Complementary Sources of Demographic and Social Statistics

The three main sources of demographic and social statistics are censuses, surveys and administrative records. They are part of an integrated programme of statistical data collection and compilation, and together they provide a comprehensive source of information for policy formulation, development planning, administrative purposes, research, commercial products and other uses.

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. The census collects data from each individual and each set of living quarters for the whole country or area. It allows estimates to be produced for small geographic areas and for population subgroups. It also provides the base population figures needed to calculate vital rates from civil registration data, and it supplies the sampling frame for sample surveys. The many steps in planning a census include securing the required legislation, political support and funding; mapping and listing all households; planning and printing questionnaires, instruction manuals and procedures; planning for shipping census materials; recruiting and training census personnel; organizing field operations; launching publicity campaigns; preparing for data processing; and planning for tabulation, production and dissemination of census results.

Because of the expense and complexity of the census, only the most basic items are included on the questionnaire for the whole population. Choosing these items requires considering the needs of data users; availability of the information from other data sources; international comparability; willingness of the respondents to give information; and available resources to fund the census. Many countries carry out a sample enumeration in conjunction with the census. This can be a cost-effective way to collect more detailed information on additional topics from a sample of the population. The sample enumeration uses the infrastructure and facilities that are already in place for the census.

A continuing programme of intercensal household surveys is useful for collecting detailed data on social, economic and housing characteristics that are not appropriate for collection in a full-scale census. Household-based surveys are the most flexible type of data collection. They can examine most subjects in detail and provide timely information about emerging issues. They increase the ability and add to the experience of in-house technical and field staff and maintain resources that have already been developed, such as maps, sampling frame, field operations, infrastructure and data-processing capability. The many types of household surveys include multi-subject surveys, specialized surveys, multi-phase surveys and panel or longitudinal surveys. Each type of survey is appropriate for certain kinds of data-collection needs. Household surveys can be costly to undertake, especially if a country has no ongoing programme.

Administrative records are statistics compiled from various administrative processes. They include not only the vital events recorded in a civil registration system but also education statistics from school records; health statistics from hospital records; employment statistics; and many others. The reliability and usefulness of these statistics depend on the completeness of coverage and the compatibility of concepts, definitions and classifications with those used in the census. Administrative records are often by-products of administrative processes, but they can also be valuable complementary sources of data for censuses and surveys.

Some countries have established comprehensive civil registration systems. Civil registration is a major foundation for a legal system for establishing the rights and privileges of individuals in a country. Where it is comprehensively maintained, it is the main source of vital statistics. A system with reasonable completeness produces vital statistics on births, deaths, marriages, divorces and other events, together with demographic and socio-economic characteristics of the individuals involved. Such a system can be further developed into a central population register (CPR), which can update statistics continuously. Nordic countries—Denmark, Finland, Iceland, Norway and Sweden—have relied on register-based statistics since the 1960s. Some countries are moving from a traditional to a register-based census.

The United Nations has long supported efforts to develop and improve civil registration and vital registration systems in developing countries, but this is a long-term, expensive undertaking. To be successful, it requires support from the government and the population, and it must have a legal basis, administrative and organizational infrastructure, technical capacity, equipment, awareness, cooperation and adequate funding. Development of a population register requires that the registration of vital events be reasonably complete.

Each type of data-collection system is appropriate for certain types of information, so countries often aim to develop capacity and experience not only in census taking but also in conducting household surveys and in maintaining administrative records. Sustained funding is a major problem, and lack of a long-term funding source may lead to compromises that lower the quality of the statistics produced. The best approach is to develop an integrated national statistical data-collection plan and adopt a strategy to determine which data sources are most appropriate for producing needed data.

1. It is well known that the three main sources of demographic and social statistics are censuses, surveys and administrative records. These three data sources are the principal means of collecting basic demographic and social statistics as part of an integrated programme of statistical data collection and compilation. Together they provide a comprehensive source of statistical information for policy formulation, development planning, administrative purposes, research and for commercial and other uses.

2. While these three sources are complementary, many countries use a combination or all three methods for various reasons. Normally, countries select one of these sources to obtain statistics based on the needs of the respective data users; reliability and timeliness of the results; and practicality and cost-effectiveness of the method. In many countries, however, a particular method is used due to statutory requirements.

3. This paper will discuss the advantages and disadvantages of these three sources, taking into consideration such factors as cost, data quality and the needs of the data users.

A. Sources of demographic and social statistics

4. A combination of two or all three data sources mentioned above is often used to collect certain data in order to obtain the most accurate estimate of certain statistics. A country may employ more than one data source because the statistics are critically important for policy and development planning and no single source is able to provide sufficiently reliable estimates for those statistics. On the other hand, employing two or all three sources to collect the same statistics will certainly increase the cost of the data collection. It is therefore necessary that the national statistical authority should take such a decision only for the highly critical statistics. For example, data on fertility are often collected through all three sources[1], particularly in developing countries. The three sources may not give the same results, but countries with a lack of data often use all the sources in order to obtain better estimates of the fertility levels and trends in the country.

1. Population and housing censuses

5. Population censuses have been carried out in almost every country of the world during the past several decades, and some countries have conducted censuses for more than a century. The main reason censuses are carried out by so many countries is because a population census is the only data source which collects information from each individual and each set of living quarters, normally for the entire country or a well-defined territory of the country. Censuses must be carried out as nearly as possible at a well-defined point in time and at regular intervals so that comparable information is made available in a fixed sequence (United Nations, 1998).

6. Population censuses are the ideal method of providing information on the size, composition and spatial distribution of the population, including their demographic and socio-economic characteristics. Population censuses provide data either for the whole population or for a very large sample of the population, so that estimates may be produced for relatively small geographic areas and population subgroups. A census is also ideal for the segmentation of a population into various population subgroups based on some specified characteristics and for identifying target populations for policy and/or planning for both governments and private

businesses. A population census is a very important source for population estimates needed to calculate vital rates based on data derived from civil registration. It is also important in providing the base population for the estimates of statistics obtained from demographic surveys.

7. To successfully cover all the population within a defined area in a relatively short period of time, a census must be carefully planned and well executed. The planning, preparation and implementation, which include a series of complex interrelated activities, may be broadly categorized as follows: (a) securing the required legislation, political support and funding; (b) mapping and listing of all households in all areas to be enumerated; (c) planning and printing of the questionnaires, instruction manuals and procedures; (d) establishing the logistics for shipments of all census materials; (e) recruiting and training all census personnel; (f) organizing the field operations; (g) launching publicity campaigns; (h) preparing for data processing; and (i) planning for tabulation, production and dissemination of the census results.

8. The above list is by no means complete, but these requirements for planning, preparation and implementation make the population and housing censuses the most extensive, complicated and expensive statistical operation for any country to undertake. To keep the census operation cost-effective, census organizations are usually under strong pressure to keep census questionnaires limited to the most basic items. Nevertheless, the topics to be covered in the census should be determined upon balanced consideration of (a) needs of data users in the country; (b) availability of information on the topics from other data sources; (c) international comparability; (d) willingness and ability of the public to give adequate information on the topics; and (e) available resources for conducting the census (United Nations, 1998).

9. Such balanced consideration will need to take into account the advantages and limitations of alternative methods of obtaining data on a given topic within the context of an integrated national programme for gathering demographic and social statistics to meet the national needs. The full range of national uses (for example, policy, administration and research) and national users (for example, national and local government agencies, those in the private sector, and academic and other researchers) should be considered in determining whether a topic should be included in the census. Each country's decision with regard to the topics to be covered

should depend upon a balanced appraisal of how urgently the data are needed and whether the information could be obtained equally well or better from other sources.

10. While census data provide a unique quantitative foundation for use in national and subnational planning across a large number of sectors, censuses have a number of disadvantages. First, a successful census requires very large resources in terms of manpower, funds and materials, while government budgets are coming under closer scrutiny with constraints increasingly being imposed on public spending. Further, there have been recent cutbacks in the funding for international development assistance which, in the past, has been a major source of funding for censuses in many developing countries. In addition, censuses are carried out very infrequently, once in 10 years for most countries. They cannot provide detailed information on any given topic and often suffer from a variety of errors that are difficult to control. In this climate, increased attention is being focused on the resource requirements for carrying out censuses and on alternative methods and strategies for obtaining the needed data (Suharto et al., 1999).

2. Sample enumeration in censuses

11. The cost and limited number of questions that can be included in the questionnaire are the main disadvantages of a population and housing census, so many countries carry out a sample enumeration in conjunction with the census to collect more detailed information on a separate (longer) questionnaire, often referred to as the “long form”. Collecting additional topics from a sample of population or households during the census operation is a cost-effective way to broaden the scope of the census to meet the increasing and expanded needs for demographic and social statistics. The use of sampling makes it feasible to produce urgently needed data with acceptable precision when factors of time and cost would make it impractical to obtain such data from a complete enumeration.

12. The success of the sample enumeration will depend on the strict execution of scientifically designed selection procedures. The most important factors to be considered in the design are the size and complexities of the sample. The advice of sampling statisticians who are conversant in both the theory of sampling and practical operations of carrying out a sample

survey in the field is indispensable at all stages of the sampling operations (United Nations, 1998).

13. The collection of more detailed information from a sample of population and households often helps to improve the quality of the data collected through the use of a smaller number of more highly qualified and better-trained enumerators. The smaller-scale census operations enable census organizations to have greater control to minimize non-sampling errors, which in a complete enumeration can be large and unmanageable, in particular, when detailed and complex questions are included.

14. The advantages of carrying out a sample enumeration as part of census operations, as compared to a separate household survey, are clear. First, the infrastructure and facilities that have been established for the census, often with large resources, are available. Second, publicity campaigns often create a state of awareness on the part of the general population regarding census activities. Such awareness is not comparable to that of any general household surveys conducted separately during the intercensal period. The momentum may also help improve the quality of data collected and may enable the census organization, if necessary, to use a larger sample size than in regular household surveys.

15. Among the disadvantages of conducting a sample enumeration in conjunction with the census operations is the risk that such additional tasks could have a negative effect on the overall census project, particularly if the census organization does not have sufficient qualified personnel to manage the sample enumeration. In such a case, the quality of data resulting from both the sample and the complete enumeration may suffer.

16. In addition, the fielding of a sample enumeration will also increase the census cost, since additional cost will be incurred for recruiting and training of more qualified enumerators and supervisors, for printing and processing a separate questionnaire, and for the additional organization and management. However, the additional cost will be offset by the advantage gained from obtaining much broader and more detailed data coverage as well as higher-quality census results. The census organization should, therefore, carefully weigh the additional census cost against the benefits gained from the sample enumeration.

3. Household sample surveys

17. Household surveys are the most flexible of the three data sources. In principle, almost any subject can be investigated through household surveys. With much smaller workloads than in censuses and the opportunity to train fewer personnel more intensively, household surveys can examine most subjects in much greater detail. While it is not possible to anticipate all the data needs of a country far into the future at the time a census is being planned, household surveys provide a mechanism for meeting emerging data needs on a continuing basis. As budgets for national statistical activities are always limited, the flexibility of the household survey makes it an excellent choice for meeting data users' needs for statistics which otherwise are unavailable, insufficient or unreliable.

18. Many countries have instituted a continuing survey programme, which includes periodic surveys (such as annual or quarterly labour force surveys or annual surveys on cost of living, etc.) and ad hoc surveys to meet specific statistical data needs. Although ad hoc surveys may satisfy immediate purposes, they do not ordinarily provide a framework for a continuing database and time series. Continuing periodic surveys, on other hand, are normally carried out to investigate a highly important phenomenon that needs to be monitored frequently. All household survey programmes should be a part of the overall integrated statistical data-collection system of the country, including censuses and administrative records, so that the overall needs for statistical data can be adequately met.

19. Other advantages for countries that have a continuing household survey programme include the opportunity of developing adequate in-house technical and field staff that continue gaining experience with the repeated surveys over time. In addition, a continuing survey programme increases the cost-effectiveness of the available resources that have been accumulated and maintained over time, such as sampling frame, cartographic maps, the field operation infrastructure, data processing, and capacity in technical know-how both in the central office and in field offices (United Nations, 1984).

20. There are different types of household surveys that can be organized for collecting demographic and social statistics, including multi-subject surveys, specialized surveys, multi-

phase surveys, panel surveys, etc. Each of these has its advantages and disadvantages and the selection of a specific programme depends upon the subject-matter requirements as well as resource considerations.

21. In multi-subject surveys a variety of different subjects is covered in the course of a single survey cycle or round. There are options for some of the subjects to be covered for all households and others to be alternated among different subsamples of households. The multi-subject surveys generally provide much greater economy than a series of surveys covering the same range of subjects.

22. Specialized surveys are concerned with a single subject or issue. The surveys can be ad hoc or part of a national survey but conducted with separate samples because of the subject matter or other considerations. They may be conducted periodically, irregularly or only once.

23. In multi-phase surveys, information is collected in succeeding phases, with one phase serving as the forerunner to the next. The initial phase normally uses a larger sample, which is screened based on certain characteristics of the sample units, to help determine the eligibility of sample units to be used in the subsequent phases. Multi-phase surveys are a cost-effective way to reach the target population in the latter phases to obtain detailed information on the particular subject under investigation. Fertility or demographic and health surveys usually adopt this type of survey.

24. In panel surveys successive surveys of the same sample units are carried out deliberately spaced over time—e.g., monthly, quarterly, half-yearly or annually—to obtain information to measure changes of certain characteristics over time. The disadvantage of the panel survey is the difficulty of maintaining the same respondents over a long period of time, including tracing those who move out of the sample areas and dealing with respondents who are fatigued or who have lost interest in the survey. One of the major advantages of this type of survey is that longitudinal measures of changing behaviour over time can be obtained. This survey is often called a “longitudinal” survey.

25. While household surveys are not as expensive as population censuses, they are costly to organize, particularly at the beginning when countries do not have a continuing programme of

household surveys. As in the case of the census, household surveys are also subject to non-sampling errors as a result of the interviewing process. In addition, household surveys are also subject to sampling error, which increases quickly with the level of geographical detail sought. An adequate sample survey design is usually possible only with the availability of detailed population or household lists, maps and other geographical materials, the various control figures and other inputs which can only be obtained from a census. In this sense, the census is the major source for preparing a survey sample design.

4. Administrative records

26. The third important data source that is commonly used in many countries is administrative records. The statistics compiled from various administrative processes can be very valuable to the overall national statistical system. Many social statistics are produced as a by-product of these administrative processes—for example, education statistics from periodic reports by the ministry of education, health statistics from periodic reports based on hospital records, employment statistics compiled from employment extension services and so forth.

27. The reliability of the statistics depends upon the completeness of the administrative recording process and the completeness of the reporting system. It is very important to continuously monitor and improve the system of recording, reporting and compiling for producing such statistics since they constitute complementary sources of data to those obtained from censuses and surveys. It is also necessary as far as feasible to keep all concepts, definitions and classifications used in these records the same as those in the other data sources so that data can be compared.

28. In many developing countries, while administrative records for various social programmes can be a very cost-effective data source, they are not well developed, resulting in the unreliability of the data produced. While the administrative processes are continuing for the purposes of record keeping and administration, the compilation of statistics is secondary. Often, the administrators at the different levels of reporting offices do not receive clear guidelines on the statistical requirements that need to be maintained (concepts, definitions, classifications,

timeliness, etc.). There may be a lack of effort by the statistical authority of the administration to ensure completeness and consistency of the data.

29. Among the disadvantages of administrative records are that they are often limited in content and their uses are restricted for legal or administrative purposes. Similarly, they do not usually have the adaptability of household surveys or censuses from the standpoint of concepts or subject detail. Sources of these kinds are often incomplete, inconsistent or limited in their coverage, and in many fields, such as health conditions, nutrition or household expenditures, appropriate administrative records are not available. Moreover, administrative records often focus on the individual and do not provide any information on the household or family, limiting the analytical usefulness of the data.

30. A civil registration system is one source that many countries have developed with varying degrees of success. The importance of developing a civil registration system cannot be overemphasized. It is necessary that national governments establish and maintain continuous, comprehensive and universal vital statistics to meet national needs in a timely manner. Civil registration is a major foundation for a legal system for establishing the rights and privileges of individuals in a country. Where it is comprehensively maintained, it is the main source of vital statistics (United Nations, forthcoming). The United Nations for many years has put considerable efforts into accelerating the improvement of civil registration and vital statistics systems in developing countries including: updating the principles and recommendations for a vital statistics system, organizing various training programmes, publishing several handbooks for countries which are making an effort to improve their systems and providing advisory services to countries which request them.

31. Countries that have established a civil registration and vital statistics system with reasonable completeness should be able to produce vital statistics reports from the system periodically, such as: number of live births by sex, date and place of births, complete with the demographic and socioeconomic characteristics of the mother and father; number of deaths by age, sex, place of deaths and cause of deaths complete with the demographic and socioeconomic characteristics of the decedents. Also, statistics on marriages and divorces can be generated from this system (United Nations, 1973, 1984, forthcoming). Another useful advantage for countries

having comprehensive civil registration is the sense of awareness and appreciation that the general population tends to have regarding the importance of legal documents, vital statistics and administrative disciplines.

32. A reasonably complete civil registration system can further be developed into a population register system, which can provide demographic and social statistics of the population in a defined area. In particular, if the system is computerized and updated electronically from various registration points, the statistics may be produced almost at any time that the reporting is required. A population register system maintains central databases of every individual in the country, and the records are continuously updated when there are changes in the characteristics of the individual. Countries that have established a central population registry (CPR) develop a unique personal identification number (PIN) for each individual (Laihonen, 1999; Harald, 1999; Myrskyla, 1999). As an example, Danish birth statistics are derived either from the CPR or from birth registration reports prepared by the midwives (as birth attendants), who are always present when a child is born either at home or in a hospital. The midwives prepare a birth registration form, which includes the child's birth date and sex and mother's PIN. This report is submitted to the National Board of Health and then forwarded to Statistics Denmark to update the CPR. A similar procedure is implemented for death registration (Poulsen, 1999). It was reported that the CPR in Denmark is able to capture 99.4 per cent of births and 99.6 per cent of deaths recorded by the registration system.

33. Combined with other social and economic registers (e.g., social security registers, taxation registers, student registers, employee pension insurance registers, registers of buildings and dwellings, registers of enterprises and establishments, etc.), such a linkage can be a very powerful data source.

34. Once such a system is established, the need to conduct the traditional decennial census becomes less important, since the system can already produce basic census-type information. Many developed countries, particularly in Europe have been developing such a capacity for many years. Nordic countries—Denmark, Finland, Iceland, Norway and Sweden—have relied register-based statistics for their data needs since the 1960s and have used demographic information from central population registers since the 1970 censuses. Other

countries in Europe, like Austria, Belgium, Luxembourg and Switzerland are in the process of transition from traditional to register-based censuses. Countries such as France, Germany and the Netherlands are developing a combination of various types of registers and sample surveys to produce census-type data (Laihonen, 1999; van Bochove, 1996; Eurostat and Statistics Finland, 1995).

35. It is important to note, however, that only the information that is recorded in the register can be compiled and produced as a register-based census. If, for example, there is no register data for people engaged in housekeeping, such data cannot be categorized separately. The flexibility of asking about emerging issues is no longer available as is the case in a traditional census (Myrskyla, 1999). Norway, one of the Nordic countries, has utilized its population register extensively and conducted its first census more than 200 years ago, based largely on an administrative register maintained by the church (Harald, 1999). The same register was then developed into a Central Population Register in 1960s with the introduction of the personal identification number.

36. It is necessary to understand, therefore, that developing a population register, even for developed countries, is not a short-term project and not without large investment. The success of the system may be achieved if it has the total political support of the government as well as the population at large, with established legislation, infrastructure and national budget. Some developing countries have attempted to establish a population register system; while many of them understand the benefits of developing such a register, the majority of these countries still do not totally comprehend the implications and requirements for such a development, like the need for a legal basis, administrative and organizational infrastructure, technical capacity, equipment, public awareness and cooperation, time and funding.

37. To date, except for a few countries with relatively small populations, no developing country has a comprehensive population register system. In addition, some developing countries that have initiated development of a population register system consider that the system, with unique personal identification number, is also valuable for maintaining public security and place the register under the agency that is also responsible for public security. Maintaining a register

system that is also used for security purposes will be difficult because the system may not get the full support of the general population.

38. As administrative and other alternative data systems emerge and improve, they may sometimes be used to reduce the demands for censuses or household surveys. For example, where civil registration systems or central population registers are properly developed, it is possible to discontinue the collection of data on births and deaths through censuses and surveys. More often, however, administrative sources, censuses and household surveys should be seen as complementary, and census and survey planning should ensure the application of integrating mechanisms, such as the use, insofar as possible, of common concepts and subject detail in the different systems. Where this is done, it is important to check administrative procedures periodically to ensure that the proper application of these common concepts and classifications is being made.

B. Scope of demographic and social statistics

1. Data-collection methodologies

39. Demographic and social statistics, essential for planning and monitoring social and economic development programmes, include a large variety of subjects and characteristics, depending on the needs of each country. Composition of the population by age and sex and geographical distribution is among the most basic information describing any population or population subgroup. These data provide a context within which all other information—such as that on labour force, income, education, health, nutrition, migration, fertility and mortality—can be placed.

40. Section A described the three sources of data for obtaining demographic and social statistics. However, within each data source there are various ways demographic and social topics can be collected, and each method has advantages and disadvantages. While detailed methodologies of data collection are beyond the scope of this paper, examination of these topics in relation to their collection through population censuses will be made. Since each country has different data needs, stage of development, level of sophistication and funding situation, it is not possible to recommend a set of topics that could be collected through different methods that will

meet the needs of all countries, particularly developing countries. In particular, this paper will discuss those topics which should be collected through complete census enumeration and which topics, if a country wishes to do so, can reasonably be collected through a census sample enumeration. It is not recommended that any country should attempt to collect all items mentioned in the list of census topics in the UN Census Recommendations[2]. Rather, countries will need to make their selection of topics in light of the considerations discussed above (United Nations, 1998, paragraph 2.9).

a. Household listing

41. Section A discussed two possible methods of data collection through censuses: complete enumeration and sample enumeration. There is the possibility, however, that some information will be collected through a household listing during the preparatory stage of a census operation. Some countries have included certain household characteristics during the mapping, house numbering and household listing stage, such as whether anyone in the household is engaged in agricultural activities, whether there is a handicraft or cottage industrial activity in the dwelling, or whether any member of the household has any disability or needs special care. These additional questions during the census preparatory stage attempt to accomplish two objectives: first, to reduce the burden in the census questionnaire and second, to collect information for the development of frames for future studies, either through complete coverage or sample surveys in the respective area. Many countries obtain information on household activities through the household listing stage of population censuses in preparation for their agricultural or economic censuses.

42. The main limitation of such an operation is the reliability of the information obtained, particularly for a rather difficult concept and definition, like disability. Often the data are collected from an informant or through observations, which may not reflect the correct situation. In addition, for certain topics, the frames obtained may become outdated in a short period of time. Naturally, to be successful, all census activities must be fully tested prior to finalizing them to ensure that the exercise will meet the intended objectives satisfactorily.

b. Census complete enumeration

Complete enumeration is the main important feature of a census. Any census must collect data on certain topics on a 100-per-cent basis. However, as mentioned earlier, many countries employ both complete and sample enumeration in a census. In a complete enumeration it is often difficult to institute and manage successful quality control measures, even if various techniques have been put in place, due to the fact that a large number of census workers are involved. When both complete and sample enumerations are used, it is necessary to ensure that topics collected through the complete enumeration are those which are of high priority, required at the lowest geographic level, and unreliable when estimated through sample enumeration due to either rare events or skewed distributions.

43. Countries that do not carry out a census sample enumeration should include basic demographic characteristics, education, economic activity and fertility and mortality questions in their census questionnaire. The minimum set of population topics, in addition to name and relationship to head or other member of household, that could be collected in the complete enumeration are: sex, age, marital status, citizenship, place of usual residence, place of birth, school attendance, educational attainment, activity status, occupation, industry, status of employment, children ever born and children living.

44. It is more difficult to determine a minimum set of housing and human settlement topics for housing censuses, due to the higher variability in housing characteristics among countries, than those in population. The three main items on buildings that are recommended to be included are type of building, construction material of outer walls and year or period of construction.

c. Census sample enumeration

45. Countries carrying out sample enumeration in conjunction with their censuses will be able to collect data on additional topics and ask more detailed questions using a long form. Depending on the need and ability of countries to include other information in the short form, basic economic and social characteristics may also be included in both forms, like school attendance, educational attainment, economic activity, place of birth, etc. Many countries also

include on the long form all items collected in the short form. If these items are not included, it is very important to stress, that all items in the short form must be collected from all households.

46. The number and type of items that should be covered in the long form also depends on many factors including balance considerations mentioned in Section A and, more importantly, the fact that the census sample will not be able to provide estimates at the lowest geographic levels. Using a smaller number of enumerators who are better qualified and better trained will enable census organizations to carry out closer supervision and tighter quality control, which in the end should produce higher-quality data. While, as mentioned earlier, it is not recommended for any country to collect all items included in the list of topics of the UN census recommendations, potentially, all those items mentioned in the list can be collected through census sample enumeration.

d. Intercensal household survey

47. In Section A, it was recommended that countries should establish a continuing programme of household surveys as part of the overall national statistical data-collection system. In the area of demographic and social statistics, intercensal household surveys should constitute an integral part of this system. Many countries that carry out decennial censuses conduct at least one national demographic intercensal survey, often in the middle of the decade. In this survey, topics similar to those collected in the census sample enumeration are included. In addition, some countries may add special emerging topics that are needed by data users.

48. Other intercensal surveys include labour force surveys, socio-economic surveys, income, consumption and expenditure surveys, health surveys, etc. The timing and work programming in conducting such surveys should be coordinated with other statistical data-collection programmes.

2. Demographic and social statistics topics

49. In this section the scope of demographic and social statistics and their possible data sources will be presented in a table. Appendix 1 contains more detailed discussions on the definitions and recommendations on each item shown in Table 1. Appendix 1 also examines the

advantages and disadvantages of each data source for various statistics with the aim of arriving at the most appropriate data sources for each of these statistics. Since compilation of demographic and social statistics is carried out by collecting the characteristics of individuals, households or living quarters, the table focuses on the characteristics or data items of individuals, households and living quarters. Cross-tabulation of these characteristics will provide the required statistics in the respective area designed to meet the need of the data users. Table 1 is organized as follows: (a) general demographic and social characteristics, (b) fertility and mortality, (c) geographical location and migration, (d) housing and human settlement, (e) education, (f) labour force, (g) time-use, (h) health, (i) disability, (j), income, consumption and expenditure, (k) food consumption and nutrition and (l) criminal justice.

a. General demographic and social characteristics (see Appendix 1, 1a-g)

50. General demographic characteristics of the individual, consisting of age, sex, relation to head or other reference member of household and marital status are the most important topics to be collected in any census. These topics at a minimum should be collected in a complete enumeration. Depending on the importance of social characteristics of the individual in the country, like citizenship, ethnicity, religion and languages in each individual country, these items can be collected through either complete enumeration or sample enumeration.

b. Fertility and mortality (see Appendix 1, 2a-h)

51. The importance of levels, trends, differentials and determinants of fertility and mortality for any country is well recognized. Children ever born and children living are the two priority items recommended under the fertility and mortality topics in the UN census recommendations as well as in the UN vital statistics recommendations. Many countries have included these items in their complete enumeration or at least in the sample enumeration. These items have also been the most important fertility and mortality questions to be collected through household demographic or fertility surveys.

52. Other fertility items included in the UN census recommendations are date of birth of last child born alive; deaths in the household during the past 12 months; survival of mother and/or father; age, date or duration of marriage; and age of mother at birth of first child born

alive. Although some countries have included one or more of these topics in their complete enumeration, these items are considered more detailed fertility and mortality items that can be collected through either census sample enumeration or intercensal surveys. It is also recommended to record some of these items as mother's characteristics in civil registration.

53. Studies show that the resulting statistics on "deaths in the household during the past 12 months" from censuses or surveys have not been reliable. Some countries have collected information on the "survival of natural mother and /or natural father" in an attempt to ascertain the level and patterns of mortality in the population. As mentioned above, these items are more appropriately collected through census sample or intercensal surveys. Countries with a complete civil registration can readily estimate the level of mortality and fertility in a particular area.

c. Geographic location and migration (see Appendix 1, 3a-g)

54. There are two concepts of a population that a census can adopt: de jure if the population is based on place of usual residence or de facto if it is based on place where present at the time of census. Therefore, it is very important to establish place of usual residence and place where present at the time of census/survey. Most household surveys use the usual resident (de jure) concept, except when the specific need of the survey requires that the de facto concept be used. Similarly, in most administrative record systems, whether it is a population or household registry, the usual residence concept is normally used.

55. Other migration characteristics include place of birth, duration of residence, place of previous residence, place of residence at a specified time in the past, and reasons for migration. Except for reasons for migration, all of these characteristics are included as priority items in the UN census recommendations. These items are also normally included in household surveys when they are needed for the analysis of the data. However, extreme caution should be exercised in deciding which items are to be included in the census complete enumeration, because each item provides different information on migration characteristics of the population. For example, statistics on place of birth classified by place of usual residence at the time of the census/survey indicate lifetime migration characteristics of the population. For those who were born in countries other than that in which the census/survey was taken, the information indicates lifetime

international migration to the country. The statistics on place of previous residence indicate the change of residence from another administrative unit in the country or from a foreign country to the present residence. And statistics derived from place where present at the time of census/survey show the migration pattern from a specified time, e.g., one year or five years, in the past to the present geographical reference area.

d. Housing and human settlement (see Appendix 1, 4a-d)

56. There are three basic characteristics that need to be collected in housing censuses: (a) characteristics of the building in which the living quarters are located, (b) characteristics of the living quarters in which the household lives and (c) characteristics of the households themselves.

57. The UN census recommendations include three items about the characteristics of the building (type of building, construction material of outer walls, and year or period of construction) and 14 items about the characteristics of living quarters. (These are: location of living quarters, type of living quarters, occupancy status, type of ownership, number of rooms, floor space, water supply system, toilet and sewerage facilities, bathing facilities, cooking facilities, type of lighting and/or electricity, type of solid waste disposal, occupancy by one or more households, and number of occupants.) The characteristics of the households are the same as those included in the population topics with the addition of tenure and rental/owner-occupant housing costs.

58. As mentioned earlier countries should decide the appropriateness of each item to be included in the housing census since the priorities and needs of each country are different.

e. Education (see Appendix 1, 5a-e)

59. There are two major sources of statistics relating to education: the first is statistics on the educational characteristics of the population, which are collected through household surveys and population censuses; the second is statistics on the educational system that are normally collected through educational institutions. Under the first category, four important educational characteristics are included in the UN census recommendations. These are literacy, school

attendance, educational attainment and field of education and educational qualification. The first three characteristics mentioned are considered priority topics.

60. The importance of each item to be included in the complete enumeration depends on the situation in each country. Some countries may not consider literacy as a priority item while other countries do. Most countries consider school attendance and educational attainment as the most important educational characteristics to be included in a complete enumeration. All of these items can also be collected in the census sample enumeration or in the intercensal surveys.

f. Labour force (see Appendix 1, 6a-f)

61. The labour force items presented in Table 1 are the following: (a) activity status, (b) employment and unemployment, (c) time worked, (d) occupation, industry, and institutional sector of employment, (e) income and wages and (f) place of work. All of these characteristics are included in the UN census recommendations, although only five items are considered priority items. Most countries consider the estimation of economically active classified by employed and unemployed population as the most important labour force statistics to be obtained from a census/survey. These items therefore can be included in the complete enumeration. As mentioned earlier, all of the items above can be collected through census sample enumerations or intercensal surveys, depending on the needs of the countries.

62. The next important characteristics that countries should consider collecting are occupation, industry and status of employment. It is necessary that countries should carefully weigh the advantages and disadvantages of including these items in the complete enumeration. The issue that must be taken into consideration is the level of classification for coding occupation and industry. Naturally, data users would like to have these characteristics coded to at least three digits. However, such a decision can have expensive implications.

g. Other social statistics (see Appendix 1, 7, 8a-f, 9a-c, 10a-b, 11a-d, 12a-c)

63. Other social statistics presented in Table 1 are time-use; health; disability; income, consumption and expenditure; food consumption and nutrition; and criminal justice. Each of

these statistics is discussed in more detail in Appendix 1. These topics are collected mostly through surveys and administrative records rather than censuses.

64. Time-use statistics are strictly collected through the time-use surveys. Many countries collect certain disability data through censuses, but most disability data are obtained through either administrative records or disability surveys. Similarly, health statistics are collected mostly either through health interviews or examination surveys or through the administrative records of health-maintenance providers. Household surveys are also the main source of data for income, consumption and expenditure statistics as well as for food consumption and nutrition statistics, while administrative records are the main sources of data on criminal justice statistics.

C. Summary discussions and conclusions

1. Interrelationships between data sources

65. This paper presents a discussion of three data sources that are fully complementary in providing a variety of demographic and social statistics. Table 1 presents a comprehensive summary of various demographic and social statistical data items and the possible sources from which such data can be collected. In Section B several data-collection methods, particularly those of population and housing censuses and surveys, were also presented, including their strengths and limitations as well their appropriateness for collecting demographic and social statistics.

66. From discussions in Sections A and B it is clear that a population and housing census is the most important data source that a country can have. A population and housing census is needed to provide data to meet data users' needs, provide a sampling frame and other population figures for household surveys, and also provide the base population needed in the computation of vital rates for data produced from a civil registration system. As it is apparent from Table 1, a census alone cannot meet all the country's data needs in demographic and social statistics. Many statistical data can be collected only through household surveys and others only from administrative records. Therefore, it is important that every country develop capacity in conducting household surveys as well as in maintaining administrative records. It is also

recommended that countries should develop a continuing programme of household surveys. While carrying out a household survey is not as expensive as a census, it is relatively costly, particularly the initial costs. One important advantage for any country that has established a continuing household survey programme is the cost-effectiveness of using the available resources.

67. Household surveys are the most flexible data source and constitute a very important component of any country's data-collection programme. However, to be able to carry out a proper household survey, the country must have a reliable sampling frame that, for most developing countries, can only be developed based on a list provided by the last census. Because of changes due to population movement and area development, the sampling frame and enumeration area maps must be updated from time to time. A flawed sampling frame can lead to biases and incorrect estimates provided by the surveys. Therefore, it is important that censuses be carried out periodically, even if infrequently. Some countries have conducted two censuses in a decade and a few countries did not conduct a census in two decades or more[3], but most countries consider the optimal time period between censuses to be 10 years. In the present stage of technological development and globalization most countries would find it very difficult not to have their sampling frame updated in a decade.

68. Administrative records also play a very important role as data sources for demographic and social statistics. As is apparent from Table 1 and from Appendix 1, some social statistics can be derived only from administrative records. Among the most important administrative records is the civil registration, since it is the major foundation for a legal system for establishing the rights and privileges of individuals in a country. People living in a country that has a comprehensive civil registration system tend to have a strong sense of awareness and appreciation for the importance of legal documents, vital statistics, and administrative disciplines, and therefore are more likely to contribute to the completeness of the register. In view of this fact, developing countries should make all possible efforts to develop and improve a functioning civil registration system. As discussed in Section A, only a very small number of developing countries have been able to produce reliable vital statistics from the civil registration system.

69. Section A also discussed further development of civil registration into a population register system by maintaining a central population register (CPR) database for every individual in the country. If lessons can be learned from the experience of the Nordic countries, which have achieved extensive register-based demographic and social statistics, the updating of CPR, particularly births and deaths, is dependent totally on the completeness of the civil registration system. Therefore, development of a population register should not begin until the country achieves a reasonable completeness in the registration of births, deaths, and other vital events. In addition, developing a population register is not a short-term project, requires a large investment and must be supported by the population at large, with established legislation, infrastructure and national budget. Use of the register for other purposes, including maintaining public security, will result in a lack of cooperation from the general population.

70. Other administrative records, particularly those maintained by different ministries, such as education, health and labour, contribute substantial information to the data users. However, in most developing countries, the quality and quantity of the data available are generally very limited.

2. Issues of data-collection costs

71. The increased demands for timely, accurate and detailed data, along with rising population numbers, have contributed to the high cost of collecting statistical data. Because of the limited available resources, allocation of funds by governments for statistical activities is often given very low priority. Governments, particularly in developing countries, realizing that the availability of statistical data in the country will also meet international needs, often hope that international assistance will be available to provide most of the cost, especially in the case of population and housing censuses. When such assistance does not materialize, time is often running out, and the lack of time sometimes leads to compromises in the statistical methodologies used. This, in turn, could impact the quality of statistics that are produced.

72. Similarly, some developing countries carry out household surveys not because the topics have become the countries' priority data needs but because an international donor agency is willing to finance the survey costs. While availability of any data is useful for the country, if

not fully considered with caution, such an undertaking may negatively affect the overall national statistical data-collection system.

73. Keeping in mind that funding for statistical data collection is always limited, the best approach for any country would be to develop an integrated national statistical data-collection plan based on the most optimistic expectation of available funds, technical and other support staff, and data processing and other equipment. It is important that countries apply cost-reducing strategies that will not compromise the quality of the data being collected. A comprehensive strategy should be carefully developed to determine which data sources should be employed for demographic and social statistics to meet the need of data users.

74. Population and housing censuses are very complex and expensive. A properly functioning population register system will take many years, if not decades, to develop and also requires a large investment and commitment. For most developing countries, therefore, the only solution is to continue to carry out censuses at the frequency and complexity permitted by the resources available in the country. While in many countries there is a statutory requirement for conducting a census, the primary factor that determines whether a census can be conducted on time or not is usually the availability of funds. In the 2000 round of censuses several countries have delayed their censuses due to shortage of funds.

75. In conducting any census there is a major overhead cost that must be provided regardless of the data collection methodology used; this includes such items as the census planning activities, mapping, household registration, house numbering, training, data preparation, equipment and supplies. Limiting the number of items collected in the complete enumeration and utilizing the flexibility of census sample enumeration to obtain other and more detailed information can broaden and deepen the data collected while at the same time improve the quality of the data collected in a cost-effective way. The census will also provide an updated sampling frame. Countries should maintain a continuing programme of household surveys to obtain information that cannot be collected through censuses. In addition, efforts should be continued to improve the civil registration and other administrative records to fill the data gaps.

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Appendix 1

Detailed discussions on items shown in Table 1

1. General demographic and social characteristics

1a. Age and sex

76. Population by age (in single year or five-year age groups) and sex, derived from the census or a complete population registration, constitute the basic population structure to be used as a guide to other population estimates derived from other sources. Sex and age are the key characteristics to be collected in any data collection on population. Population by age and sex will also be needed for major and minor geographical subdivision of the country. For example, age-sex distribution of children classified by geographical location and possibly other socio-economic characteristics is required for educational planning. The requirements for school

buildings, teachers and other educational facilities can be estimated mainly on the basis of numbers and distribution of population at the school-going ages.

77. *Suggestions:* Sex and date of birth or age of individual should be collected for all data sources related to the individual.

1b. Relation to head or other reference member of household

78. It is very important to collect this item in many data-collection activities in order to identify the respondent in relation to the head or other member of the household. This item is included first and foremost to ensure the completeness of the recording of every person in the household prior to going further with other questions in population censuses or household surveys. The topic is also included in the household register, which records everyone living in the household. This topic may not be extremely meaningful to produce statistics on its own, but it is an important variable from which other statistics are derived, particularly to establish the household and family composition and household and family status (United Nations, 1998).

79. In addition, this item is very useful to provide an indirect means of obtaining information on the age structure within a family to be used, in conjunction with other variables, to check and edit or correct response errors. Also, the item can be used to help in identifying young children living in the same household as their natural mother.

80. *Suggestions:* Relation to head or other reference member of household should be included in all data sources where data on individual is collected and where it is very important that a complete list of the members of the household is established. The characteristic also needs to be included when relationship among members of the household is important for data processing or analysis.

1c. Marital status

81. In addition to sex and age, another basic demographic characteristic which should be collected is marital status. This item not only gives biological characteristics but also reflects social, legal, cultural and often religious circumstances. Marital status is an important

characteristic in determining family and household composition. In most development programmes, particularly in developing countries, the social and economic well-being of the family and household rather than the individual is the more appropriate target (United Nations, 1984).

82. Marital status of an individual is recommended as one of the priority items to be collected in censuses and recorded in civil registration systems as noted in the UN census recommendations[4] as well as in the UN Vital Statistics Recommendations[5]. It is also included in the recommendations in most household surveys, particularly demographic and fertility surveys.

83. *Suggestions:* Marital status should be included in all data collections whenever relationship among family or household members is important for the analysis of the results.

1d. Citizenship

84. Citizenship is a social characteristic of an individual that is usually collected in a census. The UN census recommendations state that citizenship is the legal nationality of each person, and "a citizen is a legal national of the country of the census" (United Nations, 1998). Differentiation should be made between the citizenship and ethnicity of a person, as both are often equated with the term nationality.

85. Since the majority of the population in a country normally would be citizens of that country, data on citizenship is appropriately collected through population censuses and through administrative records. In many countries proper administrative records are kept for all foreigners residing in the country. If the number of foreigners in the country is sufficiently large and located in many part of the country, the census figures can be used to double-check the completeness of the administrative records. In addition, a census can provide other characteristics of the foreigners in the country.

86. *Suggestions*: Citizenship should be collected through population censuses. Citizenship is normally recorded in the personal records in civil registrations or population registers. Special administrative records, such as social security, employment or

immigration, also include citizenship in their records. Usually, citizenship is not collected through household surveys.

1e. Ethnicity

87. Data on ethnicity are often collected in countries where there are several major ethnic groups and classification based on this breakdown is needed for national programmes and policy. Depending on the situation in a particular country, items on ethnic groups or some other terms such as race, origin or tribe can be included in the census.

88. In some countries, ethnicity, because of its sensitivity and importance, is sometimes included as one of the characteristics of an individual for the purposes of administrative records, such as social security records, housing records or school records. If breakdowns by major ethnic groups are very important for policy and programmes in the country, then questions on ethnicity can also be included in the census long form and household surveys.

89. *Suggestions:* The inclusion of ethnicity in the population census depends on the situation in an individual country. Questions on ethnicity usually are not included in household surveys or administrative records.

1f. Religion

90. The same argument that applied to ethnicity will also apply to information on religion. While each country is different with regard to the issue of religion, the recommendation is that religion can be included in the census if such information will meet the needs of data users.

91. Religion is rarely included in household surveys for the sole purpose of obtaining an estimated number of individuals following certain religions. However, it is sometimes included in a survey as an explanatory variable for other characteristics. Similarly, unless it is necessary for specific purposes, normally religion is also not included as a characteristic of an individual in most of the administrative records.

92. *Suggestions:* The inclusion of religion in the population census depends on the situation in an individual country. Religion is usually not included in either household surveys or in administrative records.

1g. Language

93. Countries with a multilingual society have an obvious need to monitor the development of languages used in the society, so that both government and private sectors will be able to adjust their programmes to meet the needs of the society. Countries often differentiate between language spoken by an individual at home (mother tongue) and the use of official language(s) that the country has adopted. While language is included in the UN census recommendations it is not recommended as a priority topic. As in the case of religion and ethnicity, the inclusion of language in household surveys and administrative records depends on the objective of the data collections.

94. *Suggestions:* The inclusion of language in the population census depends on the situation in an individual country. Language is usually not included in either household surveys or administrative records.

2. Fertility and mortality

95. The importance of levels, trends, differentials and determinants of fertility and mortality for any country is well recognized. During the last three decades tremendous amounts of national and international resources have been allocated for the reduction of fertility and mortality, particularly in developing countries. While encouraging progress has been apparent worldwide, many countries tend to continue to collect these data at every opportunity whether they are needed or not.

96. The expansion of population and development programmes, as a consequence of the recommendations of the International Conference on Population and Development (ICPD) in 1994, demands the availability of better-quality and more detailed data on fertility and mortality at the lowest geographical level possible. Fertility and mortality items have, therefore, been included in population censuses and demographic or fertility surveys.

97. Efforts to improve civil registration are continuing, particularly in those countries which have already achieved a very high level of completeness in their coverage of recording vital events. Unfortunately, the majority of developing countries do not have reliable data from civil registration and are totally dependent on obtaining this information through population censuses and surveys. Even countries with relatively complete registration of births and deaths have included some of the topics, particularly children ever born, children living and age at first marriage, in population censuses or household surveys

98. During the last three decades, thanks to international assistance programmes, many developing countries have repeatedly undertaken collections of data on fertility and mortality through population censuses and surveys. Therefore, while civil registration is non-existent, the levels and trends of fertility and mortality can be monitored.

99. With the shrinking of international resources in recent years, many of these countries are facing a considerable challenge in maintaining their monitoring activities of fertility and mortality levels in the country. Countries facing this challenge should critically evaluate their data need for policy and planning purposes. To assist in making decisions the following questions may be asked: whether the fertility and mortality trends during the past decades will likely to have a drastic change, what level of geographical breakdowns of fertility and mortality estimates are required and, what level of precision of data is needed (whether estimates provided from household surveys will sufficiently meet the need or whether data should come from censuses), how often such estimates on levels and trends should be updated, etc. These questions may help in deciding whether items on fertility and mortality topics should be included in either censuses or surveys.

100. Several items are collected to support the measurement of fertility and mortality through different data sources. Each item is briefly described below with the relevant and appropriate data sources.

2a. Children ever born and children living

101. These are the two priority items recommended under the fertility and mortality topics in the UN census recommendations as well as in the UN vital statistics recommendations. Many

countries have included these items in their complete enumeration or at least in the sample enumeration. These items have also been the most important fertility and mortality questions to be collected through household demographic or fertility surveys.

102. It is recommended that these two items also be recorded as the characteristics of mother in the registration of births in the UN vital statistics recommendations. As mentioned earlier statistics on these items are often collected through more than one data source.

103. *Suggestions:* Children ever born and children living should be included in the population censuses and demographic surveys. They are also recommended to be included as mothers' characteristic in the births records in civil registrations.

2b. Date of birth of last child born alive and births occurring during a recent period

104. Some countries include one of these items in the complete enumeration of population censuses, but more frequently countries include these items in the sample enumeration. The data can be used to derive the number of children born alive in the 12 months preceding the census date. While these items are included in the UN census recommendations they are not one of the priority items. In specialized demographic or fertility surveys these items are usually collected from every eligible woman. The question may be extended to ask the sex of the child and whether the child is still living. In countries where complete registration is available, the statistics can readily be obtained from birth registrations.

105. *Suggestions:* Date of birth of last child born alive and births occurring during a recent period should not be included in the complete enumeration but may be included in the sample enumeration using the "long form", if a country adopts such an operation. Otherwise, it should be included in a household survey investigating fertility and mortality

2c. Deaths in the household during the past 12 months

106. This item is included in the UN census recommendations although it is not a priority item. Studies show, however, that the resulting statistics on this item from censuses or surveys have not been reliable. However, several countries without reliable estimates of mortality have

included this item in their censuses and sometimes in demographic surveys, knowing there is the possibility of underreporting of the events. Various demographic methods exist for estimating and adjusting for unreported deaths. Countries with a complete civil registration can readily obtain the number of deaths during the past 12 months as the measure of the level of mortality in a area.

107. *Suggestions*: Deaths in the household during the past 12 months should not be included in the census, but may be included in census sample or in a household survey. In countries with civil registrations the data can be derived from the death registrations.

2d. Survival of mother and/or father

108. Some countries have collected information on the survival of natural mother and /or natural father, in an attempt to ascertain the level and patterns of mortality in the population. Although this item is included in the UN census recommendations, it is not one of the priority items and may be more appropriately included in the sample enumeration in a census or in a household survey. Countries with complete registration do not need to include this item to measure mortality, since a better estimate of mortality is already available.

109. *Suggestions:* Survival of mother and/or father is not recommended to be included in the complete enumeration of population census. This item may be included in the sample enumeration in a census or in a demographic survey.

2e. Duration of marriage and age of mother at birth of first child born alive

110. These two items are also included in the list of items of the UN census recommendations but are not priority items. Countries with populations having a problem with the exact data on age or exact time of events, such as marriage, may not improve estimates of fertility levels and patterns with this additional information. In these countries it may not be appropriate to include duration of marriage or age of mother at birth of first child born alive in the complete census enumeration. Experimentation in a smaller household survey should be made to see the reliability of the results prior to including these items in sample enumerations as

part of censuses or in large demographic surveys. One of these two items is often included as part of the characteristics of the mother in registering births in a civil registration system.

111. *Suggestions:* Duration of marriage and age of mother at birth of first child born alive should not be included in a complete census but may included in a sample enumeration of a census or in a demographic or fertility survey. These items could be recorded as mother's characteristics in the registration of births in civil registrations.

2f. Other useful fertility and mortality items

112. In household surveys, particularly in specialized demographic or fertility and mortality surveys, such as in the World Fertility Surveys (WFS) or Demographic and Health Surveys (DHS), many other useful topics are often included that are not normally included in the population censuses or civil registration. While there are many topics that can be included, the following are some of the topics most often included:

· Knowledge, attitude and practices of contraception,

· Ever and currently used contraception,

· Access to reproductive health advice and services,

· Breastfeeding and weaning practices,

· Survivorship of siblings and

· Birth histories.

113. These topics are important to carry out detailed studies on the levels, trends, patterns and determinants of fertility and mortality, and to improve planning and monitoring of population development programmes and policy in the country.

3. Geographic location and migration

114. Geographic location and migration characteristics of the population are required to study the spatial distribution of the population and the changes occurring over time of this distribution. In the data-collection process, it is necessary to specify the geographical reference area pertaining to the location of an individual's usual residence or presence at the time of the data collection (depending on the concept used). This can be an administrative or a specially defined geographic area. In addition, it is also necessary to define the reference period of time that an individual resides in a certain geographic location.

3a. Place of usual residence and place where present at the time of census/survey

115. In population and housing censuses, geographic characteristics recorded in the enumeration constitute one of the most important characteristics to determine the population size of a particular area. There are two concepts of a population that a census can adopt: population based on "place of usual residence" (de jure) or on "place where present at the time of census" (de facto).

116. Most countries adopt only one these two concepts, but some countries may want to investigate both concepts in a census for general purposes. In the latter case, a carefully designed questionnaire must be prepared to distinguish (i) persons usually residing and present on the day of the census, (ii) persons usually residing but temporarily absent on the day of the census, and (iii) persons not usually residing but temporarily present on the day of the census. This information can be used for allocating persons, according to the appropriate concept, to the household (institution) and geographic area within which they are to be counted and to be certain that no one is counted twice. The procedures to be followed at the enumeration and the subsequent processing must be carefully planned and strictly adhered to in order that the allocation of population is accurate (United Nations, 1994).

117. Most household surveys use the usual resident (de jure) concept except when the specific need of the survey requires that the de facto concept should be used. Similarly, in most administrative record systems, whether it is population or household registry, the usual residence concept is normally used.

118. *Suggestions:* The place of usual residence and place where present at the time of census/survey are two questions that help define the population of a certain area. If the de jure concept is adopted, it is important to establish whether the place of enumeration is also the place of usual residence, whereas if the de facto concept is used no question is necessary. In the civil registration systems, the registration of births should include the recording of the place of usual residence of the mother, and in death registrations it is necessary to record the place of usual residence of the decedent.

3b. Place of birth

119. Statistics on place of birth classified by place of usual residence at the time of the census/survey indicate lifetime migration characteristics of the population. For those who were born in countries other than that in which the census/survey is taken, such a table indicates lifetime international migration to the country. This item is also used to describe some measure of internal migration among major civil divisions, or migration into large cities within the country. Therefore, this item is included as one of the priority items in the UN census recommendations and is also normally included in household surveys when it is needed for the analysis of the data.

120. In many administrative records where individual characteristics are being recorded, place of birth is considered as one of the important characteristics.

121. *Suggestions:* Place of birth of an individual is an important characteristics to be included in a census or survey. In a civil registration system, place of birth of the father is also to be recorded in registering births, and place of birth of the decedent is to be recorded in death registration.

3c. Duration of residence and place of previous residence

122. Duration of residence and place of previous residence are recommended in the UN census recommendations. Both items should be included in a census or survey so that the data can be cross-classified and will be more useful (United Nations, 1998). The statistics on place of previous residence indicate the change of residence from a major or smaller administrative unit

in the country or from a foreign country to the present residence. One important issue to note in the investigation of duration of residence and place of previous residence is that the place of residence in both of these items does not refer to being a resident in a particular living quarter, but rather being a resident of a particular geographic administrative division.

123. These items are also often included in household surveys studying migration patterns. Caution should be taken when analysing migration characteristics from sample data because the occurrence of rare events can be inflated. While the statistics derived from this characteristic are useful to study certain aspects of migration flows, it would only show the last move of individuals to the current area. Other information should therefore also be collected

124. *Suggestions:* If duration of residence of an individual is an important characteristic to be included in a census or survey, then place of previous residence should also be included. In civil registration, the duration of residence and place of previous residence are recommended to be recorded as the father's characteristics in the case of birth registration.

3d. Place of residence at a specified time in the past

125. The statistics derived from this characteristic show the migration pattern from a specified time, e.g., one year or five years, in the past to the present geographical reference area. The information derived from a "one year" time reference provides an analysis of migration patterns during a single year, which reflect the current migration as compared to information derived from a "five year" reference period. This information will complement the statistics provided by the duration of residence and the place of previous residence.

126. This item is also recommended in the UN census recommendations and can be included under either the complete or sample enumeration. Similarly, this topic can be included in household surveys investigating migration patterns of the population.

127. *Suggestions:* Place of residence at specified time (either one year or five years) in the past is an important characteristics to be included in a sample enumeration of a census or in a survey. This item is also recommended to be recorded as the father's characteristic in registering

birth in a civil registration system and as decedent's characteristic in death registration. Other specialized administrative records may include this topic in their register.

3e. Reasons for migration

128. *The* item "reasons for migration" is *not* part of the UN census recommendations. However, some countries have included this question in their census, particularly those which have experienced recent major migration among their population, such as the newly independent or transition countries or countries with recent internal conflicts resulting in a large displaced population. This item is normally included in household surveys investigating migration and the question is raised as a follow-up to those individuals who have migrated to the present residence. If included in the census it is recommended the question be used with precoded responses.

129. The analysis of the statistics on migrants by their reasons for migration is useful for area or regional planning needs, particularly for rural-to-urban and rural-to-rural migration patterns. Because of possible rare events caution should be taken in the analysis of reasons of migration resulting from small-size household surveys.

130. *Suggestions:* Reasons for migration should not be included in the census. This item may be included in the sample enumeration of a census or a special household survey.

3f. Other useful migration items

131. During the past decade many countries have been faced with major migration, both internal and international, due to political change, armed conflicts, natural disasters, economic hardships and so forth. Armed conflicts have resulted in many refugees and internally displaced population. While the statistics of such phenomena may be difficult to collect, efforts should be made through various administrative records and survey methodologies to do so.

132. In addition to the migration characteristics mentioned above, additional items regarding the status of migrants that need to be ascertained include place of origin, citizenship, refugee status, internally displaced status, causes of displacement, etc.

4. Housing and human settlement

133. The main source of housing statistics in most countries is the housing census. Most countries carry out a housing census in conjunction with the population census to utilize the momentum and reduce the cost of the collection of these characteristics.

134. Countries which do not carry out censuses and obtain their population data from a central population register often develop a register of buildings and dwellings which includes characteristics such as those collected in a census. In 1995 Norway and Sweden planned to establish such a register to be ready for their register-based census of the 2000 round of population and housing censuses (Eurostat and Statistics Finland, 1995). It was decided that both Norway and Sweden would carry out the housing census part using a traditional census methodology with a questionnaire for every household (Harald, 1999; Laihonen, 1999).

135. The main use of information on housing statistics derived from censuses include development of a basis for planning housing and human settlement programmes and policies, public and private- sector studies of urban and other non-agricultural land use, evaluation of the adequacy of housing stock and assessment of the need and market for new housing and studies of the living conditions of the homeless and those living in temporary or substandard housing.

136. Some housing characteristics and information on human settlement are sometime included as a module in multi-subject household surveys. This type of information is useful also as an explanatory variable and as an input variable for determining the economic status of the households.

137. There are three basic characteristics that need to be collected in housing censuses: (a) characteristics of the building in which the living quarters are located, (b) characteristics of the living quarters in which the household lives and (c) characteristics of the households themselves.

4a. Characteristics of the building

138. The UN census recommendations include three items under this topic: type of building, construction material of outer walls and year or period of construction. Some countries also include construction materials of floor and roof under this characteristic.

139. *Suggestions:* All three building characteristics mentioned above should be included in the census. A specialized household survey may also include these questions. These three characteristics are also very important to be included in any administrative records related to the registry of buildings.

4b. Characteristics of living quarters

140. The UN census recommendations include 14 items under this topic: location of living quarters, type of living quarters, occupancy status, type of ownership, number of rooms, floor space, water supply system, toilet and sewerage facilities, bathing facilities, cooking facilities, type of lighting and/or electricity, type of solid waste disposal, occupancy by one or more households and number of occupants.

141. Statistics on living quarters provide valuable information on the condition of housing and human settlements of the population by classifying living quarters by various housing characteristics, such as year of construction, construction materials, number of rooms, availability of cooking and bathing facilities, sanitation conditions and access to safe drinking water and electricity.

142. *Suggestions:* All 14 characteristics of living quarters mentioned above are very important; depending on the needs of the countries, some or all of these characteristics should be included in the census. A specialized household survey may also include these questions. Some of these characteristics may also be included in administrative records related to the registry of living quarters, particularly: type of living quarters, occupancy status, type of ownership, number of rooms, water supply system, toilet and sewerage facilities, type of lighting and/or electricity, type of solid waste disposal and number of occupants.

4c. Characteristics of the population and households

143. *These* characteristics are the same as those included in the population census with the addition of tenure and rental/owner-occupant housing costs. Therefore, it is obvious that combining population and housing censuses can save a lot of money and effort. Therefore housing censuses should be able to provide statistics on population (by sex and age) and households (by sex, age and socio-economic characteristics of the head) cross-classified by various housing and environment conditions of the human settlements.

4d. Other useful housing and human settlement items

144. Several additional topics have also been identified as being useful in the UN census recommendations with regard to collection of information through national housing censuses or surveys. The following is a list of additional topics by the unit of enumeration:

Unit of enumeration: Building

- Number of dwellings in the building
- Availability of elevator
- Farm building or not
- Materials of which specific parts of building are constructed
- State of repair

Unit of enumeration: Living quarters

- Number of bedrooms
- Fuel used for cooking
- Type and energy used for heating
- Availability of hot water
- Availability of piped gas

· Availability of telephone

· Use of housing unit

Unit of enumeration: Occupants

· Number of cars available to the household

· Durable consumer appliances available to the household

· Outdoor space available for household use

5. Education

145. There are two major sources of statistics relating to education; the first is statistics on the educational system that are normally collected through educational institutions, and the second is statistics on the educational characteristics of the population which are collected through household surveys and population censuses.

146. In most countries all educational institutions, from the preschool to university levels are required to submit periodically (normally, annually) to the ministry of education, or other authority responsible for education, various statistical reports derived from their administrative records. The ministry of education in turns publishes the educational statistics resulting from this report. Often, such statistics are also transmitted to the national statistical offices so that some tables may be published as part of the national statistical yearbook of the country. The ministry of education is also required to submit periodic statistical reports to the United Nations Educational, Scientific and Cultural Organization (UNESCO) for the UNESCO Statistical Yearbook (UNESCO, 1999).

147. Educational characteristics of the population are collected through censuses and household surveys. These data are collected to meet the demand for information on the distribution of population by various educational levels, by sex and age and by geographic civil division and to be used as explanatory variables of other characteristics of the population.

148. In reporting educational statistics regardless of the sources, as far as it is possible, countries are recommended to follow the definitions and classifications set out in the latest revision of the International Standard Classification of Education (ISCED) which was adopted by the General Conference of UNESCO in November 1997 (ISCED-97)[6].

149. Four important educational characteristics—literacy, school attendance, educational attainment and field of education and educational qualification—will be discussed below. Statistics related to the educational system will also be discussed.

5a. Literacy

150. The literacy level of a population in a country is often taken as one of the basic indicators of national progress. Literacy statistics provide important information for a government's planning and monitoring of its efforts to combat illiteracy in the country. Many developing countries set up a special agency within the ministry of education to be responsible for a programme to combat adult illiteracy. Unfortunately, the compilation of statistics through the agency's administrative records on illiteracy is difficult to obtain. Often such agencies rely on the information provided by the local administration on the number of illiterate adults in the area. However, the reliability of such reports is not certain.

151. For the majority of countries, population and housing censuses are still the most important sources of literacy statistics. Literacy is included as one of the priority topics in the UN census recommendations. There are two problems encountered by depending on censuses for literacy statistics: the data are available only infrequently and the data are often inaccurate because many censuses collect the information by relying on self-reporting when the definition of literacy is not easily understood. Nevertheless, the estimated illiteracy rate and number of illiterate population as published in the UNESCO yearbook are based on either the latest data submitted by the countries or UNESCO projections based on statistics collected during the national population censuses (UNESCO, 1999).

152. Countries that have universal school enrolment do not include literacy in their censuses or surveys because they believe there is little or no illiteracy in the country. Normally, these countries have other means of assessing illiteracy.

153. Household surveys can provide literacy statistics similar to those obtained from population censuses. Collecting these statistics through household surveys may offer slight advantages over censuses due to the fact that surveys may be taken more frequently and more detailed probing and literacy testing can be implemented.

154. Suggestions*:* Literacy should be included in population censuses in most developing countries. It can also be included in a household survey where this item is part of the focus of the survey or is needed as an explanatory variable. It is recommended that literacy be recorded as mother's and father's characteristics in birth registration. It is also recommended to be recorded as the characteristics of the decedent in death registration.

5b. School attendance

155. In countries where there is universal or almost universal enrolment at lower and middle levels for children between certain ages, the statistics on school attendance for the younger group of population may be obtained or estimated from the reports by the educational system based on administrative records. However, only a small number of developing countries fall in this category, and the majority of them do not have reliable statistics from this source. The school attendance statistics obtained from administrative records include number of pupils or students by sex, age and grade for each educational level. UNESCO publishes these data in its yearbook, but the completeness depends, of course, on the data reported by countries.

156. The collection of school attendance data is recommended in the UN census recommendations. The item is also often included in household surveys. The data are usually collected for ages 5 to 29 and tabulated by sex, age, urban/rural and geographic civil divisions (United Nations, 1989 and 1998).

157. It is important to note that there are instances of significant differences between attendance data obtained from censuses and surveys and that from school records. A further problem is the ambiguity about the type of schools included in the regular system; some countries include vocational schools, like commercial schools or dancing schools, while others do not. Because of these differences it is important to continue to obtain these data from both sources.

158. *Suggestions:* School attendance should be included in population censuses and household surveys where this item is part of the focus of the survey or is needed as an explanatory variable. The item should also be recorded in school administrative records.

5c. Educational attainment

159. *Statistics* on educational attainment of the population of a country are obtained primarily from censuses and surveys; this is one of the priority items recommended in the UN census recommendations. The statistics are derived from the collection of information on the highest grade completed within the most advanced level attended, defined in terms of the educational system of the country.

160. While this item is often recorded in many administrative records (e.g., population registry or employment registry) as one of the individual characteristics, the utility of the statistics derived from such sources depends on the completeness of the records. In countries that already have established a complete population register system, the register could be a reliable source, if it is updated regularly.

161. For international comparison, data from population censuses and surveys need to be classified into five categories of educational attainment: no schooling, not completed primary education, attended secondary education, completed secondary education, and post-secondary education. The United Nations recommends that as far as possible countries should make use of the educational categories contained in the ISCED-97, issued by the UNESCO (UNESCO, 1997; see also United Nations, 1998)

162. *Suggestions:* Educational attainment should be included in population censuses and household surveys where this item is part of the focus of the survey or is needed as an explanatory variable. The item should also be included in population registers or other administrative records.

5d. Field of education and educational qualifications

163. The statistics on field of education and educational qualification of the population in the country are needed to study the match between the required manpower in the labour market and the available labour supply. The statistics can also be used to help formulate national policy and to plan and direct development of educational and training programmes in the country. The item is recommended in the UN census recommendations, although not as a priority item. In household surveys, more detailed information on field of education and educational qualification can be collected.

164. Information on the number of students and graduates from the tertiary levels education by field of study is often collected through the ministry of education. Classification of field of education should also follow the ISCED-97. UNESCO also publishes annual reports on percentage of female students in each broad field of study and the distribution of graduates by broad field of study (UNESCO, 1999).

165. These characteristics are normally recorded for every individual registering at an employment exchange agency together with other characteristics, such as age, sex, educational attainment and work experience. While statistics from such administrative records are regularly published by the employment agency, they do not normally represent the overall picture of job seekers.

166. *Suggestions*: Field of education and educational qualifications should not be included in complete enumeration of population censuses; however, it may be included in the sample enumeration. It is recommended that this item be included in household surveys where this item is part of the focus of the survey or is needed for explanatory variable. This item is usually recorded in the registry of the employment exchange agency.

5e. The educational system

167. The collection of information pertaining to the educational system, such as schools and educational institutions, enrolment, teaching staff, educational facilities, etc. is normally carried out directly by the ministry of education or other agency responsible for education. The agency usually requires that each educational institution submit periodic reports (normally on an annual basis) through specially designed forms or questionnaires directly to the ministry of

education. Many countries give larger autonomy to the state or provincial administrations to share the responsibility of the education system in their respective area. In this situation, the periodic reporting is often channeled through the state or provincial education agencies which will compile the statistics and forward the results upward as part of routine administrative reports to the national headquarters of the ministry of education.

168. The information is usually published following the category of levels of education used in the national education system. The educational statistics generated through administrative records normally relate to the following (United Nations, 1984; UNESCO, 1999):

· School and other institutions providing education and training, by level and type of educational programme (like public or private, general or vocational teachings, and others);

· Teaching staff and other personnel, by sex, age, and educational qualification;

· Educational facilities (buildings, classrooms, laboratories, libraries, sport and art facilities, health services, and the like);

· Educational expenditure and finance (expenditure by state/province and by level of education; expenditure related to emolument of teachers and teaching staff; non-teaching staff; expenditure for teaching materials; and expenditure for school facilities, etc.)

169. It is desirable that the national statistics be classified by geographic or administrative divisions, and if necessary by urban-rural breakdowns.

6. Labour Force

170. There are four sources of labour-force statistics: population censuses, household surveys, establishment surveys and administrative records. The four sources provide complementary statistics rather than alternative sources of data. Population censuses and household surveys have the same population base, which is the individual population in households, and use the same type of data-collection instruments, i.e., a questionnaire with questions directed to each household member. In establishment surveys, all establishments meeting the required definition (with employees more than a certain number, or output more than

a certain value, etc.) form the population base. Specially designed questionnaires, according to the objective of the surveys (such as labour, wages and salaries) are directed to the management of the establishments selected in the sample. There are various types of registers that may be developed in the countries to meet certain administrative needs, such as employment exchange registers, social security files, unemployment insurance records, etc., from which certain labour statistics may be derived.

171. It is important, if possible, to keep the concepts, definitions, classifications, and measurement units uniform for the different data-collection sources. Household surveys and population censuses normally adopt the same concepts and definitions, which follow very closely the resolution of the Thirteenth International Conference of Labour Statisticians (ICLS)[7]. The resolution adopted by the Thirteenth ICLS in 1982 provides new standards and guidelines in the scope and objectives of the concepts, definitions, classifications and topics to be used in data collection of labour statistics, particularly the economically active population. Elaboration of these standards is given in a manual on concepts and methods for surveys of economically active population, employment, unemployment, and under employment (see Hussmanns et al., 1990).

172. The labour-force items to be discussed are the following: (a) activity status, (b) employment and unemployment, (c) time worked, (d) occupation, industry, and institutional sector of employment, (e) income and wages and (f) place of work.

6a. Activity status

173. In censuses and surveys, the population is classified into either economically active or not economically active. The economically active population comprises all persons of either sex who provide the supply of labour for the production of goods and services during the specified time reference period. The measurement of economically active population is normally based on either current activities with a shorter time reference period (e.g., one week) or usual activities with a longer time reference period (e.g., one year). Combined with other information collected in the censuses or surveys, the statistics derived from this topic can be very important in reflecting the overall social and economic situation in the country.

174. Activity rates from censuses and surveys also become the basic measures to be used for projections of the economically active population by age and sex, as well as by major industrial sectors. These projections can be used to predict the supply of labour in vital sectors of the economy such as agriculture or manufacturing. Combined with information on educational characteristics, they can provide critically important statistics for development planning in a country.

175. Although population censuses are conducted only infrequently, complete census enumerations can provide a benchmark measure for the economically active population in relation to the total population. Labour-force surveys, on the other hand, have the ability to collect more detailed characteristics and can provide much broader information concerning the economically active population. However, the rates obtained from the surveys should always be checked for consistency with those from the census so that the reliability of other information collected in the surveys can also be assured.

176. *Suggestions:* Activity status is an important item and should be included in population censuses and labour-force surveys.

6b. Employment and unemployment

177. An economically active person is either employed or not employed. In the current activity concept of labour-force framework, employment is to be measured with respect to a short reference period. Statistics on number of persons employed includes those at work, even if only for one hour during the reference period, and those who are temporarily absent from work. Work in this case refers to any activity falling within the System of National Accounts (SNA) production boundary and includes all market and non-market production (United Nations, 1993).

178. Status of employment is one of the most important characteristics in labour-force topics after assessing the activity status of a person. It is recommended in the UN census recommendations and can be included in all labour-force surveys. The statistics on employed population are normally classified by main status of employment in accordance with the 1993 International Classification by Status of Employment (ICSE-1993) which are: employees,

employers, own-account worker, member of producers' cooperative, contributing family worker, and worker not classifiable by status. Some countries keep an employment registry, and many other administrative records also contain information on employment status of individuals.

179. Unemployment statistics represent the other group of economically active population who, during the reference period, are: without work, currently available for work, and seeking work[8]. This group should also include persons temporarily absent from work without formal attachment and available for work and students or homemakers who satisfy the above criteria. Unemployed persons with previous experience should be classified according to their last job, which should include major industrial sectors, occupational groups and status of employment. The statistics should also be prepared for persons seeking work for the first time.

180. A labour-force survey is one of the most important statistical activities in many countries because of the dynamic changes in the employment characteristics of the population. At the national level, employment and unemployment data are considered some of the most important statistics to be published at regular intervals—monthly, quarterly or annually. The unemployment rate can be used as an indication of the state of the national economy.

181. *Suggestions:* Status of employment should be included in population censuses and labour-force surveys. The characteristics of unemployed persons are often included in the registry of employment exchange agency and some other administrative records.

6c. Time worked

182. The inclusion of a question regarding the amount of time worked by the employed population in a census provides a more accurate measure on the volume of work performed. The time worked is also used to determine, according to the labour-force framework, whether a person should be classified as economically active or not. The reference period used in collecting time-worked data depends on the concept used. For current activity at least one hour worked during the reference period (e.g., last week) is often used and for the usual activity concept at least one month worked during the last year is often used.

183. Data on time worked can be used to identify different degrees of participation within the employed subgroup of the population. The information on hours of work makes it possible to classify the employed population according to the number of hours of work and, in particular, to identify short-time work and to distinguish between full-time and part-time employment. Data on hours of work cross-classified by sex, age, family status, occupation, industry, status of employment and other sociodemographic characteristics enable various kind of analyses to be made for social and family policies. The aggregate number of hours worked by workers in each industry (or occupational group) provides comparable estimates of total labour input, useful for the analysis of labour costs, productivity and other studies of labour-force utilization (Hussmanns et al., 1990). Hours of work are also used to measure the visible underemployment.

184. This item is recommended in the UN census recommendations; however, it may be more appropriately included in the sample enumeration, for countries having sample enumeration in their censuses. Household labour-force surveys are perhaps more appropriate for this item than are censuses.

185. *Suggestions:* Time worked should not be included in the complete enumeration in censuses but may be included in a sample enumeration. This item should be included in household labour-force surveys.

6d. Occupation, industry and institutional sector of employment

186. As noted above, occupation, industry and institutional sector of employment are among the very important characteristics in the labour force to be collected for all economically active population with employment. While many people hold more than one job, a census is normally limited to obtaining the industrial and occupational characteristics, as well as the institutional sector of employment, related to the principal job of an individual. In household surveys, on the other hand, the secondary occupation and industry may also be collected.

187. The details of the classification used depend on the data sources and capacity of the instruments to collect and process the data. For occupational characteristics, which refer to the type of work done during the reference period, the 1988 International Standard Classification of Occupation (ISCO-88) (ILO, 1990) is recommended. Population censuses and surveys should

ideally code and tabulate the occupational characteristics up to three digits. Some countries allow only a one-digit major group in the complete enumeration but include more detailed coding in the sample enumeration of the census and in the labour-force surveys. For industrial characteristics, which refer to the economic activity of the establishment in which an employed person worked during the reference period, it is recommended that countries use the International Standard Industrial Classification, Rev.3 (United Nations, 1990a). Ideally, data obtained from censuses and surveys should be coded at least with a three-digit coding system.

188. The institutional sector of employment relates to the legal organization and principal functions, behaviour and objectives of the enterprise with which a job is associated. Institutional sector is classified as: corporation, general government, non-profit institution, and household (may include informal-sector activity). Economically active population classified by institutional sector of employment may be used to monitor structural changes in the economy under different types of economic intervention programmes. ILO compiles and publishes country data every year on employment and unemployment classified by both occupation and industry or economic activity of the establishment, classified by sex and age group (ILO, 2000).

189. *Suggestions:* Occupation, industry and institutional sector of employment should be included in population censuses and household labour-force surveys.

6e. Income and wages

190. The UN census recommendations recommend that data on income be collected in censuses, although it is not included under the priority items. Income is defined in terms of monthly income in cash or in kind from the work performed or the total annual income. Collection of reliable data on income, especially income from self-employment and property income, is extremely difficult, particularly in population censuses; the inclusion of non-cash income further compounds the difficulties. Collection of income data in a population census, even when confined to cash income, presents special problems in terms of burden of work, response errors and so forth. Therefore, this item, including the broader definition of income, is generally considered more suitable for use in a household survey. Depending on the

national requirements, countries may nonetheless wish to obtain limited information on cash income in censuses (United Nations, 1998).

191. Data on the distribution of wage and salary earners in a particular industry (as opposed to self-employment) obtained from establishment surveys is a useful indicator of the degree of development of that sector. Data on the number of wage and salary earners in different industries or occupations may also serve as benchmark statistics for the development of various industries or occupations. Such information may be used for planning social welfare schemes, health insurance programmes, etc.

192. *Suggestions:* Employment income and wages should be included in a census only in countries where it is believed that acceptable quality of data can be obtained. Income may be more suitable for inclusion in a labour-force survey if detailed probing and itemized sources of income can be made.

6f. Place of work

193. Information on place of work can be used to develop area profiles in terms of the employed labour force (as opposed to demographic profiles by place of residence); the primary objective is to link place-of-work information to place of residence. This item may be very important in some countries but may not be relevant in others. The item is recommended in the UN census recommendations, although it is not a priority item; most commonly this item is included in the labour-force household surveys.

194. *Suggestions:* Place of work should be included in a population census only if the item is very important to meet the needs of certain data users at a lower level of geographical division. The item should be included in a labour-force survey.

7. Time-use

195. Data on time-use, obtained through a household time-use survey, were originally collected in order to understand how people use their time during non-economically productive activities. The data are used to study people's lifestyle, including their social life, on the basis of

the pattern of time-use. Later on, however, it was thought necessary to measure the "invisible" unpaid work of men and women to estimate the contribution of unpaid work to human welfare.

196. During the last decade interest in production by households has been rapidly increasing, because the SNA- 93 has extended the boundary of production activities by individuals to include unpaid production of goods and services in the household. The principal objective of the time-use survey is to estimate what people do, how they spend their time, what everyday life look likes and how much time is spent on gainful employment, unpaid work, leisure activities, personal activities and so forth. To obtain this kind of information, persons (members of households) selected in the sample use a diary technique to record their activities, generally during a period of one or a few days.

197. In October 2000 a meeting on time-use statistics was convened by the United Nations Statistics Division (UNSD) as part of its work in this area and as a follow-up of the recommendations of the UN Statistical Commission and of the Platform for Action adopted by the Fourth World Conference on Women[9]. The meeting recommended that guidelines for conducting time-use surveys be reviewed; agreement was reached on the main points of the development of a new methodological publication. The meeting also recommended that further development and testing of the Trial United Nations International Classification of Activities for Time-Use Statistics be made (United Nations, 2000).

198. *Suggestions:* Time-use by individuals should not be collected through population censuses. Time-use data should be collected only through household surveys.

8. Health

199. Information on the health status of the population, the utilization of health services and the socio-economic and environmental factors affecting health are basic requirements for planning, management and evaluation of health services and for monitoring the health status of the population (United Nations, 1984).

200. In general, there are two main sources of data available to the national health information systems: (a) information that is routinely generated by the health or other

administrative sectors, and (b) information generated based on data specially collected through surveys of households or health services. Population and housing censuses provide very limited contributions to the health information system. However, some data related to national health care might be available from some censuses; for example, some censuses include a question on accessibility to health facilities which can be measured in terms of physical distance of various population subgroups from existing health services, or numbers of persons in health professions (United Nations, 1998).

201. In some countries, some of the data needed for the national health information system may be routinely generated by the health services. However, even with the most complete and efficient organization of routine administrative statistics in the health services, there are usually significant gaps in the data. For example, health services usually generate data referring only to users of the health system. Information on non-users, and in particular on their characteristics and reasons for non-utilization, can be derived only from other sources.

202. Morbidity data are derived from hospital inpatient and outpatient records, from records of doctors' practices and from registration systems specially established for various diseases.

Medical insurance and other social security plans may also provide these data. Some of these record-based systems may meet the requirements of the health manager since they can use more exact definitions of morbidity and provide this information on a continuous basis. However, care must be taken in the interpretation of the morbidity rates derived from such sources in evaluating the effect of health-care delivery on the health status of the population.

203. Data on health workers and health facilities are usually available from the health system itself or from other legal registration systems. For other categories of health workers, listings may not be readily available centrally and sometimes sampling of decentralized records is the most efficient way of estimating the size of certain categories and their distributions in the population.

204. Two major types of household surveys normally used to collect data on health to complement information available from administrative records are: (a) health examination

surveys, which are carried out by health professionals (including on-the-spot check-ups and some laboratory tests) resulting in medical diagnosis, and (b) health interview surveys that rely on reporting by the sufferers themselves or one of their family members (United Nations, 1995).

205. Health topics to be covered by the various data sources may be classified into six basic fields, which are considered important to meet the needs of planners and managers of health services and to be used in health service research and training. These are (a) state of health of the population, (b) utilization of health services, (c) causes of death, (d) health resources, (e) environmental conditions and (f) outcomes of various preventive and curative measures.

8a. State of health of the population

206. Statistics on the state of health of the population need to be prepared as frequently as possible. They include statistics on mortality, morbidity, disability and physiological and psychological parameters. The following topics may be included in health interview survey modules (United Nations, 1985): (1) general morbidity information, (2) measurement of childhood diseases, (3) maternal and child health and (4) disability (see 2.9 below).

207. Information on physiological and psychological information for the population at large may be available through some health administrative records; however, population-based data may be best collected through the health examination surveys.

208. While some countries collect information on incidence of sickness during the past certain period of time in population censuses, generally this question should not be included in a census.

209. *Suggestions:* Morbidity data should be collected both from the administrative records and through health interview and examination surveys.

8b. Utilization of health services

210. Data on the use and non-use of different types of health services can be extremely useful for the planning, monitoring and evaluation of these services, such as hospitals, maternal and child health care centres, primary health care centres and the like. Most household surveys

on health-related issues usually include questions on the use or non-use of different kinds of health services and preventive programmes.

211. The use of health services should be examined in light of both access and quality of services. Access should include not only the presence of the physical facility but also the services that are offered at the facility. Quality of care includes a wide range of factors, such as convenience, physical conditions and setting of facility, bureaucratic procedures and staff attitudes towards clients.

212. *Suggestions:* Utilization of health services should be collected primarily through household surveys on health-related issues. While some censuses include a question on distance to health services, in general it is not recommended to include this item in the census.

8c. Cause of death

213. WHO recommends that countries collect statistics on cause of death and transmit them to WHO to be published as part of the World Health Statistics Annual. Information on cause of death should be determined by a qualified medical officer and included in the death records and death certificates (United Nations, forthcoming) in a civil registration system. However, many countries have not been able to transmit such data as is apparent from WHO's annual publication. Cause of death is defined as: (i) the disease or injury which initiated the train of events leading directly to death or (ii) the circumstances of the accident or violence which produced the fatal injury. In general cause of death is not recommended in censuses or surveys. A simplified question on cause of death, differentiating only among chronic disease, accident or violence categories, may be included in a household survey.

214. Cause of death should be coded according to the international rules and guidelines and the list of three-digit categories, preferably with the fourth-digit subcategories, contained in the latest revision of the *International Statistical Classification of Diseases and Related Health Problems (ICD)*[10].

215. *Suggestions:* Cause-of-death data should be collected through administrative medical records from hospitals reports or from a functioning civil registration system. This item should

not be collected through a population census. A simplified question may be included in household surveys.

8d. Health resources

216. *Statistics* on the availability of health resources, such as health manpower and its distribution, availability, accessibility, acceptability of health services and facilities, and financial resources, are partly derived from administrative records of health facilities and partly from both censuses and surveys. As mentioned above, number of doctors, nurses, midwives, and other health workers may be derived from a health personnel registry, if it exists, but may also be obtained from population census data although it may not be up to date.

217. Data on the number of health services and facilities are usually compiled by the ministry of health based on the registry of such services and facilities, which include hospitals, public health centres, clinics for maternal and child care, etc. The information collected should include other information such as number of beds, physicians, nurses, other support personnel, pharmacists and so forth.

218. Public health expenditure is also an important statistic, normally compiled by the health ministry, for planning and monitoring public and private expenditure for health development by geographical civil divisions. A module on the expenditure on health care by households and individuals may also be prepared and included as part of a health interview survey (United Nations, 1995).

219. *Suggestions:* Data on health resources should be collected through administrative records.

8e. Environmental conditions

220. Environment statistics, particularly air quality and water pollution which may endanger public health, may be compiled for programming and monitoring public health safety. The statistics may be derived from routine testing and measurement carried out by the agency responsible for environmental protection in cooperation with the ministry of health.

221. Statistics on access to safe drinking water are often used as one of the main indicators of quality of life in many countries. In addition, availability of a hygienic sanitation system and availability of solid waste disposal are other important measures of quality of life, particularly in developing countries. Measurement of safe drinking water, sanitation facilities and solid waste disposal are included in the UN census recommendations. These items can also be collected through household surveys.

222. Administrative records from health services may also be used to monitor the evidence of health risk caused by the impact of the environment.

223. *Suggestions:* Availability of safe drinking water, sanitation systems, and solid waste disposal should be included in housing censuses and household surveys.

8f. Outcomes of various preventive and curative measures

224. Governments may have various health programmes for preventive and curative measures, such as malaria, tuberculosis, HIV/AIDS prevention programmes, drug abuse, etc. The effectiveness of these preventive and curative programmes needs to be measured and monitored. Data on the outcomes and impact of such programmes may be collected through both administrative records and household surveys.

9. Disability

225. It is important that all countries collect information on disability in their populations. A census can provide valuable information on disability and in many countries it is the only available source of information on the frequency and distribution of disability in the population, at national, regional and local levels. Census results can provide baseline data and may be useful for investigating small-area variations in the prevalence of disabilities. These data can be utilized for the monitoring and evaluation of national programmes and services concerning the equalization of opportunity,[11] rehabilitation and the prevention of disabilities.

226. An important activity associated with all census and survey work on disability is to identify affected persons according to specific definitions and concepts. In censuses and

surveys, "screening" is used to identify affected persons. In addition, investigation should be based on a common framework and definitions of disability-related issues promoted by the World Health Organization (WHO) in the *International Classification of Impairments, Disabilities and Handicaps* (ICIDH)[12] issued in 1980. The ICIDH distinguishes three dimensions that can be studied to monitor the situation of people with disabilities: impairment, disability and handicap.

227. Because of the limited space available in a census, the focus should be on only one of the three ICIDH dimensions with the other dimensions being left to a household survey. Additional information on concepts, classifications and methods for the development of statistics on people with disabilities is contained in the *Manual for the Development of Statistical Information for Disability Programmes and Policies[13]* (United Nations, 1996).

228. Administrative data relevant to impairment, disability and handicap in the population are often maintained by various organizations which provide support services for this group of population, including social security services, rehabilitation programmes and other services. For purposes of rehabilitation planning, two kinds of administrative data may be considered: (a) service records and (b) registries of individuals identified systematically as having an impairment, disability or specific health problem. Administrative information from service records or from registries is often available in the form of summary tables of agency reports (United Nations, 1996).

9a. Disability

229. In order to measure the disability dimension, a person with a disability is defined as a person who is limited in the kind or amount of activities that he or she can do because of ongoing difficulties due to a long-term physical condition, mental condition or health problem. Short-term disabilities due to temporary conditions, such as broken legs and illness, are excluded. Only disabilities lasting for more than six months should be included (United Nations, 1998).

230. The census is generally the only source of data for estimating prevalence of disability in a country and the prevalence of various types of disability. The UN census recommendations do not cover the use of the census for a broad screening question for use in establishing a

sampling frame for a more detailed survey. If a country plans to carry out a specialized disability survey, the census may be used to establish a more efficient sampling frame for the survey. In this case, a generic question may be introduced in the census questionnaire and the yes/no responses could be used to categorize the strata of the sample. However, only a few countries conduct a disability survey.

231. *Suggestions:* Disability as far as possible should be included in the census. Disability should also be collected through special household surveys designed to collect information on disability.

9b. Impairment and handicap

232. In household surveys investigating disability, additional questions may be asked on impairments, on handicaps or on causes of disability. Information related to impairments is relevant for prevention and for planning and implementing programmes oriented to early intervention and rehabilitation. A question on handicap should identify the kinds of difficulties that prevent the person with a disability from participating on equal terms in the activities of the society. In order to provide some understanding of the environment where the person with the disability lives, both physical and social aspects should be considered.

233. *Suggestions:* Data on impairment and handicap should be investigated only through household surveys and should not be collected through population censuses.

9c. Causes of disability

234. Information on causes of disability is important for the planning and evaluation of prevention programmes.

235. Due to the limited space in a census questionnaire, information on causes of disability may be obtained through follow-up household surveys by asking detailed questions concerning specific illnesses or specific injuries under which the disability arose.

236. *Suggestions:* Causes of disability should be collected through household surveys.

10. Income, consumption and expenditure

237. Data on household income, consumption and expenditure usually obtained through household surveys have a wide range of uses. They are frequently used as a basis for making decisions on welfare-oriented policies and fiscal policies as well as for studying the distributive effects of social benefits and the economic welfare of the population in general. In particular, income, consumption and expenditure data have an essential role to play in the distribution of households based on their economic status, including those below the standard set for low income (poverty line). Data on expenditure are used in the computation of weights for consumer price indices, in the construction of household satellite accounts in the SNA and so forth.

238. While in some countries information on income may be collected through other sources, like population censuses and social security records, and information on consumption and expenditure may be acquired indirectly from sales records or other sources, a household survey programme is considered to be the most effective tool for the measurement of household income, consumption and expenditure. Household surveys can be designed to represent all the population in the country and at the same time distinguish among various important groups of population (such as rural and urban, low-income and high-income households, agricultural and non-agricultural workers, economically active and inactive persons, etc). Given these advantages, household surveys are often the most important single source of statistics on household income, consumption and expenditure.

10a. Household income

239. As mentioned earlier, data on wage and salary income of individual members of a household are usually collected through labour-force household surveys. Total household income is defined as the sum of primary income, property income and current transfers and other benefits received by all members of the household. Primary income includes wages and salaries, employers' contributions to social security, income of members from producers' cooperatives and gross entrepreneurial income of unincorporated enterprises. Property income consists of imputed rents of owner-occupied dwellings, interest, dividends and rent received. Current transfers and

other benefits received are made up of social security benefits, pension and life insurance annuity benefits (United Nations, 1977).

240. The collection of data on household income is rather complex and should be carefully planned. With the expanding boundaries of economic activity, as defined in the 1993 SNA, household income should also include imputation of income as a result of household production on own account. In principle, all primary products regardless of whether they are for own account consumption or for sale should be considered as gross output in the SNA. At the same time such consumption should also be imputed as household expenditure.

241. *Suggestions:* Household income should be collected through household surveys.

10b. Household expenditure

242. As in the case of household income, the complete and consistent definition of household expenditure is an essential component of the design and implementation of a successful survey on this topic. It is important to distinguish between household consumption expenditure, non-consumption expenditure and other disbursements. The United Nations guidelines identify two concepts of final consumption: final consumption expenditure of households and total consumption of the population (United Nations, 1977).

243. While the information needed to compute final consumption expenditure of households can usually be obtained directly from the households, the information needed to compute total consumption of the population cannot be obtained from the individual households. However, it may be possible, on the basis of information obtained from surveys and other sources, to estimate the distribution of total consumption of the population according to broad socio-economic groups.

244. *Suggestions:* Household consumption expenditure should be collected through household surveys.

11. Food consumption and nutrition

245. Statistics on food consumption and nutrition are best collected under a programme of multi-subject surveys combining household income, consumption and expenditure topics. Such a survey will also provide data on levels of living of households, including their food consumption patterns and nutritional status, suitable for a wide variety of uses in policy formulation and programme planning. In general, there are two survey approaches: the first approach is mainly concerned with the evaluation of nutritional levels of households and individuals centred on the measurement of food actually consumed; the second approach is to find ways of improving the accuracy of the measurement of household income, consumption and expenditure in surveys centred on the measurement of food purchased or acquired. Moreover, due to the economic and nutritional objectives it is desirable that the overall period of the survey be at least 12 months.

246. The purpose and uses of the various kinds of food consumption and nutrition statistics and their general limitations depend largely on the types of surveys. There are four main types of specialized surveys which provide statistics on food consumption and nutrition in countries. They are (a) household budget surveys; (b) household food-consumption surveys; (c) individual dietary surveys and (d) nutritional status surveys.

11a. Household budget and expenditure

247. The household budget or expenditure survey is an important source of information on food consumption and expenditure, but the food record is less detailed compared with that of specialized food-consumption surveys. These surveys normally provide information on the amount of money spent on food and other articles purchased. However, they sometimes do not cover the consumption of own-produced food, which may be an important part of food consumption, particularly in rural areas of developing countries. The surveys provide information on food expenditure in relation to expenditure on all other items in the household budget and in relation to income. If the surveys are conducted throughout the year, they give information on seasonal changes. The surveys thus provide a factual basis for policy-making in connection with the social and economic aspects of food and agricultural planning and for monitoring the effects of changes in such policies.

11b. Household food consumption

248. Household food-consumption surveys, which are more specialized than household budget surveys, collect information at the household level on quantities of food consumed (or acquired for consumption). They record not only expenditure on each type of food but also quantities of food purchased and food consumed in sufficient detail to enable estimates of nutritional intake to be derived. They may also obtain information on age, sex, weight, height and occupation of individual members of the household (together with similar information on any visitors taking their meals within the household) and information on family members who have taken meals away from the household. In this way nutritional intake of the individual and household can be calculated in accordance with suitable national or international recommendations and can be compared with the estimated requirements.

11c. Individual dietary status

249. The main goal of individual dietary surveys is to measure the food intake of individuals and not simply consumption by the family as a whole. They may cover all members of a family separately or only a specific category of persons in the family, depending on the objectives of the survey—for example, pre-school children, children of school age, pregnant women, and so on. The objective is to obtain a clear picture of the type of diet and its possible deficiencies prior to initiating a supplementary feeding programme or programmes for improving nutrition. The methods require that foods be measured or weighed on the plate or at the time of serving, thus leading to a high degree of measurement error. These surveys are costly to undertake, and therefore usually have limited coverage, and they tend to be confined to selected socio-economic or vulnerable population groups.

11d. Nutritional status

250. To obtain comparative information about an individual's energy and nutrient requirements, and also to assess nutritional status, it is necessary to make clinical and anthropometric measurements. Such information on nutrition is required for introducing nutrition considerations into national policy-making and planning and for monitoring the highest risk group for malnutrition. For this purpose, data on nutritional status and related indicators,

notably morbidity and mortality, are required in disaggregated form in order to describe the nutrition conditions of different groups. To construct nutritional status indicators of young children, the survey must obtain information on weight, height/length, age and sex of each child in the target population. The nutritional status of a population is usually described in terms of the percentage of individuals below a specified cutoff, such as 80 per cent of the mean, or third percentile, or -2.0 standard deviations (or z-score) (United Nations, 1990).

12. Criminal justice

251. The collection and production of statistics on criminal justice is a very important activity for any country as part of the production of social statistics and indicators. The major data source of criminal justice statistics is from the records of the criminal justice administration. Each component of the criminal justice system inevitably creates a large quantity of records, which are the main source of the statistics on criminal justice. Sometimes special surveys need to be conducted to fill crucial data gaps. There are three broad uses of criminal justice statistics: for administration, planning and policy research and analysis. The agencies that require criminal justice statistics include police, prosecution, courts, prison system and other non-institutional programmes. A manual on the development of criminal justice statistics was issued by the United Nations in 1986 (United Nations, 1986).

252. It is the criminal legal system that defines crimes and consequently designates individuals as offenders. Therefore, it is inevitable that differences occur among countries in the definitions of crime, offender, victim, suspect, charge, conviction and so on. Similarly, differences occur in the recording of administrative data by the police, courts and prisons. Therefore, international comparisons must always be placed in the context of differences between national criminal justice systems and the statistics they produce. Criminal justice statistics are composed of three major subsets: (a) the criminal event, (b) the criminal justice system and (c) the demographic, social and economic context.

12a. Criminal event

253. The criminal event is the most basic category for any criminal justice statistics system. It includes data on the criminal act, the criminal actor and the victim. For the data to be

comparable, it is important that common definitions, recording procedures and classifications be used from the police record of events to actual charges, court dispositions and the like.

12b. Criminal justice system

254. The second subset of criminal justice statistics concerns the operations of the criminal justice system itself. Broadly speaking, the system is composed of four major subsystems: police, courts, prisons and non-custodial measures. Similarly, each subsystem can be broken down into smaller components resulting in a complex network of agencies concerned with crime, offenders and/or victims. This framework indicates that a minimum of four types of statistical indicators is needed to reflect the operation of a criminal justice subsystem: input statistics (case-filed, case-flow and caseload information); process statistics (how the work is accomplished); output statistics (what is accomplished) and resource statistics.

12c. Demographic, social and economic context

255. In order to construct meaningful criminal justice statistics, it is necessary to link input, process, output and resource data with the demographic, social and economic characteristics of the subjects—i.e., offenders, inmates in correctional institutions, victims and others.

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[1] In the 1970s, fertility data for many developing countries that were needed to estimate and project the trend of the world population were lacking. As a consequence, following the International Conference on Population in Bucharest in 1974, the World Fertility Survey (WFS) was established under the auspices of the International Statistical Institute (ISI), with the main purpose being to obtain accurate estimates of fertility data from as many countries as possible. At the same time, the United Nations and many donor agencies recommended and often funded projects in developing countries for refining the collection of fertility statistics on their censuses

and establishing civil registration systems to produce vital statistics. The situation now is far improved from that of the mid-1970s mostly due to this effort.

[2] Throughout this paper the "UN Census Recommendations" refers to the recommendations contained in the *Principles and Recommendation for Population and Housing Censuses* (United Nations, 1998).

[3] During the 1990 Population and Housing Census Round (1 January 1985 to 31 December 1994), 32 out of 202 countries or areas conducted more than one census and 35 countries did not conduct any census in that decade, including nine African, four Central and South American, eight Asian, six Oceania and eight European countries (Suharto, 1996).

[4] Throughout this paper the "UN census recommendations" refers to the recommendations contained in the *Principles and Recommendations for Population and Housing Censuses* (United Nations, 1998).

[5] Throughout this paper the "UN vital statistics recommendations" refers to the recommendations contained in the *Principles and Recommendations for a Vital Statistics System* (United Nations, 1973), and the *Principles and Recommendations for a Vital Statistics System, Revision 2* (United Nations, 2001).

[6] According to ISCED the levels of education are classified as follows: (a) Pre-primary education (ISCED level 0); (b) Primary education (ISCED level 1); (c) Secondary education, lower and upper levels (ISCED levels 2 and 3); (d) Tertiary education (ISCED levels 5,6 and 7).

[7] See Resolution 1 of the Thirteenth International Conference of Labour Statisticians, concerning statistics of the economically active population, employment, unemployment, and underemployment. (Geneva, International Labour Office,1982). paras. 14-20.

[8] As stated in the Resolution of the Thirteenth International Conference of Labour Statisticians (Geneva, 1982)

[9] See Reports of the Statistical Commission at its twenty-eighth session (1995) and thirty-first session (2000) on the recommendations on time-use statistics. Also see the Platform for Action adopted by the Fourth World Conference on Women, Beijing, 1996.

[10] See World Health Organization *International Classification of Diseases and Related Health Problems, Tenth Revision*, vol. 2 (Geneva, 1992).

[11] See the Standard Rules on the Equalization of Opportunities for Persons with Disabilities, as contained in the annex to United Nations General Assembly resolution 48/96, adopted on 20 December 1993.

[12] World Health Organization, 1980, (Geneva).

[13] Statistics on Special Population Groups, No. 8 (United Nations publication, Sales No. E.96.XVII.4).