) investigated the feminization of poverty in Mozambique using data from the 1997 census and a household survey (2003). They found that the proportion of female-headed households had increased in the poorest quintile (from 19 per cent to 24 per cent), as well as in the second and third poorest quintiles (with 1.6 per cent and 1.9 per cent, respectively), but decreased in the best- and second-best-off quintiles (with 4.1 per cent and 3.9 per cent, respectively). Most female-headed households are headed by widows and divorcees, while a small

proportion are single mothers. A higher proportion of female-headed households stated that their situation had worsened in the last five years, and, this perception of deteriorating conditions was found to be more pronounced among rural than urban women who head households, suggesting better opportunities for female household heads in urban areas. The underlying gender issue is that women predominate both in the agricultural sector and unskilled labour, where returns to labour are low.

Brazil. Lavinas and Nicoll (2007) examined which type of family structure represented the most vulnerable or 'at-risk' family arrangement. Using disaggregated employment data by sex among women, then classified as head of family or wives, the results suggest that even in the lowest income brackets, family arrangements involving lone mothers with children were not necessarily the most vulnerable. The sex of the family head (i.e. 'responsible person') was not a strong determinant of vulnerability; a family headed by a woman (often on her own) or by a man (the overwhelming majority with a spouse) were almost equally likely to be vulnerable, all other things being equal. Likewise, neither the sex of a family head, nor the family type (i.e. two-parent or single-parent), made almost no difference in vulnerability. This finding stands in contrast to results based on data from other countries, which has identified that single-parent families with children were much more exposed to the risk of vulnerability than two-parent families with children. Further, this study found that having children in the household increased the likelihood of a family being vulnerable.

377. In recent years, due to studies such as the one above, the emphasis on household headship as the differentiating gender variable has come under increasing criticism from both statisticians and gender researchers, for the following reasons:

a. Most women live in male-headed households, so that what happens in female-headed households imperfectly represents the situation of individual women;

b. To the extent that gender inequality is reflected in the relationship between male and female members of the same households (e.g. unequal appropriation of earnings), focusing on female-headed households may be misleading;

c. Focusing on female-headed households may lead to biased policy priorities (see also the discussion in Chapter 7).

378. Additionally, the differences in poverty rates between male and female-headed households, if not broken down into finer categories, are typically small and tend to be associated with other demographic differences between these households, such as the number of children and adult male and female household members. Medeiros and Costa (2006: 8), assert that "the relationship between poverty and female headship of households seems not to be direct and univocal, as poverty appears to have a stronger correlation with the presence of children in the family and other characteristics of family members than with the type of head of household." Again, what seems to be the need then is to understand how income is earned, allocated and spent within the household in order to understand the processes at play in poverty as it may be gendered.

379. Most censuses do not directly measure income, even

at the household level, so that the poverty status of a household has to be ascertained by means of deprivation factors, among which the 'Unmet Basic Needs' criterion is most often used. These deprivation factors cannot be specified at the individual level, but are always connected to the household.

380. In the case census questionnaires do not include questions on income, combining census information with income data from surveys still makes it possible to use small area estimation techniques, based on the determination of characteristics of the population living in poverty, to identify areas where poverty is high. Methodology Box 1 in Chapter 1 contains more details on these methods. With this methodology—developed by the World Bank—household surveys that have measures of income or consumption can be used to estimate statistical models that can be applied to census data in order to estimate poverty at small geographical levels. Once the geographic areas of poverty are identified, it is possible to analyse the socio-economic characteristics of the population of these areas compared to the rest of the country. A line of inquiry could then be as follows: 'How different is the gender gap in a subject field like education in an economically poor geographic area, compared with the national average? And how do poor areas compare with the national average on other specific women-related issues, such as the total fertility rate, sex ratios or unemployment?'

381. The Unmet Basic Needs approach uses standard indicators of the household's socioeconomic level that do not yield precise income estimates, but only broad classifications of the household's situation. The typical components of the Unmet Basic Needs Index are the following:

1. Crowding: number of persons per bedroom;
2. Quality of the dwelling: earthen floor or use of sub-standard materials for the walls or roof;
3. Sanitation: Absence of an indoor toilet or running water inside the home;
4. Educational attendance: number of school-age children not attending school;
5. High dependency: number of persons per working household member;
6. Education: level of education of the household head.

The choice of the right components to be included in the equation is critical. In some countries, the ownership of a transistor radio may still differentiate between households of distinct income levels whereas in other countries it is so common that it provides little or no information on the household's socioeconomic situation.

382. For each of these components, critical limits are defined (e.g. more than three persons per bedroom for 'Crowding', or less than two years of formal education for 'Education of the household head'). This defines the

number of Unmet Basic Needs. Finally, all households that have more than one, two, or three (i.e. depending on the country) Unmet Basic Needs are considered to be poor. This makes it possible to prepare detailed poverty maps and other analytical instruments based on census data, without having any information on income levels.

383. On the other hand, the approach has also been criticized for using a somewhat arbitrary set of indicators with equally arbitrary cut-off points. In particular, there are alternative methodologies (e.g. the wealth index of the DHS) that make use of the ownership of a standard set of consumer durables. Table 35 provides an example of the use of consumer durables as a way to classify the relative wealth of male and female-headed households, for the case of the 2006 census of the Maldives. However, this methodology is difficult to use in censuses (although some countries do use this information) because there is so much variation between countries in the way the information on consumer durables is collected. Moreover, the Unmet Basic Needs Index is subject to the same criticism that applies to composite indices in general: 'What does one gain by defining several disparate measures of household wellbeing, rather than investigating the different dimensions separately ?' Some of the consumer durables, such as washing machines, may actually not measure wealth, but may be more related to household composition and gender roles, i.e. women being more likely to wash their family's clothes than men. For more detailed

information, see Chapter 3 of the Compendium of Best Practices in Poverty Measurement (ECLAC, 2006 b).

Table 35: Maldives (2006) – Percentages of ownership of consumer durables in male and female-headed households

	Male Head	Female Head
Washing machine	41.0	86.0
Refrigerator	61.1	60.7
Air conditioner	7.1	5.2
Motor cycle	27.1	22.7
Bicycle	44.2	39.5
TV	86.8	87.0
Satellite/Cable TV	52.4	50.1
Computer	28.7	26.9
Mobile phone	85.7	83.6
Phone line	25.6	26.4

Source: Analytical Report of the 2006 Census of the Maldives, page 239

384. Censuses can provide additional information on gender deprivation factors, because they provide essential information on the characteristics of the living unit (whether a hut, a house or an apartment), in terms of comfort, equipment and status of occupation. Usually collected during the same operation as the population census, these data can be easily cross-classified with individual data. The Principles and Recommendations suggest the following core topics be included in a housing census. While all of these items may not be asked on the census, they can be useful in providing a general picture of the well-being of the household and its inhabitants.

a. Type of living quarters;

b. Occupancy status or tenure (own, rent, or occupy without cash payment);
c. Type of ownership, who is the legal owner ?
d. Number of rooms;
e. Water supply system;
f. Main source of drinking water;
g. Type of toilet;
h. Sewage disposal;
i. Bathing facilities;
j. Availability of kitchen;
k. Fuel used for cooking;
l. Type of lighting and/or electricity;
m. Main type of solid waste disposal;
n. Number of occupants;
o. Construction material of outer walls of household dwelling.

It is difficult to establish which of these categories is most relevant from a gender perspective. The table in Annex 1 focuses on b), c), e), f), j), k) and o), but this is admittedly somewhat arbitrary. Depending on the particular context, other categories may be more suited to the analysis.

385. A gendered focus would then examine these quality-of-living characteristics and spend more attention on the types of characteristics with a potential gender component. For example, access to water, source of drinking

water, and fuel used for cooking all have a potential gender component, because they can mean markedly different levels of work for women.

386. A gendered analysis of poverty at the household level may examine the level of income or characteristics of the living unit by the sex of the reference person listed as head of household noting differences across women and men. At the individual level, if the census questions on ownership of assets and cash income are asked, these data may be used to examine the relative individual material situations of women and men. Individual questions, such as education attendance or attainment, may also provide insight into how resources are allocated within the household across male and female children.

387. As can be gleaned from the summary table in Annex 1, the information available in censuses for the construction of poverty indicators varies considerably between countries. Some (e.g. Bahamas, Brazil, Croatia, French Polynesia, Jamaica, Netherlands Antilles, St. Lucia, and Singapore, among others) collect data on personal income. In the case of the Bahamas, the individual amount is even broken down into 10 possible sources of income. St. Lucia, on the other hand, focuses on the person's main job or source of income, whereas Singapore only asks for income from work and the Netherlands Antilles asks for income from the two most important sources. In other countries, income is declared only at the household

level. Mauritania asks for household expenditures, rather than household income. Still others, like Albania or Turkmenistan, define only the sources of income, without asking for specific amounts. But the most common situation is the one where no direct income/expenditure data are available, but where the census asks the questions necessary to construct Unmet Basic Needs indicators. This is the situation in, for example, Cambodia, Honduras, India, Kenya, Lesotho, Mali, Mexico, Montenegro, Malaysia, Nicaragua, Pakistan, Peru, Romania, South Africa, Thailand, Vanuatu and Zambia, among others.

388. The number of rooms in the housing unit, needed to compute the level of crowding, is not included in the table in Annex 1, but it is a fairly common feature in many censuses. Some countries (e.g. Croatia, Hungary, Indonesia, Serbia) also ask for the surface area of the dwelling, which allows the computation of crowding in terms of the number of square meters per inhabitant.

4. Tabulations

389. Tabulations focused on poverty should disaggregate the data on relevant demographic, social and economic characteristics by sex, even when bearing in mind that the poverty of men and women may not be an individual characteristic, but rather characteristics of the households in which they live. However, because poverty is relative to a country's level of economic development, salient

tabulations will differ from one country to the next to show the multiple dimensions of poverty. The Principles and Recommendations do not contain a recommended set of poverty tabulations. Possible tabulations that could be adopted across most countries include the following:

- Proportion of female and male headed households that are considered to be poor.
- Proportion of single-parent households with children by sex of reference parent that are considered to be poor.
- Proportion of women and men by geographic area that are considered to be poor
- Education levels of women and men that are considered to be poor.
- Number of households that are considered to be poor by type of households.
- Proportion of population below the poverty line by educational attainment and gender.
- Proportion of persons in certain age groups (children, adults at various age groups, elderly[31]) and gender who are considered to be poor.
- Persons by marital status and gender who are considered to be poor
- Labour force participation and economic activities of men and women who are poor.
- Specific sub-groups of the population relevant to

31 The 2010 census of Singapore includes a special question on the sources of financial support of household members over the age of 65.

a nation, such as migrant labourers, refugees, and ethnic groups who are are considered as poor.

390. As an example of the importance of disaggregated tables of this kind, consider the 2011 census of South Africa, which is one of the censuses that collect individual income data (from as many as 12 sources). Using the SuperCROSS software developed by Statistics South Africa, and implemented on its website, it is easy to disaggregate household incomes by a series of characteristics. In this case, the disaggregation was made in terms of:

- Sex of the head of household;
- Age category of the head of household;
- Number of household members; and
- Ethnic group (Black African, Coloured, Indian or Asian, White and Other).

When analyzing average households income only by sex of the head, there is a very large difference between male and female-headed households. On average, the annual income of male-headed households is 90.4 per cent higher than that of female-headed households. However, when broken down by ethnic group, the following pattern emerges:

Ethnic Group	% Female Headship	Male-Female Income Ratio	
		Gross	Standardized
Black African	43.7 per cent	1.478	1.534
Coloured	38.6	1.651	1.557
Indian or Asian	26.6	1.604	1.326
White	29.8	1.753	1.322
Other	19.4	1.088	1.142
Total	41.2	1.904	1.506

391. In part, the income-ratio of male to female heads of households is as high as it is because the incidence of female-headed households is highest (43.7 per cent) in the Black African ethnic group, which is by far the largest (78.9 per cent of households) and the poorest (38 per cent below average household income). Once the data are disaggregated by ethnic group, the male-female income ratios diminish, as shown in the Gross column. Another factor that needs to be considered is the composition of households by number of household members and age group of the head of household. When this composition is standardized between male and female-headed households, the ratio in most groups falls further, except among the Black African and Other categories where female-headed households are actually somewhat more common among the more favourable combinations of size and age of the head. In any case, whether the ratios are standardized or not, they do display a major difference by headship, with typical incomes of male headed households at least a third higher among Indians or Asians and Whites and at least 50 per cent higher among Black Africans and Coloured.

392. In the above tables 'considered to be poor' refers to either individuals or to households that have been labeled 'poor' on the basis of a test to an established poverty line or on the basis of a set of deprivation factors (e.g. unmet basic needs). Next to measuring the number of persons/households that are poor, it is also important to compare

the socio-economic characteristics of the poor with the non-poor to understand the dynamics of poverty and to identify possible strategies for poverty eradication.

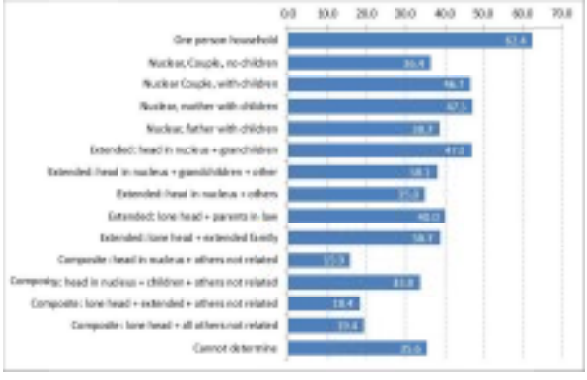
393. The census data of Vanuatu allowed for making an analysis of unmet basic needs. The following deprivation factors were chosen:

- Dwellings with floors and walls from traditional/ makeshifts or improvised materials.
- An average of more than three persons per room.
- No electricity used for lighting, no running water or water from well.
- Households with children 5-12 years old, not attending school.
- Head of household with 3 or less years of education in households with 3 or more people per employed person

394. Households were considered to be poor when they scored positive to at least one of the five deprivation factors. In total 43.5 per cent of all households scored positive on at least one of these five factors. This figure comes close to the 'Intensity of Deprivation' provided by the explanatory note of the 2011 Human Development Report on Vauatu, which was 42.7 per cent. Figure 12 shows the percentages of poor households by type of household. One-person households had the highest percentage of poor persons.. No less than 62.5 per cent of persons living on their own had at least one deprivation

factor. It is often stated that single mothers with children have much higher poverty. Our analysis shows that in fact they score about the same as nucear households with children (47.3 against 46.7 per cent). However, compared to lone fathers with children (38.7 per cent) they score higher. Extended families that include grandchildren score as high as single mothers. Composite households where the head forms part of a nucleus, but where other not related persons are present score lowest (15.9 per cent). This should come as no surprise as these are often the households where one or more housemaids are present.

Figure 12: Vanuatu (2009)—Percentage of households scoring on at least one deprivation factor



Source: Population and Housing Census of Vanuatu (2009)

395. An aspect of particular interest is the sex of the

household head. As was emphasized in Chapter 7, dividing households by the sex of the head of household is insufficient for the purpose of poverty differentiation. Table 36 shows that the differences within different categories of male or female-headed households, depending on the other particularities of their compositions, are much greater than those between the totality of male-headed versus the totality of female-headed households.

396. The table shows the percentages of households in Vanuatu that are considered to be poor, by type of household. As in Figure 12, a household is considered to be poor if it scores positive on one of five deprivation factors. The type of household was extended from the previous division to 18 distinct categories to control for the effect of having dependent young children living in the household. The table shows that both men and women who are living on their own have the highest percentage of poverty. Actually, the figures for each sex are nearly identical (62 per cent). About a third of these one-person households have heads over age 60. The latter category of households has a higher poverty rate, but again the percentages for male and female-headed households are not markedly different: 73.2 and 71.4 per cent, respectively. Vanuatu may not be typical in this respect as generally women living alone, especially widows, are poorer than men in the same situation (United Nations, 2010 a). In addition, the data probably should have been disaggregated by whether the household has a member residing

abroad as female-headed households may be relatively well-off only because they are receiving remittances from a male head of household working abroad.

Table 36: Vanuatu (2009)—Percentage of households considered to be poor, by type of household and sex of the head of household

	Nunber of households		Percentage poor	
Type of Household	Male headed	Female headed	Male headed	Female headed
One person hh – male	1,887	.	62.3	.
One person hh – female	.	1,110	.	62.5
Couple without children - male head	2,563	.	38.1	.
Couple without children - female head	.	191	.	14.1
Couple with 1 -2 children < 15	9,631	744	44.7	25.1
Couple with 3+ children < 15	6,867	446	53.6	31.2
Couple with children, no children < 15	1,567	69	43.5	29.0
Single mother, 1 - 2 children < 15	.	1,170	.	45.1
Single mother, 3+ children < 15	.	168	.	41.1
Single mother, no children < 15	.	1,296	.	50.1
Single father, 1 - 2 children < 15	444	.	38.1	.
Single father, 3+ children < 15	102	.	52.9	.
Single father, no children < 15	291	.	35.4	.
Extended hh, 1 -2 children < 15	5,272	1,544	35.6	34.8
Exteded houshold, 3+ children < 15	2,448	584	40.1	36.0
Extended hh, no children < 15	5,895	2,459	39.8	41.1
Composite household	434	77	29.7	18.2
HH not to be determined	40	64	37.5	34.4
Total	37,441	9,922	44.1	41.4

Source: Population and Housing Census of Vanuatu (2009)

397. Lone mothers who have 1 or 2 children below age 15 have somewhat higher levels of poverty than lone fathers: 45.1 per cent, compared to 38.1. However, it seems that single mothers who have 3 children or more below age 15 have a lower chance of being poor. One should take into account, however, that the number of single fathers with 3

children or more is very small (102). It is very interesting to see that in nuclear households consisting of a married couple, with or without young children, levels of poverty are lower when the head is a woman and not a man. For instance, if a woman is head in a household consisting of a married couple with 1 or 2 children below age 15 the headcount index is 25.1 per cent, against 44.7 percent when the head is a man. If the head of household is over 60 years old, poverty rates are somewhat higher in both cases, but the difference between male and female-headed households does not change appreciably. The percentage of persons that are poor among extended households is much closer between both sexes. Here, as in most other household categories, the difference between the poverty rates of households with heads over and under age 60 is larger (with higher poverty among the former) than between those with male or female heads. This situation may be different in other parts of the world, such as Latin America, where the poverty of older persons is lower.

398. These results show that a simple comparison between male and female headed household would miss all the nuances that are present. Such an analysis would indicate that the headcount index for both sexes would come very close (44.1 and 41.4 per cent for male and female-headed households, respectively). It is well possible that a selection criterion is operating making the position of households that are headed by a female (with the exception of single mothers) different from other households.

It may be that the underlying reason that makes a female head of the household is also the reason why their chance of being poor is smaller, i.e. their economic position.

399. Living conditions can also be analysed along different gendered dimensions. In terms of health and sanitation, data on the source of drinking water, fuel for cooking, sewage disposal, toilet, and main type of solid waste disposal may be relevant to use. Men's and women's roles and inequalities can be related with living conditions. Additionally, women's time use may be shaped by the household's main source of drinking water and water supply system, the availability of a kitchen, and the number of household occupants that may carry out or add to household chores. At this level, though, cultural knowledge about women's and men's roles will also inform the construction of relevant tabulations.

5. Indicators

400. Relevant poverty indicators vary across countries. At the country level it is first necessary to examine the census form to identify items relevant to differentiating absolute and overall poverty within that country's setting. A number of aggregate indices of poverty are available (see Haughton and Khandker, 2009: 69):

1. The Headcount Index is the index most frequently used. The index simply states the number of persons that are considered poor per 100 total population.

The number of persons considered poor is again the result of a .test using either a poverty line or deprivation factors. Although widely used, this indicator has some weaknesses. It does not measure the intensity of poverty; i.e. it does not look into how poor the poor really are. Another disadvantage is that it is calculated at the individual level, while most data on poverty are collected at the household level.

2. The Poverty Gap Index presents the average difference between the poverty line and persons' actual income. Only persons falling below the poverty line are included in the equation. The Poverty Gap Index (P) is calculated as:

$$G_i = (z - y_i) \times I(y_i < z)$$

Where G_i: is the poverty gap for person i;

Z is the poverty line;

Y_i is the income of person i and

I takes value 0 or 1. 0 if a person's income is greater than z and vice versa.

And subsequently:

$$P = 1/N \times \Sigma(G_i/z)$$

Apart from computing whether female-headed households (or sub-categories thereof) are or are not poorer than male-headed households, it may be worthwhile to compare the respective Poverty Gap Indices, to assess whether poverty is deeper

in female-headed households (or sub-categories thereof) than in the respective male-headed households.

3. Next to these general measures a number of specialized poverty indicators have been developed (e.g. the Squared Poverty Gap (Poverty Severity) Index, the Sen index, the Sen-Shorrocks-Thon Index. erc.). The methodological aspexts of these measures can be found in the 'Handbook on Poverty and Inequality' (2009) by the World Bank.[32]

All these poverty indices use individual data and not household characteristics. In those countries were census data on individual income are available, these measures could be calculated separately for males and females.

401. The Millenium Development Goals (MDGs) set out measurable indicators of poverty that can be used to define and monitor it over time.

Within the first goal of the MDGs (Eradicate extreme poverty and hunger) three targets have been specified. Progress in each of these targets can be measured by some specific indicators. The official United Nations site for MDG-indicators discerns the following indices[33]:

32 http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTPOVERTY/EXTPA/0,,contentMDK: 22405907~menuPK:6626650~pagePK:148956~piPK:216618~theSitePK:430367,00.html.

33 http://mdgs.un.org/unsd/mdg/Host.aspx?Content=indicators/officiallist.htm.

Target 1.A: Halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day

1.1 Proportion of population below USD 1 (PPP) per daya

1.2 Poverty gap ratio

1.3 Share of poorest quintile in national consumption

Target 1.B: Achieve full and productive employment and decent work for all, including women and young people

1.4 Growth rate of GDP per person employed

1.5 Employment-to-population ratio

1.6 Proportion of employed people living below USD 1 (PPP) per day

1.7 Proportion of own-account and contributing family workers in total employment

Target 1.C: Halve, between 1990 and 2015, the proportion of people who suffer from hunger

1.8 Prevalence of underweight children under-five years of age

1.9 Proportion of population below minimum level

of dietary energy consumption

Only a few of these indices can be calculated on the basis of census data. For the purpose of gendered research on poverty, where possible these indicators should be calculated separately for each sex.

402. Because many censuses do not provide the necessary information for computing monetary poverty metrics, the Unmet Basic Needs (UBN) approach with its different variants, is the most frequently used method for estimating poverty levels for small geographic areas. For example, Skoufias (2005), in a slight variation on the UBN-methodology explained before, used data from the 2002 Population and Housing Census of Guyana related to the access of households to basic services, like water, electricity and garbage disposal to construct a Living Conditions Index (LCI). This index is based on the assignment of the response codes into levels: level 1 for high quality to level 5 to denote low quality. Each level was assigned a number of points (i.e. 100 points for level 1, 75 for level 2, 50 for level 3, 25 for level 4 and 0 for level 5 or no access). These points were then summed across six areas:

1. Access and quality of a household's water source;
2. Source of drinking water;
3. Type of toilet facility;
4. Type of lighting;

5. Main method of garbage disposal; and
6. The extent of crowding in the household (the number of people residing in the household divided by the number of bedrooms in the dwelling).

403. For each household, the LCI value was computed as the sum of points across the six categories: the lower the sum, the poorer the household. The household-specific index was then averaged by an enumeration geography unit, such as a tract, village, district, or region, to provide a measure of the relative quality of services by that geographic unit. Because the LCI is a number that is derived at the household level, it can be used to rank households within a geographic unit.

404. A somewhat under-utilized resource are the often extensive lists of assets asked for in censuses that may or may not be present in the household. The 2007 census of Swaziland, for example, asked for the presence of 13 items, including cars, vans, motorcycles, computers, mobile phones, internet connections, refrigerators, radios and TVs. On average, male-headed households possessed items in 3.2 of the 13 categories, compared to 2.8 for female-headed households.

405. Some indicators of poverty, such as availability of water, type of heating may be important for research on gender differentials. As an example, fetching or pulling water for the household in most developing countries is more likely to be performed by girls or women than

by boys or men, which may have consequences for girls' school attendance. In sub-Saharan Africa, only 54 per cent of households are within 15 minutes from a source of drinking water, and girls under 15 years are more likely than boys of the same age to be in charge of water collection (United Nations, 2010 a). From this, it is relevant to tabulate source of drinking water across boys and girls, and then compare the levels of school attendance across boy and girl groups.

6. Multivariate and further gender analyses

406. Multivariate regression techniques provide the means to examine differentials in levels of income and poverty between different subgroups in society. Census data from two island countries, Vanuatu and Aruba, will be used to illustrate the application of multivariate regression techniques to research gender differentials in income and poverty. In the case of Vanuatu an analysis closely related to the Unmet Basic Needs will be done, while for Aruba income differentials between males and females will be examined, while controlling for intervening factors. Both analyses will use a Multiple Classification Analysis (MCA).

407. In Vanuatu, five deprivation factors were first calculated for households (see above). Whenever a household scored positive the deprivation factors obtained value '1',

in all other cases the factor remained '0'. The sum of these five deprivation factors varies between 0 and 5. This score can be interpreted as in indication of the overall deprivation of the household. Then this sum of the deprivation factors (intensity of poverty) for the households were assigned to all the persons living in the household. The overall mean of this indicator for all persons was 0.55. Table 37 shows the result of an MCA-analysis. The last colomn shows deviations from the overall mean after controling for other factors and covariates. A positive sign of the deviation means that the particular category has a higher intensity of poverty as the reference category, and a negative coefficient means a lower level of poverty. In addition to a number of categorical variables, the age of the respondent and the number of children in the household younger than 15 were introduced as control variables.

Table 37: Vanuatu (2009)—MCA analysis number of deprivation factors with selected explanatory variables

Variables	Categories	N	Predicted Mean		Deviation	
			Unadjusted	Adjusted for Factors + Covariates	Unadjusted	Adjusted for Factors + Covariates
UrbanRural	Urban	54,830	0.084	0.106	-0.468	-0.447
	Rural	170,671	0.703	0.696	0.150	0.144
Sex	Male	114,401	0.552	0.554	-0.001	0.002
	Female	111,100	0.553	0.550	0.001	-0.002
Citizenship	Vanuatu by birth	215,790	0.558	0.554	0.006	0.001
	Vanuatu by naturalisation	7,785	0.503	0.554	-0.050	0.002
	Other countires	1,926	0.128	0.425	-0.424	-0.127
Marital status	Never married	128,909	0.560	0.550	0.007	-0.002
	Legally Married	71,927	0.570	0.559	0.017	0.007
	Defacto	18,706	0.401	0.522	-0.152	-0.031
	Divorced	539	0.573	0.623	0.021	0.071
	Separated	1,223	0.549	0.606	-0.004	0.054
	Widowed	4,197	0.703	0.626	0.151	0.073
Hhold type detailed	One person household	2,997	0.775	0.830	0.222	0.278
	Nuclear, couple, no children	5,508	0.439	0.533	-0.113	-0.020
	Nuclear couple, with children	92,755	0.625	0.573	0.072	0.020
	Nuclear, mother with children	9,211	0.653	0.612	0.100	0.060
	Nuclear, father with children	2,656	0.513	0.506	-0.040	-0.047
	Extended: head in nucleus+gchildren	19,546	0.614	0.578	0.062	0.026
	Extd: head in nucleus+gchildren+other	24,276	0.482	0.530	-0.071	-0.022
	Extd: head in nucleus+others	60,981	0.447	0.501	-0.106	-0.051
	Extd: lone head+parents in law	225	0.502	0.529	-0.050	-0.024
	Extd: lone head+extended family	6,656	0.479	0.574	-0.074	0.022
	Cannot determine	690	0.436	0.532	-0.116	-0.020

Source: Population and Housing Census of Vanuatu

408. The results in Table 37 clearly show that levels of poverty are much higher in rural than in urban areas. The intensity of poverty score was 0.106 in urban areas and 0.696 in rural areas. Poverty also varied across the three categories of citizenship. Persons who had a citizenship from another country had on average a lower poverty level than persons who were born on Vanuatu or who were naturalized (difference -0.217). The results on the

type of household confirm our conclusion based on the cross tabulation depicted in Figure 12, i.e. persons residing in one-person households have a higher degree of poverty than the other households. Also, slightly higher levels of poverty are present among nuclear households with a single mother and with parents with children and in extended households with grandchildren. Differences between male and female heads of households turn out to be almost non-existing. However, this does not prove that there are no difference in income and poverty levels between males and females in Vanuatu. Because, as stated by The World's Women 2010 (United Nations, 2010 a: 159), "if the total number of poor is disaggregated by sex (i.e. the sex of the household members), the results are not going to reflect possible gender inequality within the households but merely the distribution of population by sex in poor households.". To really disentangle the existence of poverty and deprivation between the sexes on Vanuatu, more in-depth research is necessary on individual income levels and the distribution of wealth between members of both sexes in households.

409. Another approach is presented for Aruba. This analysis does not focus directly on levels of poverty, but tries to differentiate between the levels of income from work between both sexes. In the 2010 Aruban population census, two questions were asked about income: one on monthly income received from the person's main job, and one on any other form of monthly income. To

analyse the results of the first question, i.e. income from main job, a Multiple Classification Analysis (MCA) was set up to examine the gender gap in income. To control for intervening factors and covariates, the following predictors were incorporated in the model: gender, age, educational attainment, country of birth, occupational category (ISCO – main categories). 'Hours of work' was not included, as in Aruba there is hardly any difference between both sexes. Only persons between 15 and 65, who were working at the time of the census, were included. The results of the MCA- analysis are presented in Table 38.

Table 38: Aruba (2010)—MCA analysis of income from main job by main explanatory variables

		Predicted Mean	Deviation from overall mean	
Variable	Category	Unadjusted	Unadjusted	Adjusted
Gender	Male	3420.4	351.4	347.6
	Female	2726.2	-342.8	-339.1
Educational attainment	Less than primary/None	1808.0	-1261.0	-645.0
	Primary (special) education	2075.0	-994.0	-505.9
	Lower vocational education	2569.8	-499.3	-439.4
	High School 4 yr cycle.	2937.7	-131.4	-146.2
	High school 5 yr. cycle	2588.0	-481.0	-70.5
	High school 6 yr cycle	4787.3	1718.3	855.5
	Vocational Education, Intermediate	3578.5	509.5	233.0
	Higher education (Bachelor)	5058.0	1989.0	1035.4
	Higher Education (Master)	7287.5	4218.5	2952.4
	Higher Education (PhD)	9867.3	6798.3	5219.3
Country of birth	Aruba	3395.8	326.7	191.7
	Colombia	1990.7	-1078.4	-417.7
	China	2257.0	-812.0	-653.9
	Haiti	1552.9	-1516.1	-381.9
	Jamaica	1985.8	-1083.3	-191.3
	Netherlands	4848.5	1779.5	378.3
	Phillippines	2138.6	-930.4	-803.0
	USA	5339.0	2269.9	705.4
	Venenuela	2501.4	-567.7	-327.6
	Other country	2833.7	-235.4	-156.5
Occupation Main categories	Managers	5815.1	2746.0	2066.4
	Professionals	5247.1	2178.1	1063.4
	Technicians & Associate Professionals	3948.4	879.4	563.9
	Clerical Support Workers	2800.4	-268.6	-106.7
	Service and Sales Workers	2139.0	-930.1	-530.2
	Skilled Agricultural, Forestry & Fishery Workers	2156.0	-913.0	-998.2
	Craft & related trade workers	2433.1	-635.9	-564.5
	Plant & Machine operators and Assemblers	2405.8	-663.2	-692.4
	Elementary Occupations	1593.2	-1475.8	-935.3
R^2				0.375

Source: Aruba census 2010

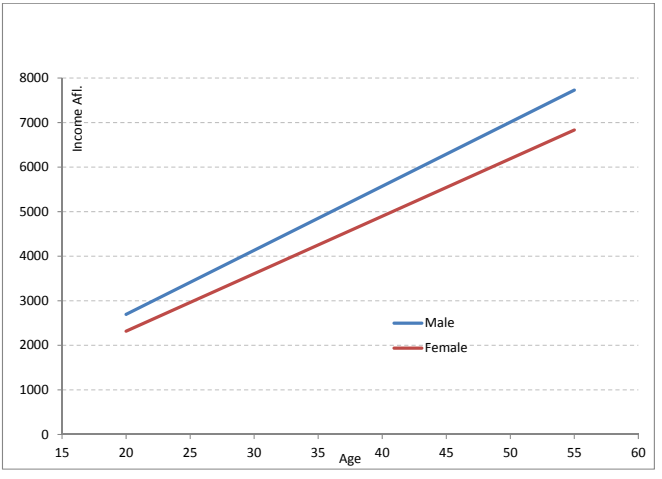
410. The second column in the MCA-table shows the (unadjusted) mean for each category. The overall average monthly income per person is Afl. 3,069 (USD 1,724, at the fixed rate of Afl. 1.78 per US dollar). The third column

gives the unadjusted deviations from the main. It shows that still a significant income gap exists between both sexes, even after controlling for intervening variables. The unadjusted deviations for both sexes are respectively Afl. 351.4 for men and – Afl. 342.8 for women. From these deviations it is clear that the difference in monthly income from main job between men and women is Afl. 694.2 (USD 390). It is interesting to see that the deviations from the overall mean for men and women, after controlling for all intervening factors and covariates, is almost the same as the unadjusted deviations. Some initial tests showed that in fact three of the predictors were working in opposite directions. Controlling only for educational attainment in the model resulted in a wider gender income gap (Afl. 789). Adding country of birth to the equation led to a reduction in the income gap (Afl. 744) and occupational category further reduced the difference (Afl. 689).

411. A further analysis into the income differences between both sexes was done by constructing a linear regression with the same variables, but some extra transformations of age. To see if there was an interrelationship between age and sex, an interaction term 'age x sex' was included. Also, the square of age was added, to check for non-linearity. The results of this analysis are presented in Figure 13. All values for the dummy variables (educational attainment, country of birth and occupational category) were kept at their mean. Figure 13 clearly shows

that a) The income gap between males and females gets wider by age. The regression coefficient for the interaction terms was -14.8, meaning that per year of life the income gap between men and women widens by Afl. 14.8. At age 20, the fitted income gap is Afl. 377, at age 30 it is Afl. 525 and at age 50 it is Afl. 673; and b) In Aruba the relationship between income and age is quite linear. The regression coefficient for the square of age was only -1.3.

Figure 13: Aruba (2010)—Differential in income from main job between men and women by age, controling for education, country of birth and occupational category



Source: Aruba census 2010

412. Beyond the analysis shown in the preceding paragraphs, there is a standard literature on the decomposition

of male-female income differences by various contextual variables, such as occupational differentiation, differences in levels of education, part-time versus full time work and other factors that might account for the income differences. Typically, these methods use the separately estimated (log) wage equations for two groups of workers to decompose the difference in their (geometric) mean wages into a discrimination (unexplained) portion and a human capital (endowments or explained) portion. The simplest decomposition procedure is to adopt one of the estimated wage structures as the nondiscriminatory norm. Often researchers select the wage structure for the group of workers believed to be dominant in the labour market (at least relative to the comparison group). Differences in the mean characteristics of the two groups are weighted by the estimated coefficients for the nondiscriminatory wage standard and summed to obtain the human capital portion of the overall wage differential. The discrimination portion of the overall wage differential is the residual left over after netting out the human capital portion. Equivalently, the discrimination portion can be directly obtained as the summed difference in estimated coeffcients between the two groups of workers weighted by the mean characteristics of the subordinate group. An implication of this procedure is that all of the discriminatory wage differential is ascribed to underpayment of the subordinate group rather than to overpayment of the dominant group (Neuman and Oaxaca, 1998).

413. Because this methodology is fairly complex and ideally requires more detailed information than what is readily available from the census, it is not discussed here in any detail. Nevertheless, for those who wish to go deeper into the econometric analysis of male-female income differences, even with census data, it is probably necessary to get acquainted with this literature, especially the articles by Oaxaca (1973), Binder (1973) and Oaxaca and Ransom (1994). In his original article, Oaxaca demonstrated that in the US 74 per cent of the male-female income difference between white workers and 92 between black workers should be considered as based on "pure" discrimination within the occupational categories that he used. As one uses finer occupational categories, this percentage tends to diminish because a greater portion of the income difference is accounted for by variations between occupations, rather than within occupations. Fresneda (2012), who used a finer occupational differentiation for the case of Brazil, found that this significantly affected the results. There is some discussion, however, as to whether such detailed occupational categories should be used because as ever more detailed distinctions between categories are introduced, there is a real possibility that the categories themselves will be instruments of labour force segmentation that discriminate against certain categories of workers, such as women.

7. Interpretation, policy and advocacy

414. Regarding the point mentioned at the end of the previous paragraph, Anker (1998) established that the largest contributor to the work and income differential between women and men is that women and men tend to concentrate in different occupations, which he refers to as horizontal occupational segregation. He also finds that even within an industry, women tend to concentrate lower in the hierarchy, which he refers to as vertical occupational segregation. In addition, cultural norms shape perceptions about what occupations are suitable for women and men, and further, that men are typically the breadwinners within the household, and hence their labour is increased in value while women's labour value is diminished.

415. The key is to understand the relative and absolute poverty situation within a given country. Understanding poverty with a gendered lens involves asking questions such as:

a. What is the proportion of women or men who are poor?
b. Where are the poorest areas of the country? Where are the most affluent?
c. Are women who are poor less educated or literate than the men, compared with the the national average or sub-region (urban, rural, other levels of

government) average?

d. What is the proportion of poor women in informal sector employment compared to men, and to the national average?

e. How does poverty vary across the nation, and are geographic differences similar for men and women? Using a geographic parameter relevant for that nation (e.g. rural/urban, grassland/desert), what proportion of women and men are poor, and then compare this to the national average.

f. To measure crowding, what is the average size of households and number of children across female and male headed households or family units?

g. What is the school attendance rate of poor young girls and boys compared to the national or sub-regional rate?

h. What are the important differences between women and men who are poor and those who are not poor – is it their level of education, their economic activity (or lack of it); their ethnic group or another factor or even a combination of factors?

416. Advocacy in the areas of poverty and living conditions was most recently supported in the Millennium Declaration, whose first stated goal is to eradicate extreme poverty and hunger. However, the right to be protected from a life of poverty has been codified in international law since 1948, with Articles 23 and 25 of the Universal Declaration of Human Rights. Still, poverty in both 'absolute' and 'overall' types persists. It is also women in our world, regardless of residing in a rich or poor country,

who are more likely to be poor (United Nations, 2010 a). Further, governments have acknowledged their commitment since the Beijing Platform (1995b) to address 1) the burden of poverty that continues to fall upon women, and 2) educational inequalities that underlie disparities in poverty. Still, poverty and inequality patterned by sex persist.

417. Access to productive resources, particularly in rural areas where poverty is higher, remains another important issue to gender equality. Rural women's access to productive resources – such as land, irrigation equipment, and other inputs necessary for cultivating their own plots and earning their own money – remains a barrier to surmount to take care of family and children's needs. Women's empowerment and economic independence are keys in the fight against poverty.

418. Gendered analysis of poverty requires that statisticians, planners and economists remain allied to idea that poverty data should be sex disaggregated to allow for an engendered approach to poverty analysis. Also, women's machineries need to be involved in the coordinating bodies or steering committees to ensure that the definitions of poverty used, the poverty data collected and the results meet their information needs for policy making, monitoring, evaluation and advocacy. For example, engendered poverty analysis needs to consider the time period the income statistics apply to, whether one year, one month

or another period of time. Is this period of time (or reference period) suitable to reflect the way women generate income in the country considering things like irregular or sporadic economic activity, income from part-time work, and income from informal sector activities?

419. In addition, gender poverty analysis should lobby for other supporting statistics about resources available to the household (e.g. land, assets, tenure, utilities), because purely quantitative measures like poverty lines have greater validity when complemented by other measures of wellbeing or deprivation. As the Data section (i.e. E.3.) underscored, it is not clear using census data how household income is allocated, spent or consumed, so gender inequality is likely to be underestimated using household level data. Information on household decision-making and resource allocation as collected in other household surveys, such as the Demographic Health Surveys, would provide the requisite data to understand women's economic position vis-à-vis men at the household level.

CHAPTER 9

Education and Literacy

1. What is it?

420. Population censuses directly collect educational information from individuals in three primary areas: literacy, educational attainment and school attendance.

a. Literacy distinguishes those who have the ability to read and write as "literate," and those who do not have the ability to read and write as "illiterate." Some surveys assess this ability by asking the interviewees to read and/or write a short paragraph, but censuses usually accept the respondent's self-assessment.

b. Educational attainment is defined as the highest grade completed, or alternatively as the highest grade attended, in the educational system of the country where the education was received. According to the International Standard Classification of Education (ISCED), education includes all deliberate and systematic activities designed to meet learning needs.

c. School attendance is defined as regular attendance of any regular, accredited programme of organised learning, either public or private, at the time of the census data collection, or alternatively, during the last school year (United Nations, 2008 a). School attendance is different from school enrollment in

that it refers to children who are actually attending school, rather than to children who have been registered as students at the beginning of the school year. The latter is the basis for the enrollment statistics of the Ministries of Education, which is often different from the data found in the census.

2. Why is it important?

421. Education is a key element in the analysis of gender issues. Educational indicators can identify gender gaps in literacy, access to schooling, and in educational attainment. Because educational status patterns both family roles and work roles, understanding how education may be different for girls and boys, and for women and men in a given society also has implications for other areas of administrative and policy concern. A gendered analysis then considers how sex can serve as a primary and overall classification, and how disaggregating the data by sex can help define and monitor an inequality in education. This type of analysis is useful for individuals involved in public policy planning and implementation as well as those associated with advocacy and equality for all, regardless of sex. Moreover, understanding education through a gendered lens makes it possible to highlight, target, and monitor inequality across men and women, and boys and girls.

422. Education is recognized and codified as a fundamental human right, and systematic unequal access to it by sex may limit the position and life chances of some rights

holders when compared with others (United Nations, 2008 a). The Beijing Platform calls upon governments to take action if there are inequalities and inadequacies in and unequal access to education and training (United Nations, 1995). In even more specific terms, the MDGs frame gender equality in education as integral to economic development. For example, Goal 2 of achieving universal primary education, can be assessed with two measures generally gathered within census data, the literacy rate and school attendance. Goal 3 to promote gender equality and empower women, also utilizes the educational indicators (i.e. the ratio of literate women to men 15-24 years old, ratios of girls to boys in primary, secondary, and tertiary education) to monitor progress. Despite the multiple international human rights instruments that obligate nations to respect the right to education, 100 million children—at least 60 per cent of them girls—do not have access to primary education and nearly two-thirds (64 per cent) of the 774 million illiterate adults worldwide are women (United Nations, 2010 a).

423. There is a strong link between education and gender equality; the global number of illiterate adults has declined slightly during the past two decades, and increases in women's education have also been associated with many changes in women's roles and positions in society. Educational and schooling decisions are the basis upon which women negotiate family and work roles (Bianchi and Spain, 1986). Women's increased

literacy and educational attainment are related to individual behaviours, such as later marriage and childbearing, fewer children over their lifetime, and higher income. Women's improved literacy and educational attainment are also related to demographic trends at the societal level, such as lower fertility, and decreasing maternal mortality and child mortality ratios, and social patterns such as greater formal labour force participation and higher status for women overall in society. Examining educational factors through a gender lens highlights issues that may affect or challenge women disproportionately in a given society as well as inform policy that seeks to provide for and improve the wellbeing of all citizens.

424. Educational data are important to collect in a census because they are used to compute adult literacy rates and average educational attainment of the population. Household sample surveys are also sources. While not offering full coverage as in the census, surveys may be more timely for policy-making purposes if it has been several years since the last census. Education data also serve as components of several widely used, international indexes, such as the Human Development Index (e.g. mean years of schooling of adults), Gender-Related Development Index (e.g. adult literacy and school enrollment) or the World Economic Forum's Global Gender Gap Index (e.g. adult literacy and school enrollment). These data are important for policy-making and planning purposes because they cover the entire population and

can be used to identify areas of need which can be better targeted for additional support.

3. Data issues

425. NSOs are recommended to collect census data on the core topics of literacy, school attendance, educational attainment, and the optional topics of educational field and educational qualifications. In addition, literacy status, school attendance and educational attainment data should be collected and tabulated separately and independently of each other without assuming any relationships among them (United Nations, 2008 a). A census usually provides a proxy for literacy based upon assessment by the respondent or the household head/informant, which can be expressed as a per cent literate or a literacy rate. This proxy variable is less reliable than the procedure used in some surveys, where the respondent is instructed to read a sentence or paragraph in common language about everyday events.

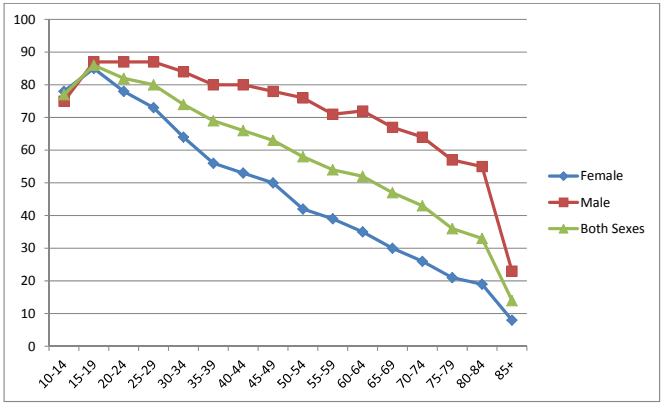
426. Across these educational topics, the challenge is to measure accurately the topic (i.e. literacy) while also collecting data that can be used in international comparisons. As an example, the literacy question currently varies across countries, so data may not always be used for valid international comparisons. NSOs may consult the UNESCO Institute for Statistics website, www.uis.unesco.org, for guidance. Also, Par. 2.215 of the Recommendations from

the International Standard Classification of Education (ISCED) (i.e. http://www.uis.unesco.org/Education/Pages/international-standard-classification-of-education.aspx) provides sample educational questions – especially in the areas of literacy, school attendance and educational attainment (e.g. three levels of education, primary, secondary and post-secondary) – in order to harmonize and standardize these measures for international comparison (UNESCO, 2008). Further, any differences between national and international definitions and classifications of education should be explained in the census publications to facilitate comparison and analysis (United Nations, 2008 a). Also note that UNESCO (2004) has published a Guide to the Analysis and Use of Household Survey and Census Data in the area of education that complements the analyses presented in this and the following sections.

427. Additionally, a distinction should be made between school attendance, which is collected in the population census, and school enrollment, which typically is derived from administrative data, such as school registration records. Because a child can be enrolled in school and not necessarily be attending, results from censuses and administrative data may differ. Further, because of this difference between "attending school" and "enrolled in school," these concepts should be clearly defined using internationally harmonized questions as measures. This distinction between the administrative enrollment data

and the census attendance data illustrates how census data can serve as a useful complement to administrative data in identifying those children in a population, who are enrolled but not attending school (United Nations, 2008 a).

Figure 14: Malawi (2008) – Literacy by age and sex



Source: Malawi. Gender in Malawi. Analytical Report 3 of the 2008 Census: Figure 5.4

428. Finally, a major consideration for analysis is that educational indicators are usually calculated by age-groups, to neutralize generation effects. In a country where access to education is improving, basing assessment of school attainment on the older generations or on indicators that mix different generations can be seriously misleading. Literacy, in particular, is affected both by the fact that the percentage of illiterates increases sharply with age and

by the much larger number of women at higher ages. If the objective is simply to quantify the number of illiterate males and females, this is not a problem, but in order to assess the current performance of the school system in promoting equality between boys and girls, the literacy rates of men and women aged 15-24 is a more appropriate measure. Figure 14 illustrates the inequality profile by age for the census of Malawi (2008).

429. Some countries have included questions about computer and internet use in their censuses of the 2010 round. Table 39 is an example of this, for the case of Qatar:

Table 39: Qatar (2010) – Percentages of computer use by sex and age

	Men			Women		
	At home	Elsewhere	Not at all	At home	Elsewhere	Not at all
5-9	61.9	41.1	36.7	60.5	40.0	38.1
10-14	84.6	67.8	13.4	83.4	64.7	14.5
15-19	90.4	80.7	7.6	88.7	73.6	9.5
20-24	74.0	67.8	23.7	62.8	47.5	36.3
25-29	72.2	67.4	25.0	51.8	35.6	47.3
30-34	77.1	72.3	19.9	54.1	35.6	44.9
35-39	79.0	73.8	18.1	55.9	36.9	43.2
40-44	79.2	73.2	18.2	56.0	37.5	43.2
45-49	73.2	67.4	24.3	52.9	34.5	46.3
50-54	56.2	51.5	41.8	47.8	30.1	51.5
55-59	53.3	48.5	44.9	37.6	23.2	61.9
60-64	60.4	53.9	37.7	27.1	16.8	72.3
65+	31.1	25.7	67.3	8.7	5.2	91.1
Total	72.6	64.0	25.1	59.1	41.7	39.8

Source: Census of Qatar (2010): Table 8

What this table shows is that there is very little difference in computer use between the younger generation of men and women residing in Qatar, up to age 20. Beyond that age, however, the difference by sex increases considerably, reaching its maximum around age 40, after which it tends to diminish somewhat. The biggest differences are found in use of the computer outside the home, which probably reflects the fact that a much larger proportion of men are employed and use computers at work.

4. Tabulations

430. Using meaningful tabulations represents another data challenge. First, literacy data should be tabulated for all persons 10 years of age and over. Literacy cannot be accurately computed from educational attainment, because persons may leave school with partial literacy skills or lose them due to lack of practice. UNESCO recommends that literacy tests should be administered to verify and improve the quality of literacy data. However, administering a literacy test to all household members is practical and may affect participation, hence limiting the utility of the results. Nonetheless, NSOs should evaluate and report on the quality of literacy statistics published using census data. Second, educational attainment should be classified as grades or years of education in primary, secondary and post-secondary school. If the educational structure has changed over time, the data should be coded or organized to make provisions for persons educated at

a time when the national educational system may have been different than the current system. Also, while educational attainment is classified into seven levels, persons with no schooling should be included, and adjustments should be made if necessary to accurately capture the situation of those who were educated in another country. Finally, attendance at an educational institution should be collected for all persons even thought it relates in particular to the population of official school age, typically 5 to 29 years old, yet this range may vary depending on a country's national educational structure (United Nations, 2008 a).

431. The Principles and Recommendations for Population and Housing Censuses Rev. 2 (United Nations, 2008 a) recommend three tabulations to use in the analysis of educational characteristics.

a. Population 10 years of age and over, by literacy, age group and sex. This tabulation describes the rate of literacy by age group across females and males in society. To tabulate adult literacy comparing women and men, ten-year increments of age are suggested for each age grouping beginning at age 10 (e.g. 10-19 years, 20-29 years, and so on) or 15 (e.g. 15-24 years, 25-34 years, and so on).

b. Population, over 15 years of age not attending school, by educational attainment, age group and sex. This tabulation describes the educational attainment, or highest grade completed, of women and men by age-specific groups (e.g. 15-24 years, 25-34 years, and so on) among those who are no longer

attending school in the population. Educational attainment may be presented in years of school or in other relevant groups, such as primary, secondary or tertiary levels, for a society. This tabulation could also be scaled to the age at the last year of primary school, age 11 or 12, in order to describe the proportion of girls and boys, separately, who have completed primary school by the expected age for a given society.

c. Population 5-29 years of age, by school attendance, single years of age and sex. This tabulation describes regular school attendance overall and in single years of age by sex at the time of the census data collection or the last school year.

432. The following tabulations allow the examination of women's differential outcomes and differences across men and women within specific groups as they may be related to, or even caused by, educational factors.

- Female educational attainment (primary, secondary or tertiary level) by the marriage rate, for age-specific cohorts;
- Female educational attainment by number of children, for age-specific cohorts;
- Educational attainment by median age of first marriage (if available), for age-specific cohorts of women and men;
- Educational attainment by labour market participation, for age-specific cohorts of women and men.

433. Cross-classifying women's literacy or educational attainment by whether women are in wage employment

illustrates how unequal access to education and later consequences, such as lower income and labour market segregation, become apparent. In this way, unequal access to education is an indicator of gender disparity as well as an underlying cause of its persistence from one generation to the next, as constrained women then may offer more limited educational life chances for their own girls.

434. Looking at education from the viewpoint of the providers, one can use the data on occupation to tabulate teachers by age and sex. In most cases, it will not be possible to disaggregate this information by level of education, but the Mongolian census of 2010, which coded occupations up to 4 digits, does contain sufficiently detailed information to generate the following table.

Table 40: Mongolia (2010) – Sex ratio of population employed as teachers, by age groups and educational levels

	Total	Pre-school	Primary	Secondary	Vocational	Tertiary
Total	27.9	2.3	7.1	31.7	63.0	49.4
Up to 25	35.2	4.6	10.1	37.6	63.8	57.2
25-29	31.4	2.7	8.6	35.7	66.4	44.0
30-34	21.7	1.5	4.6	23.1	50.6	39.0
35-39	17.5	1.7	4.4	23.2	42.2	34.6
40-44	21.7	2.2	8.1	30.4	55.9	41.2
45-49	22.9	1.7	6.1	27.7	60.8	38.2
50-54	30.9	2.9	9.9	30.8	73.2	53.8
55-59	89.0	9.7	20.0	102.0	153.8	108.1
60+	235.4	30.0	35.0	145.2	333.3	371.7

Source: Census Monograph 6 of the 2010 Census of Mongolia, Table 5.11

On the whole, this table shows a predominance of female teachers, except at the highest ages, maybe because female teachers retire earlier than male teachers. The proportion of male teachers is higher, although they do not constitute a majority, in tertiary and especially vocational education.

435. Other types of tabulations can shed a light on particular interactions of interest. Two such examples are provided by UNESCO (2004: Figures 5 and 8), on the disaggregation of school attendance by the sex of the head of the household and by the relationship of the child to the head of household. The former shows that households in Ouagadougou headed by women were much more likely to send both boys and girls to school (47 per cent) than households headed by men (29 per cent). However, generally more boys attended school than girls regardless of the sex of the household head. Based on the 1996 census in Burkina Faso, the latter analysis shows that male and female children of the household head were almost equally likely (69 per cent of girls and 71 per cent of boys) to be enrolled in school; in contrast, children who were not the children of the household head were considerably less likely to be enrolled in school, with girls far less likely (45 per cent) than boys (60 per cent) to be enrolled. There is evidence that many of the children in Ouagadougou who were not children of the household head worked in households in domestic service; as may be expected, children in domestic service may be unlikely to attend school because of work or other reasons. This example illustrates

the importance of disaggregating the data, to uncover the specific gender issues (domestic service of girls) that are at work, rather than limiting the analysis to generalities about differences between male and female enrollment.

5. Indicators

436. Among the Minimum Set of Gender Indicators approved by the UN Statistical Commission in February of 2012, there are several that relate to education. Some of these can usually be computed from census data, such as the following:

- Literacy rate of persons aged 15-24 years old, by sex;
- Adjusted Net Enrollment Ratio in primary education, by sex (although the census actually measures attendance, rather than enrollment);
- Graduates from lower secondary education, by sex;
- Education attainment of population aged 25 and over, by sex.

437. The following indicators involve the Gross Enrollment Ratio, which is made up of the number of students at a given level of education (numerator) and the corresponding typical age category (denominator):

- Gross Enrollment Ratio in secondary education, by sex;
- Gross Enrollment Ratio in tertiary education, by

sex;

- Gender parity index in enrollment at primary, secondary and tertiary levels.

The numerator of the Gross Enrollment Ratio typically comes from administrative data, whereas the denominator is usually based on census information. The Net Enrollment Ratio, on the other hand, which is based on a numerator that counts only students of the appropriate ages enrolled at a given level of education, can be computed entirely from census data, although strictly speaking the census measures not enrollment, but attendance, which is actually a more relevant criterion.

438. Finally, the following indicators require information that is usually not available from the census.

- Share of female science, engineering, manufacturing and construction graduates at tertiary level
- Proportion of females among third-level teachers or professors (although it may be possible to tabulate the number of teachers, by age and sex; few censuses have information as detailed as the Mongolian census, shown in the example earlier in this chapter);
- Net intake in first grade of primary education, by sex;
- Primary education completion rate, by sex;
- Transition rate to secondary education, by sex.

439. Literacy, educational attainment and school

attendance provide three important indicators, each in its own right, to measure access to education and progress toward the Millennium Development Goal 2, Achieve Universal Primary Education (United Nations, 2008 a). MDG 2 and the Beijing Platform (United Nations, 1995) to advocate equality in opportunity across women and men, suggest several indicators that can be computed using census data.

a. **Ratio of literate women to men.** The literacy rate discussed in the tabulations section can be used to calculate the ratio of literate women to men. Government services and advocacy groups may work in tandem to target the increased school attendance and literacy of girls. In this way, this one statistic becomes meaningful as a benchmark to raise awareness and provide an impetus for change. Care must be taken, however, not to bias this ratio as a result of imbalances in the age structure, e.g. because of the fact that in the oldest age groups, where illiteracy is highest, there are many more women than men. To avoid, such distortions, it is best to compute the indicator by age group or to apply an overall age standardization (see Chaper 2.C).

From this benchmark, administrators, public policy makers and advocacy groups may enact programmes to promote girls' educational equality and well-being. This benchmark literacy statistic can then be recalculated using census data five or ten years later, or household sample surveys collecting data on literacy, to inform progress on the issue of women's literacy by itself, and also

as a component of the overall literacy rate. This statistic can be calculated as an overall rate, but it should also be calculated for age-specific cohorts, so that women 15-24 years of age can be compared with women 25-34 years of age when the next census enumeration is conducted ten years afterwards, and so on. This statistic becomes even more meaningful if there is a policy change, as the population can be divided into cohorts corresponding to the time of the policy change. This is just one example of the usefulness of a gendered analysis of the literacy statistic.

b. **Ratio of primary school educational attainment for girls and boys.** The census question on educational attainment (i.e. the highest grade completed) can be used to compute the ratio of girls to boys who have completed primary school. If the primary school completion rate (computed above in the tabulations section) in the age range of 12-15 is .50 for girls and .60 for boys, then the ratio of primary school educational attainment for girls and boys (12-to-15-years old) is .5/.6 or .833. Just over eight girls (i.e. .833) for every 10 boys in this age range have finished primary school education in the population.

In this way, this measure may be used as an indicator of Millennium Development Goal 2 (i.e. achieving universal primary education for children). This measure should be specified so that it is age appropriate. The results of one census enumeration can be used to evaluate the longitudinal progress toward closing a gender gap in primary education by computing this indicator for age-specific

groups (e.g. 10-14 years, 15-19 years) within the population, and then comparing the oldest generation to the younger ones. If the ratio of girls to boys and women to men completing primary school increases over time, this measure indicates gendered progress in education or even a "catching up" in education as girls over the official age respond to government policies encouraging school attendance for girls.

Additionally, the educational attainment question may be used to create other educational completion ratios, for example at the secondary and tertiary post-secondary levels, to examine difference by sex. This measure can then be computed over time and compared across census enumerations or across cohorts within the same census enumeration to provide a longitudinal measure indicating progress over time.

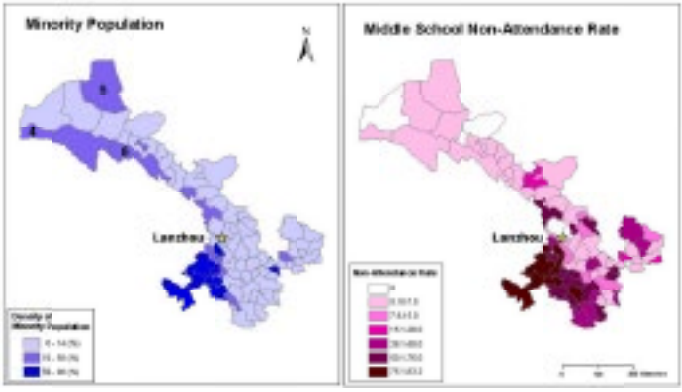
c. **"Out-of-school" girls and boys.** The census question on school attendance can be used to measure the percentage of "out-of-school" or "ever-in-school" children, and this can be disaggregated for girls and boys. This indicator is the complement of the currently attending school measure presented in the tabulations section.

Within the context of the UNESCO Education for All Goal 2, the number of out-of-school children has grown in public awareness (United Nations, 2008 a). This measure can be computed from one decennial census to provide a snapshot description of the issue, and it can be

used to monitor progress or the effectiveness of a policy implementation over time by comparing to household survey data asking about school attendance and enrollment, and long-term progress can be monitored from census enumeration to census enumeration.

The following is a relatively simple example of how spatial data can be used to elucidate the relationship between education and gender. It is from a study by Cao and Lei (2008), on female attendance of primary and middle school education in Gansu Province, China. The data for this study came from the 2000 Population and Housing Census, complemented by the 2000 Education Census, which provided information on characteristics such as the density of schools for each of the 60 counties of the Province. A multivariate analysis of these data, using the county as unit of analysis, reveals that the primary determinants of female non-attendance at the middle school level are: a) The illiteracy rate of women over age 15 (suggesting that girls from families where the mother is illiterate are less likely to attend school themselves); b) The percentage of the population consisting of ethnic minorities (see the graph below); c) Poverty level of the county; and d) Density of schools. Other variables, such as the proportion of non-agricultural population and rural income, proved to be less important.

Figure 15: Regional distribution of minority population and middle school attendance rate (Gansu Province, China), Population and Housing Census 2000



Source: Feng Jing (2005), cited in Cao and Lei (2008), Figure 4

The study could be detailed in a number of ways. In its present form, it only looks at female non-attendance and does not compare this with the non-attendance of boys. From a gender perspective, this is a limitation; it would be better if the dependent variable were some measure of differential non-attendance between boys and girls. Also, note that the use of spatial information is limited to the choice of the county as the unit of analysis, but no attempt is made to relate the characteristics of one county to others, in the neighbourhood. It may be that the county level is too aggregated for this kind of analysis, but in a more detailed study of the geography of non-attendance one

would want to consider interactions such as the influence of a high concentration of schools in one geographical unit with the non-attendance in other units nearby.

d. **Gender Parity Index (GPI) to measure parity in education.** The Gender Parity Index (GPI) can be computed and included as an additional statistic in a table to provide a gendered analysis of the literacy rate, school enrollment, or school attendance. The ratio of female to male is interpreted in the same way by group, whether examining literacy, the proportion having completed primary or second school, or the percentage currently attending school.

For a given measure, the GPI is calculated as the ratio of the value for females to that for males. A value distinctly less than one indicates disparity in favour of men or boys, whereas a value distinctly greater than one indicates disparity in favour of women or girls. For example, a GPI for literacy close to 1.00, between 0.97 and 1.03, indicates parity in literacy of a specified age group (UNESCO, 2006). Note that in the case of enrollment (or attendance) at the primary, secondary or tertiary level, the GPI is computed based on the Gross Enrollment (or Attendance) Ratios of each sex and not the raw numbers of boys and girls enrolled (or attending). This is to correct for the fact that the base populations of boys and girls of school age may be different. The resulting index may, however, still be biased if the repetition rates of one sex are markedly higher than the other (see the explanation in Section C of Chapter 2).

For primary/secondary school attendance, the GPI is still below 0.95 in Sub-Saharan Africa overall, especially evident in countries like Chad (GPI=0.75/0.44), Guinea (GPI=0.85/0.64), Niger (GPI=0.85/0.65), and the Democratic Republic of Congo (GPI=0.87/0.59). It is also markedly low in other countries such as Afghanistan (GPI=0.71/0.55), Pakistan (GPI=0.82/0.73), Iraq (GPI=0.84/0.75, in 2007), Yemen (GPI=0.82/0.63), and Turkey (GPI=0.99/0.92). However, there are also some countries with GPIs larger than 1.03. This is particularly, though not exclusively, the case in some Caribbean countries like Puerto Rico (1.04/1.04) and Guyana (1.04/1.10) (http://mdgs.un.org/unsd/mdg/Metadata.aspx?IndicatorId=9). In these countries, more girls than boys are attending primary and secondary education, which may suggest several things: 1) a gender disparity for boys' educational opportunities; 2) boys dropping out because of better economic opportunities; 3) the fact that girls need more education than boys to be competitive in the labour market; 4) educational systems playing 'catch up' to enrol often larger numbers of girls who did not enter school at the correct age, etc. This cluster of countries reinforces the need and usefulness to undertake a gendered analysis of data, so that this type of analysis is mainstreamed and used to provide equal opportunities regardless of gender to both women and men, both girls and boys.

Additionally, the Gender Parity Index (GPI) can be

calculated over time as a useful measure of progress toward gender parity on a specific educational measure. Table 41 provides a longitudinal use of the Gender Parity Index using primary net enrollment rates by region of the world and shows marked increases in gender parity for the world in general, changing from 0.93 to 0.97 over the period 1999 through 2007. This increase was fueled by less developed regions, which collectively had an increase from 0.92 to 0.97 over this eight-year period, while more developed regions remained at parity in terms of the primary school net enrollment rate. Table 41 shows the GPI longitudinally by region, but this same statistic could be calculated at the sub-country level and compared with the country level, or calculated at the country level and then compared with neighboring countries, a regional cluster of countries, the continent or the world overall.

Table 41: Gender Parity Index (GPI) based on primary net enrollment rates by region, 1999 and 2007

	1999	2007
World	0.93	0.97
Less developed regions	0.92	0.97
More developed regions	1.00	1.00
Africa	0.89	0.93
Eastern Africa	0.92	0.98
Middle Africa	0.86	0.86
Northern Africa	0.92	0.94
Southern Africa	1.02	1.01
Western Africa	0.81	0.88
Asia	0.93	0.97
Eastern Asia	1.01	1.01
South-Central Asia	0.85	0.96
South-Eastern Asia	0.97	0.99
Western Asia	0.90	0.93
Europe	0.99	1.00
Eastern Europe	0.99	1.00
Northern Europe	1.00	1.01
Southern Europe	0.99	0.99
Western Europe	1.00	1.00
L. America & Caribbean	0.98	1.00
Caribbean	0.99	0.98
Central America	1.00	0.99
South America	0.97	1.00
Northern America	1.00	1.01
Oceania	0.98	0.97

Source: Taken from The World's Women 2010 using data from the UNESCO Institute for Statistics (2009 a).

Note: Net enrollment rates are not calculated from censuses, so a better example should be placed here in the next revision.

The GPI should be used to compare rates for girls and boys, such as school attendance rates, and not absolute

numbers, such as the numbers of girls and boys in primary education. Due to the sex ratio at birth there are generally more boys than girls of school-age, so calculating the GPI for an absolute number would be artificially underestimated.

440. Other indicators, that are not part of the MDG framework, include the average age at which boys and girls enter primary school, the proportions of boys and girls that finish primary education and the average time that it takes them to do so. It has been found, for example, that in many countries girls tend to enter primary school later than boys, but that, once they are in school, they finish quicker than boys do (UNESCO, 2010). In the absence of direct information on the ages at which boys and girls enter school, a synthetic mean age can be computed based on the information on ever having been in school. The computation of this synthetic mean age is analogous to the computation of the Singulate Mean Age at Marriage (SMAM) described in Chapter 5.

441. The differential impact of education on the social circumstances of men and women can be expressed in many different ways, depending on exactly which dimension of people's social circumstances one wants to look at. Just as as example, the following computes the differential impact indicator for women compared to men in the 20-39 year age group of being unemployed as a result of having low education (primary or less), based on data

from the 2007 of the Occupied Palestinian Territories. The symbols refer to the explanation of the differential impact indicator given in Chapter 2.C:

Ω_f = Total Female Labour Force Aged 20-39 = 75,312
Ω_m = Total Male Labour Force Aged 20-39 = 411,514
$A_f + B_f$ = Total Number of Unemployed Women Aged 20-39 = 18,323
$A_m + B_m$ = Total Number of Unemployed Men Aged 20-39 = 89,925
$B_f + C_f$ = Total Number of Active Women Aged 20-39 With Low Education= 5,577
$B_m + C_m$ = Total Number of Active Men Aged 20-39 With Low Education = 106,281
B_f = Active Women With Low Education Who Are Unemployed = 1,208
B_m = Active Men With Low Education Who Are Unemployed = 28,137

$$\frac{B_f}{B_m}\ \frac{\Omega_f}{\Omega_m}\ \frac{(A_m + B_m)\,(B_m + C_m)}{(A_f + B_f)\,(B_f + C_f)} = 0.735$$

The conclusion, therefore, is that economically active women in this age group with low education are less likely to be unemployed than men in similar conditions. This may mean several things. One likely explanation is that women who cannot find employment are more likely than men to withdraw from the labour force entirely. Another possibility is that female employment is more concentrated in low-skill occupations where lack of education is not a major impediment to finding employment.

6. Multivariate and further gender analyses

442. Education is a central variable in the majority of socioeconomic analyses, including most analyses that are

relevant from a gender perspective. The other chapters of this manual contain several examples of analyses in which education comes into play either as an explanatory variable (e.g. to explain female labour force participation) or as a dependent variable (e.g. to explain how disabilities affect the education of boys and girls). Even if education itself is not the focus of interest, multivariate analyses of other issues usually have to be controlled for education, in order to eliminate spurious correlations between other variables. Consequently, this section can be relatively short as many other examples of multivariate analyses involving education can be found elsewhere in this manual.

443. Women's education and family formation. Mother's increased education is correlated with many factors such as lower teen pregnancy, later ages of childbearing, lower fertility, lower rates of marriage in some cases and delayed marriage in others. In Cameroon (Eloudou-Enyegue, 2004), girls drop out of school after becoming pregnant, while in Brazil (Chagas de Almeida and Aquino, 2009) mother's lower education explains her daughter's increased likelihood of teen pregnancy. Using census data over thirty years in the US, Bianchi and Spain (1986) show increased education is associated with the rise in age of first marriage, decline in fertility and increased labour market participation overall. These studies point to several tabulations using census data as enumerated just below. In all of these studies, educational attainment is an independent variable that shapes an outcome or

dependent variable, such as age of marriage, teen pregnancy, fertility, or labour market participation.

444. A tabulation that is normally not included in the standard census publications, but that can be generated with relatively little effort is the distribution of educational levels of husbands and wives in households where both are present. Table 42 provides an example of this for the case of the Cambodian census of 2008. The table can be further analysed by computing relative numbers, to see if the education of wives is significantly different from that of their partners and how that varies by headship. Such an analysis reveals that in about half of the cases the husband and wife have the same level of education and that in about three quarters of the cases where educational levels are different the difference is in favour of the husband. This situation is slightly more favourable for wives in households with female headship, but the difference with male-headed households is not large. One of the reasons why such differences are of interest is that, at least in the Asian context, it is thought that households where wives have higher education than their husbands are more prone to divorces. That relationship, however, cannot be analysed using only census data.

Table 42: Cambodia (2008) – Educational level of husbands and wives in households with both present

Male Head	Education of wife					
Education husband	No Education	Incomplete Primary	Complete Primary	Lower Secondary	Secondary/ Technical	Beyond Secondary
No Educ	295,696	66,855	16,606	5,546	89	118
Inc. Prim.	208,886	407,101	68,981	17,758	307	469
Comp. Prim.	103,297	200,057	154,548	31,314	468	873
Lower Sec.	51,249	90,178	84,564	99,350	1,321	2,094
Sec./Tech.	1,113	3,383	4,123	5,697	2,540	351
Beyond Sec.	2,007	6,172	8,042	12,206	1,671	8,415
Female Head	Education of wife					
Education Husband	No Education	Incomplete Primary	Complete Primary	Lower Secondary	Secondary/ Technical	Beyond Secondary
No Educ.	25,385	6,705	1,939	790	13	26
Inc. Prim.	16,725	31,444	6,406	1,818	43	54
Comp. Prim.	8,512	14,104	11,128	2,753	59	96
Lower Sec.	4,040	6,600	5,223	6,865	136	228
Sec./Tech.	108	275	274	298	216	41
Beyond Sec.	147	408	520	685	96	646

Source: Computed based on REDATAM data base, ECLAC/CELADE

445. A rather different situation is found in the case of Mongolia where there has been a growing imbalance in favour of women, especially at the specialized secondary and tertiary levels, due in part to the fact that young men in rural areas tend to take care of the farms whereas young women are encouraged to go to the city to obtain an education. In just over two thirds of the cases, husbands and wives have the same level of education. But in 20.8 per cent of the households the wife has more education than the husband, whereas the opposite is true in only 11.4 per cent of the households. Note that this only covers the households that have both a husband and a wife. There

is increasing concern in the country that many women with higher education may not find husbands and consequently live without a partner.

Table 43: Mongolia (2010) – Educational level of husbands and wives in households with both present

	Education of wife			
Education husband	Not Educated	Secondary	Vocational	Tertiary
Not Educated	5,594	10,922	708	407
Secondary	6,725	225,604	31,792	41,575
Vocational	348	19,607	18,314	11,496
Tertiary	93	15,009	11,467	66,656

Source: Based on Census Monograph 6 of the 2010 Census of Mongolia, Table 3.3

446. Maternal education and child health. Correlations exist between maternal education and markers of child health – such as infant mortality and immunization status – yet a causal relationship is not firmly established. Desai and Alva (1998) explain that mother's education acts as a proxy for the economic level of the family and geographic area of residence. In their multivariate analysis, they find that the education effect on infant mortality is lessened when husband's education, access to piped water and toilet are included as control variables. However, they find that maternal education remains statistically significant as a predictor of children's immunization status, net of control variables. Similarly, Hobcraft (1993) finds that more educated women are likely to have initiated

immunization and have completed vaccination of their children, compared with less educated women. In this way, the health benefit of increased maternal education for children's improved health or reduced mortality seems to be mediated through the household's economic status and possibly immunizations. These studies suggest that NSOs can monitor the effect of maternal education on children's health status over time.

447. Another study using data from India (Kravdal, 2004), displays that the average education of women in a census numeration area has a strong impact on child mortality, independently of the effect of the mother's own education. This finding speaks to a community education effect, similar to a mother's individual education, which translates into the use of maternity and other preventive health services, increased child's nutrition and effective care of a sick child by the mother. This finding builds on earlier research establishing a negative relationship between increased mother's education and decreased child mortality in Latin America (Haines and Avery, 1978), Africa (Caldwell, 1979) and Asia (Cochrane, 1980). The strength of the study from India is that it augments regional survey data with census data, and as a result is able to test for the relative effects of women's education at both the individual and community levels. Bourne and Walker (1991) show for the case of India that, while increased education of mothers generally favours child survival, the effect is larger for girls than for boys.

7. Interpretation, Policy and Advocacy

448. Awareness campaigns – such as billboards, radio and television – could be used to sensitize the population about girls' school enrollment in geographic areas where girls are not enrolled in the same numbers as boys. Development strategies focused on keeping girls in school need to address the diverse constraints (e.g. fetching water and gathering wood in many rural areas) that push parents to take out their daughters out of school. If development strategies can alleviate women's work burden, through access to labour saving equipment, then girls' educational prospects stand to improve.

CHAPTER 10

Work, Economic Activities and Employment Benefits

1. What is it?

449. Work is generally subdivided into three broad categories: paid employment (e.g. self-employment in income generating activities and wage labour), unpaid employment that contributes to market activity (e.g. work in family businesses, including on farms), and unpaid work that contributes to the maintaining of households. Most indicators that measure employment focus on the first two categories.

450. Labour force participation refers to the portion of a country's working-age population that engages actively in the labour market, either by working or looking for work; it provides an indication of the relative size of the supply of labour available to engage in the production of goods and services. The breakdown of the labour force by sex and age group gives a profile of the distribution of the economically active population within a country. The labour force participation rate is calculated by expressing the number of persons in the labour force as a percentage of the working-age population. The working-age

population is the population above a certain age – ideally aged 15 and older – prescribed for the measurement of economic characteristics. The population census directly collects data on the economic activities and characteristics of individuals in the areas of employment status, type of work, and the sources and/or amounts of income received by individuals and/or households (United Nations, 2008 a) and from those data, estimates of the size of labour force, as well as participation rates, can be calculated. The labour force is divided into employed and unemployed workers, but persons not actively looking for employment are not part of it, which is a situation that disproportionally affects women. The official ILO definition of employment includes unpaid labour provided to family businesses and agriculture, but excludes household labour, which is why it tends to significantly undercount the contributions of women.

451. The economically active population, or equivalently the labour force, is made up of all persons above the minimum age specified, generally 15 years of age or older, who report being available to furnish the supply of labour for the production of goods and services during a short reference period (e.g. one week, one day). The economically active population can be categorized into two groups: employed and unemployed.

- Employed comprises all persons of a specified age, generally 15 and over, who work for pay, profit or family gain in cash or kind or who do nonpaid

work for a family business or farm. If persons are temporarily absent during the reference period, they are considered to be employed.

- Unemployed comprises all individuals above a specified age, generally 15, who do not work, are available for work, and who actively sought work during the reference period.

452. The group, inactive or not currently active persons or persons not in the labour force, is a residual category, comprised of persons, generally over the age of 15, who do not fit the categories of employed or unemployed during the reference period. A person may be economically inactive due to participation in formal education or training, engagement in household duties, retirement illness, infirmity or disablity. Women are more likely than men to fall into this category, as they typically produce services – such as preparing and serving meals or caring for children, the sick and elderly within a household – that are consumed by the household. Women, therefore, are often categorized as 'inactive', not because they are not working, but because their work contributes to household production, and these contributions generally go unrecognized in official statistics.

453. Industry categorizes the employed in terms of their employer's main economic activity. It is recommended to collect information on industry in accordance with the most recent revision of the International Standard Industrial Classification of All Economic Activities

(ISIC) (United Nations, 2008 a). Ten broad categories have been defined in the ISIC (agriculture and related activities, mining, manufacturing, various utilities, construction, sales and real estate services, transport and communication, financial and other business related services and other occupations that do not fit any of the above), but more detailed two and three digit codes are also defined. The ISIC code associated with an individual does not necessarily correspond with the person's profession. For example a person who is an accountant may work for a firm that manufactures food products.

454. Some differences by sex are observed in terms of the types of industries that tend to employ men and women, but there is considerable variation in general patterns depending on the region. According to a recent ILO publication (2010), globally men are somewhat more likely to be employed in the agricultural and industrial sectors, while women are more likely to be employed in the service industry, but in South Asia agriculture is far more important as a source of employment for women, while in the Middle East the service sector is a more important employer of men. When more detailed levels of disaggregation are examined, women are found to be particularly underrepresented in the fishing, mining, transportation, and construction industries and overrepresented in the education, health hotel and restaurant service industries, as well as in domestic employment.

455. Occupation is defined as the type of work in which an employed persons is engaged. It is recommended that NSOs collect information on occupation in accordance with the latest revision available of the International Standard Classification of Occupations (ISCO) at the following URL: http://www.ilo.org/public/english/bureau/stat/isco/index.htm (ILO, 2010). The level of detail in ISCO classifications ranges from single digit codes, which are broad categories such as "Clerical support workers" (category 4), to highly detailed four digit classifications such as "Data entry clerks," (4132). The ten broad categories includeArmed forces , managers, professionals, technicians and associate professionals, clerical support workers, service and sales workers, skilled agricultural, forestry and fishery workers, craft and related trades workers, plant and machine operators, and assemblers, and finally elementary occupations. Most countries collect ISCO data at least at the 2 digit level of detail in their census. ISCO data are extremely useful in terms of determining the degree of occupational segregation that exists in a particular country.

456. Informal employment refers to persons who are employed in a reference period and do not receive the types of protection offered to formal sector workers. In defining informal employment the ILO now distinguishes between informality on the bases of production units and informality on the basis of job descriptions. The previous focus, where only workers employed in the

informal sector were included, led to an underestimate of the level of informality in many countries, workers who are employed by formal sector firms, but who are unable to claim the benefits afforded to formal sector workers, were not included. More than one-half of the economically active population in most low-income countries is in informal employment, and this problem is also present in middle- and high-income countries (ILO, 2005). The United Nations (United Nations/ILO, 2010) provides a more detailed discussion of the distinction between informal employment and the informal sector, as well as examples of survey questions that aim to capture these differences. Although some of these questions (about the concepts listed below) are also customarily asked in censuses, several of the others are not, so a full assessment of informality is usually not possible based only on census data.

457. Status in employment describes the type of economic risk and authority that workers have in their jobs, as reflected in their explicit or implicit contract of employment.. It is recommended that the economically active population be classified by employment status into the following groups: 1) Employees; 2) Employers; 3) Own-account workers; 4) Contributing family workers; 5) Members of producers' cooperatives; and 6) Persons not classifiable by status. A recent ILO report (2010) suggests that while women and men are almost equally likely to be employed as wage laborers globally, women

tend to be overrepresented among contributing family members and underrepresented among employers and own-account workers. Again though there is considerable variation by region, with the majority of South Asian women being employed as contributing family workers, while in Subsaharan Africa, women's rates of employment as own account workers are almost the same as men's.

458. Time worked is a measure that typically asks the number of hours or days per week employed persons work. The UN recommends that the question asks about actual work time during the reference period, but some censuses ask about 'usual' work hours. And while some countries ask how many hours a person works during one particular day, others ask how many days a person works in a particular week. Time worked includes actual time spent producing goods and services, time spent in repairs and on short breaks, within regular working hours, as well as overtime, during the reference period adopted for economic activity in the census. It is recommended that the reference period is short, for example, the week preceding the census. If the reference period is long, for example, the 12 months preceding the census, time worked should be measured in larger units such as weeks. If a person has more than one job during the reference period, it is recommended to record total time worked from all jobs.

459. Full-time and part-time are defined as follows:

- The definition of full-time work varies by country.

In some countries full time work is defined in terms of number of days (five or six), while in others it is defined in terms of numbers of hours (often between 35 and 40 hours).

- Part-time work is defined as working fewer hours than whatever the national definition of full time work is.

Distinguishing between full and part-time work is important because generally part-time workers are considerably disadvantaged from the perspective of employment benefits. Many are ineligible for pension benefits, paid vacation, sick leave and parental leave, for example. Additionally while some workers may prefer to work part time, others may involuntarily be working fewer hours than desired, which has implications for total income as well.

460. Part-time employment is much more common among women than among men globally, with the prevalence rate for women exceeding twice that for men in about three quarters of the countries (United Nations, 2010 a). These higher participation rates of women in part-time work are due in part to cultural assumptions that generally assign women the task of taking primary responsibility for a broad array of unpaid family related labour responsibilities. Women may choose part–time work, in order to be able to effectively juggle their unpaid responsibilities, but these choices are heavily shaped by structural factors, such as the availability of affordable,

quality child care. Working part time not only limits women's access to employment related benefits, but also affects their wage trajectories and the types of employment they can obtain since some type of work are less conducive to part time employment.

461. The institutional sector of employment describes the legal organization and primary functions, behaviour and objectives of the enterprise that are associated with a job as defined by the System of National Accounts (SNA) as the following categories: 1) corporation, 2) general government, 3) non-profit institutions serving households (e.g. churches, cultural and sports clubs and charitable institutions), and 4) households. Examining these variables in census surveys may be useful for identifying the degree to which women are dependent on public sector. Important differences in terms of women's ability to obtain benefits may also be tied to their work in certain sectors, particularly work in households.

462. Place of work is the location of an employed person's main job and typically takes the following categories: 1) work at home, 2) no fixed place of work, and 3) with a fixed place of work outside the home. However, the place of work categories may differ by nation determined by local relevancy (e.g. categories for Serbia include 1) at home, 2) on the farm, 3) no fixed place of work, 4) abroad, and 5) fixed place outside the home). In the 2011 census of Albania, 2) and 5) were merged and 4)

was disaggregated to identify neighbouring countries. Mauritius (2011) distinguishes between those working at a fixed place outside the home, those without a fixed place of work, those working at home and those working outside the country. Switzerland (2010) distinguishes between those working from home, at a fixed place of work and those working at varying locations. The Costa Rican census actually tries to establish how far away the place of work is from the home.

463. Statistics on the economic characteristics of employed, unemployed and inactive persons gathered in the population census can be used in combination with other demographic and social factors (e.g. education, household and dwelling information) to construct a comprehensive picture of employment patterns with an emphasis on differences by sex. Economic data gathered in the population census also provide baseline information from which survey and administrative data can be related and evaluated.

464. The Principles and Recommendations for Population and Housing Censuses, Rev. 2 (2008 a) do not provide specific recommendations on gathering and analysing data on social security, yet several countries gather data relating to employment, receipt of social security, contributions to social security, and health insurance coverage. Of the 99 countries examined within the most recent, long form census round (2005-14), 55.6 per cent ask

whether respondents are currently working or employed, 13 per cent ask about receipt of social security, 4 per cent ask about contributions to social security, and 12.1 per cent ask whether the respondents have health insurance.

2. Why is it important?

465. The Convention on the Elimination of Discrimination Against Women (CEDAW) (1979) protects women's access to work. Most countries have ratified CEDAW. In addition, the Beijing Platform (i.e. Fourth World Conference on Women) (United Nations, 1995) issued a commitment for women's full economic independence specifically through employment and access to productive resources and opportunities, as well as through the coordination of work and family responsibilities for women and men. Further, the Millennium Declaration linked full and productive employment and decent work for both women and men as a necessary step to promote economic development and do away with poverty and hunger, thus linking it to the achievement of MDG 1.

466. There is a marked difference, 25 percentage points, in the global labour force participation rate between men and women in 2010; 77 per cent of men participate in the labour force compared with 52 per cent of women (United Nations, 2010 a). In addition to this large gap in participation, which has persisted for 20 years, there is considerable occupational segregation (see par. 414)

and a gender wage gap that persists in all regions of the world. Women often are employed in informal economic activities, (United Nations, 2010 a). This difference in sectors of employment can account for much of the income inequality between men and women. For example, in some countries, e.g. in Central America, Colombia and Venezuela, average salaries (i.e. formal sector) for women are the same or even higher than those for men, but non-salary incomes are substantially lower, due to the informal natural of much of the work carried out by women (ECLAC, 2011). Beyond sector differences on how women and men are engaged, there remains a need to examine the different conditions of employment for women and men. Working from home may allow women who would not otherwise have the opportunity to be employed to exercise an economic activity, but if more women work from home than men, it can reinforce the marginalization and devaluation of female work (Chant and Pedwell, 2008).

467. Furthermore, although the social security concept is not intrinsically linked to work or employment, many social security systems in the world are organized around employment. Of persons over age 65 in high-income countries 75 per cent receive pension benefits, while this compares with less than 20 per cent of those in low-income countries receiving such benefits (ILO, 2010 b). Being or having been employed, usually only in the formal sector, is often a precondition for becoming eligible

for benefits, particularly when it comes to old age support and unemployment benefits, both of which are frequently a function of previous employment. Women not employed in paid work are often eligible to receive a percent of her husband's pension, upon his death. Typically, employment in the formal sector is also the precondition for maternity benefits. Some countries (New Zealand, Namibia, several European countries), however, have a flat-rate minimum old age pension benefit based on the number of years of residence in the country, rather than the number of years worked. And a number of countries also have universal health coverage that is not linked to employment.

468. Social security protection mechanisms are important for women not only because of their lower rates of employment, but also because women are more likely than men to live longer. Women though are less likely to be directly eligible for benefits, because of lower rates of participation and because their participation is more likely to be interrupted compared to men. The latter may result in lower benefits during retirement, especially in systems with a tight link between contributions and benefits (Ståhlberg et al., 2008). In many countries, women whose spouses worked in the formal sector can receive on survivor benefits, but such benefits are not extended to the many men and women who are employed outside of the formal sector. Women across the world also on average earn less than men and spend more time out of

the work force due to caregiving responsibilities, which results in "gaps" in their earnings histories.

469. After the birth of a child, family leave is another important social protection for both parents, as well as the child, to assure that women and men can combine paid and unpaid economic responsibilities, and to assure in particular that women can return to work after giving birth. Retired women generally have less access to other sources of income, such as pensions, assets and earnings, and hence rely on social security more than men to avoid poverty in older age (Hayes, Hartmann and Lee, 2010). As a result of women marrying older spouses and living longer than men, they are more likely to be widowed and then must rely on old-age pensions and social security payments for longer periods than men. Women are also more likely to deplete their financial resources caring for a spouse. In all, these demographic patterns may place women in a vulnerable economic situation (Hayes, Hartmann and Lee, 2010).

470. For more information on the different conventions regarding labour and social protection, the reader is referred to the following ILO documents:

- Convention C111—Discrimination (Employment and Occupation) Convention, 1958 (No. 111): 172 ratifications;
- Convention C100—Equal Remuneration Convention, 1951 (No. 100): 171 ratifications;

- Convention C156—Workers with Family Responsibilities Convention, 1981 (No. 156):43 ratifications;
- Convention C175—Part-Time Work Convention, 1994 (No. 175): 15 ratifications;
- Convention C177—Home Work Convention, 1996 (No. 177);
- Convention C183—Maternity Protection Convention, 2000 (No. 183): 28 ratifications.

3. Data issues

471. The visibility of women's productive work is often masked because of biases in the collection, processing, compilation and tabulation of these data. Gender biases can be introduced in assigning males and females to categories such as "own account worker" and "unpaid family worker". For example, if a woman is independently producing yarn and her husband weaves that into cloth, he is usually counted as an own account worker and she as his helper, even though both meet the definition of own account worker.

472. Comparisons between the incomes of men and women are sometimes made in weekly or monthly terms, without considering that part-time work is more common among women. This is not a problem when discussing women's increased vulnerability due to higher unpaid work responsibilities that lead to an inability to earn. However, in order to make meaningful comparisons

to determine if there is wage discrimination, wages have to be computed on the basis of the number of hours worked. Because income is typically more easily gathered in a sample survey of households, depending on the national requirements countries may ask limited information on cash income. To the extent that censuses ask for individual income information (and many don't), it is generally not specified by hours worked. Income from sources such as self-employment, property income and non-cash or in kind income can be difficult to collect in population censuses.

473. Even though the Principles and Recommendations do not make specific recommendations on the analysis of data relating to social security as defined by the ILO, many countries gather these data (e.g. currently working or employed, receipt of social security, contributions to social security, and health insurance coverage). A question to capture maternity benefit or loss of work after the birth of a child may provide a useful measure of women's status within a country. If this question is repeated longitudinally, cohorts can be followed over time. Alternatively, cohorts of women by age and by number of children including the last birth could be constructed with data from one census administration to examine loss of work due to the birth of a child or a critical number of children.

4. Tabulations

474. The Principles and Recommendations suggest several tabulations to describe how persons' work and economic lives may be shaped differently by gender. The usual or current activity status is the basis for these tabulations, yet the activity rates used to monitor labour force participation exclude unpaid work, hence, women's labour force participation is lower and women's economic contributions are underestimated compared with that of men, at all stages of the life cycle.

- Population ... years of age and over, by usual (or current) activity status, educational attainment, age and sex
- Usually (or currently) active population by activity status, main occupation, age and sex
- Usually (or currently) active population by activity status, main industry, age and sex
- Usually (or currently) active population by activity status, main status inemployment, age and sex
- Usually (or currently) active population by activity status, main status inemployment, main industry and sex
- Usually (or currently) active population by activity status, main status inemployment, main occupation and sex
- Usually (or currently) active population by activity status, main industry, main occupation and sex
- Population not usually (or currently) active, by

functional categories, age and sex

475. As discussed above, employment data disaggregated by sex often reveals the extent to which women's and men's employment rates differ, with women almost universally being less engaged in 'employment.' Additional tabulations can be used to explore the degree to which the gap in labour market participation by sex can be further disaggregated by levels of education. A further exploration of the data that could shed light on gender norms would examine whether women and men with similar levels of educational attainment are represented in the same occupations or industries at similar rates? Are women and men at similar levels of educational attainment represented in the same functional categories (e.g. management, factory line) within work organizations? Some gaps in labour market participation may be the result of women being less educated compared with men, and additionally, there may be institutional (maternity leave, child care, transportation laws limiting women's work) and/or cultural reasons (e.g. discrimination, social norms,) that limit women's participation at the same rate as of men.

476. Apart from tabulations on the economically active population, valuable insights may also be obtained from the disaggregation of the economically inactive population, by reason of inactivity. The following table was obtained from the 2009 census of Belarus, which can be analyzed on-line through PC-AXIS:

Table 44: Belarus (2009) – Number of inactive men and women with higher education, by category

Students	2,350	3,115
Awaiting the start of the working season	2,134	764
Retired	93,110	148,033
Leading household, caring for children and other family	2,242	36,464
Health problems	9,178	9,329
Has given up finding work	1,067	974
No need or desire to work	4,504	5,466
Seeking work, but unable to start in next 2 weeks	1,360	1,478
Other	2,221	3,255
Two or more reasons	331	570
No reason stated	695	1,545

Source: On-line census tabulation system of the census of Belarus (2009)

477. The objective of this table might be to express how much highly qualified male and female labour is not being used and why. As it turns out, most of it is because of retirement, with female retirees exceeding male retirees by more than 50 per cent. This situation may be somewhat particular to Belarus, where female labour force participation and higher education have historically been quite high. The other major category where men and women differ is that of women who are staying at home, despite the fact that they have a higher education, a situation that is uncommon in men. The other categories are less important and display smaller gender differences.

478. Additional tabulations may also be of interest in order to shed light on differences in male and female labour force participation. Two factors that are traditionally considered to be important determinants of female

labour force participation are education and fertility, i.e. the need to care for dependent children. However, there may also be important cultural factors that make it difficult for women to work outside the home. The 2006 census of Iran provides an example. Even though the educational attainment of women in Iran has increased significantly, to the point where there are now more 25-29 year old female university graduates (14.0 per cent) than male university graduates (12.1 per cent), female labour force participation continues low. Table 45 shows the percentage of working men and women by some socioeconomic characteristics.

Table 45: Iran (2006) – Percentage of men and women aged 20-59 working, by level of education and selected other characteristics

	Less than Primary	Primary	Secondary	University
All men	85.3	82.1	69.4	82.4
All women	8.0	7.5	11.8	51.2
Women who never had children	11.6	9.6	12.0	44.6
Urban women who never had children	12.7	10.8	11.6	43.4

Source: Based on the 10 per cent sample of the 2006 census of Iran, processed on-line using the IPUMS on-line tabulator

479. Table 45 shows that education is a major determinant of female labour force participation. Yet, it is remarkable that in no category, even among university-educated women, the percentage of working women rises significantly over 50 per cent. In particular, it is noteworthy that university-educated women who never had children, even in urban areas, are less likely to work than women who

did have children. This suggests the need to further disaggregate the data, in order to determine how age, level of household income, location, and marital status also play a role in shaping women's employment outcomes. .

480. A few censuses, such as the Australian and Canadian censuses of 2006 and the Korean censuses of 2005 and 2010, have specific questions on care-giving activities, including child care. The 2005 census of the Republic of Korea established, for instance, that 5.4 per cent of children between ages 0 and 12 are cared for by their grandparents during the daytime. Australia asked questions on unpaid domestic work carried out and care given to family members or others because of disability, a long term illness or problems related to age. With respect to child care, it asked: "In the last two weeks did the person spend time looking after a child, without pay? The data results, which were computed at the national level and excluding cases where the information was not stated or not applicable, were as follows:

Table 46: Australia (2006)—Percentage of men and women who spent time providing unpaid child care

Type of unpaid child care provided	Men	Women
Own child(ren)	19.7	22.9
Other child(ren)	5.3	10.0
Both own and other	0.6	1.6

Source: Australian Bureau of Statistics CDATA Online (2006 Census)

These data actually reveal that although women are more likely to be involved in the provision of unpaid children care, in Australia at least, a substantial number of men also contribute to the provision of care labour, although it is not clear whether in terms of total hours, men's contributions were as substantial as women's.

481. Some potential tabulations with a gendered perspective regarding social security include:

a. Participation in the labour market of persons 65 years and over, by sex and age (in five-year increments);
b. Social security or old-age pension receipt of persons 65 years and over, by sex and age (in five-year increments);
c. Health insurance receipt of persons 65 years and over, by sex and age (in five-year increments);
d. Contributions to social security or an old-age pension of persons 15 years and over, by sex and five-year increments of age; and
e. Health insurance status of persons 15 years and over, by sex and five-year increments of age.

482. Additional factors, such as race, ethnicity, marital status or rural/urban status, may also be relevant dependent on the composition of the national population and should be added to the above tabulations when relevant. Table 47 is an example from the South African census of 2007 which illustrates how women are under- or over-represented in different occupations, according to the

type of industry and the occupational category. Women are generally under-

Table 47: South Africa (2007) – Index of femininity (100*women/men) of workers in main occupational categories, by industry

	1 Legislators, senior officials and managers	2 Professionals	3 Technicians and associate professionals	4 Clerks	5 Service workers and shop/market sales	6-7 Skilled crafts or trades workers	8 Plant/machine operators and assemblers	9 Elementary occupations	10+ Other or Unknown
Agriculture, fishing, and forestry	42.2	76.6	52.8	143.8	69.1	55.9	10.7	101.7	76.5
Mining	14.4	16.2	21.4	55.6	13.1	4.9	2.3	9.8	7.6
Manufacturing	50.9	62.2	53.0	152.2	61.0	29.9	18.0	86.9	51.5
Electricity, gas and water	37.6	58.8	41.7	174.4	29.4	9.6	9.3	36.3	43.5
Construction	22.2	31.7	34.8	142.6	34.9	4.6	5.4	25.4	19.8
Wholesale and retail trade	64.9	83.2	72.9	233.0	78.4	35.7	23.4	121.1	81.3
Hotels and restaurants	102.7	101.0	88.1	246.7	144.7	56.7	29.8	217.1	115.4
Transportation and communications	41.1	74.8	57.1	101.3	76.1	18.1	4.7	73.9	54.7
Financial services and insurance	121.4	110.1	99.7	241.5	33.2	42.3	24.2	226.9	139.0
Public administration and defense	48.7	89.8	41.5	209.2	27.5	15.8	7.2	69.7	38.7
Real estate and business services	81.1	69.9	109.5	320.3	53.7	36.7	11.6	102.8	69.5
Education	137.0	220.2	186.7	394.5	197.6	44.6	9.4	142.7	181.0
Health and social work	159.9	370.4	181.3	314.8	313.8	67.9	25.9	295.3	231.2
Other services	59.7	69.5	62.6	270.6	37.9	34.7	24.2	151.7	67.0
Private household services	90.1	73.6	98.9	184.8	224.0	28.8	38.9	595.0	186.6
Unknown	63.1	109.0	69.9	244.1	65.9	38.2	15.3	128.9	96.7

Source: Based on the 10 per cent sample of the 2007 census of South Africa, processed on-line using the IPUMS on-line tabulator

represented in mining and in construction. However, even in construction, the majority of clerks and office-workers

are women. Women are over-represented in education and in health and social work. However, even in these sectors, the majority of skilled crafts or trades workers and machine operators (to the extent that there are any) tend to be men. A category of special interest is that of senior officials and managers, where women tend to be less represented than in other occupational categories of the same sector. Even in education and health and social work, where the majority of senior officials and managers are women, their presence in these occupational categories is lower than in other occupational categories of the same sectors.

5. Indicators

483. Of the labour force-related Minimum Set of Gender Indicators approved by the Statistical Commission in February of 2012, the following can be computed from census data:

- Labour force participation rates for persons aged 15-24 and 15+, by sex;
- Proportion of employed who are own-account workers, by sex;
- Proportion of employed who are working as contributing family workers, by sex;
- Proportion of employed who are employers, by sex;
- Percentage distribution of employed population by sector, each sex;

- Informal employment as a percentage of total non-agricultural employment, by sex;
- Youth unemployment, by sex;
- Proportion of employed working part-time, by sex (if the number of hours worked is asked);
- Employment rate of persons aged 25-49 with a child under 3 living in a household and with no children living in the household, by sex;
- Women's share of managerial positions;
- Percentage of female police officers;
- Percentage of female judges.

The latter three may be more or less feasible, depending on the amount of detail with which data on occupation and position in the occupation are collected.

484. The following indicators from the same set are usually not computable with census data

- Average number of hours spent on unpaid domestic work, by sex (separate housework and child care if possible);
- Average number of hours spent on paid and unpaid work combined (total work burden), by sex;
- Percentage of firms owned by women;
- Proportion of children under age 3 in formal care.

485. A gendered analysis of the factors related to paid and unpaid work begins with the core topic areas that describe persons' economic situations, and then considers

how these may vary in a systematic manner across men and women in the population. This section outlines several indicators that may be useful to measure and describe persons' economic situations.

a. **Unemployment rate for women and men**. To calculate the unemployment rate, the economically active population is divided into employed and unemployed population, and the unemployment rate is the percentage among the economically active who are not employed. Women's participation in employment increases their contribution to household income and their control over the allocation of those resources. This leads to greater economic independence and self-determination, which are both important for women's empowerment. In the vast majority of countries, adult unemployment is higher among women compared to men, with important regional differences, even without taking into account that many unemployed women are classified as not economically active. Unemployment is also prevalent among the youth population, especially young women. Northern Africa had the highest gap – seven points – between women's and men's employment rate overall in 2007, and had a gap of 12 points across young men and women (United Nations, 2010 a). Finland, on the other hand, reported that its register-based census of 2010 had found that in 2009, for the first time, the employment rate of women exceeded that of men. The economic downturn of 2009 mainly affected export industries and brought men's employment down more than women's. The occupational structures among women and men differ from each other, so that the

majority of women work in the public or services sector, which are less vulnerable to economic trends (UNECE, 2012 c). Larger numbers of unemployed men compared to women were also found in the 2010 censuses of Belarus, the Republic of Moldova, Russian Federation, Tajikistan, and Ukraine (UNECE, 2012 c).

b. Occupation and industry for women and men. The complete analysis of the distributions of women and men by status in employment, occupation (ISCO generally) and economic sector (ISIC) of activity reveal gender differences and economic segregation. Cross-tabulations, for example, of sector of activity and status in employment are necessary to answer questions such as how men and women are distributed across employment status and whether they differ in any way from one branch of activity to another. Anker (1998) for example makes extensive use of census as well as labour force survey data for forty-one countries for 1970, 1980 and 1990 to examine occupational segregation patterns and trends globally. The data obtained from almost all the non-OECD countries included in his study were census data (see Table 47 for a recent example). Using ISCO codes to construct a number of indices (the Duncan index of dissimilarity (ID) and the Marginal Matching index (MM)), he assessed the degree to which occupational segregation by sex was an issue across time and countries of differing levels of development and regions of the world. Occupational segregation existed in all forty-one countries included in the study, although there was also considerable variation across countries. For example his results suggest similar rates of occupational segregation in Egypt and Costa Rica, but

very different rates between India (low) and Ghana (high). He found no evidence that occupational segregation was correlated with level of occupation, and in fact it was quite noteworthy that the indices for a number of OECD countries were quite high. Anker also carried out sensitivity analysis to examine how robust the measure of segregation was to changes in specification of the indicators. Finally he looked over time and found that some gains have been made in terms of reductions in levels of occupational segregation in recent years.

c. Average hours of employment. One way in which the employment of men and women, as well as different groups of women, may be different is that some women are more likely to obtain part-time employment. The average number of hours worked, when asked in the census, can be compared between women and men, and even analysed by age, occupation, branch of activity, fertility,, marital status, for urban and rural areas and/or for poor and non-poor households. Comparing by occupation or industry for example, can shed light on which industries are most amenable to part time work and whether women tend to be clustered into certain professions or industries because those jobs offer more flexibility. When examined also in conjunction with fertility data, further insights may be made about whether part time work is particularly prevelant among women with multiple and/or young children, who may face more higher unpaid work burden. Comparing older and younger women with and without children may also be helpful, since some studies have shown that women may not only switch from full to part time work after their children are born, but also switch

professions, which can have negative implications for their careers and particularly their wage trajectories. Although it may not be possible to directly track individual women across census surveys, some comparisons of occupational and work hours can be done by examining how part and full time work is related to various other personal characteristics. Clarifying whether poor or non-poor women (and men) are more likely to be involved in part-time employment may also be helpful, in terms of considering how to design social safety nets.

Average hours worked by women in occupation or branch i x 100

Average hours worked by men in occupation or branch i

d. Percentage of women and men in part-time work. Part-time work is one way employed women balance paid work with family responsibilities. In many countries, employed women typically assume most of the responsibility for domestic work.

486. Some useful indicators for gender analyses of social security, some of which may be computable with census data, are:

a. Percentage of female and male beneficiaries, by age appropriate to retired population. In the US, women comprise 57 per cent of all Social Security beneficiaries age 62 and older, and 68 per cent of beneficiaries age 85 and older;

b. Average monthly social security income received by women and men, by appropriate age range;

c. Percentage of economically active women and men protected by social security, by age range;

d. Average years of contribution and average years of benefits, by sex.

6. Multivariate and further gender analyses

487. Occupational Feminization and Pay in the US. A longitudinal study (Levanon, England, and Allison, 2009) using US decennial census data found that occupations with a greater share of females pay less than those with a lower share, even when controlling for education and skill. Therefore, at each level of education and skill level within an occupation where there were more women than men working, the women were paid less than their male counterparts of the same education and skill level. The authors used census data to test two theories about why women's work is paid less. The first theory, a gendered labour queue for certain occupations reasons that employers' preference for men creates the greater propensity of women to be represented in lower paid occupations, while the second theory reasons that it is the proportion of women in the occupation that drives down wages or devalues women's work. They used fixed-effects regression models, which allow the researcher to control for the stable characteristics of occupations over 50 years. Their findings largely support the devaluation view over the queuing view. Similarly, Blackwell and Glover (2008)

use linked census and longitudinal study data to examine women's participation in science, engineering and technology fields. They find that 80 per cent of women in health-related occupations (e.g. nursing) were mothers, compared with only 40 per cent in science, engineering and technology. These results show a connection between occupation and family life choices for women.

488. Labour Force Participation of Married Women in China. Research (Maurer-Fazio, Connelly, Chen and Tang, 2011) using longitudinal population census data from 1982-2000 in China examined married, urban women's labour force participation. The authors found that having a parent, parent-in-law, or person above 75 years old in the household increases women's likelihood of being employed, while having a preschool-age child in the household reduces their likelihood to be employed. These older people in the household may take on some of the unpaid household work that women generally do in China, thus freeing these women of working age up to take paid employment outside the home. When rural-to-urban migrant status is included in the analysis, the negative effect on women's labour force participation of having young children in the household is substantially larger for married, rural-urban migrants than for their non-migrant urban counterparts. These rural-urban migrant women may not have other supports for child care if they are new to the urban area, so they stay at home with their preschool-aged children. Indeed, the study

finds that the positive effect of co-residence with elders is greater for the rural-urban migrant women than for the non-migrants. These rural-urban migrant women are in a position where the kin-based help is likely to live in the same household, whereas non-migrant urban women with elder family members established in the urban area may receive kin-based help from kin who do not live with them. Older women in particular may be called upon to provide assistance in places where female labour force participation is rising. At the same time, not all elderly household members are net contributors to household labour, since they themselves may also need care. Adult women who reside with a parent therefore may find that on the one hand this frees them from unpaid work, or increases their burden. Studies have also shown that girls may be pulled out of school in order to care for younger siblings, which is detrimental to these girls' well-being as well as having long-term development consequences.

489. Agricultural holdings in households, fertility patterns and women's labour force participation as unpaid family workers. In the 2010 census round, several countries, following FAO recommendations, included a question on whether households serve as agricultural production units, with their own plot of land and/or livestock. This opens up some gender-relevant opportunities for analysis, as rural households with their own agricultural holdings are expected to be different from those that do not have such holdings. Women belonging to such households

are expected to have higher labour force participation rates, although almost exclusively as unpaid family workers, almost all male heads of households are expected to have a wife to help them in the production, fertility is expected to be higher, and children are expected to have lower school attendance rates: boys because they need to help on the family holding, girls because they must replace their mothers in household duties. However, in order to verify these relationships, certain statistical controls have to be included. It may be appropriate to control for the socio-economic level of households, for example, by introducing some sort of wealth index based on the quality of the dwelling and the ownership of consumer durables. Moreover, it is probably advisable to control for the presence of other adults, such as grandparents, in the household as these may take over some of the household tasks of spouses (for more details, see FAO/UNFPA, 2012 a).

490. On the basis of the 2010 Aruba Population and Housing Census, two separate analyses were done to look into the occupational status of women and men: a) the type of organization of work and b) the status of employment. For both analyses multinomial logistic regressions were set up. The multinomial logistic regression is the extension of the simple logistic model with a dichotomous dependent variable. The multinomial model allows for a categorical dependent outcome with more than two levels. In the analysis, one of these categories has to be

chosen as a residual (or reference) category, and all other categories of the dependent variable are then compared to this category. The regression coefficients and odds ratios of the predictors in the multinomial regression are equivalent to those of the simple logistic model, i.e. each category of a given predictor is compared to the residual category of that predictor in terms of their probability of occurring.

491. In the Aruban census the following categories of type of work were used: 1) Limited corporation; 2) One-person business; 3) Foundation; 4) General partnership; 5) Association; 6) Government institution; 7) Government company; and 8) Other. In the analysis, categories 'General partnership' and 'Association' were placed in the category' others', as they had very few cases. The reference category for type of work was 'Limited Corporation'.

Table 48: Aruba (2010)—Multinomial logistic regression of type of organization that women work for, compared to men, by various explanatory variables

	Reference category = Limited corporation	One-p. business		Foundation		Govt.dept.		Govt. company		Other	
		B	exp(B)	B	exp(B)	B	exp(B)	B	exp(B)	B	exp(B)
Intercept		-2.124		-4.308		-2.065		-2.779		-3.636	
Age		0.008	1.008	0.026	1.027	0.007	1.007	-0.005	0.995	0.028	1.029
Sex	Male	0.000	.	0.000	.	0.000	.	0.000	.	0.000	.
	Female	-0.318	0.728	1.236	3.441	-0.014	0.986	-0.940	0.391	0.181	1.306
Marital status	Never married	0.000	.	0.000	.	0.000	.	0.000	.	0.000	.
	Married	0.152	1.164	0.046	1.047	0.166	1.180	0.332	1.393	-0.871	0.460
	Divorced/Legally sep.	0.074	1.077	-0.161	0.851	0.145	1.156	-0.013	0.987	-0.637	0.604
	Widowed	0.432	1.540	-0.338	0.713	0.034	1.035	0.351	1.421	-0.513	0.777
Educ. attainment	None	0.000	.	0.000	.	0.000	.	0.000	.	0.000	.
	Primary	0.038	1.039	-0.204	0.816	-0.104	0.901	0.126	1.135	-0.151	1.001
	Lower vocational	-0.100	0.905	0.219	1.245	0.276	1.318	0.770	2.160	-0.397	0.813
	High school (4 - 6 yrs)	-0.169	0.845	-0.079	0.924	0.437	1.548	0.501	1.650	-0.546	0.682
	Higher vocational	-0.256	0.774	1.150	3.157	0.904	2.469	1.373	3.949	-0.612	0.665
	Higher (BA - MA - PhD)	-0.354	0.702	2.289	9.862	1.468	4.339	1.076	2.934	-0.540	0.714
Country of birth	Aruba	0.000	.	0.000	.	0.000	.	0.000	.	0.000	.
	Colombia	0.458	1.580	-2.169	0.114	-2.845	0.058	-3.225	0.040	1.633	5.738
	USA	0.415	1.515	-1.474	0.229	-1.646	0.193	-1.576	0.207	0.919	4.479
	Dominican Republic	0.282	1.326	-1.505	0.222	-2.482	0.084	-2.123	0.120	0.967	3.102
	Venezuela	0.390	1.478	-1.824	0.161	-2.569	0.077	-3.302	0.037	1.095	3.629
	Curaçao	-0.169	0.844	-0.461	0.631	-0.752	0.471	-0.859	0.424	0.221	1.750
	Netherlands	-0.014	0.986	-0.181	0.835	-0.561	0.571	-1.709	0.181	0.354	1.868
	Other	0.124	1.132	-1.172	0.310	-2.240	0.106	-2.272	0.103	1.118	3.452

Source: Population and Housing Census Aruba, 2010

492. Table 48 presents the results of the multinomial logistic regression for type of organization worked for. The results show that, after controlling for age, education, marital status and country of birth, large differences remain between male and females in terms of the type of organization for which they work. Compared to employment in a limited corporation, women are less likely than men to be economically active in a one-person business (odds ratio = 0.728) or in a government company (odds ratio = 0.391). Their chances are almost equal to those of men to find work in government department (odds ratio

= 0.986), but they are much more likely to work for a foundation (odds ratio = 3.441) or the 'other type' (odds ratio = 1.306). Differences between males and females are highest for 'Government Company' and 'Foundation'. On Aruba, utilities (water, gas, electricity…) are placed in government companies. More men than women work here. On the other hand, many of the organizations in public service (elderly homes, health organizations) and education are foundations. On Aruba, jobs in these sectors clearly have a majority of female workers.

493. Table 48 sheds some light on the gender differences in status of employment. Categories for status employment in the analysis are: 1) Employer (3 or more employees), 2) Small independent, 3) Small independent, without employees, 4) Temporary employee deployed by a job agency and 5) Temporary employee, volunteer, non-paid family member. The last category actually consists of three response categories in the census questionnaire. As there were only a small number of cases in these categories, they were brought together.

494. Again the same predictors were chosen. The reference category for status of employment is 'salary earner'. Compared to this reference category, women are less likely than men to be found in any of the other categories of employment status. The differences between men and women are biggest in those categories that involve independent entrepreneurship, i.e. employer (3 or more

employees), small independent, small independent without employees. The odds of being an employer with 3 or more employees are about 2.5 times bigger for males than for females (odds ratio = 0.403). Also, men are about three times more likely than women of being a small independent without employees (odds ratio = 0.339) and twice more likely to be a small independent with one or two employees (odds ratio = 0.512).

Table 49: Aruba (2010)—Multinomial logistic regression of women's status in employment, compared to men, by various explanatory variables

	Reference category – Salary earner	Employer (3 or more employees)		Small independent		Small independent, without employees		Temporary employee deployed by a job agency		Temporary employee, volunteer, unpaid family member	
		B	exp(B)	B	exp(B)	B	exp(B)	B	exp(B)	B	exp(B)
Intercept		-5.982		-5.148		-6.143		-2.080		-1.008	
Age		0.032	1.033	0.025	1.025	0.029	1.030	-0.021	0.980	-0.019	0.981
Sex	Male	0.000	.	0.000	.	0.000	.	0.000	.	0.000	.
	Female	-0.908	0.403	-0.670	0.512	-1.080	0.339	-0.117	0.890	-0.137	0.872
Marital status	Never married	0.000	.	0.000	.	0.000	.	0.000	.	0.000	.
	Married	0.720	2.054	0.756	2.172	0.177	1.194	-0.256	0.774	-0.341	0.711
	Divorced/ Legally sep.	0.386	1.471	0.596	1.815	0.230	1.259	-0.132	0.877	-0.167	0.846
	Widowed	0.863	2.370	0.867	2.379	0.447	1.564	-0.085	0.918	0.190	1.209
Educ. attainment	None	0.000	.	0.000	.	0.000	.	0.000	.	0.000	.
	Primary	0.179	1.196	0.377	1.458	0.056	1.057	-0.392	0.676	-0.262	0.769
	Lower vocational	-0.075	0.928	0.221	1.248	0.045	1.046	-0.711	0.491	-0.531	0.588
	High school (4 - 6 yrs.)	0.729	2.073	0.466	1.594	-0.049	0.952	-0.538	0.584	-0.503	0.605
	Higher vocational	0.619	1.858	0.378	1.460	-0.128	0.880	-0.801	0.449	-0.905	0.404
	Higher (BA - MA - PhD)	1.243	3.466	0.591	1.787	-0.281	0.755	-1.174	0.309	-0.792	0.453
Country of birth	Aruba	0.000	.	0.000	.	0.000	.	0.000	.	0.000	.
	Colombia	-0.024	0.976	0.208	1.232	0.493	1.638	0.393	1.481	0.512	1.668
	USA	1.291	3.638	1.055	2.871	0.670	1.954	0.157	1.170	1.059	2.885
	Dominican Republic	0.217	1.242	0.880	1.083	0.426	1.531	0.488	1.629	0.625	1.869
	Venezuela	0.568	1.764	0.743	2.102	0.512	1.669	0.320	1.377	0.733	2.082
	Curaçao	0.367	1.444	0.382	1.465	0.099	1.104	-0.394	0.674	0.212	1.237
	Netherlands	0.892	2.440	0.624	1.865	0.333	1.396	0.203	1.225	0.448	1.565
	Other	0.832	2.253	0.508	1.663	0.268	1.308	0.125	1.134	0.417	1.516

Source: Population and Housing Census Aruba, 2010

7. Interpretation, Policy and Advocacy

495. Compared to their male counterparts, women participate in the labour market at a lower rate and are represented in higher numbers in less lucrative

occupations and sectors of the economy. This is not a coincidence, but a pattern all over the world, which reflects discriminatory practices in the labour force (i.e. education, selection, promotion, etc.). (Anker, 1998). And, women still earn less than men even after controlling for hours worked, education and skills over 15 years after the Beijing Declaration (United Nations, 1995 b) affirming women's right to employment and productive resources, and the Millennium Declaration's further commitment to full, productive employment for both women and men.

496. Unpaid work mainly carried out by women needs to measured, valued and accounted in the national accounting systems. In this regard, data should be collected in such a way that household and caretaking work, predominantly done by women across countries, is not misclassified and underestimated. Related to this, policies should be enacted that pay women for doing domestic work (e.g. Canada pays an allowance for unpaid and caretaking work and under Iranian law women are supposed to get compensated for their unpaid contributions during a marriage, in the event of divorce) and provide access to daycare to help families manage work and household responsibilities.

497. Advocates should inform policymakers and the general public about the importance of this unpaid work done by women, which in turn allows men to do paid work. Also, advocates can alleviate women's domestic

burden by sensitising the general public to inequalities in the amount of domestic work by sex among those couples where both women and men work in the labour market. Finally, the women's domestic burden may be lightened by providing basic infrastructure (e.g. clean, running water) and labour-saving equipment and technologies (e.g. cooking, grinding and cleaning appliances) accessible to all.

498. The World's Women report (United Nations, 2010 a) found that one-half of the countries worldwide meet the new international standard for minimum duration of maternity leave and that 40 per cent meet the minimum standard for cash benefits, but there remains a gap between statutory law and what is practiced. Many women, in particular those who do not work in the formal or public sectors, are not covered by the legislation. Oun and Trujillo (2005) make the case that where the maternity benefit funds come from is the reason for this inequality towards women. They suggest that payment with public funds or social insurance could reduce this inequality and gap between law and practice. Employers no longer bear the direct costs of maternity. Currently, about one in four countries, especially in Africa, Asia and the Arab States, continue to provide payment during maternity leave through the employer with no public or social security assistance.

CHAPTER 11

Migration

1. What is it?

499. Demographers differentiate between local migration or residential mobility, internal migration, and international migration, all of which entail a change in an individual's usual place of residence lasting at least six or twelve months.

a. Local migration or residential mobility refers to a change of residence, either in the same city or town, or between communities or cities.

b. Internal migration refers to a change of residence within the same country. An internal migrant is a person who moves to a different administrative territory within the same country. This kind of migration is often associated with urbanization (i.e. rural-to urban migration) or with the forced movement of people fleeing violent conflict or natural disaster. In a census, information on internal migration and the place of origin and destination of migrants is derived from cross-classification of variables on past and current residence, such as place of birth, place of previous residence, place of current residence and duration of stay. According to the Principles and Recommendations for Population and Housing Censuses, Rev. 2 (United Nations, 2008 a), "geographical and internal

migration characteristics" include: 1) place of usual residence; 2) place where present at time of census; 3) place of birth; 4) duration of residence; 5) place of previous residence; 6) place of residence at a specified date in the past; 7) total population; 8) locality; and 9) urban and rural. Note that "place of usual residence" and "place where present at time of census" can be alternative topics if countries do not have sufficient resources to investigate both topics.

c. International migration refers to a person crossing an international border. An international migrant is any person who changes his or her country of usual residence. The census topics to be analyzed in this context are: 1) country of birth; 2) citizenship; and 3) year or period of arrival (United Nations, 2009 c). Most international migrants, nearly 90 per cent, move for employment reasons (ILO, 2007: 4), be it as workers or as dependent family members of a labour migrant. "Migrant workers" are defined as those who are engaged or have been engaged in a remunerated activity in a state of which they are not a national. Migrants and members of their families are protected by international law under the Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families (CMW). However, the convention counts only 35 signatories and 46 parties that ratified it. International migration is analyzed primarily through the proxy of foreign-born populations or, when this is not available, through foreign populations (i.e. non-citizens residing in the country). Some censuses also include information on emigrants such as number of household members living abroad, sex/age of departed and amount of remittances sent back to the country of origin.

500. However, these categories do not capture the many complex and gendered features of population movements in the 21st century, especially in developing countries, where motives for migration differ vastly, and temporary moves have gained great social significance. The research literature includes other types of migration, such as internal and international, transitory, circular and permanent, regular (conforming to legal requirements) and irregular, and voluntary and forced (such as human trafficking, conflict-induced or climate migration). Due to the kinds of questions asked, censuses are most useful for traditional analyses in terms of internal and international migration.

501. Gender is a key component in shaping migrants' experiences and social realities. Women and men may migrate for different reasons – employment, education, marriage, human trafficking, etc. – that are related to gender and lead to different social outcomes for women and men. Migration laws affect women and men differently, and their social and economic realities as migrants may also differ greatly (Docquier et al., 2007). Recent research suggests that female and male migrants also make different social contributions to their host and home countries, for instance in terms of remittances (Semyonov and Gorodzeisky, 2005; Worldbank, 2006).

2. Why is it important?

502. Today, more people live outside their country of origin than at any time in history. The UN (2010) estimates that there are 214 million international migrants in the world. This means that a substantial percentage, 3.1 per cent of the world's 7 billion persons, live outside their country of birth. The 2009 Human Development Report (UNDP, 2009) makes the case that migration is a key element of human freedom. Additionally, it is effective in improving the income, education and participation of individuals, as well as enhancing their children's future prospects.

503. Migration is an issue of great concern in human rights treaties and has played an important role in development policy agendas. Guarantee of all basic human rights to all migrants – regardless of regular or irregular status in the receiving country – is one of the key elements in the International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families as well as one of 15 principles of the ICPD Programme of Action. It has been recognized that, although every nation has the right to decide who can enter and stay in the territory, such right should be exercised in the absence of discriminatory actions and policies, when it comes to ensuring equal pay for equal work or accessing health and education services (i.e. see ICPD Programme of Action, Section X).

504. Migration is one of three standard variables for demographic analysis; "data on internal and international migration, together with fertility and mortality, are needed to prepare population estimates for planning purposes and for determining policies on migration and assessing their effectiveness" (UN 2009, para. 3.69). It has long been the missing component in discussions of the demographic transition in Western Europe in the 19th century, asking for instance whether the decline of the birth rates in Europe would have been faster in the absence of substantial migration to the United States and elsewhere.

505. From a human rights perspective, a person's status as migrant in a country is sometimes associated with human rights violations and other forms of discrimination that exacerbate existing gender inequalities. Where women and girls are seen as vulnerable groups, migrant women and girls can be regarded as bearing a double burden. Specific vulnerabilities of migrant women and girls include:

a. Violation of personal integrity and basic rights such as access to education and health
b. Dependence upon male family members, employers or others and lack of collective organization (e.g. trade unions), leading to low levels of empowerment and high risk of exploitation, physical and

sexual abuse, gender-based violence and human trafficking (ICPD, 1994; IOM, 2005; Omelaniuk, 2002);

c. Loss of status, discrimination and low occupational mobility, which translates into difficulty accessing jobs with education and training of their home country;

d. Isolation and lack of social and cultural connection with their home lands;

e. Invisibility on statistics and policy-making.

506. Female migrants are a numerically important group; almost half of all international migrants globally are women and girls. While in the 1960s, women comprised 46.8 per cent of the world's migrants, this percentage rose to 49.4 per cent by 2000 (UN-DESA 2009), leading some researchers to talk of a feminisation of migration (see Castles and Miller, 1993). There are however significant regional differences. With young women and girls under-represented among migrants, especially in developed countries, "the preponderance of women in the overall migrant population is the result of high proportions of women at older ages, an outcome that probably owes more to the higher longevity of women with respect to men than to the feminization of migration" (UN-DESA 2011). Overall, an analysis of international migration and gender can breathe understanding into the interplay across migration, economic growth and poverty reduction, and further serve as a measure toward the third Millennium Development Goal of promoting gender

equality and the empowerment of women.

507. As Yinger (2006) notes, "What has changed more dramatically than the numbers are the reasons why females migrate." While in 1960 more women were classified as dependents moving for family reunification purposes, today a higher percentage of female migrants move for economic opportunities. Female labour migration is diversifying in terms of destination countries, skill levels and occupations (Jolly and Reeves, 2005). That said a gendered division of occupations – such as domestic and hotel work, care activities, sex work, and entertainment industry for women, and construction, mining, truck driving, and security for men – remains pronounced for migrant workers.

508. Overall, there is substantial evidence which supports the utility of a gendered examination of migration. In addition to the sheer numbers of women migrants and the different reasons for migration across women and men, research suggests that the nature of female and male migrant networks are qualitatively different for women and men, and this can, in turn, shape their migratory outcomes (e.g. see Curran et al. 2005). Additionally, marital status might be significant as it interacts with migration, as Kanaiaupani's (2000) research shows how marriage has a positive effect on the migration of men but a negative effect on the migration of women.

509. Marriage – voluntary or forced – or family reunification has traditionally played a significant role in migration, now exacerbated by increasing world globalization. Marriage may be a driving force for women to migrate within their countries or internationally – be it for constituting a new family, or for escaping abusive marriages that limited their freedom. Where "reasons for migration" are asked in the census (e.g. Cambodia, Colombia, Nepal), long form questionnaires or the combination of censuses and migration surveys can be used to produce simple tabulations or to carry out multivariate analyses such as the example from China below.

510. A gender perspective of migration would specifically highlight how migration may mean empowerment and/or disempowerment, both for the migrant, his or her family members or the ones left behind:

a. Empowerment: Women and men may find better living conditions in the receiving city or country, including improvement of their economic, educational and social position and increased decision-making power. Migration can help reconfigure gendered relations, particularly by offering more women the opportunity to enter the global labour market. Moving away from patriarchal systems, women may have more freedom. They may self-actualize as they seek opportunities that challenge traditional gender roles and norms. Migration may also be a means to escape conflict and personal violence, as well as to enhance one's access to education and health care (Martin 2007).

b. Disempowerment: Women and men may face discriminatory practices in the receiving country, as well as isolation, limited or no access to education and health services and informal and unregulated work arrangements, among others. In several cases, migration may put an added burden on migrant women who are often expected to transmit cultural and traditional values, including patriarchal beliefs, to their children. Moreover, many migrant women may find themselves at a greater risk of abuse and exploitation (such as being forced into sex work or protection sex) because of their legal status and their vulnerable social position.

511. Finally, studying migration is important because the impact of migration is not restricted to the migrant only. It is also necessary to assess the situation of those who are left behind by emigrant family members and the overall consequences of female and male emigration for sending countries (e.g. brain drain of qualified medical personnel).

3. Data issues

512. The Principles and Recommendations note that "as interest in the movement of people across national boundaries […] has grown steadily among countries, census items and tabulations relative to international migration have grown in importance" (United Nations 2009, para 3.77). Despite this growing interest, censuses – like other data sources – are limited in measuring emigration and often revert to citizenship as a proxy to analyse immigration. Irregular immigrants, making up between 10 and

15 per cent of immigrants globally, are rarely captured in censuses as undocumented migrants often refuse to be counted out of fear of prosecution or deportation or fear of reprisals from traffickers (International Organisation for Migration, 2010).

513. Migration is treated as a 'transition' in a census, rather than as an 'event' as it would be in population registry data. A census is therefore limited when it comes to capturing and measuring circular or seasonal movement of persons. Further, other gender issues related to migration cannot be investigated on the basis of census data alone, including the nature of migration – whether it is regular, irregular, forced, or voluntary –and the link between migration and gender-based violence. Additionally, language barriers may also create the circumstances for the undercounting of internal migration.

514. Few censuses (e.g. Cambodia, Iran, Nepal) probe respondents on their reasons for migrating. Among other things, this is because the reasons are often linked or inter-dependent, so that they do not lend themselves to neat categorizations. For example, a couple may decide that a move to a larger city might help both of them to get a better job. However, the husband might go first to find work and establish a base, and then send for his family. In such a situation, the wife, when asked for her reason to migrate, might – not unreasonably – answer that she is following her family, when actually the reasons

for moving are more complex and intertwined. Some censuses (e.g. Nepal, 2011) ask the respondents not only for their reasons for migrating, but also on their reasons for staying where they are, e.g. agriculture, business, services, study, marriage, dependent, conflict. Interpreting the answers to such a question may be even more difficult than in the case of reasons for migrating.

515. Table 50 shows the results of the simple question on reasons for migration for Cambodia (2008), one of the countries that does collect this information. The most evident difference between men and women is the much higher proportion (48.7 per cent, compared to 27.3 per cent) of women that mention family reasons as their primary motivation for moving. Once this category is removed, the largest difference is in the first category (transfer of work place), which is less common for women, but in part this may be because—for the reasons explained in the previous paragraph, some of these moves are censored by the "family moved" category. Repatriation and visiting are more common among women, for reasons which are somewhat less obvious.

Table 50: Cambodia (2008)—Reasons for migration, by sex

Reason for migration	Men	Per cent	Women	Per cent
Transfer of work place	246,962	13.8	79,175	4.5
Search of employment	431,877	24.2	329,572	18.8
Education	62,926	3.5	33,591	1.9
Marriage	331,578	18.6	185,647	10.6
Family moved	487,006	27.3	852,827	48.7
Lost land or house	22,351	1.3	19,793	1.1
Natural calamity	2,577	0.1	2,254	0.1
Insecurity	31,604	1.8	36,640	2.1
Repatriation	92,429	5.2	111,604	6.4
Orphaned	6,811	0.4	6,028	0.3
Visiting	47,901	2.7	82,006	4.7
Other	21,499	1.2	13,472	0.8
Total	1,785,521	100	1,752,609	100

Source: National Statistical Institute of Cambodia. Results of the 2008 Population Census.

516. Although about one in four countries include questions in their censuses on former members of the household who are now living abroad, identifying households where a member is an emigrant is often difficult. Among other reasons, this is because migrations that involve entire families cannot be captured this way. Another possibility is to look at those censuses that ask about the nature of household income and to consider remittances as a measure. At present, only about 10 per cent of censuses in the current census round directly ask for remittances received. In those countries whose censuses are conducted on a de iure basis, one can also use married women living without their partners as a proxy for male emigration. The best alternative, however, to

measure aggregate emigration figures, is to use the censuses or registration systems of the primary destination countries of emigrants.

517. With respect to immigration, the main challenge is the identification of immigrants and immigrant households. When migrants do not speak the host country language, language stands out as a reason that migrants are underrepresented in censuses. Additionally, migrants may not wish to be enumerated if they do not have legal residency documents. While there is much policy interest in households and individuals with a "migration background," these cannot always be interpreted as foreign citizens, because citizenship legislation differs from country to country. For instance, a person of Jewish descent or related to someone of Jewish descent can claim Israeli nationality (i.e. ius sanguini), while anyone born in France is French by birth right (i.e. ius soli). Thus, migration background may be hard to identify unless specifically asked, as in the German census which asks whether the respondent's mother or father has migrated to Germany and from where. Most other countries simply use foreign citizenship as a proxy for immigrants, thus producing a number of false positives (for example, persons born in a country under ius sanguini law but who have never relocated from one place to another) and false negatives (for example, persons who have changed their country of usual residence but hold the nationality of the census-taking country). Where international migration is

analysed using the variables citizenship (or, alternatively, place of birth), extrapolating to "migration" language should be avoided or done with caution. Special cases (stateless persons, naturalised persons, people who have dual citizenship) pose additional problems. Finally, where place of birth is used as a criterion to identify "immigrants," moves in-between birth and current residence are left unaccounted.

518. Population censuses yield the most comparable data on international migration at the global level. Census data offer near universal coverage, a vast amount of person-specific and geographic information, and regularity of data collection. At the same time, availability, timeliness and accuracy are limitations that should be addressed at the national level in order to maximize census data usefulness.

519. The main strength of census data is that they allow for a detailed analysis of the immigrant stock and its characteristics, which is – at least in some countries – a rare group in the overall population (United Nations, 2007). When data are available, given that censuses collect a wide range of information on each individual, they permit cross-tabulation of migration-related characteristics (such as citizenship, duration of stay and place of residence in the receiving country by sex) with a combination of demographic and socio-economic variables (including age, educational attainment, marital status,

labour force participation and occupation by sex) (United Nations, 2007). This helps explain the influence of these factors on the decision to migrate as well as allowing a comparison of the female migrants' experience with that of male migrants.

520. In terms of internal migration, identifying past and current residence may be difficult in the case of slum-dwellers without standard addresses and people fleeing violent conflict or natural disaster. Further, significant under-reporting can occur with students, domestic personnel, temporary or circular labour migrants and other groups who have de facto relocated their usual place of residence if they have been present for six months or longer in the new location, as well as with regards to non-residents such as visitors that may be erroneously classified as recent in-migrants. Finally, there may be confusion for persons with two or more residences and members of the armed forces. Usual residence should in any case be based on the 12-month limit.

4. Tabulations

521. Regarding geographical and internal migration characteristics, the Principles and Recommendations suggest that NSOs construct the following essential (*), recommended (R) and additional a) tabulations:

- Total population and population of major and

minor civil divisions, by urban/rural distribution and by sex*;

- Population by size-class of locality, by major civil division and by sex*;
- Population of principal localities and of their urban agglomerations, by sex*;
- Native and foreign-born population, by geographical division, by age and sex*;
- Population, by duration of residence in locality and major civil division, age and sex*;
- Population by place of usual residence, duration of residence, place of previous residence, by major civil division and sex;
- Population … years of age and over, by place of usual residence, place of residence at a specified date in the past, by major civil division, age and sex;
- Native population, by major civil division of birth, age and sex.

Table 51: Cape Verde (2000) – Emigrants by age and sex declared by the remaining household members

	Males	Females
0-4	79	80
5-9	143	150
10-14	242	314
15-19	720	760
20-24	1,156	1,127
25-29	1,096	770
30-34	906	545
35-39	638	385
40-44	365	205
45-49	168	157
50-54	79	103
55-59	68	101
60-64	87	184
65-69	78	122
70-74	50	97
75-79	40	55
80+	11	28

Source: INE, Cape Verde

522. The essential, recommended and additional tabulations on international migration and immigrant stock, in turn, are the following:

- Foreign-born population, by country of birth, age and sex;
- Foreign-born population, by period of arrival, country of birth, age and sex*;
- Population, by country of birth and citizenship, age and sex;
- Economically active foreign-born population … years of age and over, by period of arrival, occupation and sex;

- Foreign-born population, by marital status, age and sex;
- Foreign-born population … years of age and over, by usual (or current) activity status, age and sex;
- Foreign-born population … years of age and over, by educational attainment, age and sex.

523. All of the latter concern immigrants and even more specifically those born abroad. Some censuses also ask about members of the household who are currently living abroad. While this question misses some emigrants (e.g. those that went abroad with their entire household), it is currently the best instrument for measuring emigration at the origin. The results can be tabulated by age and sex, as in the following example from the 2000 census of Cape Verde.

What this table shows is that, while emigration is a predominantly male phenomenon in Cape Verde, women actually are the majority of emigrants below age 20 and after age 50.

5. Indicators

524. Internal Migration: The proportion of migrants (m/f) to an area a, who migrated from an area b, and conversely. This indicator can be used to measure the intensity of migration, by sex, and their direction of migration flow across two regions, between rural and urban areas or to measure internal migration (in terms of change of place

of residence) within the same administrative area (for example in the same region).

525. Immigration: a) Foreign population (m/f) as a percentage of total population (m/f) and b) Proportion of women in the foreign population. Indicator a) provides the estimated number of female and male international migrants expressed as a percentage of the total female and male population; indicator b) shows sex ratios in migration.

Emigration [where data are available]: a) Emigration rate (male/female) and b) emigration rate of migrants with tertiary education (m/f). Indicator a) measures the stock of female and male emigrants from a country at a particular point in time expressed as a percentage of the sum of the resident population in the country of origin and the emigrant population. Indicator b) includes only those with a university education and thus indicates brain drain.

526. Labour force participation of immigrants: Economically active foreign-born population by occupation, age, sex and urban/rural residence. This indicator provides the estimated number of female and male international migrants that are participating in the labour force by age, occupation and place of residence. This may serve as a measure of upward or downward social mobility and social stratification.

527. Immigration and household composition. Information on the living arrangements of migrant

women and men is useful for understanding migrants' lives and experiences, including:

a. Household composition (e.g. sex, age, etc. of those who live alone, live with other migrants, live with people born in the receiving country) which can be further disaggregated by age at arrival, years of residence, place of birth, highest level of education, etc. and should, at least for internal migration, be compared with women and men who live in their previous place of residence (e.g. rural areas);
b. Family size and fertility rate among immigrants; and
c. The relationship between migratory status and employment as domestic personnel.

6. Multivariate and further gender analyses

528. Several studies provide in-depth analyses on reasons for migration.

Country example 19: Marriage Migration in Nepal and Iran

Acharya and Chaudhury (2010) used census data from Nepal and Iran to find that both countries list marriage as one of the causes of both internal and international migration. They find that the largest proportion of women have moved because of marriage, in both internal and international migration. They explain that traditionally, women have to move onto their household of marriage, which is the household of the husband so they

move to a different village, district and even country. This migration isolates women from their parental household and their support systems, which can create a context of diminished social status for women in the new marital household. In contrast, men seldom incur a move after a marriage, so they do not experience this same social disruption. Because men and women migrate for different reasons, their migration and integration process in the new milieu may be different. A female migrant may experience a different trajectory of labour force participation and health outcomes compared to her male migrant counterpart due to the different reasons that one may move, which seems to be patterned by gender. The identification of city of destination, together with the country could provide information about the number of sex workers in specific cities. A next step would be to examine many factors, such as labour force participation, health outcomes, and poverty status, to understand to what extent they are similar and different across women and men.

529. A first tabulation may be to examine the per cent of migrants as a result of marriage, by age, sex, ethnic group, rural/urban, educational level, and country or city of origin. From this, it may then make sense to example using a multivariate logistic model what factors – such as age, sex, ethnic group, rural or urban background, educational level, and city or country of origin – to know what proportion of the variation in the per cent of migrants as a result of marriage is associated with each of these factors, while considering the interrelations among these factors.

530. Fan and Huang (1998) analysed interprovincial female migration as an economic strategy and, thus

empowerment, based on a 1 per cent sample of China's 1990 Census. The authors first described the pattern of female migration, then analyzed the characteristics of these migrants and their husbands, and, third, looked at the spatial features of this migration. The empirical analysis was concluded with a logistic regression analysis to assess the relative significance of structural, and economic factors in explaining the patterns of interprovincial female marriage migration. The dependent variable "marriage migration" took the value 1 and 0 was set to all other types of migration. Fours sets of independent variables were defined addressing the effect of 1) the institutional and structural factors(hukou system and the segmented labour market), 2) the education status of women, 3) economic factors (income and destination) and 4) the demographic structure (sex ratio). Female migrants with agricultural hukou (household) classification, for instance, were 5.0 times more likely to be marriage migrants than those with non-agricultural hukou. Odds ratio for the education variable suggest that women with college or above level of education were 77.3 per cent less likely to be marriage migrants than those without. The authors expected income of the originating provionces to be negatively related, and income of coastal destinations to be positively related, to the likelihood of migration. Estimates of the economic variables confirmed that female migrants from wealthier provinces were less likely (58.7 per cent), and female migrants to coastal provinces more likely (1.2 times), to be marriage migrants. Lastly,

high sex ratios were expected to be positively relatied to high propensities of female marriage inmigration. The model proved good to fit the data with a doofness of fit measure of p2=0.28. The results indicated that women in disadvantaged positions due to institutional, structural, and socioeconomic factors were more likely to pursue marriage as a strategy to achieve migration and to improve their social and economic mobility.

531. Another study may be to examine gender barriers to labour force participation. Female migrant workers are among the least protected by labour and immigration laws (cf. Beijing Platform for Action) and face additional barriers to the enjoyment of their labour rights due to language, ethnicity, culture, religion, or socio-economic status. Household composition may pose an additional difficulty. Although many female migrant workers, through their participation in the labour force and the sending of remittances, contribute to the economies of both sending and the receiving countries or cities, in many receiving countries they experience higher levels of unemployment compared with both non-migrant workers and male migrant workers. A logistic regression could be carried out with 'status in employment' or 'currently working or employed' (recoded as a binary variable: unemployed or not unemployed) as a dependent variable. The various above-cited socio-demographic variables, as well as 'disposition to work' and other work-related census variables (as long as no collinearity exists) could be

entered as predictors to assess their relative weight. As governments are accountable for facilitating migrant's full integration into the labour force and for assuring full access to economic opportunities, a better understanding of barriers to employment can help formulate policy-responses. As examples, are language courses or child care needed, or does one particular ethnic group need more social support?

532. A study by Stone, Purkayastha and Berdahl (2006) looking at differences in earnings of female migrants in the US according to their country of origin, found that some Asian subgroups require specific policy responses. Data from the 1 per cent 2000 Integrated Public-Use Microdata Series including Filipina, Asian Indian, and non-Hispanic white women living in New York, Chicago, and Los Angeles, revealed that earnings inequality among highly educated migrant women of the same age and occupation, proficient in English and working the same amount of hours, is associated with ethnic origin and period of arrival in the US. While Filipinas and non-Hispanic white women's earnings are found not to differ significantly, Asian Indian women's earnings are lower. Women who arrived in the United States in the 1990s earn significantly less compared to natives, while women who migrated before the 1980s report higher earnings compared to natives, thus defying the supposed "double burden" of being a migrant and a woman.

533. An example investigating household composition and living arrangements among migrants is Thomas' (2001) study "Evolving family living arrangements of Canada's immigrants," which used census data primarily from three censuses and from the Landed Immigrant Data System (LIDS)to examine the family living arrangements of people aged 15 and over who immigrated in 1985, 1990 or 1995. Factors including gender, length of stay, age at immigration, cultural and additional considerations were used to generate a statistical model estimating the likelihood that an immigrant will reside in an economic family with a particular type of co-resident. The model controlled for all other factors and held constant while the impact of only one factor was considered. Likelihoods were estimated for a benchmark reference immigrant against whom the influence of change in a given factor was measured. Due to their different migratory experiences, separate estimates were calculated for men and women. The author finds that "gender and gender roles often dictate family arrangements and the timing of migration for family members." Migrant men and women have different living arrangements at different stages in their lives in the receiving country. Regarding those who migrated in their twenties, there is a one in three chance that a woman will live with an immigrant who was already established in Canada, comparing with a one in four chance for men. Around 20 per cent of the men in this age-group will live with a person who followed them to Canada, contrasting with 11 per cent of

the women. Also, 15 per cent of men who immigrate in their twenties will live alone. As the age at migration increases, the probability that an immigrant, either man and woman, will live with relatives that are already established in the receiving country increases. Nevertheless, there is a 48 per cent likelihood that those who arrived as pensioners will be living with immigrants who preceded them. Also, marriage migration from the US to Canada is found to be a frequent phenomenon, and Americans and Europeans have the highest probabilities of living with Canadian-born adults.

534. Emigration and changes in family structure. Emigration can create changes in family structure. For example, women left behind may need to spend more time in productive activities outside the house and give more responsibilities of childcare and housework to their daughters. To analyse the situation, emigrant households need to be identified; then, issues such as unmet basic needs (see poverty section), employment opportunities of the spouse staying behind and children's education can be analysed. It is therefore interesting to analyse school enrolment rates of boys and girls in emigrant households and to compare them to the rest of the population. Other issues for analysis include:

a. The household structure and headship of households that have members living abroad vis à vis the general population;
b. The economic characteristics of female heads of

households that have members residing abroad, such as the amount of financial support received from people living outside of the household within the country or outside, particularly anything suggestive of the way they manage the remittances received from abroad, small businesses that they may head, homes that they may have acquired, and consumer durables in the home;

c. The age and sex of household members residing abroad cross-classified by the socioeconomic characteristics of the households may be indicative of the amount of resources sent by different kinds of migrants.

535. Gender and the brain drain. Highly skilled women are on the move as a result in part due to the rise of female education. Docquier et al. (2007) collected census or register gender-disaggregated data from countries of destination, with the highest level of detail on birth countries and three levels of educational attainment: s = h for high-skilled, s = m for medium-skilled and s = l for low-skilled. Mi;j t;g;s denotes the stock of adults 25+ born in j, of gender g, skill s, living in country j at time t. For countries where population registers (mainly Scandinavian countries) are used, data is based on the whole population. In countries where Census data are used, statistics are either based on the whole population (Australia, New Zealand, Belgium, etc.) or on a sample of it (e.g. 25 percent in France, etc.). Aggregating these numbers over destination countries j gives the stock of emigrants from country.

The authors computed sex-disaggregated indicators of brain drain as a proportion of the total educated population aged 25 and more born in the source country for 195 countries.

Denoting Nj t;g;s as the stock of individuals aged 25+, of skill s, gender g, living in source country i, at time t, we de.ne the emigration rates as

In particular, mi t;g;h can be used as a proxy of the brain drain in the source country i. This step requires using data on the size and the skill and gender structure of the adult population in the source countries. Using census data (1990 and 2000) of the receiving OECD countries, the authors restricted their study to the foreign-born adult population aged 25 years and over and classified them based on three groups of educational levels. "Population data are split across educational group using international human capital indicators. Several sources based on attainment and/or enrollment variables can be found in the literature. Human capital indicators are taken from De La Fuente and Domenech (2002) for OECD countries and from Barro and Lee (2001) for non-OECD countries. For countries where Barro and Lee measures are missing, we predict the proportion of educated using Cohen-Soto's measures (Cohen and Soto, 2007). In the remaining countries where both Barro-Lee and Cohen-Soto data are missing (about 70 countries in 2000), we transpose the skill sharing of the neighboring country

with the closest enrolment rate in secondary/tertiary education, the closest gender gap in enrollment rates and/or the closed GDP per capita. This method gives good approximations of the brain drain rate, broadly consistent with anecdotal evidence" Docquier et al. (2007). The findings suggest that, between 1990 and 2000, the number of skilled women immigrants to OECD countries increased by 74 per cent and that the share of women in the overall skilled immigrant population also increased. Regarding gender disparities, comparison of stock and rates of skilled migration by gender shows that the correlation in stocks is of 97 percent. On average, the number of skilled female migrants is lower than the number of skilled men, but the correlation is lower in rates (88 percent). Women's rate is on average 17 percent above men's. However, the female/male ratio in emigration rates varies strongly across countries. According to the authors, this feminization of the South-North brain drain mostly reflects gendered changes in the supply of education.

536. The gendered nature and consequences of remittance sending. Remittances sent by female migrants are increasing, as more women migrate independently and as income-earners.. Investigating the gendered nature of remittance sending, helps elucidate the contributions women and men make to their families and communities of origin, to GDP in their home countries and thus to poverty reduction and economic growth. There is evidence from Cuba showing that women are more likely to send

remittances (cash, goods, or both) than male migrants (Blue, 2004), be it in small amounts or in kind. In some countries, such as Sri Lanka, the amount of remittances sent by females outweighs that sent by men (UNFPA, 2006), while in others, such as the Philippines, men send more money back home than women, after controlling for earnings differentials between the sexes (Semyonov and Gorodzeisky, 2005). In many countries, remittances sent by women differ from those sent by men in amount, frequency, and orientation on how they should be spent (Blue, 2004; Semyonov and Gorodzeisky, 2005).

537. The impact of remittances – regardless of the sender – is another research topic with gender implications. For instance, studying rural areas in Pakistan, Mansuri (2006) found a positive impact of remittances on children's schooling. Not only are children in migrant households more likely to attend school, the effect is also more pronounced for girls than for boys. The authors used data from the Pakistan Rural Household Survey (PRHS) 2001-02, which collected detailed information on migration for each household member. The PRHS 2001-02 includes a complete census of all village households which ascertained the household's current migration status. Attention was contained to male migrants age 18 years or older who migrated for economic reasons. With this definition, 977 men (15% of the age group) were classified as migrants. Again, of these, 32% had returned from a migration episode in the year the survey was

conducted. The remaining were current migrants. Given the recurrent character of migration, a household is classified as a migrant household if it reported at least one male member with some migration experience current or past. At the household level, 699 households (26% of all households) had at least one male migrant. In contrast, Haveman and Wolfe (1995) studied children left behind by highly skilled female migrants and observe that these children are more likely to drop out of school than their peers. Their explanation is that these children tend to have higher levels of human capital which makes them attractive assets to the domestic labour market and able to significantly contribute to household income. Where such data is available from the census, NSOs could tabulate:

a. Average shares of remittances as part of total household income, by sex of remitter;

b. Educational attainment, literacy, school attendance (m/f) of children in remittance-receiving households, by sex of remitter.

7. Interpretation, policy and advocacy

538. If sex ratios of internal migrants and international emigrants and immigrants are significantly skewed, analysts need to ask follow-up questions, such as:

a. If internal migrants are mainly males moving to the bigger cities (e.g. Ghana): What are the characteristics of male migrants (e.g. age, education,

employment, marital status)? What are the implications on urban women (e.g. employment options), rural women (e.g. marriage options) and families left behind (e.g. remittances, children's education)?

b. If international emigrants are mainly female (e.g. the Philippines), what are the characteristics of the females who migrate (e.g. age, education, employment, marital status)? What are the reasons for migration (e.g. marriage, types of work)? What are the effects (e.g. remittances, education) to be felt by families, especially children, left behind?

539. Vulnerabilities associated with gender and migration can be mutually reinforcing. This is known double burden or double disadvantage. For example, migrant women are less likely to be employed in their European Union host country than are native women or migrant men. Neither being female nor being a migrant alone can explain this result. Rather, gender and migratory status reinforce vulnerability in this case.

540. Many gender issues related to migration cannot be invesigated using census data alone. At present just a few countries ask about reasons for migration – such as marriage, poverty, or military conflict – and census data are not useful to measure the circular or seasonal movement of persons, or whether the migration is regular, irregular, forced, voluntary, or possibly related to gender-based violence. Migrants' issues can be better understood if more replete data are collected on the process of migration itself.

541. The Philippines is one of the world's largest labour exporting countries. The number of women migrants outnumbers that of men. The National Statistical Coordination Board (NSCB) plays an important role in supporting emigrants by providing sex-disaggregated data on issues such as: 1) the distribution of overseas Filipino workers by place of work and occupation; 2) the average cash remittance of overseas Filipino workers by place of work; and 3) the distribution of overseas Filipino workers by major occupation and average cash remittance. The NSCB has regularly publishing and disseminated reports and Factsheets on Women and Men, as well as to making sex-disaggregated census data available online (www.census.gov.ph). Among the data users are NGOs, the Central Bank and the Commission on Overseas Filipinos. The latter registers emigrants, provides pre-departure orientation seminars, supports families with relatives abroad, and provides community assistance or referrals to cases involving trafficking and domestic violence. The Central Bank uses NSCB data to enhance the financial products and services available to migrants and their families, while NGOs learn more about their constituencies through census data. For instance, the United Filipinos in Hong Kong group, that monitors the working conditions of foreign domestic workers, was able to estimate the size of its target population (UNIFEM, 2008). NSCB in turn collaborates with NGOs and other stakeholders to broaden implementation of Objective A.4. of the Beijing Platform for Action, which suggests

that national and international statistical organizations should devise suitable statistical means to recognize and make visible women's participation in the unremunerated and domestic sectors, to migrant workers.

CHAPTER 12

Disability

1. What is it?

542. The International Classification of Functioning, Disability and Health (ICF) (WHO, 2001) defines disability "as an umbrella term for impairments, activity limitations or participation restrictions" and embraces at least three dimensions: body, individual and society.

543. The Convention on the Rights of Persons with Disabilities (CRPD) states, "Persons with disabilities include those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others" (United Nations 2006). The Principles and Recommendations for Population and Housing Censuses, Rev. 2 (Par. 2.376) (United Nations, 2008 a) recognize that disability is a complex concept and recommends that countries adopt an explicit definition based on the ICF when developing census or survey questions that will be used to identify disability status and level of functioning.

a. Persons with disabilities are defined as "those persons

who are at greater risk than the general population for experiencing restrictions in performing specific tasks or participating in role activities" per the Principles and Recommendations (Par. 2.351).

b. Human functioning refers to the dynamic interaction across personal factors, health conditions and environmental factors.

2. Why is it important?

544. Persons with disabilities are protected by the Convention on the Rights of Persons with Disabilities (2006). Other programmes and standards in place to protect persons with disabilities include the World Programme of Action Concerning Disabled Persons (1982) and the Standard Rules on the Equalization of Opportunities for Persons with Disabilities (1993).

545. The World Report on Disability (WHO/World Bank, 2011) suggests (using 2010 global population estimates) that over one billion people in the world, or about 1 in 7 persons, experience disability today. This estimate of 15 per cent of the persons living with disabilities is higher than prior World Health Organisation estimates, which were about 10 per cent (WHO/UNFPA, 2009). Further, disability prevalence is higher among already vulnerable populations, specifically those within low income countries, those in the lowest quintile of income within a

country, older persons and women. Older women living in low-income countries, therefore, are especially vulnerable to disability.

546. Article 31 of the Convention on the Rights of Persons with Disabilities (CRPD) (United Nations, 2006 b) addresses issues relating to statistics and data collection on persons with disabilities. States Parties are obligated to collect and disaggregate data, while also ensuring confidentiality and protecting human rights and ethical principles, in order to inform and implement policies within the Convention's scope as well as monitor and assess progress toward its full implementation.

547. As stated in the Principles and Recommendations, Par. 2.350, census data on disability "can be utilized for general planning programmes and services (prevention and rehabilitation), monitoring selected aspects of disability trends in the country, evaluation of national programmes and services concerning the equalization of opportunities, and for international comparison of selected aspects of disability prevalence in countries". In addition, census data on disability can be used to identify households for a more comprehensive survey of persons with disabilities.

548. To understand the experience of disability, it is crucial to consider the interaction between disability and gender; women and men, boys and girls generally face

specific disability experiences and may require particular social support services and policies. Although not always made explicit, policies towards people with disabilities are not gender-neutral: in practice, gender inequalities often combine with disadvantages experienced by disabled women to create particular forms of exclusion and multiple discrimination. In several social contexts, compared to their disabled male peers or non-disabled female peers, women with disabilities are less educated, poorer, more isolated, more likely to be unemployed, and more likely to be abused, as well as having lower health outcomes and lower social status (Stubbs and Tawake, 2009). Disadvantages are, therefore, due to a combination of gender, disability, other horizontal inequalities, such as migratory status and ethnicity, as they intersect with social class and economic status.

549. Regarding education, international human rights instruments, such as the Convention on the Rights of Persons with Disabilities, emphasize that persons with disabilities should be guaranteed the right to equitable educational experiences at all levels, including lifelong learning. It is therefore crucial to monitor educational attainment of persons with and without disabilities and by sex.

550. Some crucial topics on gender and disability that can be examined using census data are addressed in international instruments are listed below.

- Education. Access to appropriate education and skills-training for women and girls with disabilities is stressed by the Beijing Platform for Action. Strategic objective B.2, to eradicate illiteracy among women, stresses that governments should take actions to reduce the female illiteracy rate, with particular emphasis on women with disabilities.
- Work. The Convention on the Rights of Persons with Disabilities addresses the urge for the recognition of the skills, merits and abilities of persons with disabilities, and of their contributions to the workplace and the labour market. Strategic objective F.5 of the Beijing Platform for Action, to "eliminate occupational segregation and all forms of employment discrimination," also emphasizes the importance of implementing and monitoring positive public and private-sector employment, equity and positive action programmes to address systemic discrimination against women in the labour force, in particular women with disabilities, with respect to hiring, retention and promotion, and vocational training of women in all sectors.
- Poverty. The Beijing Platform for Action recognizes that women with disabilities are among the most economically disadvantaged groups and states that more effective anti-poverty programmes directed towards them are a need.
- Health. The Beijing Platform for Action calls for governments to ensure that girls and women of all ages with any form of disability receive supportive health services.
- Ageing. The Beijing Platform for Action recognizes that, with the increase in life expectancy and the growing numbers of older women, their health

concerns require particular attention. The incidence of impairment and disability increases with age. Older women are particularly vulnerable to disability in old age due to gender differences in life expectancy and gender inequalities over the life course.

- Care. The ICPD Programme of Action declares that governments should support and develop the appropriate mechanisms to assist families caring for children, the dependent elderly and family members with disabilities.
- Marriage and family formation. ICPD recognizes the reproductive rights for women and men with disabilities and their right to household and family formation. The document further stresses that adequate assistance must be provided to persons with disabilities in the exercise of their family and reproductive rights and responsibilities.
- Violence. The Beijing Platform for Action recognizes that women with disabilities are among those women particularly vulnerable to violence. The Convention on the Rights of Persons with Disabilities further declares that national governments should take all appropriate legislative, administrative, social, educational and other measures to protect persons with disabilities, both within and outside the home, from all forms of exploitation, violence and abuse, including their gender-based aspects.

551. As stated in the Principles and Recommendations, access to paid work is crucial to achieving self-reliance and ensuring the well-being of the adult population, both of persons with disabilities as well as of those without

disabilities. While women, in general, face discrimination related to work opportunities and income gaps, women with disabilities may face a double disadvantaged position on the labour market. Men with disabilities also tend to be economically disadvantaged, compared to their non-disabled peers. Despite such economic disadvantages, there are also additional costs of living connected with a disability, such as medical treatments, transportation costs, and support services. As such, people with a disability are more likely to be at risk of deprivation and poverty than other people.

552. The Convention on the Rights of Persons with Disabilities emphasises the need to eliminate discrimination against persons with disabilities in all matters relating to marriage, family, parenthood and relationships. While disability may stigmatize both men and women, social constructions of femininity and masculinity may lead to specific discrimination outcomes. Women with disabilities may be more vulnerable to social isolation, to sexuality repression, and to denials of family formation. According to UNESCAP, "universally, the incidence of marriage for disabled women is lower than that for disabled men." For instance, in Nepal, where marriage is a social norm for women, 80 per cent of women with disabilities reported to be unmarried (Paudel, 1995). Another analysis on the 2008 Tanzania Disability Survey showed that 54.8 per cent of persons with disabilities were in marital union, with more males being involved in

a relationship (62.5 per cent) than females (47.4 per cent) (Tanzania National Bureau of Statistics, 2010). However, one should be cautious about these conclusions as there is a serious selection bias operating. Because women (disabled or not) live longer than men, more women than men are outside a relationship, as they have lost their partner at an earlier stage in life. Another issue of concern, which has increasingly been discussed, is forced marriages among people with learning disabilities or those who lack the capacity to consent to a marriage (Clawson, 2010).

553. The World's Women 2010 (United Nations, 2010 a) notes that actively caring for disabled household members tends to be a time-consuming task primarily undertaken by women, especially in less developed countries with few public services for such care. For example, census data from the 2000 United States Census found a consistent pattern of living arrangements that leaves children with disabilities disproportionately under the roofs of their mothers or other women (Cohen and Petrescu-Prahova, 2006). Children with disabilities are more likely to live with single parents, and especially their mothers, than other children. Further, those who do not live with either parent are more likely to live in households headed by women than other children. The authors argue that gendered living arrangements among children with disabilities are a neglected aspect of gender inequality in caring labour.

554. Any serious analysis of the relative incidence of disabilities in men and women needs to take account of the fact that disability increases sharply at higher ages and that there are more older women than older men. Hence the need for disaggregation by age or age standardization (see the section on indicators). The situation also varies by type of disability. Women are more prone to blindness and other problems of vision and to problems of movement associated with osteoarthritis and osteoporosis (see Chapter 4). They also suffer the consequences of delivery-related trauma. Men, on the other hand, are more vulnerable to disabling conditions incurred as a consequence of violence and accidents. Perry (2002) reports a higher incidence of disability among females than among males in Fiji, with girls comprising 72 per cent of children with disabilities in the 0-5 year old age range and females comprising 56 per cent of persons with disabilities in the 6-20 year old age range. Another example comes from research by Stubbs and Tawake (2009) in Samoa, where women with disabilities differ from disabled men and non-disabled women in that they are less educated, poorer, and of lower health and social status. However, such findings are not universal and there are many examples of situations where the incidence of disabilities is higher among men, particularly at ages under 50. To a considerable extent, the profile by sex also depends on how disabilities are measured. Census figures on disability show large variations by country and it is likely that these variations are associated to measurement

problems which may affect men and women to different degrees.

555. Ageing processes in men and women with disabilities men may lead to secondary disabilities. Women live longer than men, and they are more likely to experience disability and severe disability, which is highest among the oldest old (WHO/World Bank, 2011). The Convention on the Rights of Persons with Disabilities stresses the right of older women and men with disabilities to be assisted by adequate social protection programmes, which must be age-, gender- and disability-sensitive.

3. Data issues

556. The Principles and Recommendations (Par 2.351) indicate that four domains are essential in determining a person's disability status: (a) Walking; (b) Seeing; (c) Hearing and

(d) Cognition. Two other functions (self-care and communications) are suggested to be included in census questionnaires. In 2001, the Washington Group on Disability Statistics was formed was set up after the United Nations International Seminar on Measurement of Disability (New York, June 2001) to facilitate international comparison of disability data . The Washington Group suggests the following short set of questions to be incorporated in national censuses:

- Do you have difficulty seeing, even if wearing glasses?
- Do you have difficulty hearing, even if using a hearing aid?
- Do you have difficulty walking or climbing steps?
- Do you have difficulty remembering or concentrating?
- Do you have difficulty (with self-care such as) washing all over or dressing?
- Using your usual (customary) language, do you have difficulty communicating, (for example understanding or being understood by others)?

557. These questions, or some variations thereof, were included by a number of countries in their most recent census questionnaire. According to the report of the Washington Group to the Statistical Commission (Forty-third session, 28 February-2 March 2012) 31 countries indicated they had used the short set of questions, or at least an adaptation of it. Some countries used a set of 4 essential questions and others the more extended set of 6 questions. Many other countries used a large variety of questions related to disability. Some examples:

- In the 2011 Australian Census the following question was included: 'Does the person ever need someone to help with, or be with them for, self care activities?' Similar questions were asked for body movement and communication activities. The 2011 census of Romania also asked about needs for help in performing everyday tasks.

- In Botswana (2011) this question was asked 'Does any listed person in A1 and B1 have any of the following disabilities?' The interviewer could then choose from a list of 17 types of disability. Similarly, in Barbados (2011), the interviewer could choose from a list of 20 disabilities, including "Other". The Hungarian census of 2011 had a "autism" as a specific disability category.
- In Cambodia (2008) the enumerator was given the following instruction: 'If the person is physically/mentally disabled give appropriate code number from the list below. Otherwise enter dash (-)'.
- The enumerators in the 2006 Egypt were instructed to note down the identifiction number of the 'handicapped' person. Then they had to inquire about the type of disability (11 categories) and the reason of disability.
- Some countries also allow the respondent to indicate degrees of disability. The 2011 census of Albania, for example, contained four categories, from no disability at all to severe impairment.
- Some African countries ask whether the respondent is an albino, which is considered to be a disability.

558. There is no doubt that the wording and contents of questions on disability affect the answer of a person and ultimately changes the overall results. Because of the wide variety of questions on disability in population censuses, comparing the prevalence levels of disability between countries using different questions should be addressed with extreme caution. One can expect that in the future,

when more and more countries adapt the principles set out by the Washington Group, this will improve. But even among countries, that are using the Washington Groups's recommendations some discrepancies may exist. One can expect that a difference exists between the prevalence of disability among those countries that use the short set of 4 questions and the group that use the full set of 6 questions. There should also be differences between countries that only admit yes/no answers and those that allow respondents to indicate degrees of disability.

559. One weakness with census data is that only a limited number of questions can be devoted to a single topic, making it difficult to gain specific information on the gaps in health between women and men. Since only a limited number of disability domains are measured, "a comprehensive picture of disability can only come from large, national, sample surveys or administrative data" (Washington Group on Disability Statistics, 2006). However, despite this and other weaknesses of census data for the analysis of gender issues related to disability, there are also some clear benefits.

560. First, disability data in censuses can be used to monitor the prevalence of limitations in each disability domain (Washington Group on Disability Statistics, 2006). Those censuses that ask the relevant questions can provide the absolute number of persons with disabilities that are otherwise difficult to find, such as the number

of blind persons in a country and those who are deaf or mentally impaired (United Nations, 2001). Moreover, for many countries, the census is the only source of information on disability at the national, regional and local levels Additionally, as the Principles and Recommendations (Par. 3.78) state correctly, census data help to monitor equalization of opportunities, measuring the social and living conditions of persons with disabilities in terms of school attendance, educational attainment, employment, marital status and living arrangements, among others.

561. Following international measures of disability, such as the International Classification of Functioning, Disability and Health (ICF), allows the systematic and comprehensive identification of persons with disabilities in the population, and allows for the ready categorization of these disabilities into types and different levels of limited functioning regarding basic activities regardless of nationality, culture or economic resources (Washington Group on Disability Statistics, 2006). Further, in addition to identifying households for a more comprehensive survey of persons with disabilities, collecting the short set of questions in the census also informs and provides a frame for future surveys on disability.

562. A potential problem of census data is non-response, which results from the complexity and sensitivity of questions related to disability status (United Nations, 2001). As an example, the person replying to the census

questionnaire may not report information about a disabled relative because of shame or stigma. Another cause of non-response is that women and men with disabilities residing in institutions may not be included in the census population or at least not in descriptive tabulations because often only non-institutionalized populations are covered (United Nations, 2001).

563. Another potential problem is that men and women do not report disabilities or, more generally, health problems in the same way or to the same extent. Although there is little direct information on the disability questions typically included in censuses, there is some evidence that women generally report more health problems than men (e.g. Merrill et al., 1997; Ladwig et al., 2000), even though the difference is generally not thought to be big enough to explain the observed differences in the male and female incidence of disabilities.

4. Tabulations

564. The Principles and Recommendations stress that a census can provide valuable information on disability and human functioning in a country (Par. 8.2.350) and the need to develop statistics on the situation of persons with disabilities in order to assess equalization of opportunities (Par. 3.109). For this purpose, the principal topics in census recommendations should include items such as a) sex, b) age, c) place of residence, d) type of household,

e) marital status, f) educational attainment and school attendance, g) activity status, h) status of employment, i) industry and j) occupation. Data permitting, tables can be constructed by disability status as well as by specific types of disability. As an example, examining the participation in education for people with and without disability is especially valuable if the analyst compares among different types of disability within the school-age population.

565. The tabulation plan for disability data should include not only the prevalence rates by sex and age, but also comparisons between persons with and without disabilities on these key social and economic characteristics, as well as the type of disability. The Principles and Recommendations recommend the following basic tabulations on disability characteristics:

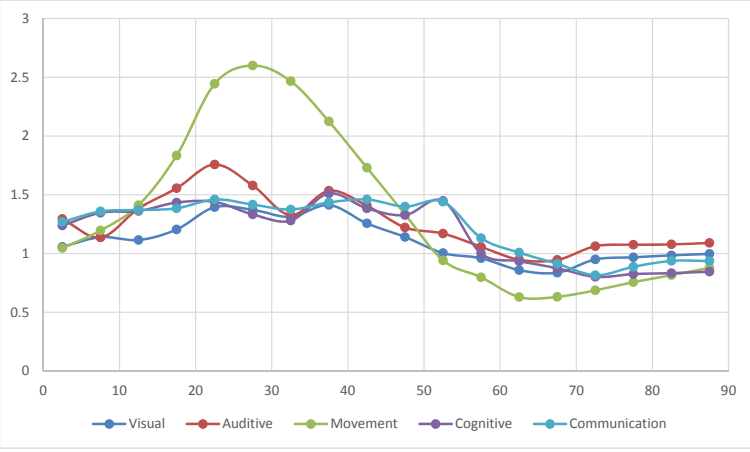
- Population with and without disabilities by urban/rural area, age and sex;*
- Population 5 years of age and over, by disability status, educational attainment, age and sex;
- Population 15 years and over, by disability status, economic activity status, age and sex.

566. Additional tabulations on disability characteristics suggested by the Principles and Recommendations are:

- Population with and without disabilities by urban/rural area, age and sex;
- Population 5 years of age and over, by disability status, educational attainment, age and sex;

- Population 15 years and over, by disability status, economic activity status, age and sex.

Figure 16: Occupied Palestinian Territories (2007) – Sex ratio (male/female) of the prevalence of major disability categories by age



567. It is difficult to make generalizations about the relative incidence of disabilities in men and women. Nevertheless, the sex ratio of disabilities found in the 2007 census of the Occupied Palestinian Territories in Figure 16 is fairly typical of what is found in many countries, with a higher incidence of most types of disabilities among men (sex ratio over 100) at younger ages and a higher incidence among women at higher ages. In this case, the incidence of problems of movement is particularly high among young men and older women. The

former may be due, to some extent, to the effects of war and conflict. In the case of other kinds of disabilities, the prevalence after age 60 is only marginally larger in women than in men. This may be different in other countries, where sex ratios after age 60 often drop more steeply (e.g. the example of Ireland, which is discussed next).

568. The following table from the 2006 census of Ireland provides more detailed information on the prevalence of particular kinds of disabilities by age and sex:

Table 52: Ireland (2006) – Prevalence (in percentages) of detailed disability categories by age and sex

Type of Disability	Men					Women				
	<15	15-24	25-44	45-64	65+	<15	15-24	25-44	45-64	65+
Blindness, deafness / severe vision hearing impairment	0.5	0.6	0.9	2.3	8.1	0.5	0.6	0.8	1.7	8.8
Substantial limitation of some basic physical activities	0.6	0.7	1.5	5.6	16.6	0.5	0.7	1.7	5.7	23.0
Difficulty learning, remembering, concentrating	3.2	2.8	1.7	2.5	6.1	1.6	1.7	1.5	2.2	8.5
Difficulty dressing, bathing, getting around in the home	0.8	0.5	0.6	1.6	7.7	0.5	0.4	0.7	2.0	14.0
Difficulty going outside the home alone	0.9	0.8	0.9	2.0	10.7	0.6	0.7	1.1	2.6	18.7
Difficulty in working or attending school/college	0.9	1.4	2.1	5.6	8.9	0.5	1.1	2.2	4.9	11.8
Learning or intellectual disability	3.1	2.8	1.4	1.4	1.7	1.5	1.6	1.0	1.1	2.0
Psychological or emotional condition	0.6	0.8	1.4	2.2	2.6	0.2	0.8	1.7	2.3	3.6
Difficulty in participating in other activities	1.1	1.1	1.5	3.6	10.8	0.7	1.0	1.7	3.9	16.3
Other, including chronic illness	1.1	1.1	1.8	4.9	9.7	0.9	1.2	2.1	4.7	10.8

Source: Population and Housing Census of Ireland (2007), Report 11

Slightly over half of the percentages in Table 52 are higher for men than for women. The major exception, however, is the 65+ age group, where all disability rates for women are higher than for men. Because this age category has such a large weight in the overall disability rate, the latter is higher for women in all disability categories,

with the exception of learning and intellectual disabilities.

569. In the Qatar census of 2010, disability was higher among boys under age 15 and men over age 75, but in the age range in between women had significantly higher disability rates. In this particular case, however, the numbers are distorted by the population composition in terms of migrants and nationals. This is because migrants are predominantly male, between the ages of 15 and 65, and their disability rates are significantly lower than those of the native population. When only Qatari nationals are considered, male disability rates were higher than female rates in every age group, except 45-54 (census of Qatar, 2010: Tables 101 and 103). Again, this demonstrates the importance of using the appropriate disaggregations and/or standardizations (see below).

570. Tabulations on the distribution of the prevalence of disability by age and sex in the population should also consider geographical division, urban/rural residence and the living arrangements of persons with disabilities. If data are available, tabulations should also disaggregate by income level or poverty status, as well as by recent migrant status.

571. Tabulations on household composition provide useful information for determining the economic and social provisions that may be needed for persons with disabilities living alone or with relatives. For this, information

on the size of households and the distinction among the one-person household, the nuclear family household and the extended family household are essential. Another crucial point is the provision of tabulations for calculating prevalence of disability per household (number of households with at least one person with disability per 1,000 households). In addition, the marital status of persons with disabilities can serve as a measure of their social integration, especially if this calculation is compared to persons without disabilities within the population.

572. Besides the basic tabulations on disability suggested in the Principles and Recommendations (see 4.1—4.3), this manual also suggests a set of other tables based on UN guidelines.

a. Education

- School attendance and educational attainment, by sex and age group.
- Net enrollment rate in primary education, by sex, age group and disability status (Beijing indicator).
- Net enrollment rate in secondary education, sex, age group and disability status (Beijing indicator).
- Gender parity index in 1, 2 and 3 levels of education, by sex, age group and disability status (Beijing indicator).
- Literacy rate for 15-24 years of age by sex, further disaggregated by disability status (Beijing indicator).

b. Income generation

- Labour force participation rates for 15-24 years of age, by sex and disability status (derived from Beijing indicator).
- Labour force participation rates for 15 and older (in five-year age groups), by sex and disability status (derived from Beijing indicator).
- Average total income for adults with disabilities, by sex and age group.
- Disability status as a predictor or explanatory variable in a regression analysis predicting what is associated with poverty or lower income status.

c. Marriage and family formation

- Total population 15 years of age and over, by disability status, marital status, number of children ever born alive (if available for men), age group and sex.

d. Care of disabled family members

- Children with disabilities, by the sex of the household head and household composition. In many national contexts, data reveal that persons with disabilities, especially children with disabilities, tend to live in families headed by women. The care of persons with disabilities is mainly a female responsibility.
- Population 60 years of age and over with disabilities, by five-year age groups of 60-64 years, 65-69 years, etc., by the sex of the household head and household composition.

Table 53: Occupied Palestinian Territories (2007) – Relative propensity for not attending school of 6-15 year olds by sex and type of disability

Girls	Visual	Auditive	Movement	Cognitive	Communication
6	5.72	11.83	15.96	22.96	23.46
7	10.85	26.14	45.83	62.00	60.88
8	11.15	28.43	49.47	67.40	64.23
9	6.67	19.24	41.55	59.48	61.75
10	6.51	16.53	39.80	51.54	55.77
11	7.79	19.54	43.29	60.08	63.03
12	5.17	15.95	33.71	41.58	46.24
13	4.72	12.83	26.85	38.28	39.29
14	2.47	10.16	15.56	24.09	24.56
15	1.98	5.63	9.81	13.97	13.92

Boys	Visual	Auditive	Movement	Cognitive	Communication
6	5.97	8.72	16.78	19.11	17.24
7	10.73	21.50	43.00	54.34	49.74
8	8.92	17.75	40.16	53.56	52.17
9	5.42	17.49	40.83	45.53	52.41
10	6.64	12.24	25.84	37.81	39.14
11	5.07	10.32	23.80	34.43	36.50
12	3.39	7.02	16.88	22.06	22.04
13	2.77	5.38	11.11	16.67	17.61
14	1.95	3.96	6.32	10.01	10.26
15	1.47	2.84	3.65	5.92	5.99

Differential impact (Girls/Boys)

	Visual	Auditive	Movement	Cognitive	Communication
6	0.96	1.36	0.95	1.20	1.36
7	1.10	1.22	1.07	1.14	1.22
8	1.25	1.60	1.23	1.26	1.23
9	1.23	1.10	1.02	1.31	1.18
10	0.98	1.35	1.54	1.36	1.42
11	1.54	1.89	1.82	1.74	1.73
12	1.53	2.27	2.00	1.89	2.10
13	1.70	2.39	2.42	2.30	2.23
14	1.27	2.56	2.46	2.41	2.39
15	1.35	1.98	2.69	2.36	2.32

Source: PCBS, Special Tabulation of the 2007 Census

573. As an example of differential school attendance, consider the able 53, which was generated on-line from

special tabulations of the 2007 census of the Occupied Palestinian Territories. It shows the relative propensities for boys and girls of school ages with particular disabilities not to be in school and, in the final part, the ratio of these relative propensities for boys and girls, i.e. the differential impact indicator. For example, the relative propensity of girls with visual impairment aged 10 to be out of school is 6.51, which means that girls with a visual impairment are 6.51 more likely to be out of school than the average for girls aged 10. It is computed based on the number of girls with a visual impairment that are not in school (33), the total number of girls aged 10 (43,566), the total number of girls aged 10 with a visual impairment (508) and the total number of girls aged 10 who are not attending school (435):

Relative Propensity = 33 * 43,566 / (508 * 435) = 6.51

For details, see the explanation in Chapter 2.C.

574. The table shows that having a disability significantly reduces children's chances to attend formal education, particularly in the case of cognitive or communication problems. Moreover, the disadvantage is more pronounced in the case of girls and this difference increases with age. The differential disadvantage of a girl with cognitive impairment at age 7 is 1.14 times that of a boy of the same age, but by age 14 the ratio has increased to 2.41. The WHO World Report on Disability (2011) (Table

7.1) lists school completion figures for a weighted sample of 51 countries, based on survey data, which suggest that disability reduces a boy's chances of school completion from 61.3 to 50.6 per cent (i.e. a factor of 0.825) and a girl's chances from 52.9 to 41.7 per cent (i.e. a factor 0.788).

575. However, as always it is crucial that these data be analysed by age group, not only because male and female age structures may be different, but also because things may have changed and the situation of younger cohorts may be quite different from older cohorts. The report of the 2007 census of Swaziland (Volume 4), for example, lists 617 girls with disabilities between the ages of 10 and 19 that had never attended formal education, compared to 665 boys, suggesting a slightly more favourable situation for girls. But among men and women with disabilities between the ages of 40 and 49 the overall number and the gender balance were quite different, with 2789 women and 1484 men that had never attended formal education. In the 2010 census of Qatar, 62.2 per cent of native Qatari men aged 25-34 years with a disability had not studied beyond primary eeducation, compared to 68.3 per cent of Qatari women aged 25-34 with a disability. The figures for men and women without disabilities were 12.4 and 9.3 per cent, respectively. This indicates that both men and women with disabilities in Qatar are negatively affected in their educational achievement, possibly women slightly more so than men, although the difference is very small.

576. Table 54, from the 2007 census of El Salvador and the 2011 census of Bangladesh, compares the probabilities of men and women with disabilities ever having been married by the time they are in their thirties. The picture here is somewhat mixed. Although some types of disability affect the marriage chances of women more than those of men, such as difficulties in walking or in the use of hands or arms, women with hearing or speech impairments or with mental retardation or deficiency or those who have difficulty in performing everyday activities actually have a better chance of marrying than men with these disabilities. The Bangladesh data show a higher marriage rate for all categories of people, including those with disabilities. Otherwise the pattern is similar to the one found in El Salvador, with the exception of speech impairment which, contrary to the case of El Salvador, affects the marriage chances of women in Bangladesh slightly more than those of men.

577. The census of Qatar (2010) did not publish any detailed tabulations by type of disability. Nevertheless, the results are similar. Among women aged 25-44 with a disability, 66.8 per cent were single, compared to 63.7 per cent of males. Among women and men of the same age without disabilities, these numbers were 22.7 and 21.2 per cent, respectively. This indicates that disability is a major impediment to marriage, both for men and for women, but without a significant difference by sex.

Table 54: Percentages 30-39 year olds by sex and type of disability that were ever married or in union

El Salvador (2007)

Type of Disability	Men	Women
Difficulty Walking or Moving	57.0	49.9
Difficulty in Use of Hands or Arms	53.4	48.0
Sight Impairment, Even Using Glasses	68.8	67.0
Hearing Impairment, Even Using Hearing Aids	39.3	42.5
Speech Impairment	21.4	28.2
Mental Retardation or Deficiency	6.9	16.0
Difficulty Bathing, Clothing, Eating	31.8	38.7
Other Type of Disability	51.9	51.7
No Disability of Any Type	79.1	77.1

Bangladesh (2011)

Type of Disability	Men	Women
Sight Impairment, Even Using Glasses	89.7	93.6
Hearing Impairment, Even Using Hearing Aids	90.8	94.6
Speech Impairment	81.8	75.7
Mental Retardation or Deficiency	56.3	68.0
No Disability of Any Type	93.9	98.7

Sources: Computed from the on-line REDATAM Data Base of the 2007 Population and Housing Census of El Salvador and the on-line data processing facility of IPUMS for the 10 per cent sample of the 2011 Population and Housing Census of Bangladesh

578. It would be interesting to know how many men and women with particular disabilities are married to women and men who also have a disability and if there are any asymmetries in this relationship. Although it is possible to investigate such topics using census data, it requires finding couples within the household structure and

classifying them by the disability status of both. Because this goes beyond simple tabulations, it has not been attempted here, but it could certainly be done.

578. Census data on voluntary caring for persons with disabilities are hard to get by because only a handful of censuses ask these questions. The 2007 census of Ireland, which did address this issue, yielded the following table for men and women by marital status. The UK also asked this question, including ill health, disability and old age.

Table 55: Ireland (2007)—Voluntary care given by sex and marital status of the caregiver and the number of hours of care given per week

Men	Total	1-14 hours	15-28 hours	29-42 hours	43+ hours
Single	20,190	12,251	2,218	1,762	3,959
Married	36,565	21,853	3,554	2,013	9,145
Separated	2.979	1,800	361	201	617
Widowed	969	496	107	73	293
Women					
Single	24,594	15,069	2,725	1,650	5,150
Married	64,054	35,806	6,877	3,181	18,190
Separated	6,723	3,783	758	403	1,779
Widowed	4,843	2,305	493	295	1,750

Source: Population and Housing Census of Ireland (2007), Report 11

578. Some countries publish more detailed tabulations, based on more detailed census information, beyond the standard questions. The census report of Liberia (2008), for example, contains a table on the cause of disability, with the following categories:

Table 56: Liberia (2008) – Causes of disability by sex

From birth	4,708	4,174
Polio	2,288	1,878
Stroke	1,162	982
Epilepsy	1,195	1,125
War	7,634	6,131
Occupational injury	2,633	1,407
Transportation accident	1,731	923
Other types of accident	4,116	2,303
Ageing process	4,224	5,675
Other causes	11,147	12,476
Other diseases	15,824	16,624
Total	56,562	63,698

579. What this shows is that overall disability numbers are slightly higher for women than for men, but that this difference is entirely accounted for by the last three causes of disability. The greater incidence of disabilities associated with ageing is due, to some extent, to the larger number of elderly women in the population, but this does not explain everything. The female population over age 60 is 6.1 per cent larger than the equivalent male population, but the number of disabilities related to ageing in women is 34.4 per cent larger. Women, therefore, do appear to suffer disproportionally from disabilities associated with old age. Strangely, a category of causes of disability not included here is that of disabilities associated to childbirth. That this category can be important is shown by Stubbs and Tawahke (2009), in their study on Samoa, which shows that 7.7 per cent of women with

disabilities acquired their disability through child birth complications. Another important category from a gender perspective is disability caused by spousal violence. This is one of the 7 categories (congenital/prenatal, disease/illness, injury/accident, spousal violence, other violence, unknown, other) included in the 2010 census of Zambia. The Croatian and Romanian censuses of 2011 also include a question on the cause of disability, but no gender-specific causes are identified. Hungary asks for the age at which the disability was acquired.

5. Indicators

580. Using data from subsequent censuses can provide another gendered measure of disability status. Using census data from Ireland, it was found that there were more males than females living with a disability in 2000 (among the disabled population enumerated in the 2000 census, 20,576 were males and 20,214 were females; the sex-ratio was 101.8). Nevertheless, although the sex ratios indicated more males than females among the disabled population (both in 1990 and 2000), the decline in the sex ratio in 2000 denoted that the female disabled population has been growing at a faster rate than the corresponding male population. In order to correctly interpret this trend, however, one would need to separate the components of this increase that are due to the actual increase of the age-specific prevalence of disabilities from the age effect, which is due to the fact that the female population

is ageing faster than the male population. A solution to this type of problem is by using age standardization (see the Methodology Box below).

Methodology Box 9: Age Standardization

The 2011 census of Montenegro found that 54 per cent of the people in the country living with a disability were women and 46 per cent were men (UNECE, 2012 b). If the objective of computing this statistic is to know whether the care for persons with disabilities should be organized predominantly to attend to female or to male patients, it is an appropriate indicator. However, if the objective is to establish whether women are more or less prone to suffer from disabilities than men, it is flawed by two intervening factors, namely:

1. There are more women than men in the population; and

2. The excess of women over men is concentrated in the oldest ages, where disabilities are most common.

To take care of the first problem, one may compute a different statistic, namely the percent-age of men and women that suffer from disabilities. Unlike the previous indicator, this one is not affected by the total number of men and women. The result is 11.7 per cent for women, compared to 10.2 per cent for men, which still suggests a higher incidence of disabilities among women. However, when one age-standardizes this difference, i.e. when

one computes the percentages by age and then applies them to the same age distribution (in this case, the age distribution for both sexes combined), the difference disappears and both percentages become 11.0 per cent. The incidence of disabilities in men is higher early in life, whereas for women it is higher at older ages, but given the age distribution for both sexes combined, the overall incidence is about the same.

The following example from the 2010 census of Mexico illustrates how to carry out the various steps to standardize the age structure.

	Population			Percent Disabled		Number Disabled		Idem Standardized	
	Male	Female	Total	Male	Female	Male	Female	Male	Female
0-4	5,346,943	5,181,379	10,528,322	0.87	0.70	46,259	36,323	91,086	73,807
5-9	5,604,175	5,443,362	11,047,537	1.87	1.35	104,718	73,380	206,431	148,928
10-14	5,547,613	5,392,324	10,939,937	2.00	1.59	110,882	85,523	218,660	173,509
15-19	5,520,121	5,505,991	11,026,112	1.81	1.43	99,954	78,713	199,652	157,628
20-24	4,813,204	5,079,067	9,892,271	1.89	1.37	91,053	69,806	187,135	135,958
25-29	4,205,975	4,582,202	8,788,177	2.08	1.42	87,530	65,043	182,890	124,746
30-34	4,026,031	4,444,767	8,470,798	2.45	1.67	98,726	74,296	207,720	141,593
35-39	3,964,738	4,328,249	8,292,987	2.78	1.97	110,259	85,073	230,627	163,001
40-44	3,350,322	3,658,904	7,009,226	3.59	2.85	120,248	104,229	251,571	199,668
45-49	2,824,364	3,104,366	5,928,730	4.77	4.14	134,690	128,499	282,733	245,408
50-54	2,402,453	2,661,840	5,064,291	6.40	6.04	153,815	160,884	324,237	306,090
55-59	1,869,537	2,025,828	3,895,365	8.50	8.30	158,881	168,187	331,044	323,399
60-64	1,476,667	1,639,799	3,116,466	11.44	11.49	168,883	188,340	356,423	357,943
65-69	1,095,273	1,221,992	2,317,265	15.32	15.56	167,839	190,138	355,096	360,559
70-74	873,893	1,000,041	1,873,934	20.64	21.29	180,328	212,863	386,687	398,875
75-79	579,689	665,794	1,245,483	27.54	28.39	159,620	189,031	342,949	353,615
80-84	355,277	443,659	798,936	35.39	36.63	125,739	162,497	282,758	292,623
85+	298,739	404,556	703,295	46.01	48.40	137,461	195,801	325,612	340,388
Total	54155012	56784120	110939132	4.17	4.00	2256885	2268626	4761313	4297736

Source: INEGI, Tabulations from the 2010 census

The percentage of persons with disabilities who are women is 2,268,626 / (2,256,885 + 2,268,626) = 50.1 per

cent. The percentage of persons who have a disability is 100 * 2,268,626 / 56,784,120 = 4.00 per cent for women, compared to 100 * 2,256,885 / 54,155,012 = 4.17 per cent for men. The age standardization consists in applying the percentage of persons with a disability, separated by sex, not to the corresponding male or female population, but to a common population, in this case made up of all individuals, of both sexes. This yields the hypothetical results displayed in the last two columns, which vary between the sexes because of the different proportions of disabilities among men and women, but not because of the different numbers of men in the base population. The age standardized percentage of women with disabilities is now 100 * 4,297,736 / (54,155,012 + 56,784,120) = 3.87 per cent, compared to 100 * 4,297,736 / (54,155,012 + 56,784,120) = 4.29 per cent for men. Again, the male rates tend to be higher until age 60, whereas the female rates are higher at older ages.

581. In the case of Nicaragua, where the overall percentage of persons with disabilities is 9.1 for men and 11.3 for women (Mont, 2007), male disability rates are higher than female rates until adulthood; men and women are similar until age 39; after that, the rates diverge to a 10 percentage point differential in favour of men. This suggests that there is something about events during the life course that differentiate the experiences of women and men in how and when they acquire disabilities. The example from Samoa by Stubbs and Tawake (2009) mentioned

earlier might suggest that this mid-life higher propensity to develop a disability for women could be associated with child birth or lower income. In order to understand the Nicaraguan case better, the researcher may tabulate having a disability by sex, age group, and poverty status.

582. The following table provides unstandardized and standardized indicators from the 2010 census of Mexico, separated by type of disability.

Table 57: Mexico (2010) – Unstandardized and standardized prevalence of selected types of disabilities

Type of disability	Percentage Female	Prevalence		Standardized	
		Male	Female	Male	Female
Walking or moving	53.3	2.10	2.29	2.19	2.20
Seeing	52.2	1.14	1.19	1.18	1.15
Hearing	45.2	0.50	0.40	0.53	0.38
Speaking or communicating	43.0	0.42	0.30	0.42	0.30
Personal care	52.6	0.20	0.21	0.21	0.20
Paying attention or learning	45.9	0.21	0.17	0.21	0.17
Mental disabilities	43.8	0.47	0.35	0.47	0.34
Total	50.1	4.17	4.00	4.29	3.87

Source: Census of Mexico (2010)

6. Multivariate and further gender analyses

583. Disability-free life expectancy. For addressing the interrelationships of ageing, gender and disability, the disability-free life expectancy measure may be useful. This concept provides an indicator of elderly persons'

health condition in order to help plan adequate services and facilities. The method to calculate this disability-free life expectancy was first presented in a report of the US Department of Health Education and Welfare (Sullivan, 1971) and is often referred to as 'Sullivan Health Expectancy method'. The Sullivan method makes use of a life table and the age-specific proportions of persons with a disability. The age-specific proportions of persons with a disability are multiplied by the corresponding number of person years (Lx) lived between ages x and x + n in the life table. On the basis of these calculated Lx values, the total after lifetime (Tx) in the disabled state can be calculated. By dividing these age-specific Tx values by the total life table survivors (lx), one obtains the life expectancy in the disabled (and non-disabled) state.

Table 58: Life table for Aruba 2010-2011 (males and females) life with and without disability

Males							% Disabled	e(x) Not disabled	e(x) Disabled	% e(x) Disabled
Age	l(x)	D(x,n)	L(x,n)	S(x,n)	T(x)	e(x)				
0	100000	710	99354	0.99290	7387957	73.9	0.4	67.9	6.0	8.1
1	99290	0	397160	0.99987	7288603	73.4	0.4	67.4	6.0	8.2
5	99290	0	496450	0.99934	6891443	69.4	2.2	63.4	6.0	8.7
10	99290	131	496123	0.99868	6394994	64.4	2.3	58.5	5.9	9.2
15	99159	131	495469	0.99569	5898871	59.5	2.5	53.7	5.8	9.7
20	99028	724	493332	0.99148	5403402	54.6	2.8	48.9	5.7	10.4
25	98305	957	489131	0.99084	4910069	49.9	3.0	44.4	5.6	11.2
30	97348	834	484652	0.98936	4420939	45.4	2.6	39.9	5.5	12.1
35	96513	1228	479494	0.98715	3936287	40.8	3.9	35.4	5.4	13.2
40	95285	1236	473332	0.98499	3456793	36.3	3.7	31.0	5.3	14.5
45	94048	1606	466226	0.97506	2983461	31.7	5.6	26.6	5.2	16.3
50	92442	3046	454597	0.96145	2517234	27.2	7.4	22.3	5.0	18.2
55	89396	3964	437072	0.94223	2062637	23.1	9.6	18.3	4.8	20.6
60	85432	6136	411823	0.89999	1625566	19.0	10.5	14.5	4.5	23.6
65	79297	10339	370636	0.84687	1213742	15.3	16.6	11.0	4.3	28.0
70	68958	12364	313879	0.76874	843106	12.2	25.1	8.2	4.0	33.0
75	56594	16671	241291	0.67552	529227	9.4	30.5	5.6	3.8	40.1
80	39923	14647	162997	0.55034	287936	7.2	39.2	3.7	3.5	48.1
85	25276	14671	89703	0.34571	124939	4.9	56.2	2.0	3.0	59.8
90	10605	8806	31012	0.13622	35236	3.3	67.9	1.0	2.3	68.9
95	1799	1799	4224		4224	2.3	76.9	0.5	1.8	76.9

Females							% Disabled	e(x) Not disabled	e(x) Disabled	% e(x) Disabled
Age	l(x)	D(x,n)	L(x,n)	S(x,n)	T(x)	e(x)				
0	100000	1591	98552	0.98259	7975199	79.8	0.2	70.8	8.9	11.2
1	98409	150	393276	0.99892	7876647	80.0	0.3	71.0	9.0	11.3
5	98259	0	491296	1.00000	7483371	76.2	1.5	67.1	9.0	11.9
10	98259	0	491296	0.99929	6992075	71.2	1.8	62.2	9.0	12.6
15	98259	139	490948	0.99831	6500779	66.2	2.8	57.3	8.9	13.4
20	98120	192	490120	0.99817	6009831	61.2	2.6	52.5	8.8	14.3
25	97928	167	489222	0.99772	5519712	56.4	2.7	47.7	8.6	15.3
30	97761	278	488108	0.99481	5030490	51.5	3.1	42.9	8.5	16.6
35	97482	735	485573	0.99230	4542382	46.6	3.6	38.2	8.4	18.0
40	96747	761	481834	0.99200	4056809	41.9	4.6	33.7	8.3	19.7
45	95987	782	477978	0.98990	3574975	37.2	5.9	29.1	8.1	21.8
50	95205	1149	473151	0.97807	3096997	32.5	7.6	24.7	7.9	24.2
55	94056	3002	462773	0.96220	2623846	27.9	10.4	20.3	7.6	27.2
60	91053	3994	445282	0.94484	2161073	23.7	11.7	16.4	7.3	30.8
65	87059	5831	420719	0.91657	1715791	19.7	18.4	12.7	7.0	35.8
70	81228	8210	385617	0.86853	1295072	15.9	23.9	9.3	6.6	41.4
75	73019	12069	334921	0.79378	909454	12.5	33.4	6.4	6.1	48.8
80	60950	15558	265855	0.67355	574533	9.4	46.7	4.0	5.5	57.8
85	45392	19158	179066	0.50989	308678	6.8	63.9	2.2	4.6	67.4
90	26234	15946	91305	0.41956	129612	4.9	69.4	1.4	3.6	72.2
95	10288	10288	38308		38308	3.7	78.9	0.8	2.9	78.9

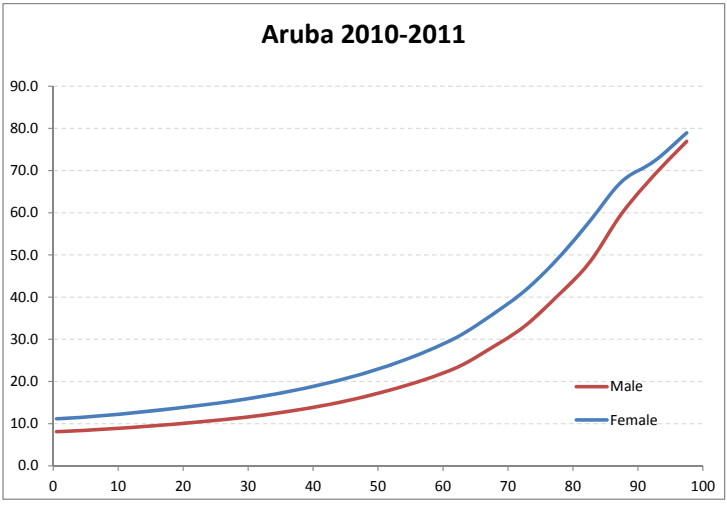
Source: Population and Housing Census Aruba 2010; Helder (2012)

584. Table 58 shows an example of the Sullivan method for Aruba. For each age-category, the percentage of total remaining life expectancy with a disability was calculated. Differences between males and females in the percentage of remaining life spent with a disability are depicted in Figure 17. Life expectancy for men on Aruba at age 60 is 19.0 years. At this age, an average man can expect to live 14.5 years disability-free and 4.5 with at least one disability. Women live longer. Their life expectancy at age 60 is 23.7 years, which is 4.7 years more than men. Of these years, they spend 16.4 years in the disability-free state and 7.3 years in the disabled state. Compared to men, most of the extra years women live are spent in the disabled state. At age 60, a man can expect to live with a disability for 23.6 per cent of his remaining years, for a woman this is 30.8 per cent.

585. A study from Thailand (Jitapunkul et al., 2003) showed similar results. Although women had a longer life expectancy than men, they spent more years in the disabled state. At age 60, women had a life expectancy of 23.9 years, and on average could expect to spend 18.2 years free from long-term disability, leaving 5.7 years (or 24 per cent of their remaining life expectancy) of years lived a disability. By contrast, men aged 60 had a remaining life expectancy of 20.3 years and a disability-free life expectancy of 16.4 years, resulting in 3.9 years (or 19 per cent of remaining life expectancy) spent in a disabled state. Women, therefore, had more years to live,

both in disabled and in disability-free states. Similar conclusions were obtained in a study from the City of São Paulo, Brazil (Camargos, Perpétuo and Machado, 2005). In 2000, 60-year-old men could expect to live, on average, 17.6 years, of which 14.6 years (83 per cent) would be free of functional disability. Women of the same age could expect to live 22.2 years, of which 16.4 years (74 per cent) would be free of functional disability. Men would have a functional disability and be dependent on others for 1.6 years (9 per cent), while the comparable period for women would be 2.5 years (11 per cent).

Figure 17: Percentage of life expectancy at age (x) spent with at least one disability, by sex



586. Using the Sullivan method in censuses, one can at

least make some predictions about gender differences in the incidence of disability on the basis of prevalence data, provided that one can control for the duration of disability. One potential solution is to compute what percentage of their remaining life men and women are expected to live with disabilities. In the example of Aruba in Table 58, this is 30.8 per cent for 60 year old women and 28.9 per cent for 60 year old men. But this result is still biased by the fact that women, because they live longer, survive to more advanced ages, where disabilities are more common. A better alternative is therefore to standardize using the same life table (i.e. the one that characterizes the mortality experience for both sexes combined) for both men and women. In this way one can see how the results would change if men and women survived equally. Based on the female life table, women aged 20 should expect to spend 8.8 years of their remaining life with a disability, compared to 5.7 for men (see Table 58). But when the life table for both sexes is used, this result changes to 7.5 years for women, compared to 6.5 for men. This implies that, although the prevalence of disabilities beyond age 20 is indeed higher for women than for men, a substantial part of the difference is also accounted for by the fact that women live longer and are therefore more likely to survive to higher ages, where disabilities are very common.

587. The Sullivan method provides an insight into gender differences in levels of disability. However, there are also some shortcomings in using this method. There

are at least two methodological problems linked to this approach. The first one is that the results may be biased because persons with disabilities may have higher mortality than the general population. This means that the number of years lived with a disability will be over-estimated in an approach that assumes the same life table for those with and without disability. Although this bias affects both sexes, it may be more severe in the case of women, thereby explaining part of the higher life expectancy with disability that characterizes women.

588. The second shortcoming has to do with the nature of the data used in the Sullivan method. In general, each health condition can be described in terms of its prevalence and incidence. Incidence refers to new cases of a health condition in a given period and prevalence to the number of existing cases at a certain point in time. The Sullivan method uses data on prevalence of disability, but to answer the question whether women are more or less prone to disabilities than men would also require data on the incidence of disability. These data are not available in censuses, as it would require a question on the timing when the respondent became disabled. However, prevalence and incidence are closely linked. One of the basic formulas in epidemiology states that prevalence = incidence x average duration. The study of Oman et al. (1999) sheds some light on the relationship between prevalence and incidence of disability. In their cohort study of 2,025 residents 55 years of age and older in Marin County,

California, they found that the incidence rates for lower body physical disability were not significantly different between men and women. However, age-specific and age-adjusted prevalence rates were consistently higher among women. They attributed this difference to the longer duration women live with a disability, due to the lower recovery and mortality rates among females vis à vis males.

589. As was noted in the discussion of Table 53, persons with disabilities generally run a greater risk of being excluded from formal education. The following example deepens this analysis by showing not only how in Vanuatu children and adolescents between the ages of 5 and 20 with a disability are less likely to attend education than others of their age, but also how this tendency varies by a number of attributes. Table 59 displays the results of a logistic regression in which the dependent variable was whether a child was going to school (full time or part time – value 0) or not (i.e. left school or never attended – value 1). Answers to the four questions on disability used in the population census were included, namely:

Does this person have difficulty in:

a. Seeing, even wearing glasses ?
b. Hearing, even if using a hearing aid ?
c. Walking or climbing steps ?
d. Remembering or concentrating ?

In addition to these four disability conditions, sex, age, rural/urban residence, and citizenship were included as control variables.

590. The results of the logistic regression clearly show that, for each of the four disability variables, children with some difficulties have higher probabilities of not attending than those without difficulties. Children who cannot hear, walk or remember/concentrate at all score much higher than those who have some difficulty. For instance, a child who cannot walk has more than 6 times higher odds of not attending school. A child with some difficulty has about 90 per cent higher chance to remain without schooling. Somewhat unexpectedly, the effect is less pronounced (but present) for children who are visually impaired. Finally, girls have a slightly higher probability of not attending school than boys, but the difference is only 3 per cent. This is more or less the same as the difference in the general population, without controling for intervening factors in a multivariate analysis: among all boys aged 5-19, 72.2 per cent attend school against 71.5 per cent of girls. Note, however, that the education of the mother has a profound effect on the chance of a child to attend school. The odds of children to be in school, with a mother who has more than primary education is 2.5 times as high (1/.406) than among children whose mother has less than primary education.

Table 59: Vanuatu (2009)—Logistic regression of non-attendance of school by children and adolescents aged 5-20, by type of disability and other explanatory variables

Variable	Category	B	exp(B)
Sex	Male		
	Female	0.032	1.033
Age	5 - 7 yrs.		
	8 - 10 yrs.	-0.755	0.470
	11 - 13 yrs.	-0.374	0.688
	14 - 16 yrs.	0.894	2.445
	17 - 19 yrs.	2.420	11.248
Urban/Rural	Urban		
	Rural	0.358	1.431
Difficulty seeing	No difficulty at all		
	Some difficulties	0.361	1.435
	Cannot do at all	0.528	1.696
Difficulty hearing	No difficulty at all		
	Some difficulties	0.170	1.185
	Cannot do at all	1.256	3.512
Difficulty walking	No difficulty at all		
	Some difficulties	0.657	1.929
	Cannot do at all	1.867	6.469
Difficulty remembering	No difficulty at all		
	Some difficulties	0.420	1.522
	Cannot do at all	1.319	3.739
Citizenship	Vanuatu by birth		
	Vanuatu by naturalisation	-0.095	0.909
	Other countires	-0.287	0.751
Education mother	Less than primary		
	Primary	-0.506	0.603
	More than primary	-0.902	0.406
Constant		-1.274	0.280

Source: Population and Housing Census of Vanuatu (2009)

591. Noteworthy studies that utilize census data to profile persons with disabilities within their populations are Zambia and Israel. These studies can be viewed online at

the following URLs: Zambia (http://www.statssa.gov.za/census01/html/Disability.pdf), and Israel (http://www.cdc.gov/nchs/washington_group.htm). This latter study was discussed in the 10th Washington Group Meeting in Luxembourg in 2010.

7. Interpretation, policy and advocacy

592. Negative stereotypes about persons with disabilities may result in lowered expectations of their abilities and social policies that do not allow them to realize their full potential. Negative images and portrayals of persons with disabilities, especially older women with disabilities, influence society's view of them, and consequently, their ability to integrate and participate in society. Negative stereotypes also increase their vulnerability to abuse and discrimination.

593. According to Rousso (2003), boys may have the advantage in obtaining assistive devices and other rehabilitation services needed to get to and participate at school. Women receive only one fifth of the rehabilitation in the world and, particularly in developing countries, men have greater access to rehabilitation services and to prosthetic and orthotic devices than women. Gender bias in access to rehabilitative services and devices is in itself a barrier to education for girls with disabilities. He recommends that more reliable data should come from increased research

on such basics as the number of girls with disabilities who are of school age, their school enrollment levels, and their educational outcomes. This requires developing a consistent definition of disability as well as disaggregating data on children who are disabled by sex, and disaggregating data on girls by disability status.

594. Country examples for successful advocacy for data collection include an NGO-alliance led by North India Cerebral Palsy Association that campaigned in Punjab, India for women and men not to hide their disabilities during the census.

Conclusions

The previous chapters should have provided you with a sound understanding of the strengths and weaknesses of census data as they relate to gender equality issues and the empowerment of women and be able to make sense of tabulations, indicators and multivariate analyses on a variety of gender topics.

The introductory chapter explained how analysing census data in a gender-responsive way is situated within the overall efforts to produce, disseminate and use gender statistics. You were introduced to the differences between sex-disaggregated data and gender statistics and familiarised you with some of the challenges regarding gender statistics. You were also taken through the key concepts related to gender analysis such as sex, gender, gender equality and gender mainstreaming. You should now be able to understand some of the differences in the way statisticians and gender experts use certain terms. Hopefully, this will enable you to communicate more clearly and collaborate more effectively towards our shared goal, i.e. providing an evidence-base to monitor progress towards gender equality and the empowerment of women in your country and to inform policy-making and innovation in this area.

Chapters 3 to 12 examined how ten issues of known gender relevance can be analysed on the basis of census data. The ten gender issues were fertility, sex ratios, marital status, household composition, living conditions/poverty, education, work, migration, disability and social security. Each chapter followed the same structure: After defining the main concepts, it was explained why the particular issue at hand is important from a gender and human rights perspective and point to some of its policy implications. A section on data challenges helped you appreciate the nature and quality of the census variables at your disposal for analysis. The text then introduced some of the key tabulations and indicators that can be constructed around the topic, using census data only, and how these should be interpreted. Finally, it suggested some further, more advanced, gender analyses that can be carried out as well as some potential advocacy uses.

Some of the key messages conveyed or implied by this manual can be summed up as follows:

- Collaborate. Gender analysis of census data is not a task for NSOs alone. Where gender experts from various backgrounds (e.g. national mechanisms for gender equality, universities, media, NGOs and other civil society organisations) work together with NSOs, gender analysis will be more meaningful on the ground.
- Understand the limitations of your data. The data in front of you have not been derived from a gender-neutral process. Census-taking is gender biased

because of the questions asked (and not asked) and the way the census questionnaire is constructed, the number and quality of female and male staff engaged in enumerating, recording, processing and editing the data and for many other reasons. Furthermore, as the individual chapters on gender issues showed, there are specific limitations associated with each topic. For instance, to find out about child marriage, further disaggregation of existing census variables or computation of a new indicator may be required before embarking on the analysis.

- Go beyond sex-disaggregation. While sex-disaggregated data is a key tool to developing meaningful gender statistics, gender analysis goes far beyond: Gender analysis includes the development of gender-responsive indicators, in-depth examination of the gender implications of key social phenomena, efforts towards multivariate analysis, and efforts towards translating data into policy and planning.
- Tease out gender differences as well as differences based on age, socio-economic factors, household composition, migration- or disability status, etc. While tabulations and single indicators provide important overviews of complex issues and are powerful advocacy tools, analysis should not stop there. Women, men, girls and boys are not homogeneous groups and a person's age, disability status, where she/he lives, with whom, etc. will have important implications for that person's life chances. In order to make policies and programmes gender-responsive, meaningful on the ground and effective, one needs to analyse all the information available, rather than simply looking at the dichotomy female/male. Again, the collaboration

of data experts and gender experts is required in this process.

- Go beyond census data. In many instances, census data provides only an initial glimpse of where gender is operating. To fully understand the phenomenon, other data sources (where available) should be combined with census data or analysed in a second step. For instance, to understand the gender pay gap in your country, you may use the census as a sampling frame and then look at Labour Force Survey data for an accurate measure of women's and men's incomes, hours worked, etc. to determine differences between the sexes. You may choose to also consult other gender data, e.g. on maternity leave legislation in your country, access to child care, and cultural attitudes and beliefs regarding women's labour force participation, child rearing, etc.

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APPENDICES

APPENDIX 1

Gender-Relevant Issues in 2005-2014 Census Forms

Clarifications

Numbers refer to the number of alternatives that can be selected (sometimes involving more than one question), e.g. 2 means that the question has an answer such as yes/no, male/female, etc. The plus sign (+) is used for questions that have open-ended answers. A number followed by a plus sign indicates a certain number of precoded categories plus an open-ended answer.

Fertility/Mortality

Children Ever Born Alive, Surviving and Born During Last 12 Months: S indicates differentiation by sex and D indicates that the criterion was the date of birth of the last born child. B means that both the date of birth of the last child and the number of children born during the past 12 months were asked.

Marital status: P after the number of categories indicates that polygamous unions can be identified; C means that informal/consensual unions can be identified.

Date/Age at first marriage: D = Date, A = Age

Household/Dwelling

Criteria for selection of head of household:

N = None specified

A = Authority / decision-making criterion

H = Person who owns home or pays rent

R = Randomly assigned reference person

M = multiple headship considered as a possibility

Relationship to head of household: D after the number of categories indicates that the categorization makes it possible to identify domestic servants and their families.

Father/mother live in household and also Orphanhood question:

F = father, M = mother; fm = either;

FM = both mother and father

In the case of construction materials, the number refers to the number of items that ask about materials used: external walls, floor, roof, etc. In the case of personal income, the number refers to the number of sources that can be identified.

Depending on the way the question is asked in different countries, consumer durables may include:

Air conditioner
Bicycle
Boat
Bull/buffalo cart
Cable
Canoe
Cell/mobile phone
Computer
Cuisinière
Daily newspaper
Dish washer
DVD player
Fixed telephone
Generator
Insurance (home)
Internet connection
Microwave oven
Motor cycle
Motor vehicle
Mower
Outboard motor
Oven (conventional)
Parabolic antenna
Radio
Refrigerator/ freezer
Rickshaw
Satelite disk
Secondary residence
Sink with piped water
Solar collector
Solar water heater
Stereo set
Stove
Television
Toaster oven
VCR
Washing machine
Water heater (electrical)
Water tank

Income/Poverty

An R after the number of sources for which an amount of personal income was declared indicates that one of the specific sources declared was Remittances.

Disability

The numbers listed here are equal to the number of disability topics addressed by the questionnaire times the number of alternatives given for each topic (minimum of 2, i.e. does/does not have the particular disability).

ISO codes for the countries in the table

ABW	Aruba
ALB	Albania
ARE	United Arab Emirates
ARG	Argentina
ASM	American Samoa
AUS	Australia
AZE	Azerbaijan
BDI	Burundi
BFA	Burkina Faso
BGD	Bangladesh
BGR	Bulgaria
BHS	Bahamas
BLR	Belarus
BMU	Bermuda
BRA	Brazil
BRB	Barbados
BTN	Bhutan
BWA	Botswana
CAN	Canada
CHE	Switzerland
CHN	China
COG	Congo
COK	Cook Islands
COL	Colombia
CPV	Cape Verde
CRI	Costa Rica
CYM	Cayman Islands
CYP	Cyprus
CZE	Czech Republic
DEU	Germany
DJI	Djibouti
DOM	Dominican Republic
DZA	Algeria
ECU	Ecuador
EGY	Egypt
ETH	Ethiopia
FJI	Fiji
FRA	France
GHA	Ghana
GNB	Guinea Bissau
GUM	Guam
HKG	Hong Kong
HRV	Croatia
HUN	Hungary
IDN	Indonesia
IMN	Isle of Man
IND	India
IRL	Ireland
IRN	Iran
ISR	Israel
JAM	Jamaica
JOR	Jordan
JPN	Japan
KAZ	Kazakhstan
KEN	Kenya
KHM	Cambodia
KIR	Kiribati
KOR	Korea, Republic of
LAO	Lao People's Dem. Rep.
LBR	Liberia
LCA	St. Lucia
LSO	Lesotho
MAC	Macao
MDV	Maldives
MEX	Mexico
MLI	Mali
MLT	Malta
MNE	Montenegro
MNG	Mongolia
MNP	N. Mariana Islands
MOZ	Mozambique
MTQ	Martinique
MUS	Mauritius
MWI	Malawi
MYT	Mayotte
NCL	New Caledonia
NFK	Norfolk Island
NGA	Nigeria
NIC	Nicaragua
NIU	Niue
NPL	Nepal
NZL	New Zealand
PER	Peru
PHL	Philippines
PLW	Palau
PRK	Dem. People's Rep. of Korea
PSE	Occ. Palestinian Territories
PYF	French Polynesia
QAT	Qatar
REU	Reunion
ROM	Romania
RUS	Russia
SAU	Saudi Arabia
SDN	Sudan
SGP	Singapore
SLB	Solomon Islands
SLV	El Salvador
SRB	Serbia
SWZ	Swaziland
SYC	Seychelles
TGO	Togo
THA	Thailand
TJK	Tajikistan
TKL	Tokelau
TLS	Timor Leste
TON	Tonga
TTO	Trinidad & Tobago
TUR	Turkey
UKM	United Kingdom
USA	United States of America
VEN	Venezuela
VIR	US Virgin Islands
VNM	Viet Nam
VUT	Vanuatu
WLF	Wallis and Futuna
WSM	Samoa
ZAF	South Africa
ZMB	Zambia

	Questionnaire Items	ALB	DZA	ASM	ARG	ABW	AUS	AZE	BHS
Fertility/ Mortality	1. Children Ever Born Alive (by sex)	+	+S		+	+S	+	+	+
	2. Children Surviving (by sex)	+	+S		+			+	+
	3. Ch. Born in 12 Months / Date of Last (by sex)		+S		D	D			+
	4. Maternal/paternal orphanhood								
	5. Number of persons deceased in household		+						
	6. Sex of deceased		2						
	7. Month/year of birth or age of deceased		+						
	8. Month/year of death of deceased		+						
	9. Relation to pregnancy		4						
M S	10. Date of / Age at first marriage		D					A	
	11. Marital status	5	4	5	6	4C	5	6C	9C
Household / Dwelling	12. Criterion for headship selection	R	N	H	N	H	N	N	N
	13. Relationship to head of household	16	?	14	9D		6+	11	16D
	14. Father/mother lives in household	F				FM			
	15. Grandchildren living in home / cared for			2		2			
	16. No. of items asking for construction materials			3	5	5		1	2
	17. Presence of kitchen inside the home		2	2	3				
	18. Source of heating for cooking		3	6	7				
	19. Origin of water consumed in household	5	5	6	6	5			7+
	20. Status of occupation of home	5	4	8	7	8	5+		5+
Inc. / Poverty	21. Presence of consumer durables	16	11	8	4	9	2	4	9
	22. Health insurance coverage			8	5				
	23. Receiving social security payments			+	4	2			
	24. Amount of personal income (by no. of sources)			10R		1	1		10R
	25. No. of sources of pers. income without amounts					7+		11	
	26. Only amount or sources of household income	7R							
	27. Personal ownership of assets								
Educ	28. Literacy	2	+		2			2	
	29. School attendance and grade or level	+	+	14	9	12	2	10	4
	30. Last grade or level attended/completed	11	+	14	9	12	6	11	22
	31. Ability to speak national language		2				4		
Work / Economic Activities	32. Business use of the dwelling			2		2			
	33. Care-taking of dependent children						3		8
	34. Care-taking of disabled/sick household members					8	2		
	35. Currently working or employed	5	7	3	2	2	5	2	9+
	36. Reasons for not working	8				6			
	37. Any work done for pay		2	4	2				
	38. Disposition / availability to work	2		3		2	4		
	39. Looking for work		2	2	2	2	3	4	
	40. Main occupation	+	+	+	+	+	+	13	+
	41. Main activity within occupation			+		+	+		
	42. Hours per week worked	+		+		+	+		6
	43. Status in employment	4	6	7	4	10	2	11	6+
	44. Institutional sector		3		4	8	2		
	45. Sector of activity / Industry		+	+	+	+	9+		+
	46. Contribution to social security				3				
Migration	47. Place of birth	+	+	+	+	8	7+	+	+
	48. Residence at fixed time in the past	+	+	+	+	9	+	?	+
	49. Citizenship	+	+	6	8	8	2	+	+
	50. Number of persons living abroad	+	+						+
	51. Sex of departed	2	2						2
	52. Age at time of departure or at present	+	+						+
Disability	53. Difficulty hearing / seeing	8		4	4	8			
	54. Difficulty understanding / concentrating	8		2	2	8			
	55. Dif. of motion/dressing/bathing/doing errands	8		8	4	8			
	56. Other kinds of disability					7+			
	57. Generic disability question								
	58. Does the person need help in performing tasks ?					9	9		
Misc.	59. Ethnicity or race	+	+	+			3+		8+
	60. Religion	+				9	9+		+
	61. Language spoken at home			+		7	7+		
	62. Means of transportation to work or school	12	6	9					7+

		BGD	BRB	BLR	BMU	BTN	BWA	BRA	BGR	BFA	BDI	KHM	CAN	CPV	CYM
Fertility/ Mortality	1.		+S	+	+	+S	+S	+S		+S	+S	+S		+S	8
	2.		+S			+S	+S	+S		+S	+S	+S		+S	
	3.		+		6	+S	+S	B		+S	+S	+S		B	B
	4.						FM	F		FM	FM			FM	FM
	5.					+	+	+		+	+	+			+
	6.					2	2	2		2	2	2			2
	7.					+		+		+	+				
	8.							12		+	+	+			+
	9.					2				4+	5	2			
MS	10.				A										
	11.	4	6C	6C	7	6C	6C	8C	4C	8P	8P	5	5C	5C	5C
Household / Dwelling	12.	N	N	R	R	N	N	M	N	N	N	N	N	N	R
	13.	5	10	11	18D	22	14	20D	12	10	11	+	13+		11D
	14.		FM					F		FM	FM			FM	
	15.									1					
	16.	1	2	1		2	3	1	1	3	3	3		1	
	17.								3					4	2
	18.		8			5+	12+			8	8	6+			4+
	19.	3	7		7+	5+	11+	10	4	7	7	7+		3	3+
	20.	3	6	5+	6		11		6	5	7	3+	2		6+
Inc. / Poverty	21.		22	3	6	14+	16	10	16	11	6	?			12
	22.				6										5
	23.				3			8	2						2
	24.		1		6			2					11		
	25.			12		11									7
	26.														1
	27.									2	2				
Educ	28.	2		2		2		2	3	2+	6	2		2	
	29.	2	8	5	7+	2	+	27		3+	10+		4	3	8
	30.	?	9	7	16+	17	+	14+	15	11	+	9+	18	11	18+
	31.			4							4	2	4		
Work / Economic Activities	32.							2				4			
	33.				8								6		
	34.														
	35.	4	9	3	5	2	9+	10	5	2	2	2		4	8+
	36.			9+	11	11	5+			7	8		3	11	
	37.					2	2	2					+	6	
	38.			2				2	2	2	2		6	2	
	39.	2		10	2			2	2	2	2		3	9	
	40.		+	+	+	+	+	+	+	+	+	+	+	11	+
	41.			+									+		+
	42.		8		+			+					2	8	+
	43.		6	5	9	4+		7	7	6	7	4+	4		7
	44.								3	+	+	8		+	+
	45.	3	+	+	+	12+	+	+		+	+	+	+		+
	46.							3	7				8		8
Migration	47.		+	+	+	+	+	+	+	+	+	+	13+	5	17+
	48.		6				+	+	+	+	+		3+	5	9+
	49.			2+	5		14+	+	3+	3+	3+	+	2+	5	7+
	50.		+	+	+		+	+	2	+	+	+			+
	51.		2				2	+				2			2
	52.		+				+	+				+			+
Disability	53.	4	4		10	4	8	8			2	4	3	4	4
	54.	4	6		8	2	4	2			2	2	3	2	4
	55.	2	18		6	2	22	4				2	3	2	4
	56.	2	10+		42+	2					2			3	3+
	57.									7	10		10	1	
	58.				8										
Misc.	59.		8		8			5+	4+				11+		
	60.	5	23			3	7	+	7+	6	+	3+		11	20
	61.			2+		+	12+			+			2+		9
	62.				19				7				8		8

		CHN	COL	COG	COK	CRI	HRV	CYP	CZE	PRK	DJI	DOM	ECU	EGY	SLV
Fertility/ Mortality	1.	+S		+S		+	3+		4	+S	+S	+S			+S
	2.	+S		+S		+					+S	+S			+S
	3.	+S		+S							+S	D			
	4.			FM							FM				
	5.	+		+						+	+	+			+
	6.	2		2						2	2	2			2
	7.			+						+	+	+			+
	8.			+						+	+	+			+
	9.									4	3				4
MS	10.	D								A					
	11.	4	6	6P	6	6C	4C		4C	4	6P	6C		6P	6C
Household / Dwelling	12.	N	A	N	A	N	R		N	N	N	N		N	N
	13.	9	10D	10D	8	12	15			8	8	13D		11D	13D
	14.										FM				
	15.			+							1				
	16.	1	3	3	3	5			1		3	3		1	3
	17.	3					+					3			2
	18.	5	4	6	4	5				6	6+	6			9
	19.		24+	10	4+	7	3		4	7	8+	10		4	10
	20.	8	5	5	7	7	7		8		8+	5		8	
Inc. / Poverty	21.		24	21	24	4	2		2	2	15+	16		22	13
	22.									7					
	23.		6		6	8				7					
	24.		12		12										
	25.	7					10								
	26.														
	27.			2							2				
Educ	28.	2		3		2	2				8	2			2
	29.	5	2	3+	2	7	16				3	4+		5	3
	30.	7	+	+	+	8	19		11		6	4+		9	9
	31.		2			+					2				
Work / Economic Activities	32.	3									2				6
	33.														
	34.														
	35.	3	2	2	2	4	9		2	2	2	2		15	4
	36.	9		8					4		7				6
	37.		2		2	5	3			6	2	2			7+
	38.	2	2	2	2		2				2	2			6
	39.	7		2		7	2				2	2			4
	40.	+	+	+	+	+	+		+	+	+	+		+	+
	41.					+					7				+
	42.		+		+					+					+
	43.		9	9	9	6	9		5	3	7	5		6	7
	44.			+							+				+
	45.		+	+	+	+	+		+	+	+				
	46.														
Migration	47.	3+	+	+	+	+	+				3	+		+	3+
	48.	2+	+		+	+			+	+		+			
	49.			+			3+		+	2				+	
	50.	+				+	+							+	+
	51.	2												2	2
	52.					+									
Disability	53.					4	4			8	2	4		4	4
	54.					4	2			4		4			2
	55.					2				4		16			4
	56.					4	4				2	16		6+	2
	57.		+	8	+						8				
	58.	4					4								
Misc.	59.	+	5+	+	5+	10	1+		+		4				10+
	60.		9+	9	9+		3+		3+		4			4	
	61.														
	62.						13		9						

		ETH	FJI	FRA	PYF	DEU	GHA	GUM	GNB	HKG	HUN	IND	IDN	IRN	IRL
Fertility/ Mortality	1.		+S		+		+S	+	+S		+	+S	+S	+S	+
	2.		+S				+S		+S			+S	+S	+S	
	3.	+					+S		+B			+S	+S	+S	
	4.	FM													
	5.	+					+		+						
	6.	2					2		2						
	7.	+					+		+						
	8.								+						
	9.	2					2		4						
M	10.								A			A			
	11.		6	4PC	4PC	7C	6C	5	6PC	5	?	5	4	4	7
Household / Dwelling	12.	N	N	R	N	N	N	H	N	R		N	N	N	N
	13.	11	10				11	14	+	5+D	8	+	9D	12	+
	14.			FM										M	
	15.			+	+			2							
	16.	4	1		3		3	3	3		1			1	
	17.	7+			3		8+	3		+	2			2	
	18.	7+	6+	6			9+		5					7	
	19.	7	7+		3		14+	6	14		3			7	5
	20.	7	6+	4	6	4	5+	4		9				6	8
Inc. / Poverty	21.	3	23	4	11		4	8	10					12	3
	22.							7+							
	23.					3		2							
	24.		1R					8R		5					
	25.														
	26.														
	27.			2	2										
Educ	28.	2			2		7		2			2	4	2	
	29.	2	4		6	2	3	8	3	+	12	8	3	3	
	30.	+		18	9	17	12	14	5	+	12+	+	9	+	13
	31.				2				2	2	+		2		2
Work / Economic Activities	32.		9+					2							
	33.							2							
	34.														
	35.			2	2	9			4		12		3	8	7+
	36.	7	6+	6	6		6		3	7+		7			
	37.		4		2	2	2	7	5	2	3				
	38.	2	2	2	2	2	?	3	2	2	2		2		
	39.		2	2	2	3	?	2			2	2	2		
	40.	+	+	+	+	10+	+	+	10	+	+	+		+	+
	41.			5	8	+		+		+					
	42.			2	3			+							
	43.		6+	4	8	10	8	7	4	6	7+	4	6	5	
	44.			+	6		6	4	+					2	
	45.	+	+	+	6	23	+	+		+		+	19		+
	46.														
Migration	47.		+	+	5+		23	+	+	6		+	+	+	+
	48.		+	3+	6+			+	+	+			+		+
	49.		3	3+	3+	5	16	6	+	2			+	8+	2+
	50.								+		+				
	51.								2						
	52.								+						
Disability	53.	4	4				4	4			7	4	8	4	2
	54.	2	2				2	3			3		4		2
	55.	2	2				2	8				2	8		2
	56.	8	3+				2+				4+	4		8	2
	57.								2+		5				2
	58.														
Misc.	59.		14+						+		18+		+		7+
	60.	6	+			9	8+		+	10+	1+	6	6+	5	5+
	61.				+			+	2	2	18+		+		
	62.		10	5				9		20+	8	10			

		IMN	ISR	JAM	JPN	JOR	KAZ	KEN	KIR	LAO	LSO	LBR	MAC	MWI	MDV
Fertility/ Mortality	1.		+	+S			+	+S	+S	+S	+	+S		+S	+S
	2.			+S			+	+S	+S		+S	+S		+S	+S
	3.			+S						+S	B	+S		+S	+S
	4.							FM	FM		FM	FM		FM	
	5.			+				+		+	+	+		+	
	6.			2				2		2	2	2		2	
	7.			+						+	+	+		+	
	8.			+											
	9.			+				4		2		2		5	
M	10.		D				D				A				A
	11.		6	5C	4	5	4	6P		4	7P		5	4	4P
Household / Dwelling	12.	N	N	N	N	N	N	N	N	N	N	N	R	N	N
	13.	7+	21D	13D	12D	9D	11	11	+	6	11D	+	9	5	10
	14.						Fm	M					2	FM	7
	15.														
	16.			2			1	3		3	3	3		3	3
	17.			3											2
	18.			8+				7+		8	9+	5+		7	4
	19.			8+			6	14+	5	7	10+	7+		14	5
	20.		5	5+				10	5	5	5	3+	5+	3	3
Inc. / Poverty	21.		13	6		13	2	13	15		10	6	5	10	13
	22.					5									
	23.			5+											
	24.		5	7			1						1		
	25.		1				9+		5R						
	26.														
	27.		2												
Educ	28.					2	2				7	2	4	4	
	29.		3	10+	7			3	3	3	4	2	2	3	8
	30.		9	10+		+	10	?	21	13	29+	+	+	6	8
	31.						9			4			4	8	
Work / Economic Activities	32.														
	33.														2
	34.														
	35.			10+	2	5	2		3	12	13+				
	36.	9+			5		4		+				4+	6	10+
	37.			3	3	2							2		2
	38.	3	2			2	2						5	2	2
	39.		2	+					2				6+	3	2
	40.	+	+		+	+		?	+	4+		+	+	+	+
	41.	+	+										+		
	42.		+	+		+		+							+
	43.	5	8		8	5			+			+	4	6	5
	44.			6+							5+				8
	45.	+	+		+	+	10+	?		+	18	+		+	+
	46.														
Migration	47.	6+	+	14+		+	+	+	+	12	13+	+	8+		2+
	48.		+		4+	(+)		+	+	12	13+		6+		2+
	49.	+			+	+	2+		+	12	5	+	7		2
	50.			+		+		+							
	51.			+						2					
	52.			+						+					
Disability	53.		4	8		4		4		4					
	54.		4	4		2									
	55.		16	12				2							
	56.			4		8		4		3					
	57.						3				?	+			
	58.													3	
Misc.	59.		+	5+				+	7	50		+	7		
	60.		5	21+		3	6+	8	+	5		+		4	
	61.												8		
	62.		10		9		5						6+		

APPENDIX 2

Glossary of important gender terms [38]

Empowerment – A process through which women and men in disadvantaged positions increase their access to knowledge, resources, and decision-making power and raise their awareness of participation in their communities in order to reach a level of control over their own environment.

Gender – The roles and responsibilities of women and men that are socially rather than biologically determined. Gender explains the way in which social and cultural values and traditions determine how women and men are perceived and expected to think and act.

Gender Analysis – An analytical tool that examines the differences and disparities in the roles that women and men play, the power imbalances in their relations, their needs, constraints and opportunities and the impact of these differences on their lives. Gender analysis may be conducted at all stages of an intervention, from priority-setting and data collection to the design, implementation

38 Based on UNSD/CAPMAS (2000). Gender and Development: An Information Kit I. Cairo, CAPMAS.

and evaluation of policies or programmes.

Gender and Development – An approach to development based on the premise that all policies, programmes, and projects should reflect the needs, priorities, roles and the impacts of development processes on men and women.

Gender-Based Indicators – Indicators that can gauge the extent to which gender objectives have been achieved.

Gender Bias – The perception that the other sex is not equal and hence does not have the same rights.

Gender Blindness – Failure to recognize that gender is an essential determinant of social outcomes, including education, health and the standard of living.

Gender Difference – Any kind of distinction between the characteristics of men and women, regardless of whether it is based on the social attribution of roles or on innate predispositions.

Gender (or Sexual) Discrimination – Prejudicial treatment of a person on the basis of a gender stereotype.

Gender Disparity – Differences in men's and women's access to services, status, and power which usually favour men and are institutionalized through laws and social customs.

Gender Equality – Absence of discrimination on the basis of a person's sex in opportunities, the allocation of resources or benefits, or in access to services.

Gender Equity – Fairness and justice in the distribution of responsibilities and benefits between men and women. It recognizes that men and women have different needs and power and that these differences should be identified and addressed in a manner that rectifies that imbalance between the sexes.

Gender Gap – The disparity measured quantitatively between women and men and girls and boys in their education, health, access to resources and services.

Gender Mainstreaming – The integration of gender concerns into the analysis, formulation and monitoring of policies, programmes and projects. The objective is to achieve greater equality and thereby reduce gaps between women and men in opportunities and benefits.

Gender Perspective – A framework of analysis to assess how women and men affect and are affected by policies, programmes, projects and activities in any development intervention.

Gender Roles – Specific economic and social roles that a society considers appropriate for men and women. Gender roles and responsabilities vary between cultures and may change over time. Men are generally identified with

productive roles. Women have a triple role: reproductive, including domestic responsibilities, productive work and community work. These are often carried out simultaneously. Women's roles tend to be undervalued and excluded from national income accounts in almost all societies.

Gender Sensitivity – The ability and willingness to perceive existing gender issues, gaps and inequalities and incorporate these into programmes, strategies and actions.

National women machinery – Governmental body (bodies) entrusted with drawing policies, strategies or plans for improving women's welfare. This body may also be responsible for designing and implementing interventions and for coordinating women-focused interventions at the national level.

Participation – Inclusion of all segments of society, particularly the marginalized, in the process and benefits of development. The purpose is to improve self-reliance through increased accessibility to resources and opportunities in order to improve welfare and the standard of living.

Sex – The genetic and physiological characteristics and traits that indicate whether one is male or female.

Women in Development (WID) – The development framework that recognizes the distinct needs and capacities of women. It focuses on developing strategies and

action programmes that will facilitate their participation in the productive sector.

APPENDIX 3

Mapping of Resources on Gender Statistics, Relevant to the Gender Analysis of Census Data

CensusInfo

- User-friendly database system for the dissemination of population and housing census results, designed by UNSD, UNICEF and UNFPA, adapted from DevInfo database technology.
- Data is presented in several forms (tables, graphs and maps).
- Useful tool for identifying disparities and priority groups.
- Database administrators can add their own sets of national, regional and local indicators to their databases.
- Website: http://www.censusinfo.net/
- ECLAC Gender Equality Observatory for Latin America and the Caribbean
- Provides a number of regional and national indicators.
- Main areas of concern: Paid and unpaid work, time use and poverty, Access to decision-making and political representation, gender violence, health, and reproductive rights.
- Website: http://www.eclac.org/oig/default.asp?idioma=IN
- International Statistical Agencies

- Provides a list with links to National Statistics Offices (NSOs) around the world.
- Website: http://www.census.gov/aboutus/stat_int.html
- Gender, Institutions and Development Data Base (GID-DB)
- Data base developed by the Organisation for Economic Co-operation and Development (OECD), compiled from various sources.
- Combines in a systematic and coherent fashion the current empirical evidence that exists on the socio-economic status of women.
- Covers a total of 160 countries and comprises an array of 60 indicators on gender discrimination.
- Measures intra-household behaviour and social norms (family code, physical integrity, civil liberties, ownership rights, etc).
- Includes the Social Institutions and Gender Index (SIGI). Launched in March 2009, it complements and improves existing measures in several ways: while conventional indicators of gender equality capture inequality outcomes, the SIGI focuses on the root causes behind these inequalities (www.genderindex.org).
- Website: www.oecd.org/dev/gender

GenderStats

- Electronic database of gender statistics introduced by the World Bank.
- A compilation of data on key gender topics from national statistics agencies, United Nations databases, and World Bank-conducted or funded surveys.
- Themes included: demographics, education, health, labour force, and political participation.

- The database is updated three times a year (April, September and December).
- Website: http://go.worldbank.org/YMPEGXASH0
- Gender Statistics Programmes in the Arab Countries (GSP)
- Developed by ESCWA, in coordination with the UNDP, UNICEF, CAWTAR, AGFUND and IDRC has launched the
- Website: http://www.escwa.un.org/gsp/index.html

Global Resources Database - BRIDGE

- The library contains over 3,000 specially selected gender documents picked from over 1,500 sources.
- Covers longstanding concerns and debate as well as emerging issues.
- Presents records of good practice, lessons learnt and case studies.
- The database is added to monthly.
- Browse by theme or by region.
- Website: http://www.bridge.ids.ac.uk/go/global-resources-database

UNECA African Centre for Gender and Development (ACGS)

- African Gender and Development Index (AGDI): is an Africa-specific tool that measures gender inequalities in the social, economic, political and human right fields in Africa. It is composed by two parts: 1) the quantita-tive Gender Status Index (GSI) and 2) the qualitative African Women's Progress Scoreboard (AWPS). See: www.uneca.org/eca_programmes/acgd/

- Website: http://www.uneca.org/fr/acgd/en/1024x768/acgd.htm

UNECE Gender Statistics Database

- The Database helps to monitor the situation of women and men in all UNECE member countries.
- Includes a set of Common Gender Indicators based on gender issues relevant for the UNECE region.
- Data mainly supplied by National Statistical Offices.
- Website: http://www.unece.org/stats/gender/
- UNSD Statistics and indicators on women and men
- Data compiled from official national sources as well as international sources.
- six specific fields of concern: population, women and men in families, health, education, work, and political decision making.
- Website: http://unstats.un.org/unsd/demographic/products/indwm/

UNSD Gender Info

- Global database of gender statistics and indicators on a wide range of policy areas, including: population, families, health, education, work, and political participation.
- Easy-to-use tool to shed light on gender issues through customizable tables, graphs and maps.
- It is an initiative of the United Nations Statistics Division, produced in collaboration with the United Nations Children's Fund (UNICEF) and the United Nations Population Fund (UNFPA).

- Website: www.devinfo.info/genderinfo
- WIDNET: Women in Development Network
- Offers regional and country-by-country population, family, household, health, education, labor, and political power information extracted from statistics compiled by the International Labour Organization, the UN, and other sources.
- Website: http://www.focusintl.com/widstat0.htm
- WomanStats Project
- Data on all countries with a population greater than 200,000 – a total of 174 countries.
- Quantitative and qualitative information on over 310 indicators of women's status.
- Access is free of charge
- Information on the site is continually updated as newer information becomes available.
- Website: http://www.womanstats.org/

APPENDIX 4

A Brief Overview of the Evolution of Gender Statistics

Gender statistics are defined as statistics that adequately reflect differences and inequalitiesin the situation of women and men in all areas of life (United Nations, 2012). They have evolved significantly over the last thirty years, beginning with the First World Conference on Women in Mexico City (1975). At the time, Women in Development (WID) was an emerging paradigm, and the conference demands mainly focused on the inclusion of women into statistics, addressing the underreporting of women's issues and the lack of sex-disaggregated data[39]. The political mobilization announced 1975 the International Women's Year, and also proclaimed the following years as the United Nations Decade for Women (1976-1985). An important book that illustrates the WID paradigm was Women's Role in Economic Development,

39 The World Plan of Action of the First Conference also stated that regional action should include regional standing committees of experts from countries in order to "give leadership in the methods of reporting on the situation of women and in the development of indicators for assessing the progress made towards the goals of this Plan in conjunction with regional statistical bodies and international efforts to this end" (World Conference of the International Women's Year, World Plan of Action, Paragraph 207, 1975).

by Ester Boserup (1970), which showed that women made important economic contributions that were being ignored by governments.

The two subsequent Women's Conferences – Copenhagen (1980) and Nairobi (1985) – affirmed a growing demand for the production of sex-disaggregated data. Par. 92 of the Report of the Copenhagen Conference, for instance, proclaimed that "all data-collecting agencies should give a sex and age breakdown of any information they gather, wherever relevant." In addition, paragraph 95 suggested that "a set of statistical indicators should be established by which progress towards equality between the sexes can be monitored" (UN, 1980).

Another significant shift was the change in perspective, from statistics on women, in the 1970's and 1980's, to statistics on gender – mirroring the evolution from the women in development (WID) dominant strand of thinking to the gender and development (GAD) approach. This shift recognized that gender identities are relational and that the roles of all social actors, both men and women, are constructed within a gendered society – even though power relations have tended to make women, as compared to men, a more vulnerable segment.

With the GAD perspective, advocacy stressed not only the requirement of sex-disaggregation but also the importance of introducing specific questions concerning only

men or only women into the census or survey questionnaires. Moreover, gender mainstreaming throughout the statistical operations became an end in itself. Historically, this perspective change was followed by country reports and booklets, as noted by Corner (2003: 2):

The initial work focused primarily on statistics on women and a number of countries produced booklets on Women in Statistics that primarily confined themselves to presenting data on women. However, it was soon recognized that the situation of women could be adequately described and analysed only in relation to the comparative situation of men. As a result, the focus moved from statistics on women to statistics on women and men.

Razavi and Miller (1997) discuss the benefits and limitations of various other analytical models along a continuum of integrationist to transformatory: the Gender Roles Framework (GRF), the Development Planning Unit (DPU), the Social Relations Framework (SRF), Gender and Macroeconomics and Alternative Analytical/Training Frameworks.

The GRF (Harvard/USAID) is a project-focused framework constructed around the role differentiation between men and women and how these roles are performed by members of each sex in relation to activities, access and control over resources. It is limited by confining the analysis to the household without an appreciation of the

interdependence of the household on other institutions such as the market and the effects of race and class on gender relations. Rather than challenging the assumptions underlying development, it accepts the prevailing development paradigm, its primary concern being that women's contributions should be accounted for and integrated into development planning. The GRF is, however, the easiest framework to use in the analysis of census data, as it allows a focus access to and control over resources by disaggregating data by sex in such areas as demography, education, economic activity and housing.

The DPU framework, developed by Moser (1993), also addresses gender roles, but goes further. The key to this framework is its emphasis on the triple roles of women in the productive, reproductive and community spheres, and the distinction between women's practical and strategic needs. Practical needs relate to services and resources women need to enable them to perform their work and strategic needs concern measures to change gender-based power relationships through policy changes. Due to this latter focus, DPU challenges development assumptions and unequal power relations between the sexes. Another characteristic of the framework is the spectrum of policy interventions it identifies, from welfare to empowerment. According to Razavi and Miller, its emphasis on community roles diminishes attention to power relationships within the household.

The SRF (IDS Sussex) treats gender relations as an aspect of social relations that are constructed around the institutions of the household, the community, the market and the state. In this framework, gender intersects with race, class, religious and ethnicity. Defining features of the framework are the premises that gender relations can be conflictual as well as cooperative and that gender roles impinge on claims, rights and obligations, and the realignment and equalization of economic, social and political power between men and women.

Gender macroeconomics analyzes the gender aspects of macroeconomic policy. Neoclassical feminist economists have analyzed gender anmd structural adjustment, a theme that has also been analyzed by feminist critical economists. Both kinds of models share the concern that reproductive labour performed by women, because it is unpaid, is not factored into macroeconomic analysis and is largely overlooked in national accounting. Elson (1991) and Jacobson (2007) have exploted gender biases in the market that operate to women's disadvantage. While in theory men and women have equal access to the market, women experience the gender-linked disadvantage of the low value assigned to their productive labour, added to responsibilities for reproducing and maintaining human resources. If census data on home duties performed are available, these provide a window into an analysis along the lines of this framework. Alternative analytical and training frameworks are the Socioeconomic and Gender

Analysis framework (SEGA), UNDP Training for Gender Mainstreaming, and the Women's Employment Framework (Longwe method).

A fundamental conclusion presented by Razavi and Miller is that agencies and planners need to move beyond the mere disaggregation of data by sex and the integration of women in existing development paradigms, to examine gender relations and conflict in order to rearticulate the development agenda.

In line with the GAD approach, the Platform for Action of the Fourth World Conference[40] (Beijing, 1995) formulated claims for gender statistics by means of a specific strategic objective (H.3) – along with other references throughout the document. [cite this in full ? Annex ?] The Beijing +10 declaration introduced in Par. 25 the focus on "men and boys as gendered persons", further recognizing their capacities in bringing about changes in attitudes, relationships and access to resources. More recently, the conceptual approach of The World's Women 2010: Trends and Statistics (United Nations, 2010 a) is based on the premise that "statistics on men figure as prominently as statistics on women."[41]

40 The Beijing Platform for Action made reference to the need to develop and strengthen statistical systems in several issues, such as labor and economic activity (including female contribution in the unremunerated and domestic sectors), health of girls and women of all ages, incidence of violence (including domestic violence, sexual harassment and other different forms of violence against women and girls), and sharing of power and decision-making.

41 http://unstats.un.org/unsd/demographic/products/Worldswomen/

Finally, there have been noteworthy conceptual shifts in the attempt to capture gender differences, specificities and disparities with more accuracy. In this vein, conceptual adjustments were made and new analytical categories were created. The International Labour Organization (ILO), for instance, revised its definition of economic activity to include informal sector and non-market activities. Since 1993, the range of activities to be considered as 'extended economic activity' includes some activities that had previously been classified under 'household activities'[42], thus capturing somewhat more adequately the economic contributions of many women, particularly in rural areas, to household income and family businesses. Despite these efforts, many commentators have noted that "the distinction between 'subsistence work' and 'housework' is still unclear in ongoing labour force surveys" (Ayhan, 2001) and that a large amount of women's (unpaid) work is still excluded from conventional labour force definitions and statistics (UNECE/World Bank Institute, 2010).

Since the mid-eighties, national statistical offices, too, have started paying more attention to statistics on women and to gender statistics. Statistics Sweden and Statistics Norway, for instance, were among the first countries to

WW_full%20report_color.pdf

42 Activities no longer considered as 'household activities' include: production of agricultural produce, gathering of fruits etc. and their storage; processing of primary products (produced or bought) and the collection of water; other processing activities, sold or not, like weaving, dress making and furniture making. (Tempelman, 1999).

introduce a gender perspective by designating specific staff to work on gender statistics (Sweden) and establishing units or departments dedicated to collecting and analysing gender data (Norway).[43] Ever since there has been much debate whether it is favourable to 1) have designated staff responsible for gender issues in national statistical offices; or 2) mainstream gender throughout the system by training existing staff.

Although designated staff may play an important role in gender analysis, the risk that gender may be seen as a separate, detached issue within NSOs is not addressed. Mainstreaming gender issues throughout the national statistical system may enhance system-wide sensitivity and ensure that a gender perspective is adopted in all stages of data production and analysis. For this reason, gender advocates tend to support the second approach today: "the production of gender statistics has to affect the whole official statistic system and not only the single unit addressing gender, if there is one" (Sabbadini, 2008: 08). This is a bit contradictory with the calls for statistical data bases on gender made elsewhere in this document.

In recent years, gender-related indicators and indices have also multiplied. The Millennium Development Goals (MDGs) and the Beijing + 10 Declaration, for instance, reiterated the need for developing timely and reliable

43 http://www.gender.no/Facts_figures/1322

gender statistics, especially at the level of national statistical systems, suggesting sets of indicators and strategies for engendering the monitoring and progress reporting. Numerous websites of National Statistical Offices now provide data and indicators to be used for gender analysis and advocacy (see http://www.census.gov/aboutus/stat_int.html). Organizations such as UNECE, the World Bank, ILO, and universities in many countries have developed web-based data resource centers dedicated specifically to gender statistics. International databases such as GenderInfo have also been developed, gathering information from different countries.

In 2006, the Global Gender Statistics Programme was established by the United Nations Statistics Division. As part of this programme, three Global Fora on Gender Statistics were organized in 2007 (Rome), 2009 (Accra) and 2010 (Manila) with the purpose of promoting the advancement of gender statistics among decision makers and other user groups. The Forum also aims at reviewing best practices in the incorporation of a gender perspective in national statistical systems, at discussing the measurement of women's participation and contributions to the economy and gender dimensions of health statistics (United Nations, 2008 b, 2009 b, 2010 d). The Global Fora have established a regular and continuing basis for sharing experiences and supporting the implementation of adequate technical procedures.

Nevertheless, even though gender issues are addressed more systematically now than they were a few decades ago, there is still a long way to go. Much has to be done to tackle current challenges and obstacles, such as the gender data gap in particular world regions, the development of adequate legislation and methods regarding gender statistics and the need to intensify the interaction between data producers and users at all levels – as discussed in Appendix 4.

Text Box 12: Evolution of gender statistics

- Historically, gender statistics gradually received increasing importance and attention in conferences, meeting, forums and other political and advocacy events, especially following the Fourth World Conference on Women (Beijing, 1995).
- Change in approach from statistics on women alone to statistics on gender equality issues - following the WID to GAD shift in perspective.
- Past experience along with review and reformulation of strategies led to adjustments in definitions and to the creation of new analytical categories (ILO, FAO, UNFPA, UNIFEM, etc).

- A number of NSOs have created specific departments or units for mainstreaming gender issues in official statistics.
- Increase in the number of gender statistics sources for incomprehensive areas (time-use surveys, gender-based violence surveys, access to decision-making in all spheres, etc.).
- Proliferation and revision of indicators and indices.
- Elimination of gender bias in some data sources.
- Additional questions in surveys and censuses that are useful for gender analysis.
- Review and adjustment of data collection instruments and methodologies for information from a gender perspective.
- Dissemination of gender statistics increasingly more regular and frequent in many countries, including through technological devices such as web-based data centers.

- Increase in high level policy dialogues and meetings specifically on gender and statistics.

APPENDIX 5

From Understanding the Gender Data Gap to Improving the Production and Analysis of Gender Statistics

The phrase gender data gap refers to the fact that the coverage of gender issues, including women's lives and realities, is generally inadequate in mainstream data and statistics. This occurs to some degree everywhere but is worse in some regions (Africa and Oceania) and for some types of statistics (e.g. social services, disability, time use and unpaid work, gender-based violence, access to resources, access to decision-making processes, informal economy) (UNSD, 2005).

There are several reasons for the existence of a gender data gap including:

- Underreporting of women in censuses and surveys in many countries. To get women out to respond, information campaigns have to explain the purpose and relevance of data collection; women have to be allowed and feel safe to speak as individuals; and enumerators, male and female, need to be trained

to specifically seek the inputs of women.

- Questionnaires are primarily developed by men/male statisticians who may bring gendered biases in the focus and phrasing of questions. There is a tendency to focus on the more public sphere of men's lives, as opposed to the more private spheres of women's lives (for example unpaid work is usually not reflected nor counted). Questions may use pronouns that lead to assumptions, such as using the term "he" when asking about the head of household.
- A lack of routine disaggregation (by age and sex at the very least) which, in combination with the male norm in language and society, blurs the input and contribution of women. Speaking of "rural workers", "smallholders" or "secondary school students" makes many people think of males rather than females and may hide important gender differences within these groups. This also leads to certain categories of women, such as indigenous women, women with disabilities, adolescent girls, and elderly women, to be particularly underrepresented. Further levels of disaggregation or multivariate analysis are needed to provide a fuller picture, and in some instances, additional questions need to be asked to identify special social groups.
- Inadequate budgets, low human and technical capacities, lack of gender mainstreaming and inadequate concepts and methods hinders the quality of data being collected and tabulated and also the publishing of the information.

The following will examine some of the major recommendations to producing and using high-quality gender

statistics as well as outline the global standards, potential problems and country examples.

Recommendation 1

Data must be relevant to Gender Equality Issues-Need for strong alliances between data users and producers

Why is this important? Gender statistics are the foundation of gender-based analysis and go well beyond sex-disaggregation. As such, producers of gender statistics are required to know more about the topics of gender, and users of gender statistics must know about the scope and limitation of the data. Collaboration between the producers and users of gender statistics will help ensure that gender statistics are more meaningful and user-friendly and include issues from multiple angles while also keeping in mind policy and planning imperatives. Raising the awareness of the institutions that produce statistics about gender issues may also help increase the demand for gender sensitive data for public policies.

Global standards: Strategic objective H.3./206.c) of the Beijing Platform for Action asks Statistical Services to "Involve centres for women's studies and research organizations in developing and testing appropriate indicators and research methodologies to strengthen gender analysis, as well as in monitoring and evaluating the

implementation of the goals of the Platform for Action". It is now widely understood that other governmental (Ministry of Fmaily/Women/Social Affairs for example) and civil society organisations (non-governmental organisations, universities, media, trade unions, etc.) should also be involved in this process.

Potential problems: A potential problem is the asymetry of power relations: Women's machineries are often marginalised in government, suffer from a chronic lack of resources and have limited/no understanding of the availability of data or how to use data for programme/policy development. Consultations wth civil society organisations are sometimes mere window-dressing in response to growing national and international pressure to engage with them. If data users are not at the table at the time census questionnaires are designed and tabulations are planned, it will be hard to present gender statistics in a user-friendly way. Data may not be published "just in time" for crucial policy decisions if there is no interaction between policy-makers and data-producers.

Country example: Uganda. The Uganda Bureau of Statistics (UBOS) regularly promotes Public Seminars, organized in collaboration with policy makers and users of statistics (stakeholders), to present analysis and research findings using data routinely collected by the Uganda Bureau of Statistics (UBOS), including census data and gender indicators. One of the main purposes

of the seminars is to educate the public about the use of statistics.

Internationally: Over the last ten years, alliances between producers and users of statistics have been strengthened through international meetings on gender statistics. For example, a Working Group on Gender Statistics was created during the fourth meeting of the Statistical Conference of the Americas of the Economic Commission for Latin America and the Caribbean (ECLAC) in 2007. This inter-institutional and inter-agency (UN Women and the Gender Affaires Division/ ECLAC) initiative has led to progress in statistical activities across the region.

Country example: Germany. The Conference of Ministers on Equalization decided at the middle of 2007 to develop a system of gender-related indicators covering different topics, available primarily for the 16 federal states, the German "Länder", and if possible for administrative districts. They were to be based on existing surveys to avoid additional expenses. A task force was formed at the end of 2007 consisting of government representatives and statisticians. Government representatives expressed their data needs and interests in relation to policy-making, while statisticians brought in their expertise, for example concerning feasibility and availability of data. The result was a core set of 30 indicators, which was accepted by the Conference of Ministers in October 2008. These can be

subdivided into four categories: 1) Participation, which includes the fields of decision-making as well as women and men in policy; 2) Education; 3) Employment, income and child care; and 4) Life style, exemplified by life expectancy or elderly people living in single-person households (UNECE/World Bank, 2010: 141).

Recommendation 2

An enabling institutional environment is needed for the production of gender statistics – political will, a legislative framework, sufficient funding, commitment and buy-in from senior leaders

Why is this important? Gender statistics emerge from demand, whether from politicians, specific ministries, women's departments or the public. Political will for gender statistics can be thought of as support from political leaders that results in policy change. It generally originates with a single individual or small group, often situated somewhere within the state apparatus (best if at a high level) who become the "champion" for gender statistics, build coalitions and, as part of those coalitions, raise funds for the issue, push for its firm anchoring in the legislative framework and try to sustain the policy change once achieved. Where political will is lacking, funds are unlikely to be allocated to gender statistics and an enabling environment (legislative and administrative framework) is unlikely to be created.

Global standards: Many countries incorporate CEDAW provisions on gender equality and women's empowerment into domestic law, in particular their civil, penal and labour codes. Countries also reform their Gender Equality Architecture, conduct Gender Audits and initiate Gender-Responsive Budgeting to monitor whether and how political translates into funding and impact. Gender analysis of sex-disaggregated data is needed to monitor progress in compliance with CEDAW and other international and national instruments at country-level.

Text Box 13: Gender-Responsive Budgeting

Gender-responsive budgeting (GRB) is government planning, programming and budgeting that contributes to the advancement of gender equality and the fulfillment of women's rights. It entails identifying and reflecting needed interventions to address gender gaps in sector and local government policies, plans and budgets. GRB also aims to analyse the gender-differentiated impact of revenue-raising policies and the allocation of domestic resources and Official Development Assistance.

Source: http://www.gender-budgets.org/; accessed 1 March 2011

Potential problems: As UNSD pointed out, it is essential to "distinguish between a national plan on gender statistics and a law on gender statistics", since "without a specific law, there is no guarantee that gender statistics will be included in the work plan each year" (UNSD

2009). Moreover, the laws on gender statistics must also be relatively detailed, clearly spelling out administrative and budgetary implications. Where a law on gender statistics exists, budget negotiations will be easier and the gender statistics architecture is more likely to dispose of the means it needs to fullfil its functions.

Country examples: Kyrgyz Republic: Obliges State bodies, institutions of local self-government and heads of legal entities regardless of forms of ownership to submit appropriate information on gender issues to the National Statistical Committee (Art. 30).

Philippines and Nepal:, CEDAW Monitoring Bodies have been set up that are responsible for producing and diffusing gender statistics.

Italy: A detailed law on gender statistics makes producing sex-disaggregated data from population censuses compulsory, including data on households and institutionalized persons, as well as on different household typologies. (UNECE/UNDP, 2004)

Korea: A new statistical act was released (2007), giving the Korean Statistical Office the jurisdiction to expand the topics included in data collection, in order to provide more relevant data for gender analysis (UNSD, 2009).

Spain: The 2007 statistical legislation of the Andalusia region included the provision for gender mainstreaming

which created an enabling environment for the production of gender statistics, also leading to laws requiring gender budgeting and the monitoring of its effectiveness (UNSD, 2009).

Colombia, Trinidad and Tobago, Ecuador, Mexico and Peru (Costa Rica has a law project) have laws requiring the NSO to collect information on time use and non-remunerated work for unremunerated satellite accounts.

Recommendation 3

Gender data must be reliable and adhere to international standards – Need for common definitions and quality standards to enhance comparability

Why is this important? Gender statistics are essential for monitoring progress on international treaties and agreements as well as providing countries with comparable data to track progress being made in promoting gender equality. In order to do so, comparison of data must be possible both over time and between countries. However, concepts such as household and household headship, marriage, economic activity, informal sector, etc. pose numerous measurement problems. The main benefit of having common definitions and quality standards is disposing of evidence that is sound and reliable and that is a solid base for informed policy decisions.

Global standards: While the Principles and Recommendations for Population and Housing Censuses, Revision 2, form the normative basis for census taking and census analysis, no such reference framework is available for gender statistics. Existing informal guidance documents include a number of publications by the UN Statistics Division and other international agencies, including development banks (see appendix 2).

Potential problems and benefits: In terms of definitions, the main issue is to balance between "validity" (measuring what you went out to measure, which implies using a culturally appropriate approach) and comparability. When standard definitions are too forced, categories lose their meaning on the ground and hence are no longer useful tools for policy-making. In terms of quality, the main issues are capacity and resources: To produce highest quality gender statistics, National Statistics Offices need the appropriate human and financial resources to pilot test and analyse, train enumerators, invest in data editing, etc.

Regional example: The Gender Statistics programme of the Secretariat of the Pacific Communities has created a website (PRISM) collating statistics from 22 countries and territories in the Pacific on common indicators used for monitoring gender equality (see http://www.spc.int/prism/data/gender). Other regional observatories: Latin America and the Caribbean Gender Equality

Observatory (http://www.cepal.org/oig/) with the support of UN Women.

Recommendation 4

There is severe underreporting on gender issues – Need for capacity-building for NSOs

Why is this important? Underreporting on gender exists both in terms of who gets enumerated/surveyed and in terms of what gets published. Therefore, the institutionalization of gender mainstreaming is crucial to engendering all statistical operations. On an organizational level, this means training staff on gender statistics and gender analysis as well as establishing Gender Units in NSOs. On an operational level, it implies ensuring gender responsiveness in questionnaire elaboration, field operations and their supervision, as well as in data management, analysis, publication and dissemination.

Global standards: Data is supposed to adequately reflect the situation of all citizens (male and female, old and young, indigenous populations and persons with or without disabilities, etc). Being inclusive of every citizen and asking truly relevant questions is therefore imperative in order to achieve high data quality. Collecting data on women and girls and on gender-specific issues is one step into the direction of achieving a fuller, more valid picture of the situation in a country.

Potential problems: In many countries, high turnover of staff (sometimes due to unattractive working conditions and remuneration) makes capacity-development a never-ending challenge. Specialized gender teams, intersectoral and inter-agency gender working groups, and gender departments established in the National Statistics Offices, can ensure that the participation of gender statistics experts in other relevant official statistical productions is institutionalized. Capacity-development is also needed for effective data dissemination strategies: The analytical capacity of national statistical systems should be strengthened to ensure that available data are used productively and the findings communicated more successfully to the appropriate audiences, especially to the policy makers and the media.

Country example: Nepal: Regional training workshops on gender sensitization were conducted in joint partnership with international agencies and included participants of senior and mid-level officers of the Central Bureau of Statistics.

Challenge 5

Micro-data on gender issues is dispersed - Need to unify what is available, upstream small-scale data

Why is this important? At the national and international levels, there is still a large gap with regards to

the availability of data on social services, disability, time use and unpaid work, gender-based violence, access to resources, and the informal economy, to name just a few important gender concerns. Such data are needed by in-country NGOs, line ministries and local governments to monitor projects, prepare advocacy materials and negotiate budgets. If National Statistics Offices could act as a clearing house for disparate small-scale data at the sub-national level, or effectively cross-analyse data from various sources (vital statistics, census, surveys, etc.), much could be gained for understanding gender issues "on the ground".

Global standards: The UN's Inter-Agency and Expert Group Meeting on the Development of Gender Statistics emphasized the need of two specific issues: 1) "the review of existing national data collections to identify and develop inventories of sex-disaggregated statistics and gender related indicators"; and the need to 2) "the re-coding, re-tabulation and re-analysis of micro-data from surveys or censuses, from a gender perspective" (idem: 08). Similarly, "one of the strategies recommended by FAO for filling the gender data gap is to promote the coordination, integration and re-tabulation of agricultural data by sex and age at the sub-national level (FAO 1999:23)"

Potential problems: A high level of technical expertise is needed for cross-analysing data collected on small samples of different population groups at different points

in time. Despite huge efforts in combining sources, data quality may be too low for meaningful analysis.

Recommendation 6

Information is available but not used - Need for better communication and dissemination of gender data

Why is this important? It is not enough for gender data to simply be available. To make a difference in the lives of women and men, girls and boys, these data need to be disseminated – and ideally used – by policy-makers, opinion leaders and the general public. A variety of formats are required to achieve this. Along with reports and press releases, dictionaries and metadata are important tools for ensuring that the underlying concepts are actually comprehended and that the results are well interpreted. Online resources and services, like query databases and downloadable files, are now a large part of the public's information toolkit. Documents, tables, maps and images available on the internet facilitate the access and visualization of data.

Global standards: Several issues are at play here: The public's right to information is key, as is the moral imperative to feed knowledge back into the public domain. Policy makers can be reminded of norms such as transparency and accountability to invite them to cement

the knowledge-base on which their policy-decisions are based.

Potential problems: If NSOs are increasingly offering a broader range of formats for dissemination, users of gender statistics also need to be more proactive in accessing and using the existing data. Benefits include a better-informed public, and – in the best case – better informed public policies. A collateral benefits is heightened visibility for the NSO (which can have budgetary repercussions).

APPENDIX 6

How to Apply this Guide in a Country Context

While there are many ways in which this guide can be used, the following provides four key steps for carrying out a gender analysis project at the country level. It emphasizes collaboration between the producers and users of gender statistics by involving NSO and gender experts from the government, academia and civil society. As such, these steps will help ensure that gender statistics are more meaningful, user-friendly and address the key gender issues relevant to that country.

Step One

Selection of Gender Issues

Participants: NSO, Gender experts from government and civil society, including research institutions

Format: Workshop

Documentation: 10 Key Question Tool, Census Questionnaire, this manual (table of contents: chapter 3)

Purpose: To identify the key gender issues that can be analysed with the census data obtained in country X.

Roles: Gender Experts provide an evidence-based overview of the key gender issues in the country, ideally using the 10 Key Question Tool below and considering the 10 gender issues. Statisticians explain what can and cannot be measured with census data on the basis of the country's census questionnaire.

Expected Outcome: Consensus on what statisticians should compute

Box : The 10 Key Questions Tool

1. Who does what? [activities]
2. How? With what? [access to resources]
3. Who owns what? [ownership of assets]
4. Who is responsible for what? [obligations]
5. Who is entitled to what? [claims, rights]
6. Who controls what? [income, spending]
7. Who decides what? [power]
8. Who gets what? [distribution]
9. Who gains and who loses? [redistribution]
10. Why - What is the basis for the situation? [rules, norms, customs]

(Questions 1-9 can be combined with the additional question, "And With Whom?' in order to capture the social relations involved)

Step Two

Census Analysis – Preparation of Tabulations and Computation of Sex-Disaggregated Indicators

Participants: NSO, Gender experts from research institutions, external consultants

Format: Desktop study/in-depth statistical analysis

Documentation: "Principles and Recommendations", this manual (sections 4 and 5 of each chapter in Part II)

Purpose: To provide the raw data, tabulations and indicators needed for answering the key gender questions identified in Step One.

Roles: Statisticians and researches perform high quality data analysis

Expected Outcome: Tabulations and indicators are available and of high quality

Step Three

Interpretation of Data, Suggesting further Analyses

Participants: NSO, Gender experts from government and civil society, including research institutions

Format: Workshop

Documentation: Tabulations and indicators produced by NSO, this manual (sections 2 and 6)

Purpose: To make sense of the data and suggest further analyses going into more depth with some key findings

Roles: Statisticians walk participants through the analyses carried out, outline problems encountered and summarise the gender differences identified; Gender Experts discuss what may be underlying the gender differences documented

Expected Outcome: Consensus on additional variables that need to be taken into consideration (and technically can be) in order to shed light upon the findings

Step Four

Advocacy Material is devised

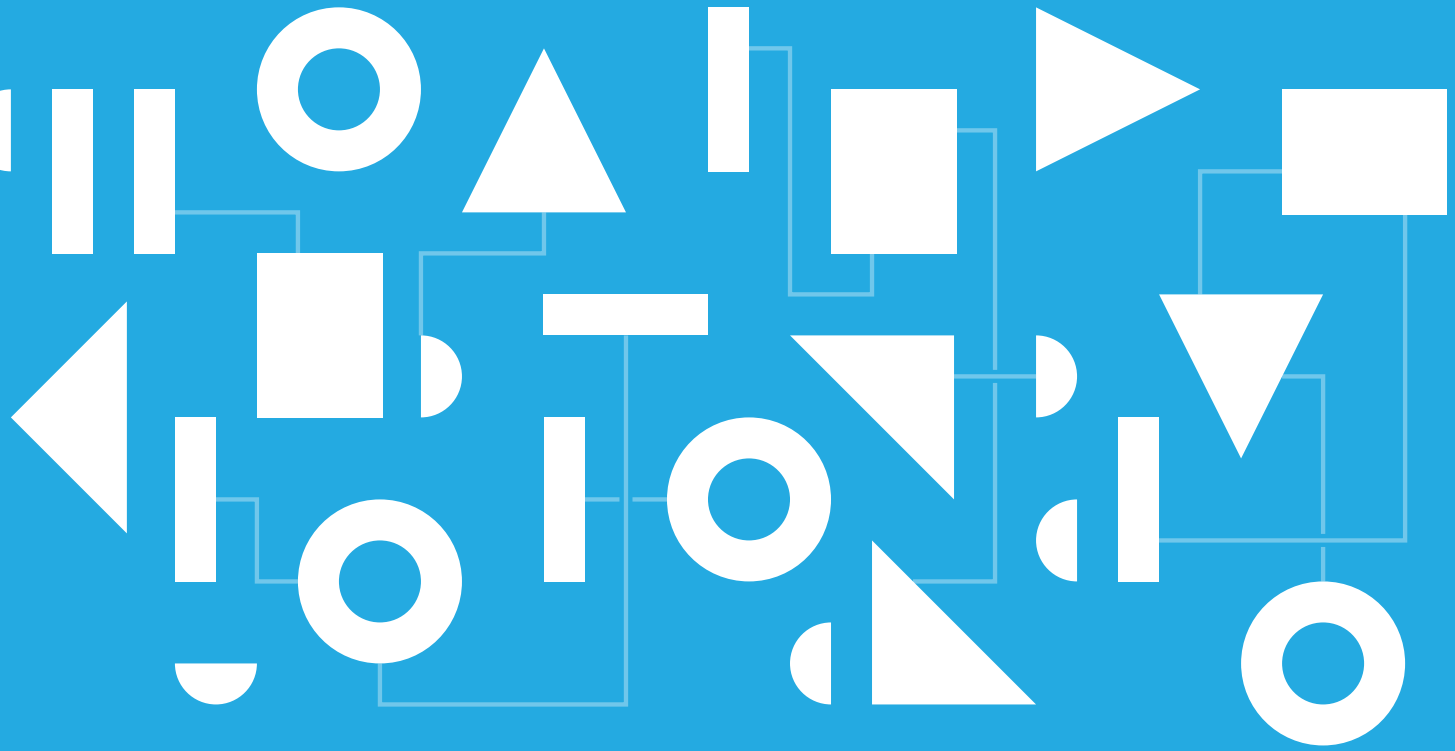
Participants: Gender experts from government and civil society

Format: Workshop

Documentation: Key national policies, this manual (section 8)

Purpose: To identify how the indicators, tabulations and results of multivariate analysis can be used to inform and advocate for current and future national gender equality policies and initiatives, or for reporting purposes

Roles: Experts provide an overview of the key gender policies and initiatives currently on-going and planned in-country and select critical data for evidence-based advocacy.



Methodological Guidelines for the Gender Analysis of National Population and Housing Census Data

Design: Office for Visual Affairs | officeforvisualaffairs.com

Technical Division of the United Nations Population Fund (UNFPA)
Population and Development Branch
Gender, Human Rights and Culture Branch