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Principles and Recommendations for a Vital Statistics System

Revision 3



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Department of Economic and Social Affairs

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Preface

This, the third revision of *Principles and Recommendations for a Vital Statistics System*, was submitted to the United Nations Statistical Commission at its forty-fourth session in 2013 and formally adopted at its forty-fifth session in 2014. It is the most recent in a series of updates of the principles and recommendations for a vital statistics system first published in 1953.¹ The first revision was published in 1973;² and the second revision was issued in 2001.³ The present set of principles and recommendations provides guidance on establishing a functioning system for collecting, processing and disseminating vital statistics; improving sources of vital statistics, primarily the functioning of the civil registration system and its components; and the role of complementary sources of vital statistics, such as population censuses, household surveys and public-health records.

The essential standard for generating accurate, reliable and regular vital statistics from the civil registration system, as promulgated by this and all previous versions of the principles and recommendations, has remained unchanged and is as valid as ever. In this context, while it is understood that civil registration is the preferred and best source of vital statistics, there needs to be a clearer distinction between vital statistics as a set of data crucial for policymaking and its source, the civil registration system. This distinction gains in importance in the light of the fact that civil registration is a major and critical element for establishing the essential rights and privileges of individuals. This dimension of civil registration dictates the need to clearly delineate vital statistics as a product of civil registration and, at the same time, to provide guidelines for the establishment, proper management, operation and maintenance of civil registration.

The process of revising the principles and recommendations for a vital statistics system included several stages. In the first stage, a concept note regarding the proposed scope and content of revision was dispatched to all national statistical authorities. Replies and reactions were then synthesized and presented at the United Nations Expert Group Meeting on International Standards for Civil Registration and Vital Statistics Systems, held in New York from 27 to 30 June 2011.⁴ Based on the proceedings of this Meeting, the first draft of the revision was prepared by the United Nations Statistics Division and circulated to the members of the Expert Group for comments and suggestions, which were incorporated in the second draft. This draft, too, was circulated to all the members of the Expert Group, whose final input was solicited. As noted above, the final draft was submitted to the Statistical Commission at its forty-fourth session, held from 26 February to 1 March 2013. The complete, edited version, including the annexes, the index and the glossary, was submitted to the Statistical Commission for adoption at its forty-fifth session in 2014.

The third revision reflects a restructuring of the second revision, from which it differs in several ways. The third revision consists of three main parts: part one focuses solely on the vital statistics system, as distinguished from the civil registration system, in terms of its main features, principles and recommended topics. Part two focuses on sources of vital statistics, with the main centre of attention being civil

1 Statistical Papers, Series M, No. 19 (United Nations publication, Sales No. 1953.XVII.8).

2 Statistical Papers, Series M, No. 19, Rev.1 (United Nations publication, Sales No. E.73.XVII.9).

3 Statistical Papers, Series M, No. 19, Rev.2 (United Nations publication, Sales No. E.01.XVII.10).

4 All the papers, presentations and the final report are available at http://unstats.un.org/unsd/demographic/meetings/egm/CRVS2011/list_of_docs.htm.

registration: its establishment, functioning and characteristics; part two also elaborates on other sources of vital statistics, encompassing, inter alia, the role of health institutions and population censuses and household surveys. Part three elaborates on key elements needed for securing regular, reliable and accurate vital statistics, such as mechanisms for quality assurance and assessment and strategies for improving civil registration and vital statistics systems.

The present publication provides an extensive examination of the role of population registers in the context of both vital statistics and civil registration. Building on its predecessors, it also includes a comprehensive consideration of the role of health institutions in the context of both vital statistics gathering and functioning of civil registration; contains a revised list of core and non-core topics for vital statistics; and updates relevant international classifications used in the context of the vital statistics system.

While the five United Nations Handbooks on Civil Registration and Vital Statistics Systems,⁵ which accompanied the second revision of the principles and recommendations, remain highly relevant and valid in the context of the third revision as well, this is noted with the understanding that certain parts of these handbooks will be updated and adjusted as necessary to reflect contemporary approaches and best practices.

5 *Developing Information, Education and Communication*, Studies in Methods, Series F, No. 69 (United Nations publication, Sales No. E.98.XVII.4); *Policies and Protocols for the Release and Archiving of Individual Records*, Studies in Methods, Series F, No. 70 (United Nations publication, Sales No. E.98.XVII.6); *Preparation of a Legal Framework*, Studies in Methods, Series F, No. 71 (United Nations publication, Sales No. E.98.XVII.7); *Management, Operation and Maintenance*, Studies in Methods, Series F, No. 72 (United Nations publication, Sales No. E.98.XVII.11); and *Computerization*, Studies in Methods, Series F, No. 73 (United Nations publication, Sales No. E.98.XVII.10).

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Part one

The vital statistics system

Chapter I

Definition, concepts and uses of vital statistics

A. Definition of vital statistics and vital events for statistical purposes

1. Vital statistics constitute the collection of statistics on vital events in a lifetime of a person as well as relevant characteristics of the events themselves and of the person and persons concerned. Vital statistics provide crucial and critical information on the population in a country.

2. For statistical purposes, vital events are events concerning life and death of individuals, as well as their family and civil status. Vital events proper concern life and death and include live births, deaths and foetal deaths.¹ Dual events are those occurring simultaneously in the lives of two individuals, which cannot occur again in the life of either individual without a previous change to his or her status. Those events include marriage, registered partnership, separation, divorce, legal dissolution of registered partnerships and annulment of marriage. Finally, vertical family events are those involving a descendant; they comprise adoption, legitimation and recognition. A list of each event for which data are to be collected for vital statistics purposes and its recommended definition is provided directly below:

- **Live birth:** the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached; each product of such a birth is considered live born (all live-born infants should be registered and counted as such, irrespective of gestational age or whether alive or dead at the time of registration, and if they die at any time following birth, they should also be registered and counted as deaths).
- **Death:** the permanent disappearance of all evidence of life at any time after live birth has taken place (postnatal cessation of vital functions without capability of resuscitation). (This definition excludes foetal deaths, which are defined separately below.)
- **Foetal death:**² death prior to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy; the death is indicated by the fact that after such separation the foetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord or definite movement of voluntary

¹ Including legally induced abortions.

² Also referred to as “dead-born foetus” and “stillbirth”.

muscles (note that this definition broadly includes all terminations of pregnancy other than live births, as defined above).³

- **Marriage:** the act, ceremony or process by which the legal relationship of spouses is constituted. The legality of the union may be established by civil, religious or other means as recognized by the laws of each country. Countries may wish to expand this definition to cover civil unions if they are registered; in that case, registered partnership usually refers to a legal construct, registered with the public authorities according to the laws of each country, that leads to legal conjugal obligations between two persons.
- **Divorce:** the final legal dissolution of a marriage, that is, that separation of spouses which confers on the parties the right to remarriage under civil, religious and/or other provisions, according to the laws of each country. In case a country recognizes registered partnerships, a legal dissolution of a registered partnership refers to the legal final dissolution of such a partnership, according to national laws, conferring on the parties the right to re-enter into another partnership or marriage.
- **Annulment:** the invalidation or voiding of a marriage by a competent authority, according to the laws of each country, which confers on the parties the status of never having been married to each other.
- **Separation, judicial:** the disunion of married persons, according to the laws of each country, without conferring on the parties the right to remarry.
- **Adoption:** the legal and voluntary taking and treating of the child of other parents as one's own, insofar as provided by the laws of each country.
- **Legitimation:** the formal investing of a person with the status and rights of a person born in wedlock, according to the laws of each country.
- **Recognition:** is the legal acknowledgement, either voluntarily or compulsorily, of the paternity of a child born out of wedlock.

B. Uses of vital statistics⁴

3. Acquiring knowledge of the size and characteristics of a country's population on a timely basis is a prerequisite to socioeconomic planning and informed decision-making. Vital statistics and their subsequent analysis and interpretation are essential for setting targets and evaluating social and economic plans, including the monitoring of health and population intervention programmes, and the measurement of important demographic indicators of levels of living or quality of life, such as expectation of life at birth and the infant mortality rate.

3 The legal requirements for the registration of foetal deaths vary from country to country. It is recommended that dead foetuses weighing 500 grams or more at birth (or those of 22 completed weeks of gestation or crown-heel body length of 25 centimetres or more if weight is not known) be registered. In addition, for statistical purposes, it is recommended that such terminology as "abortion", "early foetal death" and "late foetal death" be replaced through the use of weight-specific measures, e.g., the foetal death rate for foetuses of 1,000 or more grams or the foetal death rate for foetuses weighing between 500 and 1,000 grams, etc.). See World Health Organization, *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10)* (Geneva, 1992), vol. 2. Please note that since its original issue, ICD-10 has had three updates, the most recent being that of 2010. Details available from <http://apps.who.int/bookorders/anglais/detart1.jsp?codlan=1&codcol=15&codcch=835>.

4 Presented here are uses of vital statistics in general terms. Specific uses are elaborated in part one, chap. III.

4. Vital statistics are also invaluable for planning, monitoring and evaluating various programmes such as those dealing with primary health care, social security, family planning, maternal and child health, nutrition, education, public housing and so forth. Among the demographic uses of vital statistics are the preparation of population estimates and projections, studies of mortality, fertility and nuptiality, and the construction of life tables.

5. There are various sources of vital statistics: records of vital events from civil registration, specific retrospective questions on fertility and mortality in population censuses and household sample surveys, vital records from sample registration areas and health records. It is important that different sources of vital statistics employ the same concepts and definitions of vital events so as to ensure national and international comparability.

6. Vital statistics are obtained preferably through a civil registration system, as this is the ideal source from which to derive accurate, complete, timely and continuous information on vital events. In addition, vital statistics derived from the civil registration system (and the population registers) can include annual flow statistics from the smallest civil divisions, which no other data-collection system can provide. When civil registration input does not exist or is deficient, some countries may have recourse to a population census or a household sample survey to estimate the necessary vital statistics through retrospective questions on fertility, mortality and nuptiality. Fertility, mortality and nuptiality statistics may also be collected by instituting sample registration areas. In some countries, vital statistics needed for planning purposes rely on these other sources of data, together with the application of indirect techniques of demographic estimation. It must be stressed, that, even though population censuses, sample surveys and sample registration may provide estimates of the levels of fertility, mortality, foetal mortality, marriage and divorce, and, in the case of sample registration, estimates for mortality events by cause of death, they are not a substitute for a civil registration system, since they cannot provide such details over regular annual intervals and with universal coverage.

1. Use in estimating the size and growth of a population

7. Statistics on births and deaths are essential for preparing population estimates and projections for the entire country as well as for different levels of geographical areas within a country. Because a population increases by the addition of live births and decreases by the subtraction of deaths, and is impacted by migration, information about the number of live births and deaths occurring in a population is crucial for estimating the natural increase (or decrease) and the annual change in population size and structure for that population. Knowledge of the size and growth of a population is a prerequisite for national and regional planning and allocating resources. Information on the annual population estimates is also indispensable for the calculation of a majority of indicators.

8. One of the advantages of vital statistics generated from civil registration is geographical and small population group coverage. Adequate civil registration data which achieve a high level of coverage at the national level also have the potential of allowing the estimation of differentials at the regional level, thus providing invaluable information for regional planning and the appropriate allocation of resources in such areas as education, health care and social security at the appropriate administrative level.

2. Use in implementing and evaluating public health and maternal and child health programmes, as well as other government programmes

9. Vital statistics, either by themselves or through linkage with other sources, provide information for use in planning, monitoring and evaluating government programmes on public health and on improvement of maternal and child health and other government programmes.

10. Vital statistics derived from civil registration will constitute the only nationally representative source of information on mortality by cause of death, provided that civil registration is universal, continuous and permanent. Such information is invaluable for the assessment and monitoring of the health status of a population and for the planning of adequate health interventions. The timely recording of deaths by cause can provide early insights into trends in disease prevalence and thereby help in the design of prevention or intervention strategies. Reliable and timely data on cause of death also make it possible to provide real-time public-health alerts on deaths caused by rare diseases. Information on unusual patterns of deaths and deaths by causes may suggest to public-health officials that there is a need for intervention.

11. Maternal care and child health programmes can be carried out effectively based on the availability of statistics on births, foetal deaths and maternal and infant deaths.⁵ These data, classified, inter alia, by place of occurrence (hospital, home, urban/rural location), birth weight, gestational age, parity and age of mother provide information that can be useful in planning, operating and evaluating services designed to prevent maternal and infant deaths.

12. Data on live births classified by weight at birth and on other items such as delivery method, place of occurrence, nature of prenatal care and maternal characteristics can be used to study the impact of delivery method, experience of physicians, level of prenatal care and maternal characteristics on malformations and birth injuries. Follow-up interventions can be carried out with a view to providing training to physicians and pregnant women.

13. The increasing importance given to the registration of foetal deaths is in recognition of their value in measuring perinatal mortality⁶ and pregnancy outcomes. The matching of birth to infant death records will provide additional characteristics of the would-be mother, such as age, marital status and socioeconomic status, for intensive studies of pregnancy and birth outcomes.

14. Family planning services require fertility data by age of mother and parity for the planning, implementation, monitoring and evaluation of family planning programmes. Data on marriage rates and age at first marriage are also useful for understanding the dynamics of fertility.

15. Data on marriages and divorces allow analysis of the impact of divorce on mothers and children. Single mothers and their children constitute a particularly

5 “Maternal death” is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes. According to the World Health Organization (WHO) (2012) the major complications that account for 80 per cent of all maternal deaths are severe bleeding (mostly bleeding after childbirth), infections (usually after childbirth), high blood pressure during pregnancy (pre-eclampsia and eclampsia) and unsafe abortion. Infant deaths refer to deaths of infants up to 1 year of age.

6 Perinatal mortality, as defined by WHO, refers to the number of stillbirths and deaths in the first week of life (early neonatal mortality).

vulnerable group in most populations. Such information may be useful in making legal provisions for protecting the rights of mothers and children in cases of divorce and for allocating resources accordingly.

16. Linking of fertility data with other administrative data, such as education statistics, provides an opportunity to study the impact of maternal characteristics on early childhood development. By linking vital statistics with provision of health services, one can assess the quality of provision. For example, analysis can be conducted on the impact of different types of health services (e.g., public versus private) on birth outcomes.

17. Vital statistics from civil registration have significance in other societal areas of interest, especially with regard to the study of the establishment and maintenance of families as units of society. The registration of births, marriages and divorces, as well as other family events — adoptions, for instance — provides tangible proof of the official recognition of the process of family formation, and can yield valuable insights about the evolution of that process through time. A related source of information is the assessment of the incidence of out-of-wedlock births.

3. Use in understanding the economic and social dimensions of a population

18. Information on the number of live births occurring over a given time period, classified by various characteristics of the women giving birth, constitutes the basis for analysis of the dynamics of reproduction. Information on deaths, classified by various characteristics of the deceased, especially age and sex, is necessary for calculating life tables and estimating the probability of dying at various ages. The fertility and mortality estimates thus derived are essential for a variety of purposes, including for understanding the growth dynamics of the population concerned; assessment of the human aspects of socioeconomic development; and measurement, for insurance and social security purposes, of the risks of dying for males and females at specific ages.

4. Uses in producing development indicators

19. Continuity in the availability of good-quality vital statistics and their subsequent analysis and interpretation are essential for setting targets and evaluating social and economic plans, including the monitoring of health and population intervention programmes, and the measurement of important demographic and social indicators of levels of living and quality of life.

20. Vital statistics are the basic data required for the calculation of various indicators of fertility and mortality, among which the total fertility rate, the infant mortality rate, the under-five mortality rate, the maternal mortality ratio, life expectancy at birth and the crude death rate are important measurement indicators of developmental progress.

21. Another important use of birth and death statistics, combined with information on migration, is in producing annual population estimates, which are the denominators for compiling most indicators, and not only the fertility and mortality indicators mentioned above. For example, the figure for total population is needed to calculate the proportion of the population living below \$1 (purchasing power parity (PPP)) per day—an indicator that may be measured against progress made in eradicating extreme poverty and hunger. Vital statistics-based population estimates are

also required for the calculation of some social and health indicators, such as the literacy rate of 15- to 24-year-olds; HIV prevalence among the population aged 15-24; and the proportion of the population using an improved drinking water source, to name just a few.

5. Other uses

22. Birth, death and marriage rates and data on family size and composition are important sources of the information needed in planning related to public housing. The trends in the birth and marriage rates are indicators of future housing needs and size of the school population and data on those trends are essential in planning for provision of school facilities, as well as for the training of teachers.

23. Vital statistics are useful in planning related to future markets for consumer goods such as medicine, food, clothing and furniture. If the birth rate remains high, it may be expected that the demand for maternity clothing will remain high; that medicine, food, clothing, equipment and furniture will continue to be in demand; and that housing and house furnishings will be at a premium price. Statistics on births and projections are useful to commercial firms and enterprises when planning for stocks of clothing, toys and play equipment, among other items, for growing children.

24. The number of marriages has importance for the construction industry and the trends in the marriage rate will influence the business prospects of clothing and furniture manufacturers, among others. These are some of the commercial sectors that use the vital statistics available at local level.

25. Vital statistics from different sources need to be of the highest quality to serve as the basis for better decision-making. Producers of vital statistics should aim for the highest quality in terms of completeness, correctness, availability and timeliness. For example, use of vital statistics for local and regional planning requires that such data have achieved a high level of coverage at local level. Real-time alerts on mortality to be provided to public-health officials require the availability of death data that are timely and accurate. It is also highly desirable that different sources of vital statistics employ the same concepts and definitions of vital events to enhance the complementarities of the different sources and to ensure national and international comparability.

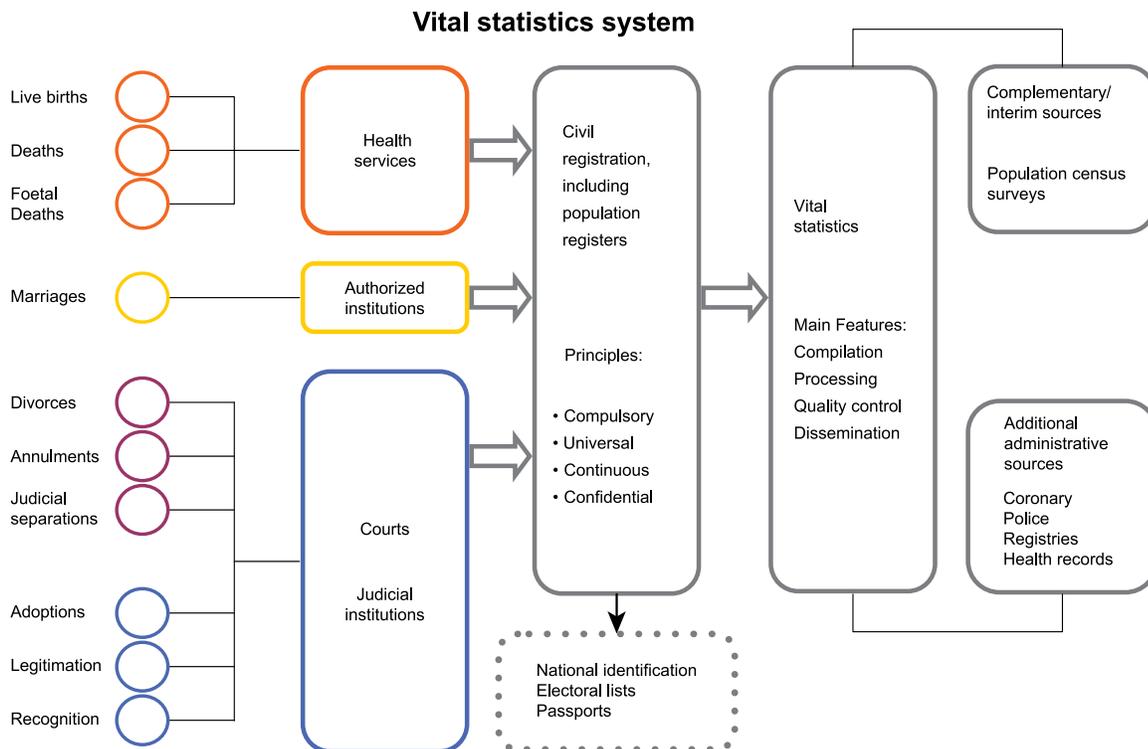
Chapter II

The vital statistics system: guiding principles

A. Definition of a vital statistics system

26. In the context of defining a system as a set of interacting or independent components forming an integrated whole and for the purposes for which these principles and recommendations are to be applied, the components of a vital statistics system are: (a) legal registration and (b) statistical reporting of, and (c) collection, compilation and dissemination of statistics pertaining to vital events, as illustrated in figure II.1 below. The vital events of interest are: live births, adoptions, legitimations and recognitions; deaths and foetal deaths; and marriages, divorces, separations and annulments of marriage (see chap. I, para. 2, for definitions).

Figure II.1



B. Source of vital statistics

27. The critical source of vital statistics are records of vital events derived from civil registration, which refers to the continuous gathering of information on all relevant vital events occurring within the boundaries of a country or a well-defined area within a country.

28. Complementary data sources, such as population censuses and in-depth household surveys, have also been utilized to evaluate and enrich civil registration data and to gather information on demographic and epidemiological processes that complements the information obtained through civil registration.

29. Additional sources within a vital statistics system include specific questions on fertility and mortality added to population censuses, household sample surveys, vital records from sample registration and health records. Through the use of these sources of data together with the application of indirect techniques of demographic estimation, some countries have been supplied with certain of the statistical indicators needed for planning purposes, mainly at the national level. However, there is no substitute for the availability of continuous information on vital events based on their civil registration. It is essential that countries strive to ensure that the statistics produced by their systems are accurate, timely and complete. Allowance is to be made, as appropriate, for the use of other sources of complementary or alternative data.

C. Priority in data collection

30. In establishing or improving a vital statistics system, first priority should be given to setting up procedures for the registration of live births and deaths including causes of deaths, followed closely by foetal deaths. Data on births and deaths are fundamental to the understanding of population dynamics and are directly related to the measurement of key health indicators, such as infant and childhood mortality, maternal mortality and life expectancy. The priority for collection of information on the frequency and characteristics of foetal deaths should be almost as high as that for live births and deaths, as there is increasing health-related interest in and need for information about foetal loss, to assist in the measurement of pregnancy outcomes, women's health, and mortality occurring just before, during and shortly after the birth. The increasing importance given to the registration of foetal deaths reflects the recognition of their importance in measuring perinatal mortality and pregnancy outcomes.

31. Slightly lower priority is given to collection of nuptiality statistics through civil registration. While the traditional *de jure* and registered marriage remains the critical family building block in many societies, there are an increasing number of marriages established through religious or tribal ceremonies, extra-legal "consensual" unions and temporary marriages which often go unregistered. Statistics based on the registration of statutory marriages and, in some instances, of religious ceremonies have value for administrative and study purposes; however, the needs of demographers, sociologists, economists and other users are not always met by such data. Population censuses and sample surveys may serve as better sources of data on the formation and dissolution of various kinds of marital unions. Particular attention is drawn to the desirability of exploring methods of obtaining information on non-statutory marital unions (common-law or consensual unions), since, given their

characteristics, information on these unions may be difficult to collect through a civil registration system.

32. It has to be emphasized that the annulments, judicial separations, adoptions, legitimations and recognitions are legal constructs and their entry into full legal force largely depends on their registration; hence, individuals have a clear interest in registering the occurrence of these events, as such registration enables the establishment of their status. Collecting and producing statistics on the events, however, are not on the same level of priority.

33. When a field sample survey or population census is used as a supplementary means of collection, the events to be investigated can be any of the vital events, e.g., live births, deaths, foetal deaths, marriages and divorces. However, first priority is given to live births and deaths, followed by marriages. The collection of information on foetal death is not recommended because of the problems associated with accurately reporting the event.

D. Principles of a vital statistics system

34. **Universal coverage.** A vital statistics system should include all of the vital events occurring in every geographical area and in every population group of the country.

35. **Continuity.** The principle of continuity is critical to the collection and compilation of vital statistics, as data need to reflect short-term fluctuations, including seasonal movements, as well as longer-term movements. Continuity is most easily achieved once civil registration has been fully established, because, usually, monthly (or quarterly) and annual reporting then becomes a routine activity within the system. Where supplements to civil registration, such as sample surveys, are employed to obtain estimates of vital rates, special efforts may be needed to ensure that data become available frequently and regularly.

36. **Confidentiality** of personal information in vital statistics microdata and any associated statistical reports should be safeguarded to an extent consistent with the intended uses of these records for specific administrative and statistical purposes. Statistical reports based on vital events, whether derived from a registration system or obtained by any other means, such as a sample survey, should be opened to the widest possible legitimate use consistent with appropriate concerns for the provision of an assurance of confidentiality to the individuals whose data contribute to the statistics.

37. The confidentiality principle is based on the right of the individual to expect that information given in confidence to the registrar or interviewer will be used only for authorized statistical or administrative purposes. In turn, the national authority that collects vital event data with a promise of confidentiality should expect that the data to be reported by individuals are full and accurate, regardless of the sensitivity of the information.

38. **Regular dissemination.** The compilation of vital statistics should have as its minimum goal two attainments: (a) the provision of total monthly or quarterly summary counts of vital events on a time schedule prompt enough to provide information for health intervention and population estimation programmes, administrative uses or other needs and (b) the production of detailed annual tabulations of each type of vital event cross-classified by its demographic and socioeconomic characteristics.

39. In the planning of the detailed tabulation programme, it is important to ensure that resources are available for completing it on a regularly established basis and on a time schedule that will ensure the effective use of the analysis of the interrelationship among demographic, economic and social factors in the planning, operation and evaluation of public-health programmes, and for the purpose of formulating and evaluating economic and social plans. As far as possible, such statistics should be comparable within the country, across demographic data sources and on an international basis to permit international analysis. Where particular circumstances within a country require departures from international standards, publication of the data should be accompanied by an explanation of these departures and an indication of how the national presentation can be converted so as to meet or approximate international standards.

E. Designation of responsibilities and organizational structure of a national vital statistics system

40. The legal framework for the vital statistics system should:

- (a) Assign the functions of establishing, operating and maintaining a national vital statistics system to a governmental agency or agencies so as to guarantee the production of basic vital statistics and their primary analysis and dissemination;
- (b) Provide clear designation of duties and responsibilities with respect to registration, recording, reporting, collection, compilation, analysis, evaluation, presentation and dissemination of data;
- (c) Establish an appropriate organizational structure or structures for the efficient management, operation and maintenance of the system;
- (d) Link the production of vital statistics to the civil registration system;
- (e) Designate a central government agency or agencies to be responsible for the maintenance of standards for the design and conduct of the various operations through which vital statistics are collected, compiled, processed, published and disseminated.

41. The place of the agency or agencies responsible for the vital statistics system within the administrative structure will depend on national circumstances, but the aim must be to achieve centralized and peripheral coordination among the civil registration system, the vital statistics system, the general statistical service, population and migration statistical services, health statistics services, etc., and with officially recognized research projects that encompass such demographic factors as are characteristic of the economic, social and medical fields. Close coordination and collaboration are essential to ensure that concepts, definitions and classifications are the same across sources and that duplication of responsibility is eliminated.

42. The organizational structure or structures for the efficient management, operation and maintenance of the system might be centralized or decentralized. In terms of its overall structure, a centralized system relies on being managed at the national level, with subnational offices at appropriate local levels. Decentralized systems are those where the primary responsibility for civil registration and local vital statistics rests with subnational authorities, such as governments of States or provinces. In the latter situation, a national organization would establish national stand-

ards and guidelines to be applied uniformly and compile overall statistics for the country from the data provided by the subnational entities.⁷

43. Several alternatives may be considered in respect of administering vital statistics programmes. One option is to place the vital statistics administration under the national statistical service. In this case, the vital statistics programme becomes a part of the general statistics programme. Another option is to place the vital statistics administration within the civil registration administration. A third option is to designate specific government agencies to carry out different vital statistics functions related to their respective areas of work. For example, the health service agency might collect and process data on births, deaths and foetal deaths, while the general statistical service or the court system might compile marriage and divorce statistics. While other arrangements are possible, it is essential in any case that the vital statistics programme be clearly defined and its administration have strong, permanent governmental support. In most countries, the agency responsible for the production of vital statistics has no responsibility for carrying out the actual registration of events. Because of the separate administration of these functions, coordination among the responsible agencies is particularly important, as is the fact that such an arrangement provides additional opportunities to establish, develop and maintain independent tools and protocols for assessing the quality and coverage of the registration.

F. Integration, coordination and collaboration in the vital statistics system

44. The clear delineation of duties should be supplemented by arrangements for coordination of needs and services among official agencies concerned with the registration of vital events, those responsible for compiling facts for statistical purposes, and those using the data for administrative or analytical purposes in connection with economic and social matters, or for planning, operating and evaluating public-health programmes on either a national or an international level.

45. Coordination, especially with respect to coverage, definitions, classification and tabulation programmes, should also be maintained with the authorities responsible for the population census or other types of population statistics, with those in charge of migration statistics, and with the agencies responsible for public-health statistics, and other related social and economic statistics.

46. It is important that collaboration mechanisms exist between different institutions within the vital statistics system, or between a vital statistics system and other data-collection systems, so that those institutions can work together under a joint action plan.

47. The widespread use of vital statistics as components of the data to be used for a broad range of social and economic planning and analytic applications demands a high degree of statistical integration. The assessment of needs, the establishment of targets and the evaluation of progress depend upon the availability of a large number of statistical series, whose data must be logically consistent.

48. How such consistency is attained varies according to the organizational structure within a country. Centralized coordination of statistical activities is desirable in order to ensure that the structure functions efficiently in producing statistics

⁷ A comprehensive examination of centralized and decentralized civil registration is presented in *Handbook on Civil Registration and Vital Statistics Systems: Management, Operation and Maintenance* (United Nations, 1998d).

that are based on standard concepts, definitions and classifications embodied within tabulations, and that meet the needs of consumers on a timely basis without errors, duplications or omissions. The oversight of such coordination should be vested in a central statistics office.

49. Regardless of whether the system is centralized or decentralized in the country, certain principles should guide the coordination process. First and foremost, uniform legislation and regulations should be adopted on a nationwide basis for each national statistical programme. Care should be exercised in the wording of such legislation to ensure that specific data elements in one data system are defined identically in another. The definitions of vital events adopted in the statistical programmes and in the civil registration system should be consistent with those employed for the same events in the vital statistics system. In the case of sources of demographic statistics in general, it is of particular importance that the concepts, definitions, classifications and tabulations be coordinated with those employed in population censuses, in sample field surveys and in international migration statistics.

50. The requirement of compatibility applies not only to the definitions of vital events, such as births, deaths, foetal deaths, marriages and divorces, but also to characteristics of the persons experiencing these events, such as status of economic activity, occupation, educational attainment, place of usual residence, administrative division and urban/rural, and each common topic in the data sources (see part one, chap. III for recommended definitions). The base population must also be considered in order to ensure consistency between the numerator and denominator of the vital rates at a given point in time and over longer durations. Figures for births and other vital events used by countries for the purpose of computing vital rates and ratios should therefore refer to events involving residents and non-residents of the country separately in order to ensure consistency between the numerators and denominators of the ratios.

51. Where international standards have been agreed upon, as in the field of population censuses and in a number of fields of interest to the specialized agencies of the United Nations system, such as the classification of causes of death and the associated definitions of live birth and foetal death, the investigation of economic characteristics and of education, it is recommended that these standards be applied when collecting and disseminating data. If local conditions require a departure from these standards, it would serve a useful purpose in maintaining comparability of results if the local classifications could be expressed in a form convertible to the international classifications, whenever possible.

52. Another recommendation for the improvement of coordination between vital statistics and other user agencies is the establishment of an inter-agency coordination committee comprising staff members of the agencies involved. This committee should meet at least once a year to discuss any matters that might affect the agencies. A similar recommendation for an inter-agency coordination committee established for civil registration is made in part two. It is possible that one committee might serve both needs.

53. In addition to external coordination, coordination within the vital statistics system is essential for ensuring that uniform processes and practices are followed at every level throughout the system. Regardless of whether the system is centralized or decentralized, good communication among the various offices involved in the collection of information from the civil registration system for the production of vital statistics is required in order that high standards of quality within the system may be established and maintained. The communication links must function in both direc-

tions: from the regional offices to the central authority and from the central authority to the field offices. In addition, communications must be good between those working in the registration domain and those working in the statistical and analytic domain. A number of communications techniques have been shown to be effective in vital statistics systems, including the use of periodic workshops and conferences, national conventions, newsletters and travelling field consultants and communications through electronic networks. Each of these practices contributes to the identification of problems and the achievement of appropriate and uniform solutions to common issues. A good communications system contributes to the establishment of teamwork within the system and helps to maintain good morale among the workers. Included in the communication network should also be representatives from areas outside of the vital statistics system, primarily the civil registration system or the health ministry, when coordination with other agencies and disciplines is appropriate. For example, the members of the above-mentioned inter-agency coordinating committee should ideally participate in applicable activities of the communications networks.

G. Quality assurance and assessment

54. Quality assurance and assessment refer to strategies and procedures for ensuring the quality of vital statistics. Quality assurance occurs at each operational stage within the vital statistics system. Quality assessment usually involves studies with specific objectives, such as coverage of birth statistics, identification of unregistered vital events and evaluation of the competency of cause-of-death coders. The quality of vital statistics is measured by their completeness, correctness or accuracy, availability and timeliness. Whether confidentiality procedures and protocols are followed strictly by the vital statistics system should also be evaluated and measured against international standards.⁸

55. Quality assurance procedures need to be set up as regular and routine activities including field activities at the collection, compilation and processing stage: recording of vital events through civil registration or collecting statistics through population censuses and sample surveys; query practices at the time of data collection to ensure that omissions and errors are caught early enough to enable the solutions to be incorporated in the original records; follow-up with statistical reports to ensure accurate and complete data transfer; and checking and querying at the statistics editing, coding and tabulation stages.

56. Quality assessment may be conducted periodically or on an ad hoc basis, preferably by external authorities. There are various ways of conducting quality assessment, through either direct or indirect methods. Additional guidelines on the practice of different assessment methods as well as on how to choose appropriate methods for evaluation are described in detail in part three.

H. In-depth sample surveys in the vital statistics system

57. The value of in-depth sample surveys carried out in conjunction with the system of civil registration should be recognized as a means of gathering information

⁸ In this regard, principle 6 of the Fundamental Principles of Official Statistics states that: "(i) individual data collected by statistical agencies for statistical compilation, whether they refer to natural or legal persons, are to be strictly confidential and used exclusively for statistical purposes".

(a) that cannot be collected efficiently by routine comprehensive statistical reporting or (b) that is required only at such widely separated intervals of time as to render inadvisable their inclusion as regularly reportable items of information for statistical purposes.

Chapter III

Topics and themes to be covered in a vital statistics system

A. Selection of topics and themes

58. The list of topics included in the global recommendations for vital statistics systems are derived from national experiences. At the country level, there is a need to meet both national needs and international standards when selecting the topics and themes to be included in the country's vital statistics system. Since the international standards are derived from national experiences, these two sets of criteria are rarely incompatible. Sometimes, a country may need to collect data in more detail than necessary in order to meet international comparison objectives. In such cases, the data can be collected in such a way as to permit them to be collapsed into categories appropriate to the international standards.

59. Topics and themes to be investigated for the purpose of producing vital statistics are scrutinized to determine whether the data desired are collectable. If one cannot expect to collect meaningful quality data on a topic, then that topic should be excluded. It is sometimes possible to collect data on a sensitive topic if it is made clear to the respondents that the appropriate confidentiality safeguards are in place. If a question's difficulty seems to preclude respondents from supplying quality data through their answers, alternative wordings of the question can be pretested on a population sample.

B. Topics and themes to be covered for vital statistics purposes through the civil registration system

60. The present section considers topics to be investigated for vital statistics purposes through the civil registration system, within the categories of live birth, death, foetal death, marriage and divorce. Information should be collected on the incidence of each event in time and on specified characteristics of each event and of the persons directly involved in it.

61. The list of recommended topics is structured around two "collection priorities", in recognition of the fact that not all countries will be able to conform to the standards at the same time, or to operate at a uniform pace in achieving complete coverage of all recommended topics. Coverage of the higher-priority topics, indicated by boldface type, constitutes an immediate goal, while coverage of those not so indicated constitutes a less urgent goal. In actual practice, information on the recommended topics will need to be supplemented, for judicial and administrative purposes, by other information required so as to permit identification of the persons and events under consideration (see annex I). This would be accomplished through, for example, (a) inclusion of registration serial number, (b) inclusion of place of registration, (c) identification of the registrar, (d) inclusion of given name and surname of the person or persons directly involved in the event, including personal identification number, if available and (e) inclusion of information on the characteristics of the informant, including personal identification number, if available, etc.

62. For convenience, the recommended topics are grouped under two main headings: (a) characteristics of the event in question and (b) characteristics of the persons directly involved in the event, such as the child, the foetus, the parents, the decedent, the partners in the marriage and the divorcees.

63. A further distinction is made between “direct topics” and “derived topics”. Direct topics are those for which data are collected by way of specific questions on the statistical reports filled out at the time of registration. Derived topics are usually computed or inferred from information on the statistical reports and are not obtained from replies to direct questions. Examples of derived topics include “age”, if it is computed from a question asking for date of birth, and “urban/rural occurrence”, if it is inferred from a question asking for specific place of occurrence or residence. Derived topics are considered tabulation components and represent important information that is to be obtained from collected data contained in the statistical reports, as shown in table III.1 below.

64. Tabulations of the recorded information gathered through civil registration on the topics and characteristics recommended below normally exhibit the number of events classified by various characteristics of the persons experiencing those events. Users of vital statistics require not only absolute numbers but also rates and indicators which involve relating the number of events to the population at risk. An indicator of infant mortality, for instance, is obtained by dividing the number of deaths of children under age 1 in a given calendar year by the total number of births occurring during that calendar year. An indicator of fertility, the crude birth rate, is obtained by dividing the total number of live births occurring over a year by an estimation of the population at risk, such as the average population or the population at the middle of the year. The section under each topic entitled “Characteristics of population at risk” provides some guidance on the sources of appropriate denominators.

65. In the list of topics contained in paragraph 66 below, the numbers in parentheses after each entry refer to the topic numbers provided in section D below on definitions and specifications of topics (see paras 70-210 below).

66. In the following list of topics and themes for vital statistics purposes, core topics are indicated by boldface. Topics for which information is collected directly are indicated by the symbol \blacklozenge . Topics for which information is derived are indicated by the symbol \square . Additional topics are indicated by the symbol \circ .

Table III.1

Topics and themes to be investigated for vital statistics purposes through the civil registration system

<i>Live birth</i>	
(i) Characteristic of the event	
Date of occurrence (1)	\blacklozenge
Date of registration (2)	\blacklozenge
Place of occurrence (3)	\blacklozenge
Locality of occurrence (4)	\square
Urban/rural occurrence (5)	\square
Place of registration (3)	\blacklozenge
Type of birth (i.e., single, twin, triplet, quadruplet or higher-multiple delivery) (37)	\blacklozenge
Attendant at birth (38)	\blacklozenge
Type of place of occurrence (hospital, home, etc.) (45)	\circ

(ii) Characteristics of the newborn	
Sex (12)	◆
Weight at birth (14)	◆
(iii) Characteristics of the mother	
Date of birth (11)	◆
Age (11)	□
Marital status (27)	◆
Child born in wedlock (legitimacy status of the child) (13)	□
Educational attainment (30)	◆
Literacy status (31)	○
Ethnic and/or national group (32)	○
Citizenship (33)	○
Economic activity status (34)	○
Usual occupation (35)	○
Socioeconomic status (36)	□
Place of usual residence (6)	◆
Locality of residence (4)	□
Urban/rural residence (5)	□
Duration of residence in usual place (7)	◆
Place of previous residence (8)	○
Place/country of birth (9)	◆
Migrant status (10)	□
Date of last menstrual period of the mother (15)	○
Gestational age (15)	□
Number of prenatal visits (16)	○
Month of pregnancy prenatal care began (17)	○
Children born alive to mother during her entire lifetime (19)	◆
Birth order or parity (22)	□
Children born to mother during her entire lifetime and still living (20)	○
Foetal deaths to mother during her entire lifetime (21)	◆
Date of last previous live birth (23)	◆
Interval since last previous live birth (23)	□
Date of marriage (26)	◆
Duration of marriage (26)	□
(iv) Characteristics of the father	
Date of birth (11)	◆
Age (11)	□
Marital status (27)	◆
Educational attainment (30)	◆
Literacy status (31)	○
Ethnic and/or national group (32)	○
Citizenship (33)	○
Economic activity status (34)	○
Usual occupation (35)	○
Socioeconomic status (36)	○
Place of usual residence (6)	◆
Locality of residence (4)	□
Urban/rural residence (5)	□
Duration of residence in usual (present) place (7)	○
Place of previous residence (8)	○
Place/country of birth (9)	○
Migrant status (10)	□
(v) Characteristics of population at risk	

Population at risk for indicators related to live births is population, either mid-year population, or population disaggregated by age and sex, by marital status or by geographical location. The figures are to be obtained independently from population censuses, population registers, sample surveys and intercensal estimation procedures.

<i>Death</i>	
(i) Characteristic of the event	
Date of occurrence (1)	◆
Date of registration (2)	◆
Place of occurrence (3)	◆
Locality of occurrence (4)	□
Urban/rural occurrence (5)	□
Place of registration (3)	◆
Cause of death (41)	◆
Manner of death (42)	○
Whether autopsy findings were used to establish cause of death (43)	○
Death occurring during pregnancy, childbirth and puerperium (for females 15-49 years of age) (44)	○
Certifier (39)	◆
Type of certification (40)	□
Attendance at birth (for deaths under 1 year of age) (38)	○
Type of place of occurrence (hospital, home, etc.) (45)	○
(ii) Characteristics of the decedent	
Date of birth (11)	◆
Age (11)	□
Sex (12)	◆
Marital status (27)	◆
Educational attainment (30)	○
Literacy status (31)	○
Ethnic and/or national group (32)	○
Citizenship (33)	○
Economic activity status (34)	○
Usual occupation (35)	○
Socioeconomic status (36)	□
Whether birth was registered (for deaths under 1 year of age) (18)	○
Born in wedlock (for deaths under 1 year of age) (13)	○
Legitimacy status (for deaths under 1 year of age) (13)	□
Place of usual residence (6)	◆
Place of usual residence of the mother (for deaths under 1 year of age) (6)	◆
Locality of residence (4)	□
Urban/rural residence (5)	□
Duration of residence in usual (present) place (7)	○
Place of previous residence (8)	○
Place of birth (9)	○
Migrant status (10)	□
(iii) Characteristics of population at risk	
Population at risk for indicators related to general deaths is population, i.e., mid-year population, or population disaggregated by age and sex, by marital status or by geographical location. The figures are to be obtained independently from population censuses, population registers, sample surveys and intercensal estimation procedures.	
Population at risk for indicators related to infant deaths (deaths under 1 year of age) is usually live births, which is preferably to be obtained from the civil registration system.	
<i>Foetal death</i>	
(i) Characteristics of the event	
Date of occurrence (of foetal delivery) (1)	◆
Date of registration (2)	◆
Place of occurrence (3)	◆
Locality of occurrence (4)	□
Urban/rural occurrence (5)	□
Place of registration (3)	◆
Type of birth (i.e., single, twin, triplet, quadruplet, or higher-multiple delivery) (37)	○
Attendant at birth (38)	○
Certifier (39)	○

Type of certification (40)	<input type="checkbox"/>
Cause of foetal death (41)	<input type="radio"/>
Type of place of occurrence (hospital, home, etc.) (45)	<input type="radio"/>
(ii) Characteristics of the foetus	
Sex (12)	<input checked="" type="checkbox"/>
Delivered in wedlock (13)	<input type="radio"/>
Legitimacy status (13)	<input type="checkbox"/>
Weight at delivery (14)	<input type="radio"/>
Date of last menstrual period of the mother (15)	<input type="radio"/>
Gestational age (15)	<input type="checkbox"/>
(iii) Characteristics of the mother	
Date of birth (11)	<input checked="" type="checkbox"/>
Age (11)	<input type="checkbox"/>
Number of prenatal visits (16)	<input type="radio"/>
Month of pregnancy when prenatal care began (17)	<input type="radio"/>
Children born alive to mother during her entire lifetime (19)	<input checked="" type="checkbox"/>
Birth order or parity (22)	<input type="checkbox"/>
Children born to mother during her entire lifetime and still living (20)	<input type="radio"/>
Foetal deaths to mother during her entire lifetime (21)	<input checked="" type="checkbox"/>
Date of last previous live birth (23)	<input checked="" type="checkbox"/>
Interval since last previous live birth (23)	<input type="checkbox"/>
Date of marriage (26)	<input checked="" type="checkbox"/>
Duration of marriage (26)	<input type="checkbox"/>
Educational attainment (30)	<input type="radio"/>
Literacy status (31)	<input type="radio"/>
Economic activity status (34)	<input type="radio"/>
Usual occupation (35)	<input type="radio"/>
Socioeconomic status (36)	<input type="checkbox"/>
Ethnic and/or national group (32)	<input type="radio"/>
Citizenship (33)	<input type="radio"/>
Place of usual residence (6)	<input checked="" type="checkbox"/>
Locality of residence (4)	<input type="checkbox"/>
Urban/rural residence (5)	<input type="checkbox"/>
Duration of residence in usual (present) place (7)	<input type="radio"/>
Place of previous residence (8)	<input type="radio"/>
Place of birth (9)	<input type="radio"/>
Migrant status (10)	<input type="checkbox"/>
(iv) Characteristics of the father	
Date of birth (11)	<input checked="" type="checkbox"/>
Age (11)	<input type="checkbox"/>
Education attainment (30)	<input type="radio"/>
Literacy status (31)	<input type="radio"/>
Economic activity status (34)	<input type="radio"/>
Usual occupation (35)	<input type="radio"/>
Socioeconomic status (36)	<input type="checkbox"/>
Place of usual residence (6)	<input checked="" type="checkbox"/>
Locality of residence (4)	<input type="checkbox"/>
Urban/rural residence (5)	<input type="checkbox"/>
Duration of residence in usual (present) place (7)	<input type="radio"/>
Place of previous residence (8)	<input type="radio"/>
Place of birth (9)	<input type="radio"/>
Migrant status (10)	<input type="checkbox"/>
Ethnic and/or national group (32)	<input type="radio"/>
Citizenship (33)	<input type="radio"/>

(v) Characteristics of population at risk

Population at risk for indicators related to foetal deaths is live births, which is preferably to be obtained from the civil registration system.

<i>Marriage</i>	
(i) Characteristics of the event	
Date of occurrence (1)	◆
Date of registration (2)	◆
Place of occurrence (3)	◆
Locality of occurrence (4)	□
Urban/rural occurrence (5)	□
Place of registration (3)	◆
Type of marriage (46)	○
(ii) Characteristics of bride and groom (separately)	
Date of birth (11)	◆
Age (11)	□
Marital status (previous) (27)	○
Number of previous marriages (28)	○
Marriage order (28)	□
Educational attainment (30)	○
Literacy status (31)	○
Economic activity status (34)	○
Usual occupation (35)	○
Socioeconomic status (36)	□
Ethnic and/or national group (32)	○
Citizenship (33)	○
Place of usual residence (6)	◆
Locality of residence (4)	□
Urban/rural residence (5)	□
Duration of residence in usual (present) place (7)	○
Place of previous residence (8)	○
Place of birth (9)	○
Migrant status (10)	□
(iii) Characteristics of population at risk	
Population at risk for indicators related to marriages is population, i.e., mid-year population, or population disaggregated by age and sex or by geographical location. The figures are to be obtained independently from population censuses, population registers, sample surveys and intercensal estimation procedures.	
<i>Divorce</i>	
(i) Characteristics of the event	
Date of occurrence (1)	◆
Date of registration (2)	◆
Place of occurrence (3)	◆
Locality of occurrence (4)	□
Urban/rural occurrence (5)	□
Place of registration (3)	◆
(ii) Characteristics of divorcees (husband and wife separately)	
Date of birth (11)	◆
Age (11)	□
Type of marriage being dissolved (46)	○
Number of dependent children of divorced persons (25)	○
Number of children born alive to the marriage being dissolved (24)	○
Date of marriage (26)	◆
Duration of marriage (26)	□
Mode of dissolution of previous marriage (29)	○
Number of previous marriages (28)	○
Marriage order (28)	□
Educational attainment (30)	○
Literacy status (31)	○
Economic activity status (34)	○
Usual occupation (35)	○

Socioeconomic status (36)	<input type="checkbox"/>
Ethnic and/or national group (32)	<input type="radio"/>
Place of usual residence (6)	<input checked="" type="checkbox"/>
Locality of residence (4)	<input type="checkbox"/>
Urban/rural residence (5)	<input type="checkbox"/>
Duration of residence in usual (present) place (7)	<input type="radio"/>
Place of previous residence (8)	<input type="radio"/>
Place of birth (9)	<input type="radio"/>
Migrant status (10)	<input type="checkbox"/>
Place of occurrence of marriage being dissolved (3)	<input type="radio"/>

(iii) Characteristics of population at risk

Population at risk for indicators related to divorces is population, i.e., mid-year population, or population disaggregated by age and sex, by marital status or by geographical location. The figures are to be obtained independently from population censuses, population registers, sample surveys and intercensal estimation procedures.

C. Topics and themes that can be collected in population censuses and household sample surveys

67. There is no substitute for a well-designed and well-maintained civil registration system as a source of data on vital events for the production of vital statistics. However in countries where civil registration is lacking, deficient or insufficiently reliable, other sources of demographic statistics can be used to collect information on the incidence of vital events and to estimate or calculate vital rates—namely, population censuses and household sample surveys.

68. Even when civil registration is well established and well maintained, these other sources of demographic data are useful in providing independent estimates of demographic parameters, which can be used for evaluating the level of completeness of civil registration and vital statistics, or as complementary sources of demographic and health data. Moreover, population censuses are essential in providing the necessary denominators for calculating vital rates and ratios in combination with civil registration data (numerators). In particular, the utilization of population census data to obtain denominators is indispensable when the civil registration system is not accompanied by a population register.

69. The fundamental topics and themes outlined below in table III.2 are often used in population censuses and household sample surveys as a basis for collecting basic fertility, mortality and nuptiality data. The data provided may yield estimates of the levels of fertility, mortality and foetal mortality as well as the marital status of the person being interviewed, but these sources of statistics are not a substitute for a civil registration system, since they cannot provide such details as estimates of mortality by cause of death, other epidemiological information and a series of annual rates for various administrative divisions. Estimates obtained from censuses and surveys also tend to be associated with underreporting issues, which require adjustment after the data are collected. In addition, these sources provide very limited data on vital events themselves, since their investigations focus on household members as a unit, not on individuals; hence, information collected on vital events is characteristic of those units, not of individual household members. A universal and well-maintained civil registration system remains the single best source of information on vital events for administrative, demographic and epidemiological purposes.

Table III.2

Information on topics and themes that can be collected in censuses and in single-round retrospective surveys to estimate fertility, mortality and nuptiality

-
- I. To be collected in population censuses and single-round retrospective sample surveys that use census-type questions**
- 1. For all members of the household**
 - Relationship to the head of household
 - The line number on the questionnaire of his or her mother, if she lives in the household
 - Date of birth
 - Maternal and paternal orphanhood (or survival of parents)
 - Marital status
 - 2. For women 15 years of age (or the minimum age adopted in the country) and over**
 - Total number of children ever born alive, by sex
 - Total number of children ever born alive and still living, by sex
 - Date of birth and sex of the last child born alive
 - Survival of the last child born alive at the time of the census or survey
 - Date of death of the last child born alive
 - Age at first marriage
 - Age at first birth
 - Duration of marriage (or date of first marriage)
 - 3. For households**
 - Number of deaths in the household during the previous 12 months
 - For each deceased:
 - Name
 - Sex
 - Date of birth
 - Date of death
 - Cause of deaths, whether occurring during pregnancy, childbirth or puerperium
- II. To be collected in individual in-depth single-round retrospective surveys**
- 1. For all members of the household, see section I above**
 - 2. For women 15 years of age and over (or the minimum age adopted in the country)**
 - For basic questions on fertility, mortality and nuptiality, see section I above
 - Questions on the birth history (or a maternity/pregnancy history) of the woman
 - To be collected for each child born alive (if a birth history is used) and for each outcome of pregnancy (if a pregnancy history is used):
 - Name
 - Date of birth
 - Sex
 - Survivorship status
 - Age at last birthday, if alive
 - Age at death, if dead (or date of death)
 - Gestational age, if foetal death (in completed weeks of gestation)
 - Date of occurrence, if foetal death
 - To be collected for the woman:
 - Age
 - Age at first marriage
 - Age at first birth
 - Duration of marriage (or date of first marriage)
 - History of marriages
-

D. Definitions and specification of topics

70. Each topic in the vital statistics report or in vital records should be accompanied by a clear, explicit and simple definition which will allow the persons recording the information, e.g., the local registrar, to obtain the information needed for

statistical purposes as accurately as possible. So that international comparability can be achieved, emphasis should first be given to providing definitions, followed by a recommendation that those definitions be in accord with established international standards, if such exist, and, in any case, with current population census practice. This latter point is particularly important because the computation of vital statistics rates depends on relating vital statistics frequencies to appropriate population counts. Unless the characteristics of the two are similarly defined, the resulting rates will be difficult—if not impossible—to interpret. The points at which correspondence should be established will be indicated in the definitions provided below.

71. The definitions and specifications given below apply to the direct topics recommended above, and to derived topics that are based on one or more of the direct topics.⁹ Except where otherwise indicated, the characteristics should be reported as of the date of occurrence of the vital event. For common topics, these definitions should also be applied in the other complementary sources of vital statistics, namely population censuses and sample surveys, as appropriate.

1. Date of occurrence

Recommended tabulations: LB-3, LB-4, DE-3, DE-4, DE-10, ID-2, MA-1

72. The date of occurrence is the exact date when the event occurred, and should be expressed in terms of day, month and year as well as hour and minute, if appropriate (for live births, foetal deaths and deaths). The year should be recorded in four digits. The date of occurrence of a divorce is the day, month and year when the divorce decree was granted.

73. Information on date of occurrence should be collected in such detail as to permit its use in computing age intervals down to less than one day, where appropriate.

74. Total numbers of registered live births, deaths, foetal deaths, marriages and divorces should be based on date of occurrence, which is the recommended basis for the time reference of all vital statistics tabulations.

2. Date of registration

Recommended tabulations: LB-3, DE-4

75. The date of registration of a vital event is the day, month and year when the entry in the civil registration system was made. The time of day, i.e., hour and minutes, may be also recorded if required by the registration law.

76. The differences in elapsed time between dates of registration and dates of occurrence should be analysed in order to provide insight into the lag between the occurrence of events and their registration, giving some indication of the magnitude of delays in registration and of the underregistration problem.

⁹ Countries with more advanced vital statistics systems may consider the inclusion of other topics for health purposes in statistical reports on live birth and foetal death: medical risk factors for the pregnancy, obstetric procedures, congenital anomalies of the live-born child or foetal death, method of delivery, Apgar score, prenatal blood test, abnormal conditions of the newborn, etc.

3. Place of occurrence and registration

Recommended tabulations: LB-2, LB-3, LB-4, LB-13, DE-2, DE-3, DE-4, DE-5, DE-11, ID-1, FD-10

77. Place of occurrence is the geographical location in the country: (a) locality and (b) major division or other geographical place in which the locality is situated, where the live birth, death, delivery of a dead foetus, marriage or divorce occurred. This information should be given in enough detail to enable tabulations to be made for at least the largest administrative subdivisions of the country and for the smaller administrative subdivisions, as may be required (see also “locality” (topic 4) and “urban and rural” (topic 5)). Countries should adopt procedures for handling “place of occurrence” of vital events when those events occur in or on moving vehicles, such as ships, airplanes, trains and cars.

78. Counts of the numbers of vital events by place of occurrence are useful for the planning and evaluation of various medical, health and social programmes. For example, data on the number of live births by place of occurrence are useful in the planning and evaluation of medical facilities and manpower, and in monitoring the workload and performance of the civil registration system in each civil division. Unusual changes in counts of births or in the ratio of male to female births may indicate registration problems or changes in the availability of medical care or health and hospital facilities. Data on deaths by occurrence are useful for the analysis of the numbers of deaths occurring in hospitals, other institutions, in public places and at home for each geographical subdivision of the country. Such data are helpful in planning related to medical facilities and health-care manpower.

79. Place of registration is the geographical location in the country—(a) locality and (b) major civil division or other geographical place—where the live birth, death, delivery of a dead foetus, marriage or divorce is registered in the civil registration system. This information should be provided in enough detail to enable each specific registration office to be identified for a variety of administrative purposes, including backtracking for clarification of registration and statistical reporting problems, for local registration office workload analyses and for optimal geographical distribution of registration points with reasonable proximity to where vital events are occurring.

4. Locality

Recommended tabulations: all tables

80. Locality is a derived topic of high priority in a vital statistics system which is based on geographical information obtained from place of occurrence and place of usual residence. Locality is defined as a distinct population cluster (also designated as inhabited place, population centre, settlement, etc.), in which the inhabitants live in neighbouring sets of living quarters and which has a name or a locally recognized status. Localities should not be confused with the smallest civil divisions of a country. In some cases, the two may coincide. In other cases, however, even the smallest civil division may contain two or more localities. On the other hand, some large cities or towns may contain two or more civil divisions, which should be considered segments of a single locality rather than separate localities.¹⁰

81. In compiling vital statistics, the basis for geographical tabulation may be either place of occurrence, i.e., the locality, major civil division or other geographical

¹⁰ *Principles and Recommendations for Population and Housing Censuses, Revision 2* (United Nations, 2008), paras. 2.78-2.79.

place where the event occurred, or place of usual residence, i.e., the locality where the person in question (parent, decedent, marriage partner, etc.) usually resides.

5. Urban and rural

Recommended tabulations: all tables

82. Urban and rural is a derived topic of high priority in a vital statistics system which is based on geographical information obtained from place of occurrence and place of usual residence. Because of national differences in the characteristics that distinguish urban from rural areas, the distinction between the urban and rural populations is not yet amenable to a single definition that would be applicable to all countries or, for the most part, even to the countries within a region. Where there are no regional recommendations on the matter, countries must establish their own definitions in accordance with their own needs.¹¹

83. The traditional distinction between urban and rural areas within a country has been based on the assumption that urban areas, no matter how they are defined, offer a different way of life and usually a higher level of living than are found in rural areas. In many industrialized countries, this distinction has become blurred and the principal difference between urban and rural areas in terms of the circumstances of living tends to be a matter of the degree of concentration of population. Although the differences between urban and rural ways of life and standards of living remain significant in developing countries, their rapid urbanization has created a great need for information related to the different sizes of urban areas. This is when classification by size of locality can usefully supplement the urban/rural dichotomy—or even replace it, depending on the circumstances in the country.

84. Information on vital events by urban/rural occurrence provides useful indications of whether there is a difference between vital events occurring in urban or rural areas in terms of pattern or impact. Similarly, for information on vital events by place of usual residence, the urban/rural differential in respect of the frequency and incidence of certain vital events may also be of interest.

6. Place of usual residence

Recommended tabulations: LB-2, LB-4, LB-5, LB-7, LB-9, LB-11, LB-12, LB-15, LB-16, LB-17, LB-18, LB-19, LB-20, DE-1, DE-2, DE-3, DE-6, DE-7, DE-8, DE-9, ID-1, ID-3, ID-4, ID-5, FD-1, FD-4, FD-5, FD-6, FD-9, MA-1, MA-2, DI-1, ST-1–ST-8

85. Place of usual residence is the geographical location in the country, locality or civil division, or foreign country, where the specified person usually resides. This need not be the same as either the place where he or she was found at the time of the occurrence of the event or inquiry, or his or her legal residence. For vital statistics purposes, the place of usual residence of a live birth, a foetal death or an infant death is the place where the mother usually resides.

86. Although for most persons there will be no difficulty in determining their place of usual residence, some confusion is bound to arise in a number of special cases, where persons have more than one residence. These cases might include persons who maintain two or more residences, students living at school, members of the armed forces living at a military installation but still maintaining private living quarters away from the installation, and persons who sleep away from their homes during the working week but return home for several days at the end of each week. The treatment of

¹¹ Ibid., para. 2.81.

all such cases should be clearly set forth in the registration or enumeration instructions. In most instances, clearly stated time limits of presence in or absence from a particular place, usually based on a 12-month time limit, are found to be useful in determining whether or not the person is usually resident there. Countries that have a nomadic population need to make special provisions for reporting place of residence for nomadic persons.

87. Data on the number of births and deaths by place of usual residence are useful for purposes of studying the geographical distribution of birth and deaths. Birth and death rates, which can be calculated at subnational levels, are important for programme planning, evaluation and research in many fields of application, such as health, education, population estimates and projection, and social and economic policy. Place of usual residence for marriages and divorce is also useful in studying geographical differentials in patterns of family formation and dissolution.

88. Data on births classified by both place of occurrence and place of usual residence of the mother are used to obtain information on whether mothers are giving birth in the same civil division as that of their residence or in other geographical locations. Data on deaths, by both place of occurrence and usual residence, are useful for interpreting mobility-related patterns of mortality.

89. Information on place of usual residence should be collected in enough detail to enable tabulations to be made for the smallest geographical subdivisions of the country required by the tabulation plan and also for residents and non-residents. To satisfy the requirements of the geographical classifications recommended in the tabulations contained in annex II, information is needed for both minor civil divisions and localities. Places of residence used for tabulations should coincide with those used for tabulation of places of occurrence. Furthermore, if the information source is the civil registration system, the places should coincide with those in the population census database in order to allow the calculation of vital statistics rates.

7. Duration of residence, in usual place

Recommended tabulation: LB-20

90. Duration of residence is the interval of time up to the date of the occurrence of the event, expressed in completed years, during which each person has lived in (a) the locality that is his or her place of usual residence at the time of occurrence of the event and (b) the major or other civil division in which that locality is situated.

91. If, in the compilation of the incidences of birth, death, marriage and divorce according to geographical units, events are allocated to place of occurrence rather than to usual place of residence of the persons concerned, information on duration of residence for events occurring to persons removed from their usual place of residence must be interpreted carefully. Such events must be identified as occurring among non-residents so that they will not be erroneously counted as events occurring to recent migrants.

92. In collecting information on duration of residence, it should be made clear that the concern is with length of residence in the major civil division and the locality, not in a specific housing unit.

93. Information on duration of residence should be collected so as to permit classification of events as occurring to (a) residents with duration categories of less than 1 year, 1-4 years, 5-9 years, 10 years and over, and not stated, (b) transients or visitors and (c) persons whose status as residents, transients or visitors is not given. This

classification is the same as that recommended for the population census supplying the base for the calculation of rates.

8. Place of previous residence

94. Place of previous residence is the geographical location within the country, the locality or major or other civil division, or foreign country, in which the individual resided immediately prior to migrating into his present civil division of usual residence.

95. Data on the place of previous residence without data on the duration of residence in usual place have only limited value in themselves because they do not provide information on the time of in-migration. Therefore, when the topic is investigated, the duration of residence should also be investigated, if at all possible, so that the data can be cross-classified by both the place of previous residence and the duration of current residence for the vital event that is of interest.

96. Instead of using the combination of place of previous residence and duration of residence, another approach to collecting migration information while registering vital events is to ask for the place of residence at specified time in the past. Place of residence at specified time in the past is the geographical location in the country, the locality or major or other civil division, or the foreign country in which the individual resided at a specified date in the past. It is a particularly useful topic in the context of measuring the incidence and character of migration and migrants. Given the frequent use of this item in field surveys, its additional use for vital statistics can lead to a variety of useful combinations of census and vital statistics data.

97. The reference date chosen should be the one most useful for national purposes. In most cases, this has been deemed one year or five years preceding the date of occurrence of the vital event. Also to be taken into account in selecting the reference date should be the probable ability of individuals to recall with accuracy their usual residence one year or five years prior to the date of occurrence of the event. In addition, information on year of arrival in the country may be useful for international migrants.

98. Accordingly, the criteria for selecting a suitable time reference for this question should focus on striking a balance between a period long enough to produce a volume of changes of residence sufficient for study and one that will not unduly increase the number of multiple moves that may have taken place and the number of migrants who may have died in the interval, these being the two imponderables that may tend to bias the results. The more remote the date of reference, the more difficult it will be for the informant to give an accurate answer to the question regarding earlier residence because of a memory lapse, and possibly also because of changes in boundaries during the interval. Also, the longer the period, the greater the understatement of the volume will tend to be owing to changes of residence of persons who have died and the increased probability of multiple changes of residence. The date of the last previous population census or demographic survey which yielded data on population by place of residence could be useful, since it might provide the components needed for applying the differencing method of estimating net migratory gains and losses over the interval. The appropriate period in any particular instance will, of course, depend to a large extent on national circumstances.

99. Data should be compiled in such a way as to permit classification into (a) non-migrants, i.e., persons concerned with events who, at the time of the occurrence of the event (or inquiry), were living in the same locality as that in which they

were living at the earlier date and (b) migrants, i.e., persons who at the time of the inquiry were living in a locality different from their place of residence at the earlier date.

9. Place of birth

Recommended tabulation: LB-11

100. Place of birth is the geographical location in the country, the locality or major or other civil division, or foreign country, in which the person was actually born. Countries should adopt procedures for handling the place of birth for a new-born delivered on or in a moving vehicle, such as a ship, airplane, train or car.

101. The collection of information distinguishing between persons born in the particular country (natives) and those born elsewhere (foreign-born persons) is necessary where any inquiry on place of birth is undertaken. Even countries where the proportion of persons born outside the country is insignificant and which desire to compile information on the place of birth of the native and non-native population must first separate the native from the foreign-born population. It is therefore recommended that the question on place of birth be asked for all persons. For respondents who are unable to name their country of birth, an attempt should be made to ascertain, if possible, the continent.

102. For purposes of international comparability as well as for internal use, it is preferable that information on place of birth be available according to national boundaries existing at the time of the occurrence of the event or inquiry. To ensure such comparability, however, it is necessary to obtain information not only on country of birth but also on major or other civil division or even specific locality so that reported place of birth can be correctly allocated to countries according to present boundaries. The desirability of such detailed reporting should be carefully weighed considering (a) the probable number of foreign-born persons from countries that have lost or gained territory and (b) the cost of coding a large number of specific foreign locations.

10. Migrant status

Recommended tabulations: LB-11, LB-20

103. Migration, i.e., physical movement from one place of residence to another, is used as a variable in the study of differential fertility, mortality, nuptiality and divorce. Topics that provide information on the extent and direction of internal migration, discussed earlier, are: (a) place of birth, (b) place of usual residence, (c) place of previous residence and (d) duration of residence in usual place. The place of residence at specified time in the past may be included instead of place of previous residence and duration of residence in usual place.

11. Age and date of birth

Recommended tabulations: LB-5, LB-6, LB-7, LB-8, LB-9, LB-11, LB-12, LB-18, DE-6, DE-7, DE-8, DE-9, DE-12, DE-13, ID-2, ID-3, ID-4, FD-1, FD-3, FD-6, FD-8, LB-FD-3, MA-2, MA-3, DI-2, DI-3

104. Age is the interval of time between the day, month and year of birth and the day, month and year of occurrence of the event, expressed in the largest completed unit of solar time, such as years for adults and children, and months, weeks, days,

hours or minutes of life, as appropriate, for infants under 1 year of age. Every effort should be made to ascertain the precise age of each person.

105. Information on age may be secured either by obtaining the year, month, day and hour of birth or by asking directly for "age at the last birthday". The first method usually yields more precise information but may be difficult to apply in the case of illiterate respondents. Additional data processing is necessary to convert "year-month-day of birth" into "completed years of age", but the results are usually more accurate provided that the exact date of birth is known to the respondent. The direct question on age at last birthday is more economical to process but may yield less precise results, since it more easily permits approximate replies, including preferences for even-numbered ages and those with the terminal digit "0" or "5". It is, however, the appropriate question to use when a considerable proportion of the population cannot give a precise birth date. Thus, it may be seen that "age" is a derived topic when calculated from the topic "date of birth" but a direct topic when "date of birth" is not obtained.

106. Where exact age is unknown, estimated age may be recorded. As an aid in obtaining a reasonable estimate of age among less literate persons, it may be useful to employ a historical calendar consisting of a list of dates of well-known events, such as famines; epidemics; natural disasters, such as eruption of volcanoes or earthquakes; construction of landmarks, dams and bridges; imposition of new taxes or regulations; and significant political changes. Climatic or farming cycles, and religious or national festivals may be used as well. Estimation of the age of an individual may also be attempted by employing simple criteria of physiological age or by reference to the ages of other members of the household having a known relationship to the person whose age is being estimated.

107. Obtaining relatively reliable information on age calls for special efforts on the part of the interviewer (the registrar, the physician, the marriage officiant, etc.). Care must be exercised, for example, in those cultures where age is reckoned from the New Year. In such communities, it is considered that an infant is 1 year of age at birth and 2 years old at the succeeding New Year (it may be Chinese or Muslim) and continues to advance one year at each successive New Year, regardless of actual birth date. Thus, unless special care is taken to ask for date of birth in terms of the solar calendar, reports on age for persons following this custom are likely to result in an upward bias averaging about one and a half years.

108. Information on age of mother and father for live births and foetal deaths should be collected in such a way as to permit classification into five-year age groups between ages 15 and 49, with terminal groups of "under 15 years" and "50 years and over". Age of mother for live births is a very important variable for the study of fertility. Age-specific fertility rates, for example, are used to calculate the total fertility rate, which can be compared with corresponding rates for other populations without the comparison's being affected by the differences between the groups in terms of age-sex composition. Age of father for a live birth is sometimes used to calculate father's age-specific fertility rate.

109. Infant's age at death should be collected in such a way as to permit classification of infants into age groups as follows: under 24 hours, single days through 6 days; 7-13 days; 14-20 days; 21-27 days; 28 days to under 2 months; single months of life from 2 months to 11 months inclusive; and not stated. Age is an important factor in the study of infant mortality. The impact of biological versus environmental factors can be seen in terms of the proportion of infants who die shortly after birth (e.g., under 1 day, less than 1 week or less than 1 month) compared with those who survive

the first month of life but die before attaining 1 year of age. These data are essential for the calculation of such key public-health measures as the perinatal mortality rate and the neonatal mortality rate.

110. Age at death of persons other than infants should be collected in such a way as to permit classification into age groups as follows: under 1 year; single years to 4 years; 5-year age groups to 94 years; 95 years and over; and not stated. If recording by 5-year age groups is not possible, efforts should be made to distinguish the following groups as a minimum: under one year (infants); 1-4 years (preschool age); 5-14 years (school age); 15-49 years (childbearing age); 15-64 years (working ages); and 65 years and older (elderly persons). Age at death is usually used to calculate age-specific mortality rates, which are used for the construction of life tables and net reproduction rates. In conjunction with the other indicators of population change, age-specific mortality rates are useful for demographic projections by the component method.

111. Age of brides and grooms at marriage should be collected so as to permit classification into age groups as follows: under 15 years; 5-year age groups to 74 years; 75 years and over; and not stated. Age at marriage for brides and grooms has sociological implications for future completed family size and is useful for planning in such fields as economics and education.

112. Age of divorcees should be classified in the same way as that of marriage partners. Age of divorcees is useful in establishing age patterns of divorced couples. Cross-tabulation of age of husband and wife at divorce can be used in the sociological study of age differences between husbands and wives as factors in the stability or instability of marriages.

12. Sex

Recommended tabulations: LB-1, LB-9, DE-1, DE-2, DE-6, DE-7, DE-8, DE-9, DE-11, ID-2, ID-3, ID-4, FD-1, FD-2, FD-3, FD-4, FD-7, LB-FD-3

113. Sex refers to the biological characteristic and it is needed to describe a newborn child, a decedent or a foetal death. Data should be categorized into “male” and “female”, and in case of a foetal death, the category “unknown” is also appropriate.

114. Vital statistics disaggregated by sex serve various purposes. For example, data on live births by sex is used to calculate the sex ratio at birth. Unusual changes in the ratio of male to female births may indicate gender-biased registration problems and an unusually high or low sex ratio at birth may indicate some degree of gender preferences in the society. Infant deaths and deaths by sex allow analysis of mortality differences by sex.

13. Children born in wedlock (marital status of the mother at the time of the child's birth)

Recommended tabulations: LB-5, LB-12, FD-2

115. In accordance with the laws of the country, for statistical counting purposes, live births or foetal deaths may be labelled “born in wedlock” if the mother is married at the time of delivery or “born out of lawful wedlock” if the mother is not married at the time of delivery. For countries that use a combined form for civil registration and vital statistics purposes, this topic should be placed in the statistical section of the form in order to eliminate the possibility of stigmatizing the child (individual) to whom it is applied. (Equally—or even more—stigmatizing is the less preferred term “illegitimate.”) Since birth records are legal documents which are not only of value

and use at the time of the vital event but also preserved and used over long periods of time and must be presented to others for a wide variety of uses during the lifetime of the registrant, such stigmatizing information is best treated as statistical information which is collected in connection with the marital status of the mother at the time of birth, and should not be made a part of the legal document. Careful consideration must therefore be given to the manner in which potentially embarrassing information, such as the marital status of the mother or the derived wedlock status of the child or foetus, is recorded, and the way the information might be used or made available to others.

116. In spite of the sensitivity of information on whether the child is born in wedlock, there is little dispute regarding its value as a statistical topic for many countries. It may be considered an indication of the strength of the institution of marriage as a determinant of the family unit, and may be a predictor of the future levels of health, educational attainment and other socioeconomic measures for the child. For countries where this is an important statistical measure, it may be desirable to subdivide the out-of-wedlock category further into “recognized” and “not recognized”, and to subdivide the “not stated” category into “with information on father” and “without information on father”.

117. If the information is collected only on statistical reports for purposes of producing aggregated vital statistics, there is no opportunity for embarrassment, as statistical topics remain strictly confidential. However, the knowledge that even statistical reports will be reviewed by employees of the system may influence the way the supplier of the information (informant) provides the data. He or she should be informed that the topic is confidential so the possibility of distorting or biasing the statistics will be slight.

118. On the other hand, there may be compelling reasons in some countries to include marital status or legitimacy on the vital record itself, rather than on the statistical report. The information might be needed for inheritance purposes or for the determination of other benefits and rights.

119. Therefore, regardless of the manner in which such information is recorded (through the vital record itself or on a separate statistical report), it is essential that there be a system in place for protecting the privacy and confidentiality of information on vital records and associated statistical reports. If sensitive information is included on the legal portion of the vital record, consideration should be given to providing either of two types of copies: a full certified copy containing all of the items on the document, or a “short form” which attests to only the basic details associated with the event, such as, names, dates, geographical locations, etc. The short form might, routinely, be the form of choice for providing copies, except in circumstances where the entire form is required for a particular legal or administrative use.

14. Birth weight

Recommended tabulations: LB-15, LB-16, LB-17, FD-3, FD-4, FD-6, LB-FD-2

120. Birth weight is the first weight of a foetus or newborn obtained immediately after birth. For live births, birth weight should preferably be measured within the first hour of life, before significant postnatal weight loss has occurred. The actual weight recorded should be expressed to the degree of accuracy of the measurement. Weight should not be recorded in groupings. Weight may be recorded in pounds and ounces if these are the units of measurement in the country; conversion to measurement in grams should be carried out subsequently as part of the tabulation process.

121. Definitions of “low”, “very low” and “extremely low” birth weight are not mutually exclusive categories. Categories overlap inasmuch as each category includes the one(s) below it (i.e., “low” includes “very low” and “extremely low”, and “very low” includes “extremely low”). Low birth weight is defined as follows:

- (a) Low birth weight = less than 2,500 grams (g) (up to and including 2,499 g);
- (b) Very low birth weight = less than 1,500 g (up to and including 1,499 g);
- (c) Extremely low birth weight = less than 1,000 g (up to and including 999 g).

122. Birth weight can provide information needed for the study of infant mortality and health during infancy and childhood, since low birth weight is associated with an increased risk of health and developmental problems during infancy and is highly correlated with infant mortality. Statistics on birth weight cross-classified by family socioeconomic measures—like the level of education of the mother, for example—are particularly important bases for targeting subpopulation groups in need of prenatal care and medical services after birth.

15. Date of last menstrual period of mother/gestational age

Recommended tabulations: LB-16, FD-5, FD-7

123. The date (day, month and year) of the last normal menstrual period of the mother is used to calculate the gestational age of a live-born infant or foetal death. This calculation is best carried out as part of the data processing of the record and should not be conducted at the time of registration of the event. The date should be recorded in full (by day, month, year).

124. The gestational age of a newborn or dead foetus is the elapsed time measured from the first day of the last menstrual period of the mother to the date of delivery. Gestational age is expressed in completed days or completed weeks (e.g., events occurring 280-286 completed days after the onset of the last normal menstrual period are considered to have occurred at 40 completed weeks of gestation).

125. For the purposes of calculation of gestational age from the date of the first day of the last normal menstrual period to the date of delivery, it is important to understand that the first day is day zero and not day 1; days 0-6 therefore correspond to “completed week zero”; days 7-13 to “completed week 1”, and the fortieth week of gestation corresponds to “completed week 39”.

126. If the date of the last normal menstrual period is not collected, gestational age should be based, if possible, on the best clinical estimate. In any case, gestational age should be expressed in completed days or weeks and so labelled; the data are usually classified into age groupings in completed weeks as follows: under 20 weeks; 20-21 weeks; 22-27 weeks; 28-31 weeks; 32-35 weeks; 36 weeks; 37-41 weeks; 42 weeks and over; and “not stated”.

127. Information on gestational age for live births and foetal deaths provides important information for health research and for policies on medical care for mothers and newborns. Cross-tabulation of gestational age and birth weight for live births can also help to identify cases that are implausible by medical standards.

16. Number of prenatal visits

Recommended tabulation: FD-9

128. In the case of a pregnancy terminating in a live birth or foetal death, it is useful to know if the mother received prenatal care from the health services, and if so, whether it was adequate in terms of number of visits. It is important to define a prenatal visit in cooperation with the health services and to apply uniformly the agreed-upon definition when gathering this information. For purposes of tabulation and data presentation, the following groupings should be used: none; 1-3; 4-6; 7-9; 10 or more; and “not stated”.

17. Month in which pregnancy prenatal care began

Recommended tabulations: LB-17, LB-18, LB-19, FD-9

129. In the case of a pregnancy terminating in a live birth or in a foetal death, it is also useful to know when the mother started receiving prenatal care from the health services, since early care is significantly better not only for the health of the mother but also for the outcome of the pregnancy and for the health of the newborn child as well. Responses to this topic should be provided in terms not of a named month but rather of the number of months elapsed in the pregnancy prior to the first prenatal care visit, e.g., the response should indicate whether the care began in the third month, the fifth month, etc. For purposes of tabulation and data presentation, groupings should be based on the trimester of pregnancy and broken down into: first trimester; second trimester; third trimester; “no prenatal care”; and “not stated”.

130. For analytic purposes, this topic and the topic “number of prenatal visits” can be used together to assess the adequacy of prenatal care of live births and foetal deaths in terms of birth weight, sex and outcome of pregnancy.

18. Was birth registered?

Recommended tabulation: ID-5

131. This question provides information on live-birth registration and is asked concerning infants who died before the age of one year. Its purpose is to evaluate completeness of registration and to facilitate linkage between registers of recorded births and those of recorded infant deaths.

19. Children born alive to the mother during her entire life

Recommended tabulations: LB-8, LB-9, LB-10, LB-19, FD-8

132. This topic is defined to include all children born alive to the mother concerned up to the time of the present live birth or the time of the woman’s death (for females of childbearing age and over). The number recorded should include the present live-born child and all the other live-born children (sons and daughters), whether born in wedlock or not and whether born of the present or of previous marriages, regardless of whether they are alive or dead at the time of the inquiry and regardless of whether they are living with the mother or elsewhere. In the case of multiple issue, each live-born child should be counted separately.

133. The information on “total number of live-born children during her entire lifetime” is a priority topic, to be included in statistical reports on live births, on deaths of females of childbearing age and over, and on foetal deaths. For legitimate live births,

provision should be made for obtaining information on the number of live-born issue from both current and previous marriages.

134. Birth order is strongly associated with fertility level and with birth outcomes. In addition to age-specific fertility rates, birth order-specific fertility rates are also calculated in some cases. There have also been studies demonstrating that the number of previous births has an impact on the outcome of a woman's next pregnancy.

135. The collection of accurate data on the number of children born alive can be difficult. On the one hand, some of the replies will erroneously include foetal deaths, while on the other they may not include children who died in early infancy; or, because of a misinterpretation of the term "children", the replies may omit offspring who are grown or have left the household. It is therefore recommended that, in the effort to obtain this information, the question be posed in terms of "sons" and "daughters" rather than "children", and that it be part of a series of probing questions covering, in addition, (a) all previous issue (deliveries), including foetal deaths, (b) the number born dead (foetal deaths), (c) the number still living and (d) the number who were born alive but died. Any lack of consistency among the answers to these questions will indicate some error in the response, which can then be probed further.

136. Data on number of children born alive during the lifetime of the mother should be collected so as to permit classification of live births and foetal deaths by birth order and live-birth order (see topic 22 below).

20. Children born alive to the mother in her entire life and still living

137. This topic is defined to include all the children born alive to the mother who are still living at the time of occurrence of the present live birth or at the time of the woman's death. The number recorded should comprise her present live born, if alive at the reference date, and all the other surviving children (sons and daughters), whether born of the present or previous marriages or outside of marriage, and regardless of whether they are living with the mother or elsewhere.

21. Foetal deaths during the entire life of a woman

Recommended tabulation: FD-8

138. This category is defined as including all foetal deaths (regardless of gestational age and including abortions, whether spontaneous or induced) occurring to the woman concerned up to the time of present delivery. The number should comprise all foetuses born dead, including the present, whether born within wedlock or not and whether born of the present or of a previous marriage.

22. Birth order

Recommended tabulations: LB-8, LB-9, LB-10, LB-19, FD-8

139. Birth order, a derived topic, is the numerical order of the live birth or foetal death being recorded, in relation to all previous issue of the mother, irrespective of whether the issue was live-born or born dead (foetal death), or whether pregnancies were nuptial or extra-nuptial. Total "previous issue" is based on the answers to the questions posed to the mother or the woman on children born alive (topic 19) and on foetal deaths (topic 21) during her entire lifetime.

140. If birth order is determined by considering previous live births only, or previous legitimate issue only, it is suggested that the terms "live-birth order" and

“marital-birth order” (see topics 19 and 20) be used, respectively. Similarly, should there be the desire to restrict birth order to previous foetal deaths, the term “foetal-death order” should be used.

141. Data should be classified into single orders (first, second, third, etc., through ninth, tenth and over) and a “not stated” group.

23. Interval since last previous live birth/date of last previous live birth

Recommended tabulation: LB-10

142. Information on birth interval may be secured either by asking directly for the number of completed months or years elapsed since the last previous live birth or by obtaining the date of the last previous live birth and calculating the birth interval at the data-processing stage.

143. This interval measures the time elapsed, in completed months, between the day, month and year of the last delivery of a live-born child and the date of delivery of the previous live birth (see also topic 19 on children born alive to mother).

144. Information about the birth interval indicates the time elapsed since a woman achieved a given parity (birth order) status. This type of information permits identification of the passage of time between parities for the compilation of the reproductive histories of individual mothers. Such information also allows for analysis of the impact of birth interval on the birth outcomes.

24. Number of children born alive to the marriage being dissolved

145. Number of children born alive to the marriage being dissolved is defined to include all issue born alive during the marriage, irrespective of whether they are living or dead at the time the petition for divorce is filed.

25. Number of dependent children of divorced persons

Recommended tabulation: DI-4

146. Number of dependent children of divorced persons is the total number of living children under 18 years of age who are dependent on either of the parties to a divorce at the time the petition for divorce is filed. This number should include any dependent children from previous marriages.

147. “Time of petition” is chosen as the reference point because this is actually the only time when the informant can be questioned regarding such matters as number of dependent children. It is recognized that this may predate the effective date of the divorce by several years, but the time of petition seems nevertheless to be the proper reference point for evaluating the relationship between the number of dependent children and the incidence of divorce. It also agrees with the reference point in time of number of children born alive to the marriage being dissolved (topic 24).

26. Duration of marriage/date of marriage

Recommended tabulations: DI-3, DI-4

148. The duration of marriage is defined as the interval of time between the day, month and year of marriage and the day, month and year of occurrence of the event under consideration, expressed in completed years.

149. Information on duration of marriage may be secured either by obtaining the year, month and day of marriage, or by asking directly for the duration of marriage in completed years. While the date method generally results in more accurate durational data, the calculation required entails an extra step during the data-processing phase. This method also assumes that the exact day, month and year of marriage will be provided for a large proportion of the cases. However, the direct question on duration of marriage is recommended for use in population censuses and where it is unlikely that a considerable proportion of the population will be able to give an exact date. If necessary, duration may be estimated by the registrar, using the technique described in paragraph 106 above in connection with the investigation of age.

150. The information on duration of marriage, in connection with live births and foetal deaths born in wedlock, is used in the analysis of fertility. Depending on the type of analysis to be made, inquiry may relate to either the “first marriage” or the “present marriage” of the mother. To minimize inaccuracies in reporting, the reference point should be clearly defined in each instance.

151. Information on duration of marriage should be collected in completed years so as to permit its classification, as follows: under 1 year; single years to 9 years; 10-14 years; 15-19 years; 20 years and over; and “not stated”.

27. Marital status

Recommended tabulations: LB-5, LB-12, DE-7, FD-2

152. Marital status is the status of individuals with respect to the marriage laws or customs of the country. It is recommended that the following categories of marital status be identified: (a) single (never married), (b) lawfully married, (c) religious marriage, consensual union and customary union, (d) widowed and not remarried, (e) divorced and not remarried and (f) married but legally separated (see United Nations, 2008, para. 2.144).

153. It is necessary to take into account customary unions (which are legal and binding under customary law) and extralegal unions, known as de facto or consensual unions. Some countries may also wish to distinguish between married persons living with their spouses and those living apart from their spouses.

154. In countries that wish to distinguish between (a) persons in lawful (contractual or civil) marriages, (b) persons in religious marriages, (c) those in de facto unions, (d) persons lawfully married but legally separated, (e) those lawfully married but de facto separated and (f) those divorced, the composition of each category should be clearly defined and indicated in published statistical tables.

155. The statistical treatment of persons whose only or most recent lawful (contractual or civil) marriage has been annulled is dependent upon the relative size of this group in the country. Where the group is substantial in size, it should constitute an additional category; if its size is insignificant, the individuals should be classified according to their marital status before the annulled marriage took place.

156. Such modifications of this classification as may need to be made in order to take into account the special situations existing in some cultures must be based on first-hand knowledge of the local environment and customs. It should be mentioned, however, that in all cultures, marital status spans a continuum ranging from legal to consensual unions; and within that range, unions may be monogamous or polygamous. The extent to which various types of unions are socially accepted will determine the modifications that will be required to meet national needs. For example, in countries that permit polygamy, it may be desirable to include a question on number

of current wives. Modifications should be made within the framework of the basic classification in order to maintain international comparability as far as possible.

157. The categories of marital status described in paragraph 154 above do not provide complete information on the range of de facto unions that may be common in some countries, in terms of their varying degrees of stability, nor do they adequately describe the prevalence of formal marriages combined with relatively stable de facto unions outside of marriage. Information on these relationships is very useful in studies of fertility but it is not possible to provide an international recommendation on this matter because of the widely differing circumstances among countries. It is suggested, however, that countries that wish to investigate these relationships should consider the possibility of collecting separate data for each person on formal marriages, on de facto unions and on the duration of each type of union.

158. In the study of live births, information on the marital status of the mother permits information to be derived on whether the child was born in or out of wedlock. Statistically, such information may be used to calculate the marital fertility rate and to examine fertility differentials by marital status of the mother, for the purpose of formulating welfare and social policy. Marital status also provides information on mortality differentials by marital status.

28. Number of previous marriages/marriage order

Recommended tabulation: DI-7

159. Number of previous marriages is the number of contractual marriages entered into prior to the marriage being contracted or the one being dissolved by divorce, irrespective of whether these marriages were dissolved by death or divorce.

160. Marriage order is a derived topic: the information is derived from the information requested on the number of previous marriages. Marriage order represents the order of rank (i.e., first, second, third, etc.) of the marriage being contracted or being dissolved.

29. Mode of dissolution of previous marriages

161. A legal contract of marriage may be dissolved by: (a) the death of one of the spouses, (b) a divorce decree or (c) cancellation (annulment).

162. Previous marriages refer to marriages contracted prior to the marriage currently being either contracted (in the case of marriage) or dissolved (in the case of divorce).

30. Educational attainment

Recommended tabulations: LB-8, LB-15, DE-8, MA-4, DI-5

163. Educational attainment of parents, decedents, brides, grooms and divorcees is the highest grade completed within the most advanced level attended in the educational system of the country where education was received. For international purposes, a grade is a stage of instruction usually covered in the course of a school year.

164. Educational attainment, as one of the socioeconomic variables, adds value for analysis and forecasting of the occurrence of vital events. For example, birth and death statistics by mother's educational attainment allows for study of differentials in fertility rates and infant mortality rates by education of mother. Social policy aimed at

improving the mother's educational level might be implemented if there is found to be an association between the mother's education and fertility as well as birth outcomes. Information on educational attainment should be recorded in grades within each level so as to permit the following levels of education to be identified, as recommended by the United Nations Educational, Scientific and Cultural Organization (UNESCO) International Standard Classification of Education (ISCED 2011):¹²

ISCED level 0. Early childhood education encompasses early childhood programmes that have an intentional education component. There are two categories of ISCED level 0 programmes: early childhood education development and pre-primary education. The former has educational content designed for younger children (in the age range of 0 to 2 years), while the latter is designed for children from age 3 to the start of primary education.

ISCED level 1. Primary education (e.g., elementary school, primary school), which provides students with fundamental skills in reading, writing and mathematics and establishes a solid foundation for learning and understanding core areas of knowledge, and personal and social development, in preparation for lower-secondary education.

ISCED level 2. Lower-secondary education, typically designed to build on the learning outcomes from ISCED level 1. Usually, the aim is to lay the foundation for lifelong learning and human development. That foundation may then constitute the springboard for a further expansion by educational systems of educational opportunities. Some educational systems may already offer vocational education programmes at ISCED level 2 that are designed to provide individuals with skills relevant to employment.

ISCED level 3. Upper-secondary education, typically designed to complete secondary education in preparation for tertiary education or provide skills relevant to employment, or both. Programmes at this level offer students more varied, specialized and in-depth instruction than do programmes at ISCED level 2.

ISCED level 4. Post-secondary non-tertiary education provides learning experiences, building on secondary education in preparation for labour-market entry as well as tertiary education. It aims at the individual acquisition of knowledge, skills and competencies at a level of complexity lower than the level characteristic of tertiary education.

ISCED level 5. Short-cycle tertiary education, often designed to provide participants with professional knowledge, skills and competencies. Typically, these are practically based and occupationally specific and prepare students for entry into the labour market. However, these programmes may also provide a pathway towards other tertiary education programmes. Academic tertiary education programmes below the level of a Bachelor of Arts or Science programme or the equivalent are also classified within ISCED level 5.

ISCED level 6. Bachelor of Arts or Science or equivalent level, often designed to provide participants with intermediate academic and/

12 See United Nations Educational, Scientific and Cultural Organization, Institute of Statistics (2012). Available from <http://www.uis.unesco.org/Education/Documents/isced-2011-en.pdf>.

or professional knowledge, skills and competencies, leading to a first degree or equivalent qualification.

ISCED level 7. Master of Arts or Science or equivalent level, often designed to provide participants with advanced academic and/or professional knowledge, skills and competencies, leading to a second degree or an equivalent qualification. Programmes at this level may have a substantial research component but do not yet lead to the awarding of a doctoral qualification.

ISCED level 8. Doctoral or equivalent level, designed primarily to lead to an advanced research qualification. Programmes at this ISCED level are devoted to advanced study and original research and are typically offered only by research-oriented tertiary educational institutions, such as universities. Doctoral programmes exist in both academic and professional fields.

165. People with no schooling should also be identified. Any differences between national and international definitions should be explained in the vital statistics publication in order to facilitate comparisons and analysis.

31. Literacy status

166. Literacy status refers to both the ability to read and the ability to write. Data on literacy should be collected so as to distinguish between persons who are literate and those who are illiterate. A person is literate if he can, with understanding, both read and write a short, simple statement on his everyday life. A person is illiterate if he cannot, with understanding, both read and write a short simple statement on his everyday life. Hence, a person capable of reading and writing only figures or his name should be considered illiterate, as should a person who can read but not write and one who can read and write only a ritual phrase which has been memorized.

167. The language in which a person can read and write is not a factor in determining literacy and need not ordinarily be considered. In multilingual countries, however, this information may be essential for the determination of educational policy and would therefore be a useful additional subject of inquiry.

168. Data on literacy should be collected for all persons 10 years of age or over. In order to permit international comparisons of data on adult literacy, however, any tabulations of literacy not cross-classified by detailed age should at least distinguish between persons under 15 years of age and those 15 years of age or over. Persons less than 10 years of age should be classified in the category "not applicable".

169. Because of the possible reluctance of some illiterate persons to admit to their illiteracy and the difficulties of applying a test of literacy during an investigation, the data collected may not be accurate. If it is considered likely that this deficiency is significant, it should be so stated as a qualification in any publications of the data. If a literacy test has been applied, it should be described. However, if it is believed that data collected on literacy status would result in unreliable information, educational attainment (topic 30) should be considered as an alternative.

32. Ethnic/national group

170. The specific ethnic and/or national groups of the population that are of interest in each country are dependent upon individual national circumstances. Some of the criteria by which ethnic groups are identified are ethnic nationality (i.e., coun-

try or area of origin, as distinct from citizenship or country of legal nationality), race, colour, language, religion, customs of dress or eating, tribe or various combinations of these characteristics. In addition, some of the terms used, such as “race”, “origin” or “tribe”, have a number of different connotations. The definitions and criteria applied by each country investigating ethnic characteristics of the population must therefore be determined carefully and with the involvement of or consultation with representatives of the groups that it desires to categorize. Given the nature of this topic, these categories and their definitions will vary widely from country to country; therefore, no internationally accepted criteria are possible.

171. Because of the difficulties of interpretation that may occur, it is important that, where such data are collected, the basic criteria used should be clearly explained so that the meaning of the classification will be readily apparent. It is also suggested that the primary classification consist of only a few broad categories, leaving open the possibility of a more detailed breakdown for important tribal or other groups where these are relevant.

33. Citizenship

172. Citizenship (of parents, decedents, brides, grooms and divorcees) is defined as the particular bond between an individual and his or her State, acquired by birth or naturalization, whether by declaration, choice, marriage or other means according to national legislation. It should be noted that citizenship does not necessarily coincide with country of birth.

173. Data on citizenship should be collected so as to permit the characterization of the persons concerned as (a) citizens by birth, (b) persons who acquired citizenship after birth through naturalization, option, marriage, declaration, etc., and (c) foreigners. Information on the country of citizenship of foreigners should also be collected. It is important to record country of citizenship as such and not to use an adjective to indicate citizenship, since some of these adjectives are the same as those used to designate ethnic groups.

174. For countries in which the population includes a significant proportion of naturalized citizens, the information distinguishing citizens by birth from citizens by naturalization would allow, for example, the study of possible differentials in fertility and mortality.

175. Instructions should be given for the disposition to be made of (a) stateless persons, (b) persons with dual nationality, (c) persons in process of naturalization and (d) any other groups of ambiguous citizenship.

34. Economic activity status¹³

Recommended tabulation: DE-13

176. Economic activity status (of parents, decedents, brides, grooms and divorcees) is the status of each person with respect to their usual economic activity within the calendar year preceding the year of occurrence of the vital event. The usual activity status that prevailed over most of the 52 weeks (or most of the 365 days) during the preceding calendar year should be recorded. Information should be collected

¹³ Simultaneous with the production of this publication, the International Conference of Labour Statisticians is revising the international standard on the economically active population, employment, unemployment and underemployment. These changes will be reflected in an addendum to this publication, which will be posted online.

for each person at or above the minimum age for which economic characteristics are to be tabulated, as to whether the person concerned is usually economically active or non-economically active.

177. Particular attention should be given to groups that may be especially difficult to classify, such as female unpaid family workers in agriculture, young persons seeking work for the first time and persons receiving pensions as a result of retirement from one job who are at the same time working at another job.

178. The minimum age limit adopted for the question on economic activity should be set in accordance with the conditions in each country but should never be higher than 15 years. Those countries that have a large proportion of their labour force engaged in agriculture, mining, weaving or petty trade, types of activity in which children may participate, should select a lower minimum age than that in countries where employment of young children is uncommon. In order to permit international comparisons of data on the economically active population, however, any tabulation of economic characteristics not cross-classified by detailed age should at least distinguish between persons under 15 years of age and those 15 years of age and over.

179. A specific time reference for data on economic characteristics is fundamental to the concept of the economically active population. It is recommended that the time-reference period adopted for vital statistics purposes be the calendar year preceding the year of the vital event occurrence.

180. The usually economically active population comprises all persons of either sex who provide, or are available to provide, the supply of labour for the production of economic goods and services during the time-reference period chosen for the investigation. It includes both persons in the civilian labour force and those serving in the armed forces. The civilian labour force comprises both persons employed and those unemployed during the time-reference period. These two groups should be distinguished in accordance with the criteria set out below.

181. The employed comprise all persons, including family workers, who worked during the time-reference period established for data on economic characteristics (see para. 179); or who had a job in which they had already worked but from which they were temporarily absent because of illness or injury, industrial dispute, vacation or other leave of absence, absence without leave or temporary disorganization of work due to such reasons as bad weather or mechanical breakdown; or who were self-employed; or who were self-employed but temporarily not at work during the reference period.

182. The unemployed consist of all persons who, during the reference period, were not working but who were seeking work for pay or profit, including those who never worked before. Also included are persons who, during the reference period, were not seeking work because of temporary illness, because they made arrangements to start a new job subsequent to the reference period or because they were on temporary or indefinite layoff without pay. Where employment opportunities are very limited, the unemployed should also include persons who were not working and were available for work but who were not actively seeking work because they believed that no jobs were open. The recorded data on the unemployed should distinguish persons who never worked before.

183. In classifying by economic activity status, participation in an economic activity should always take precedence over a non-economic activity; hence, employed and unemployed persons should be included in the usually economically active population even though they may also be, for example, students or homemakers.

184. The not usually economically active population comprises the following functional categories:

- (a) Homemakers: persons of either sex, not classified as usually economically active, who are engaged in household duties in their own home, for example, housewives and other relatives responsible for the care of the home and children (domestic employees working for pay, however, are classified as usually economically active);
- (b) Students: persons of either sex, not usually economically active, who attend any educational institution, public or private, for systematic instruction at any level of education;
- (c) Pension or capital income recipients: persons of either sex, not classified as usually economically active, who receive income from property or other investment, interest, rents royalties or pensions from former activities and who cannot be classified as students or homemakers;
- (d) Others: persons of either sex, not classified as usually economically active, who are receiving public aid or private support, and all other persons not falling in any of the above categories, such as children not attending school.

185. Since some individuals may be classifiable in more than one category of the not usually economically active population (e.g., a person may be a student and a homemaker at the same time), the registration instructions should indicate the order of preference for recording persons in one or another of the categories.

35. Usual occupation

186. Occupation (of parents, decedents, brides, grooms and divorcees) refers to the kind of work done during the calendar year preceding the year of occurrence of the vital event by the person employed (or performed previously by the unemployed), irrespective of the industry, the status in employment and sector (as employer, employee, etc.) in which the person should be classified.

187. Analysts and users of vital statistics data based on occupation should be cautioned that, in vital statistics publications, measures using vital events occurring to an occupation group in the numerator, and a census count of all persons in the population classified to that same occupation in the denominator, may give misleading or incorrect results (a census typically records current occupation, while for vital statistics purposes, occupation is defined as an individual's usual occupation during the year preceding the year of occurrence of the vital event). A better procedure might be to relate the vital events in a given occupational group to the total number of vital events for all occupations, i.e., to use a proportional ratio instead of a rate (see para. 210 for a discussion of rates and ratios).

188. For purposes of international comparisons, it is recommended that countries compile their data on occupation in accordance with the International Standard Classification of Occupations (ISCO-08) (Geneva, International Labour Office, 2008). If this is not possible, provision should be made for the categories of the classification employed to be convertible to ISCO-08 or at least to the minor (two-digit) groups of this classification. If national data are not classified in conformity with ISCO-08, an explanation of the differences should be given in vital statistics publications.

36. Socioeconomic status

Recommended tabulations: DE-13

189. Because of national differences in the characteristics that distinguish socioeconomic status, it is not yet possible to provide an international definition for this topic. Socioeconomic status can be based entirely on economic characteristics or take into account other characteristics, such as educational attainment and similar social traits.

190. The purpose of a classification of vital events by socioeconomic status is to identify groups, each with similar socioeconomic characteristics, that might be different from other socioeconomic groups with respect to their vital statistics-related characteristics. These groups can then be used to study the relationship between the socioeconomic status of individuals and selected vital statistics, e.g., birth rates, infant mortality rates, cause-specific death rates, etc.

37. Type of birth

Recommended tabulation: LB-FD-1

191. Type of birth refers to the single or multiple nature of the product of the pregnancy to which the statistical report relates. Each live-born infant or dead-born foetus should be characterized as single, twin, triplet etc., and its birth order with respect to its newborn siblings should also be specified (first of two, second of two, first of three, etc.). For each member of a multiple birth, provision also should be made for indicating the sex of the other member(s) as well as his, her or their condition with respect to being born alive or dead (foetal death).

192. Statistically, information on type of birth serves two different purposes: (a) to study the trend of single, twin, triplet or higher-order births over time and (b) to analyse the impact of type of birth on birth outcomes.

38. Attendance at birth

Recommended tabulations: LB-13, LB-14

193. The attendant at birth or delivery is the person who assisted the mother in delivering a live-born infant or a dead foetus. The attendant should be classified as: (a) physician, (b) nurse, (c) nurse-midwife, (d) midwife, (e) other paramedical personnel, (f) layperson or (g) "not stated".

194. Attendance at birth or delivery provides useful information on the utilization of medical-care facilities and resources. Statistics on live birth by site of delivery and attendant at birth are of great use in evaluating the need for medical services and for providing insight into patterns of infant mortality.

39. Certifier

Recommended tabulations: DE-11, FD-10

195. The certifier is the person authorized by law to certify the fact of death or foetal death and, in the case of death, to certify the circumstances (accident, suicide, homicide, natural causes) and the specific disease, injury or other cause(s) of death. Data should be collected in such a way as to permit classification of deaths according to whether the death was certified by a physician or surgeon who attended the decedent in his terminal illness, a medical practitioner who examined the body after death,

a coroner or other medical-legal authority, a midwife, a nurse (other trained person) or a layperson.

196. Medical certification of the cause of death or foetal death is usually the responsibility of the attending physician, if there was one. In the case of medically unattended deaths or deaths believed to have been due to violence (accident, suicide, homicide), a medical-legal officer (coroner or medical examiner) is responsible for the certification under the laws of many countries. In any case, if the cause of death is determined by a medically qualified individual or a medical-legal officer, the diseases or injuries should be reported and recorded in the format and detail contained in the most current version of the International Form of Medical Certificate of Cause of Death, which is reproduced in paragraph 496 below. Whenever possible, a separate certificate of cause of perinatal death (foetal death and neonatal death) should be completed. WHO also provides the content and design of such a certificate (see World Health Organization, 2011, sect. 4.1.3).

40. Type of certification

Recommended tabulations: DE-11, FD-10

197. “Type of certification” is a derived topic: type of certification is based on the identity of the certifier (see topic 39), who could be a physician, medical practitioner, coroner, medical-legal authority, midwife, nurse or layperson.

41. Cause of death

Recommended tabulations: DE-10, DE-12, ID-4

198. Causes of death are “all those diseases, morbid conditions or injuries which either resulted in or contributed to death and the circumstances of the accident or violence which produced any such injuries” (ibid., sect. 4.1.1). Symptoms and modes of dying, such as heart failure or respiratory failure, are not considered to be causes of death for statistical purposes.

199. The cause of death to be used for primary statistical tabulation purposes has been designated as the underlying cause of death. The underlying cause of death is defined as “(a) the disease or injury which initiated the train of events leading directly to death, or (b) the circumstances of the accident or violence which produced the fatal injury” (ibid., sect. 4.1.2).

200. From the standpoint of public health and prevention of disease and premature death, it is important to understand the morbid process from onset to conclusion and to break that chain of events. The most effective public-health objective is to prevent the precipitating cause from operating. For that reason, the underlying cause of death has been defined as the basis for mortality statistics by cause of death. The process of certifying the underlying cause(s) of death is elaborated in chapter IV of part two.

201. In order to ensure uniform application of the above principle, it is imperative that the medical certification form recommended by the World Health Assembly be used. The use of such a form places the responsibility for indicating the train of events on the medical practitioner signing the medical certificate at death. The form is designed to facilitate the selection of the underlying cause of death, especially when two or more conditions are recorded. It is assumed that the certifying medical practitioner is in a better position than any other individual to decide which of the morbid

conditions led directly to death and to state the antecedent conditions, if any, that gave rise to this cause (ibid., sect. 4.1.3).

42. Manner of death

202. This topic is intended to give the certifier of a death the choice of indicating, in addition to providing the diagnosis or assigning a specific cause, that the death was due to one of the following: natural causes, accident, suicide, homicide or “manner undetermined”.

203. In many countries, a coroner or other medical-legal officer must be involved if a death is due to or suspected of being due to violence (i.e., if the manner of death is an accident, suicide or homicide) or if its manner cannot be determined after careful review and/or post-mortem examination.

43. Whether autopsy findings were used

204. This topic is intended to assist in the evaluation of the quality of cause-of-death data. Data on the proportion of deaths that are examined post-mortem and the underlying causes of death based on such examinations are useful in the assessment of the adequacy of medical certification of deaths.

44. Death occurring during pregnancy, childbirth or puerperium

Recommended tabulations: DE-10, DE-12, ID-4

205. A death occurring during pregnancy, childbirth and puerperium is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the cause of death. Because of the worldwide interest in minimizing maternal mortality, WHO recommends the inclusion of an item on death certificates that would identify those women (ibid., sect. 5.8.1). This allows the identification of deaths of women who do not die directly of pregnancy-related causes but of other conditions which may have been aggravated by the pregnancy.

45. Type of place of occurrence

Recommended tabulations: LB-13, LB-14, DE-5

206. This topic refers to the type of place where the vital event in question occurred (site of occurrence). Births, foetal deaths and general deaths should be categorized as having occurred in “hospital” (as defined by each country), “other institution”, “at home”, or “other place”. An event should be regarded as having occurred in another place when it did not occur in a hospital or in another institution (e.g., prison or custodial care facility) or at home; the term “other place” includes trains, airplanes, ships, automobiles and public byways, such as roads and sidewalks.

46. Type of marriage

207. Type of marriage is the type of act, ceremony or process by which the legal relationship of husband and wife is being or was constituted. Data should be collected so as to permit the classification of marriages as civil, religious, civil/religious or customary.

47. Population at risk

Recommended tabulations: All tables

208. Information about the population at risk is necessary for the calculation of basic demographic measures and analysis of vital statistics. The required population information may be obtained from the most recent census, intercensal estimates, population registers, appropriate registration system counts (e.g., of the total number of live births or the total number of deaths) or, in the case of field surveys, counts of household members present and those temporarily absent at the time of the survey.

209. The population at risk is that population (or estimate thereof) from which a particular kind of vital event could arise. In the case of annual mortality, the total population is considered to be at risk; in the case of divorces, only the currently married population is at risk; for infant mortality, live-born infants comprise the population at risk, etc. However, vital events are usually counted during a period of time, usually a calendar year (Gregorian calendar), while population counts are taken at a fixed point in time. Therefore, many vital statistics measures are calculated as rates where the numerator of the calculation consists of a count of vital events occurring during a given year, while the denominator (the population at risk) represents a count as of the midpoint of that same year. The denominator, in such cases, is considered to be an estimate of the number of persons who, during the year, were subjected to the relevant "risk" (e.g., death or marriage). Other vital statistics measures use counts of vital events occurring during a period of time for both numerator and denominator (e.g., the calculation of infant mortality, where the numerator consists of the number of deaths to children under age 1 occurring during the year and the denominator consists of the number of live births occurring during the same year, both figures derived from civil registration data).

210. Through common use (and misuse), many vital statistics measures are technically misnamed as rates (e.g., the infant mortality rate, which is really a ratio), and the calculation of the measure often entails using a value in the denominator that is not for a true population at risk (which is the case, e.g., for the birth rate, which is calculated by dividing the number of live births by the estimated mid-year total population instead of by the number of females of childbearing age, a more correct estimate of the population at risk of having a live birth). These and similar anomalies should not detract from the importance of relating raw counts of vital events to a predefined and universally accepted population-at-risk denominator value in order to promote comparability nationally within countries over time and among countries at the international level.

Chapter IV

Compiling and processing vital statistics

A. Advance planning

211. Advance planning is crucial to the success of any statistical programme. The vital data and the form that records the data determine the kind of statistics that can be processed. Regardless of the method of processing, the statistics compiled and tabulated cannot be more accurate and complete than the data from which they are derived.

212. The statistical processing plan should establish several goals. The first is to ensure that the information needed by major data users will be collected. The second is to ascertain what tabulations are needed by the users. As it is impossible to meet all user needs, it is essential to determine user priorities and to attempt to satisfy those deemed most important. Third, long-range programming is needed because the preparations for the conduct of the statistical programme for a given year are usually made a few years in advance. Therefore, a three- or four-year plan for the collection, editing, querying, coding, sorting and tabulation of the data and the analysis, evaluation, interpretation and the dissemination of the results is critical to ensuring the success of these programmes.

B. Coverage

213. Vital statistics should be compiled, as far as possible, for the total geographical area of the country, for each major or other minor civil division and for each principal town and city. They should also distinguish between urban and rural for at least the country as a whole and for each major or other civil division. The presentation of vital statistics at these levels enables the user to obtain vital statistics about individual areas of interest, in addition to exhibiting variations among local areas in individual parts of the country. When sampling has been employed, for example, in a sample survey, vital statistics should still be compiled for the sample areas and in such a way as to enable minor civil divisions to be distinguished, where appropriate, and the urban/rural differentiation to be retained.

214. When the source of vital statistics is civil registration, every effort should be made to ensure that national vital statistics refer to the total population of the country. In cases where registration of vital events for important population subgroups is less than 90 per cent complete or where the quality of the data is poor, separate tabulations should be made for the various segments of the population, accompanied by a clear statement of qualifications and limitations of the data wherever the statistics appear.

215. In countries where the social and economic characteristics of large segments of the population vary greatly, such as among ethnic (or national) groups or nomads, it is recommended that, as far as possible, the identity of each important population subgroup be maintained in the tabulations.

216. All vital events occurring to the usual resident population should be included in the total count of the geographical area of interest, regardless of the place

of occurrence. As for events involving two persons, such as marriages and divorces (dual events), the area or country of allocation should be that of the common usual residence of the (marrying or divorcing) partners; in default, the place of residence of the male partner (for opposite-sex relations) or of the older partner (for same-sex relations) could be taken as reference.

217. Compliance with international recommendations would contribute to minimizing the risk of double counting, especially for those vital events that concern two persons (dual events).

C. National centralized compilation from individual statistical reports

218. National vital statistics should be compiled and tabulated uniformly for the country, using common definitions, classifications, coding, querying, data entry and editing procedures throughout. Tabulations should conform, as a minimum, to predetermined tabulation plans, and should permit the flexibility and adaptability needed to meet national and international requirements.

219. In order to ensure production of the highest levels of accuracy, uniformity and flexibility, it is recommended that compilation from individual reports, either paper-based or electronic, be undertaken centrally. In cases where the numbers of vital events would be overwhelmingly large if processed at the central level, a decentralized approach may be adopted whereby subnational offices are set up to carry out all or selected data-processing functions. When compilation is carried out in a decentralized manner, detailed written guidelines, dealing with such procedures as coding, editing, querying and data entry, must be issued by the central national authority.

1. Control of receipt of statistical reports

220. The first step in developing controls is to establish a strict reporting schedule. This principle applies for both manual and electronic systems. Once the schedule has been established, the receiving office must diligently control the receipt of reports, and in this regard address issues of promptness and completeness of reporting. The control method used should allow the national office to ascertain whether or not reports are received on time, as well as whether returns are received from every geographical reporting area. In addition, the control method must reveal whether the reporting frequencies are consistent with those of the preceding period.

2. Editing

221. Editing of statistical records entails electronic checking through computer programs and visual checking to ensure that the reports received by the central office are complete and accurate and errors have been minimized. Any items that are missing, inconsistent or obscure should be detected and corrections should be made in consultation with the data-collection agency responsible for the errors.

3. Querying

222. Items on the statistical report with missing, inconsistent or inappropriate responses should be questioned or “queried” by referring the item to the data-collection

agency for clarification. This querying process should be adopted as an integral part of the vital statistics system in order to improve the resulting statistics. An ongoing query programme is also a tool for educating the providers of information about the need for high-quality data.

223. It is important that the appropriate reporting office or the person responsible for filling out the item in question be queried. If it is not possible for the national office to query this individual directly (for example, the physician or the midwife or the household being interviewed), it may become necessary to contact the local or regional office and request that it contact the appropriate source.

224. Pursuant to the query, the corrected data must be transmitted to the central office (or, in the case of decentralization, to the subnational office), either manually or electronically. In some areas of the country, the local office may forward a corrected report. In others, the corrected information may be obtained electronically. In either case, if the item is of legal as well as statistical concern (e.g., place of occurrence or date of death), it is important that the correction be made on the legal record in addition to the statistical report. A mechanism must be established in the local civil registration office to ensure this.

4. Imputation of missing or inconsistent data items

225. The querying procedure described above will not always yield the missing or corrected information being sought. If this is the case, it may be possible to “impute” the needed information. Imputation is the process of assigning a probable value to an item whose true value is unknown. For example, if the information on “sex” is missing, it might be inferred from the given names of the person; or if age is missing, certain mechanisms may be used to produce an estimated age.

226. Imputation should serve as the aid of last resort in the attempt to supply missing or obviously incorrect data, and should be employed only if the querying process described above has failed to produce the information sought. Furthermore, it should be clear that any imputed value is to be used for statistical purposes only and not for amending the legal record. There are several common methods of imputation;¹⁴ however, imputation in any form should not be undertaken unless querying has first been attempted.

5. Coding of data

227. Coding is the translation of items of information into numerical values to facilitate data processing. Some items of information, such as age or birth weight, are reported as numerical values and need no translation, although the unit of measurement (such as hours, days, months or years in the case of age or kilograms, grams, pounds or ounces in the case of weight) should be coded in addition to the numerical value, where appropriate. For some other items, such as sex, marital status or literacy status, as the number of possible choices of answers is limited, it is useful to print pre-coded answers on the form. Since coding of such items is usually straightforward, interpretation is not required. It is also essential to establish codes to be used in situations where the answer is “unknown” or “not stated”.

228. However, many items, such as cause of death, place of occurrence, place of registration, place of residence and occupation, need to be coded according to instruc-

¹⁴ See *Handbook on Population and Housing Census Editing, Revision 1*, Studies in Methods, Series F, No. 82/Rev.1 (United Nations publication, Sales No. E.09.XVII.11) (United Nations, 2010).

tions. Therefore, clearly written instructions, including the classifications to be used and the definitions involved, should be developed. Wherever applicable, these should follow recommended international statistical classifications issued by such organizations as the International Labour Organization (ILO) and WHO. The preservation of written instructions and the decisions made in applying these instructions from year to year is important for appropriate analysis and interpretation of the data.

6. Converting data into an electronically readable form

229. Capturing data from paper-based individual statistical reports for transfer onto electronic media for further processing may involve modifications of, or additions to, the above sequence of compilation steps. For example, the actual transcription of data into a format readable by computer might entail “keying” on a keyboard connected to a computer or the automated “reading” of specially designed forms through the use of optical character recognition hardware and software. Prior to utilization of either of these modes of data capture, however, the control of the receipt of reports and most if not all the prescribed editing and coding steps must be completed. If any querying is necessary, this, too, must be completed in order for the data to be converted to electronic form.

230. Depending on the specific computer software being used, it may be possible to carry out some of the editing, coding and imputation of missing or inconsistent data as an automated process concurrent with the data-capture function. For example, the computer can assist with the coding of selected items as they are entered by assigning a derived code, such as the code for “urban/rural”, based on the input of the “place of occurrence” code. The computer can also edit entries for “out-of-range” values, such as an unlikely or impossible age or birth weight, and it can impute missing values based on a priori rules (United Nations, 2010).

231. If data are keyed into the computer, there is always the likelihood that inadvertent errors will occur as part of the transcription process. For that reason, for each type of record, it is good practice to group the work into batches and to institute a verification system whereby, for a small sample of each batch, the work is independently redone and the results compared with the results of transcription from the identical records produced through the original data entry. If the discrepancy exceeds a preset limit, the entire batch should be done over (see paras. 233-239 below).

232. If a country’s civil registration system is automated, it is recommended that data collection and conversion of entered data to electronic form for both registration and vital statistics be the responsibility of the civil registration authority, either at the central or the subnational level. This approach requires the adoption of an individual form that meets the information needs of both civil registration and vital statistics (United Nations, 1998e).¹⁵ Under this arrangement, the vital statistics agency would not deal directly with data entry and would instead receive from the civil registration authority the electronic files needed for the production of vital statistics. These files should be transferred under an agreement between the two agencies that provides for the appropriate confidentiality and protection of individually identifiable data (United Nations, 1998b).¹⁶

15 See *Handbook on Civil Registration and Vital Statistics Systems: Computerization*, Studies in Methods, Series F, No. 73 (United Nations publication, Sales No. E.98.XVII.10, para. 232).

16 See *Handbook on Civil Registration and Vital Statistics Systems: Policies and Protocols for the Release and Archiving of Individual Records*, Studies in Methods, Series F, No. 70 (United Nations publication, Sales No. E.98.XVII.6), para. 30 (e) (i).

7. Quality assurance

233. As discussed earlier, quality assurance procedures need to be set up as regular and routine activities in a vital statistics system at all stages—collection, compilation and processing. The errors and omissions that may be introduced in the original statistical reports, as well as during coding, keying, sorting, posting and tabulation, should be detected and corrected before the vital statistics are published.

234. Coding errors can be checked by independently recoding a sample of the data recorded on the statistical reporting forms. This process must be performed by a person other than the one who did the original coding. Whether it is sufficient to verify the coding on a sample basis or on all of the reporting forms depends on the level of error revealed. Tolerance limits should be set and the coding work should be redone if the limit is exceeded.

235. The next step is to control the transcription of the data. If mechanical and manual transcription is used, 100 per cent verification is needed by an independent group of verifiers.

236. If computer data processing is used, quality assurance can be practised in several ways. If manual data entry is employed as a first step in the computerization process, verification of the coding and keying should be done by recoding and rekeying all or a sample of the work, as described above. The computer can then be used to carry out sophisticated and extensive checks of the data through the use of an edit program designed to “flag” records that have missing values, or values that are outside an acceptable range or inconsistent with other related data. Records so designated should be checked for both coding and data entry errors. Certain kinds of missing data may be imputed by the computer.

237. Regardless of the type of transcription, whether mechanical and manual or computerized, if the data is to be used for the civil registration system as well as for vital statistics, then there must be zero tolerance for errors; hence, 100 per cent verification is required. On the other hand, no imputation of data is permissible in the file to be used for civil registration, as every item has a legal connotation.

238. In manual or mechanical systems, data in posted tables can be verified by proofreading the tables. By this method, one person reads from the original tables while another scans the posted data. A second method of detecting errors in posted data is through “internal checks”, which may include the summation of marginal sub-totals to the table total and checking the consistency among several tables. A final step in controlling errors in mechanical or manual tables entails the technical review of tabulations for credibility, consistency and plausibility.

239. If an automated system is used, it is important that the tables produced be critically inspected for credibility and consistency, since errors might be introduced through programming mistakes. Therefore, it is most vital for all tabulations to be inspected by both statisticians and data-processing personnel in order that as many errors as possible may be detected and corrected.

D. Tabulation

240. Preparation of the tabulation plan must take into account the need for the provision of enough detail to meet criteria regarding: (a) the degree of coverage of the statistics produced under the plan; (b) the quality of those statistics in terms of the accuracy and completeness of the characteristics collected for each vital event;

(c) whether the tabulations are of sufficient detail to reveal important relationships; and (d) the timeliness of the availability of the statistics, including in publications. In addition, there are governing principles to be adhered to in the preparation of tabulations according to which: (a) even if registration is not complete, tabulations are to be prepared and users are to be provided with information on the level of completeness of registration; (b) where definitions diverge from those that are internationally accepted, the definitions are to be set out in easily understandable language; and (c) tabulations are to be prepared on a regular basis and in timely fashion. In order that all criteria may be met, the tabulation programme should be prepared in accordance with the basic principles provided below.

1. Coverage

241. A basic requirement within a vital statistics system is that each vital event occurring within the geographical area covered by the system be registered once and only once for legal purposes and reported for statistical purposes within the time period stipulated by law, thus enabling 100 per cent—or universal—coverage. Statistical tabulations should therefore encompass the entire geographical area and include events for all population groups within the area occurring during specified time periods. Because of delayed or late registration of some vital events, the completeness of tabulation coverage for statistical purposes may fall somewhat short of 100 per cent in the final counts of registered events. Every effort should be made to overcome this deficiency.

242. Even when coverage in a vital statistics system is not complete, it is still recommended that data be tabulated at the existing level of coverage and that sufficient information be provided in this regard.

2. Population of reference

243. Ordinarily, there is a relatively small difference between a country's resident population and the population present in that country at a given time, since persons who are travelling internationally or are otherwise not in their customary place of residence—such as representatives of business, the military, diplomats and tourists—usually constitute a very small proportion of the population and are unlikely to contribute in large numbers to either mortality or natality. Because of these comparatively small numbers and the difficulties of arranging for international exchange of information or for the circulation of reports on vital events between the countries involved, it is sometimes considered that the sum of vital events occurring within a country's national boundaries is a good approximation of the sum of those occurring among its residents. However, all reasonable efforts should be put in place in order to ensure that the vital statistics indeed refer to the usually resident population, regardless of where the vital event has effectively occurred.

3. Time reference

244. In any calendar year of registration, the tabulation programme of vital statistics should be able to provide (a) the total monthly or quarterly counts of live births, deaths, foetal deaths, marriages and divorces and (b) detailed annual tabulations (e.g., three or six months after the year of registration). Final and detailed tabulations should refer to specific calendar periods, such as months, quarters or years, as required.

245. Final tabulations for any calendar period should be based on events that actually occurred and not on those merely registered during that period. Should it be administratively necessary to tabulate final figures by date of registration rather than by date of occurrence, evaluation studies should be undertaken to determine the degree to which the one type of tabulation approximates the other. It is of course desirable that the analyses of this relationship be published.

246. For purposes of preparing current weekly, monthly or quarterly summaries, which must be compiled rapidly, counts referring to date of registration may be used; but in this case, it is important to demonstrate the extent to which counts of events registered during the period in question can be assumed to approximate the counts of those that actually did occur during that period.

247. Accordingly, final annual tabulations by date of registration are appropriate only for those countries where it is established that data tabulated on that basis may for all practical purposes be used interchangeably with those tabulated by date of occurrence. This means, in effect, that unless registration is timely and virtually complete, date-of-registration statistics are not a desirable substitute for those compiled by date of occurrence. It means also that date-of-occurrence statistics will need to be accompanied by a measure of the degree of underregistration. The reason for the operation of this principle is that substitution of date-of-registration tabulations for those by date of occurrence will introduce distortions into the statistics unless date of registration does not differ appreciably from date of occurrence.

248. The selection of the date of occurrence as the basis for tabulation requires the determination of a terminal date after which final tabulations can be made. Since varying periods of time are allowed during which an event can be registered and since the count is to consist of the events that occurred during a calendar period, it is clear that complete registration and statistical reporting of those events which occurred near the end of the calendar period cannot be expected until some time during the following year. Therefore, final annual tabulations should be made on the basis of statistical reports received before a specified or "cut-off" date.

249. The factors to be considered in determining the national cut-off date include the legal length of time allowed for registration by type of vital event. The decision should also reflect consideration of the number of offices through which the report must travel to reach the statistical authorities, the efficiency of communications and any other relevant factors.

250. Reports received after the cut-off date should be tabulated separately by date of occurrence to provide for the analysis of the problems of delayed registration and delayed reporting; extensive detailed national tabulations would not ordinarily be made on these late reports. However, in cases where the volume of late reports is large, they should be taken into consideration in the national printed tabulations, since to ignore them would result in a significant bias in the results.

251. Whatever the time of arrival of the information, data disseminated in electronic format should always include all the events that occurred in the reference year. Even if those data arrived well after the cut-off date, the vital statistics referring to the concerned year of occurrence must be updated accordingly. This is important especially for online data dissemination, which should always reflect the most up-to-date situation.

4. Geographical reference

252. Final tabulations for geographical areas smaller than the total national territory, such as major or other civil divisions, and also cities, should be made according to place of usual residence. In addition, such place-of-occurrence tabulations as are required for administrative or other purposes should be made.

253. For provisional or advance tabulations, there will be no problem with respect to place of residence versus place of occurrence provided that those tabulations are based on national totals. However, advance tabulations for subnational administrative units usually cannot be based on place of residence because of the difficulty of quickly allocating events to place of usual residence. It is therefore useful in provisional or advance tabulations to make the following distinctions among events occurring in a specified geographical unit: (a) those occurring to persons with usual residence in the unit and (b) those occurring to persons with usual residence outside the unit.

254. As noted in paragraphs 85-89 above, producing a definition of usual place of residence is a difficult and complex challenge, varying as it does according to national and local law. For statistical purposes, it is recommended that the definition of usual place of residence be the same as that established for the purposes of the population census (United Nations, 2008, paras. 2.46-2.51). This allows for the computation of basic demographic rates by relating vital events to corresponding population groups.

255. With a view to ensuring national and international uniformity and comparability, place of usual residence for purposes of tabulation should be determined as follows:

Live births: place of usual residence of mother at time of delivery of live birth.

Foetal deaths: place of usual residence of woman at time of delivery of dead foetus.

Infant deaths: place of usual residence of mother at time of death of infant (or of infant, if mother is dead).

Deaths: place of usual residence of decedent at time of death.

256. For ready reference, tabulation plans are provided in annex II. The tabulation plan is intended to serve only as a guide to the preparation of vital statistics.

Chapter V

Presentation of results and data dissemination

257. The present chapter presents principles and guidelines for achieving the most effective dissemination of vital statistics data. It examines different methods of presentation appropriate to different target audiences and suggests approaches to communicating with users on statistical products.

A. Types of data dissemination

1. Annual publications

258. The tabulation programme of the national vital statistics system should provide annual data in those classifications required for the study of the frequency distributions of vital events, and time trends and geographical differentials for the most important characteristics of vital events. These data must be made available on a timely basis through publication or other means of dissemination such as ad hoc tabulations and electronic media, as appropriate. A detailed review of a national tabulation programme, including outlines of essential tables, is contained in annex II.

259. In preparing reports, statistical tables should be accompanied by a clear explanatory text and, if possible, an analysis. Of special importance are annotations to explain the limitations and qualifications of the data so as to increase their usefulness as source material. An analysis of the data, including the calculation of vital rates, is also very desirable, as is the use of figures, maps and graphs to illustrate important points.

260. Publications of vital statistics should conform to a carefully orchestrated plan, that is to say, they should be part of a series designed to meet specific user needs; and they should also be released according to a regular and timely schedule. Each series should be easily identifiable to facilitate filing and referencing in libraries. This is essential if the vital statistics office is to fulfil the service function for which it was established.

261. Once vital statistics have been published, the next step is to make them available to users so that the purposes of the entire system may be fulfilled. Published vital statistics represent the primary product of the vital statistics system, and unless this product is made available to the main users and the public, it cannot be expected that they will be willing to support the system. Therefore, the provision of means for the timely dissemination of vital statistics should be a fundamental concern in terms of upholding the authority of the vital statistics system. In cases where the data are of doubtful or of unknown quality, the statistics should still be made available but they should be clearly labelled and accompanied by the appropriate caveats and qualifications required to alert users to possible misinterpretations.

262. Annual publications offer the user a regular and dependable source of vital statistics data; and such publications provide the vital statistics agency with visibility in terms of its fulfilment of national needs, its purpose and its importance to society. Annual publications provide yearly information to local, municipal and county-level

administrations which allows them to update their population database by sex and age within the framework of interaction with the population census database. Geographical information systems are becoming more and more critical in their enhancement of the dissemination of vital statistics.

263. Timeliness is an important factor in terms of the availability of vital statistics data. The issuance of an attractively printed report, complete with data tables, graphs, charts, maps and analyses, is a worthy goal for the vital statistics system. Annual data should also be made accessible in other downloadable formats—formats that allow for more immediate or more convenient use by those in need of vital statistics data.

264. The annual report should also include appendices that offer copies of the statistical collection forms for each type of event, technical notes concerning coding and classification schemes, definitions of vital statistics items, an explanation of formulas used in generating vital statistics rates contained in the report, and notes on the strengths and limitations of the published data. In addition, the annual publications should include information on delayed and late registration, by year of occurrence, to assist users and researchers in reconstructing the time series of vital events.

2. Monthly and quarterly bulletins

265. Monthly and quarterly bulletins, in addition to the annual publication of data, serve several purposes. The data in such bulletins need not be exhaustive or extensively cross-classified. However, selected totals compiled on a monthly and quarterly basis can alert responsible officials on a relatively current basis of unusual changes in numbers of vital events. Such reports are of great importance for epidemiologic surveillance and also serve as a quality control tool for early detection of missing data or data that are being seriously miscoded.

266. Analysts and other users of the data find it valuable to review key vital rates based on a moving 12-month period. These are calculated each month by dropping the oldest month's frequency and replacing it with the most recent value, thus giving each month an estimated vital rate based on the latest 12-month period. Monthly and quarterly bulletins should be made available to those with an interest in or need for provisional information, but it is usually not necessary to disseminate their tabulations as widely as annual publications.

3. Vital statistics disseminated by electronic media

267. It has become increasingly common for countries to use electronic media (CD-ROMs or the Internet) for data dissemination. Disseminated data may be in the form of tabulations or in databases from which users can extract information or create self-defined tables. The advantage of using electronic media, compared with the traditional paper format, lies not only in the fact that they are environmentally friendly and cost-effective, but also in their ability to cater to specific user needs. In addition, because of the low costs involved, the volume of information that can be disseminated using electronic media is basically unlimited.

268. As a basic principal of data dissemination, accompanying information on the content, context and limitation of statistics should be provided to users so as to increase their understanding of the data and the properties of the data. More specifically, because of the large volume of information available electronically, vital statistics agencies may need to implement certain strategies designed to enhance the dissemi-

nation of statistics through electronic media. Examples of such techniques include providing information to users at different levels; developing basic guidelines for presenting information; linking metadata directly with statistical data; and using data visualization tools to make statistics-related stories interesting and easy to read and to allow users to discover patterns within the statistical data.

4. Microdata dissemination

269. In addition to data at an aggregated level, individual vital statistics records may be provided to certain users for research purposes, under a user agreement on confidentiality and the use of data between the statistical agency and users. Usually, identifying information is removed from the file to protect the privacy of individuals.

5. Special tabulations on request

270. There are occasions when neither the annual publication and the monthly and quarterly bulletins nor the data available on electronic media completely answer the needs of the user. It is advantageous in such cases for the vital statistics agency to be able to offer special tabulations to meet the user's specific needs. It is of further advantage, in the case of special tabulations, if the agency can offer analytical consultations to the customer, which can help to ensure that the specially tabulated vital statistics data are interpreted correctly. Studies involving small-area data analysis, sample data analysis or analysis of vital statistics data, for example, matched to data from another source, can yield special tabulations.

B. Broadcasting of data

271. Broadcasting in this context is defined as proactive dissemination of information using various means to suit a diverse range of user interests in a manner that facilitates communication. To do this effectively, one must ensure that the information provided by the vital statistics agency is relevant to a diverse range of users. In many cases, reaching the potential audience will require some "pushing" of the relevant data or information.

272. To achieve communication with users, the statistical agency may periodically hold group meetings with a view to discussing the availability and proper use of the data. At such group meetings, a question that is posed can be responded to efficiently on a one-time basis, instead of over and over, as a result of the office's being contacted by a multiplicity of separate users. The meetings may also serve as a forum with which direct user input could be obtained concerning how well the agency is meeting user needs.

273. In addition to the holding of group meetings, e-mail notifications sent to subscribers regarding the latest available data or publication might be utilized. Some countries have been availing themselves of social media to broadcast information regarding their statistical products. It is certain that both e-mail notification and the social network expedite the communication process and also allow for more constant communication with users. However, no matter what type of method of communication is used, it is *proactive* communication with users that is key.

Part two

Sources of vital statistics

Chapter I

Introduction

274. The essential objective of the present revision of the principles and recommendations for a vital statistics system is to present vital statistics and civil registration as separate entities, with the ultimate goal being to establish, maintain and exploit these two entities as components of a coordinated and coherent system for registering and producing vital statistics. The procedures for recording births and deaths are equally important for civil registration in legal terms and for vital statistics in the context of source of statistics; hence, the work of civil registrars and that of statisticians are interdependent.

275. Vital statistics generated out of such a system offer the most valuable regular, accurate and relevant information on fertility and mortality, including for small areas; enable the computation of proximate population estimates and projections; enable the identification of fertility patterns at small-area levels; and serve as the basis for cohort studies, and the construction of life tables—to name but a few of the many uses of vital statistics generated directly from civil registration which illustrate its critical importance in providing relevant statistical information.

276. At the same time, the requirements in terms of content with which producers of vital statistics are currently confronted are becoming more complex and demanding. Data needs go well beyond the production of such well-developed indicators as crude fertility and mortality rates, average age at first birth, and age-specific fertility rates, among many others. The compilation of detailed statistics on all of the interventions provided by health services during pregnancy, delivery and post-natal care, although they are technically right at the intersection of vital and health statistics, is becoming indispensable for assessing the functioning and the costs of the health system. It is also the case that fertility rates vary depending on ethnicity, income, exposure to violence within households, and the time demands placed on women in providing family, among many other factors.

277. In addition, there are other types of events of recognized demographic importance, such as migratory movements and naturalization, which are not usually subject to civil registration and thus require the development of separate statistical instruments for data capture and quantification. Similarly, civil registration, by definition, does not cover non-registered marital unions, such as common-law, customary and consensual ones, which means that separate techniques for generating the relevant statistics need to be designed.

278. Consequently, vital statistics generated from civil registration need to be complemented by input from other sources of information, such as population censuses, population surveys, health services records and other administrative records, depending on the legal arrangements. This is necessary for an in-depth understanding of the factors that influence vital events and phenomena, such as income distribution, poverty, living conditions and access to safe water and to health services, among others.

Chapter II

Civil registration as a source of vital statistics

A. Definition of civil registration: method and system

279. Civil registration is defined as the continuous, permanent, compulsory and universal recording of the occurrence and characteristics of vital events pertaining to the population, as provided through decree or regulation in accordance with the legal requirements in each country. Civil registration is carried out primarily for the purpose of establishing the documents provided for by law. The usefulness of these records as the best source of vital statistics is well established. A discussion on how to implement a viable civil registration system is preceded by a brief description of civil registration as method and system.

280. The term “civil registration method” refers to the procedure employed in gathering the basic information on the incidence and characteristics of vital events that occur in the population of a country (or area) within a specified time period, upon which the preparation of vital records with legal value and the production of vital statistics are based. This method should be distinguished from other methods of gathering data about the population because it is mandated by law to be continuous and permanent. Information collected within the framework of this system has legal authority.

281. Vital statistics are incidence—not prevalence—statistics, that is to say, they are statistics providing a measure on a current basis of the occurrence of certain types of vital events to members of a specified population during a specified period of time. Experience has shown civil registration to be the only reliable method for obtaining a continuous and current record of events occurring throughout a period. In order to ensure both the current nature of the statistics and their accuracy with respect to dates and characteristics, the registration record should be completed as soon as possible after the occurrence of the event. The simplest and quickest way of accomplishing this end is to require an informant to provide the needed information soon after the event has occurred.

282. Registration as a continuous process implies also that the process is a permanent one. Registration maintained for short periods and then allowed to lapse will not yield data and measures that are useful, either as current incidence statistics or as indicators of changes over time.

283. Enactment of legislation that makes registration compulsory is the best means of ensuring continuous, permanent recording of vital events. Such legislation should provide sanctions to ensure fulfilment of the requirements of the registration system. Thus, the registration method is characterized not only by the continuous nature of its observations, but also by its compulsoriness. Both features are fundamental to the successful operation and maintenance of the system.

284. A system of civil registration includes all institutional, legal and technical settings needed for the performance of civil registration functions in a technical, sound, coordinated and standardized manner throughout the country, taking into account the cultural and social circumstances particular to that country.

285. The registration functions include: recording vital events; storing, safe-keeping and retrieval of vital records; protection of confidentiality; certificate issuing and other customer services; recording and reporting information on vital events for statistical purposes; and providing reliable and timely information and data to other government agencies, such as the ministry of health, population registers, pension funds systems; electoral services, personal identification services and research institutions.

B. The fundamental role of the civil registration system

286. The essential purpose of civil registration is to furnish legal instruments of direct interest to individuals. Societies today, even the least developed among them, exhibit considerable complexity in interpersonal relations and increasing bureaucratization in dealings between individuals and the State; hence, it is important, to ensure certainty in legal matters, that the individual be provided with special probatory instruments which allow him or her to prove, with ironclad certainty, the facts relating to his or her existence, identity, and personal and family situation. The principal *raison d'être* of civil registration—its basic purpose and one that must be facilitated by the State—is to serve as an institution capable of disclosing facts relating to civil status based on technical legal principles, through which individuals can be assured of the legitimacy and authenticity of civil status-related facts in order to accredit them to other individuals or the administration itself, by means of public registration documents known as certifications. The purpose of registration activity, and of the registration method—which consists in the collection and compulsory, continuous and permanent recording of civil status data for storage—is precisely to ensure its possible subsequent use in any eventuality and at any time when there is a need to prove its veracity and legality authentically and with the necessary guarantees (United Nations, 1998c).¹⁷

1. Legal and protective advantages to individuals

287. Aside from noting the direct and overarching importance of civil registration to the public authorities—in that the information compiled using the registration method provides essential data for national or regional preparation and planning for medical and health-care programmes, family care and family planning programmes, mother and child health services, other social services, public-health programmes for controlling infectious diseases, health research programmes, social and demographic studies, etc.—it should be emphasized that the role played by civil registration in proving, establishing, implementing and realizing many of the human rights embodied in international declarations and conventions reflects one of its most important contributions to the normal functioning of societies (*ibid.*, para. 192). Essentially, two sets of human rights can be identified in this respect: (a) human rights that require States to ensure that vital events are registered, e.g., the right to be registered and named, pursuant to article 7 of the Convention on the Rights of the Child¹⁸ and (b) human rights whose exercise may depend on the vital

¹⁷ See *Handbook on Civil Registration and Vital Statistics Systems: Preparation of a Legal Framework*, Studies in Methods, Series F, No. 71 (United Nations publication, Sales No. E.98.XVII.7), para. 74.

¹⁸ United Nations, *Treaty Series*, vol. 1577, No. 27531.

events, having been registered, for example, the right to vote, pursuant to article 21 (3) of the Universal Declaration of Human Rights.¹⁹

2. Administrative advantages

288. A functioning system for the registration of vital events has certain administrative advantages not found in any other system. The keeping of individual records for each vital event allows their use for identifying a subset of the population requiring intervention or services on an individual basis, such as infants in need of immunization or health care, new mothers requiring post-partum care and households in need of public-health services following a death from contagious disease. Universal registration allows for the monitoring of causes of death, and the maintenance of population registers, personal identification registers, electoral rolls, pension funds registers, etc. In addition, a full registration system makes it possible to meet the need for data and information on small civil or geographical divisions. Civil registration is the most cost-effective way to obtain data for smaller population areas on a continuous basis.

3. Statistical advantages

289. A comprehensive civil registration system has a number of statistical advantages over other means of obtaining vital statistics: it generates records that are relatively free from certain types of response errors and that are not subject to sampling errors; it provides statistical data for planning, administration and research at whatever geographical or administrative level is required; it is, by nature, continuous; once it is established, statistics can be obtained at a relatively low cost because they are now the by-product of an administrative process; it can record data that might not be obtainable in a field inquiry such as weight at birth or cause of death; and it provides an inventory of events that can be evaluated against those in other records and against census data, and used as a starting point for more in-depth studies of fertility, morbidity and mortality.

C. Vital events recommended for registration

290. The vital events that are recommended for inclusion in a civil registration system are the same as those listed and defined in part one. It is important that the definitions of vital events for legal purposes coincide with those for vital statistics purposes, so as to ensure national and international comparability. Such events include: live birth, foetal death, death, marriage, divorce, annulment, judicial separation, adoption, legitimation and recognition.

291. Not every country records all vital events or publishes the statistics for registered events, although this remains an ultimate goal. Some countries do not yet have the means or feel the need to register each kind of vital event. In order to facilitate the establishment or the improvement of the civil registration system, an order of registration priority is assigned to vital events. Those of higher priority are live births, deaths, foetal deaths, marriages and divorces. Top priority should be given to live births and to deaths because they are basic to the assessment of population growth as well as the health of the population. Recording of foetal deaths and their characteris-

¹⁹ General Assembly resolution 217 A (III).

tics should be granted the next highest priority, especially because of their value to the understanding of fertility, fecundity and pregnancy outcomes.

D. Principles of the civil registration method

292. The purpose of a country's civil registration system is to record and store information on the occurrence of vital events and their characteristics and to permit retrieval of the information when needed for legal, administrative, statistical and other uses. The work is accomplished through the registration method. Civil registration is carried out primarily because the resulting legal documents, as provided for by law, are valuable; at the same time, the usefulness of these records as a main source of vital statistics is universally recognized.

293. The civil registration method may be characterized as follows: it is compulsory, universal, continuous and permanent, and confidential. In addition, the records generated through the application of this method should be maintained in such a way as to ensure that they can be retrieved individually, as required.

294. **Compulsory.** A country's civil registration system must be compulsory in order to assure its smooth operation and effectiveness. While it is necessary for every country to establish a law on registration, it must be noted that the existence of such a law is not a sufficient condition for ensuring that the general public reports the occurrence of vital events. Registration as compulsory has to be linked to the imposition of some form of penalty on those who fail to comply with registration law, i.e., failure to register the occurrence of a vital event should be punishable by law. Since penalties for failure to comply with registration laws may not always be invoked and penalties may also be a deterrent to registration, it is imperative that there be a legal basis for prosecution to ensure that general compliance with the registration law is practised. Thus, a legal framework for civil registration is fundamental to its sound operation as a coherent, coordinated and technically sound system.

295. In spite of the existing provisions for penalties in a number of countries in cases of non-compliance, the level of completeness of registration remains low. The most important reason for such non-compliance has to do with the lack of incentives for registration. Incentives must be established not only to stimulate but also to encourage compliance with the compulsory registration law. Besides the privileges and rights that are to be enjoyed upon proof of registration, national registration systems, within their own respective sociocultural environments, should offer other incentives which are of practical use, especially at the individual level.

296. **Universal.** In order to ensure that maximum value is derived from the registration system by both individuals and users of vital records and statistics information, registration requirements must apply to the entire population of the country, independent of geographical location or population subdivision. When there are significant variations in the level of social and economic development in different parts of the country, it may be necessary to establish special procedures for the registration of certain vital events. However, the universality of civil registration must be maintained. Vital events occurring to residents who are abroad temporarily should also be registered.

297. **Continuous and permanent.** The continuity and permanence of the registration method require the existence of an agency of sufficient administrative stability whose operation is not limited by the factor of time. Permanence is contingent upon the authority given to the civil registration administration through the

enactment of a civil registration law. Permanence of the system is a requirement for the continuity of registration and vital statistics data, which is necessary for a meaningful understanding of both current figures as well as trends in vital statistics measures.

298. **Confidential.** Through the civil registration method, a variety of information is collected about individuals within the population. While all of the information collected has importance, some data, when identified with a specific individual, may be highly personal and sensitive. In order to promote the provision of full and honest data to the system, the confidentiality of the information must be protected, i.e., those who provide information must rest assured that it will be used only for the purposes prescribed by law and/or in aggregated form so that individuals are not identifiable.²⁰ However, confidentiality provisions should not interfere with administrative procedures.

299. Confidentiality provisions should not be so rigid as to exclude the use of the records for special studies, nor should those provisions weaken the value of those records as legal documents. Considering the wide administrative, public health-related and social uses made of accurate civil registration records, it is impossible to provide the guarantee of absolute confidentiality that can be provided in connection with purely statistical inquiries. However, confidentiality provisions can be spelled out in such a way as to ensure that the records are used for research purposes without publicly disclosing the identity and characteristics of the parties involved. Similarly, copies of the records to be used for the establishment of legal facts (e.g., proof of occurrence, proof of age, etc.) need not include some or all of the statistical items. Because of the importance of confidentiality to data quality as well as data usefulness, a provision for confidentiality of information and protection of the privacy of individuals should be made part of civil registration law.

E. Other characteristics of the civil registration method

1. Goal of the registration programme

300. The goal of the registration programme is to attain full coverage of the population so that all types of vital events occurring to its members are accurately and completely registered on a timely basis in accordance with the registration law.

2. Designation of responsibilities and organizational structures for civil registration at the national level

301. Responsibility for the establishment or development of a civil registration system should lie with an agency or agencies of a national Government.

302. The assignment of functions should be accompanied by a clear designation of duties and responsibilities with respect to registration; recording; custody of records; statistical reporting; collection, compilation, analysis, presentation and dissemination of data; and critical review and evaluation of the system.

303. In organizing, administering and maintaining a civil registration system, it is essential to give consideration to the relationship between the registration

²⁰ It must be emphasized that confidentiality in the context of civil registration has some additional dimensions which do not exist in the context of the Fundamental Principles of Official Statistics. For a more complete elaboration in this regard, see United Nations (1998b).

function and the statistical function, which are frequently carried out under the auspices of different ministries of the government. For example, registration functions may be placed under the jurisdiction of a ministry such as the ministry of the interior, of local government, of health or of justice. The responsibility for the production and primary analysis of vital statistics is typically found to be within the jurisdiction of the country's central statistical service, which may in turn be independent or a constituent part of the ministry of economy, finance or commerce. On the other hand, it is common for the health ministry to be responsible for or heavily involved in the production and analysis of vital statistics, particularly in the areas of natality, general mortality and foetal, perinatal and infant mortality. Because of the frequently encountered division of responsibility for registration and vital statistics among separate agencies of government, it is important that a clear delineation of responsibilities be established. The choice of a specific administrative structure to carry out these two interdependent functions is largely dependent on national conditions and preferences. However, whatever the organizational structure may be, if the system is to operate successfully, there must be a clearly spelled out specification of the functions and responsibilities of each of the agencies of the government involved in the registration of vital events and in the compilation of vital statistics.

(a) The legal framework for civil registration

304. Continuous, permanent recording of vital events can best be ensured by means of proper legislation and the establishment of mechanisms designed to enforce it nationwide. The legal framework is an essential contributor to the efficient management, operation and maintenance of the registration system. Given the huge importance of the legal framework, owing to the fact that it provides the rules and regulations needed to continuously and permanently register events that affect the civil status of individuals, countries should ensure that it is up to date. It also defines the administrative structure, the roles of different agencies and the possible times for the collection of information, the production of vital statistics and the use of the information by agencies in performing their duties. The civil registration law, a component of the legal framework, should provide clear and specific guidelines on the type of organizational structure adopted for the civil registration system in the country or area and the rights and obligations of all parties when carrying out its provisions. It should cover the types of vital events that must be registered, their definitions, the designation of informants for each type of event, the time allowances for registering each type of vital event, procedures for late registration, the registrars' duties, the penalties for non-compliance and the storage and preservation of records.²¹

305. Provisions for confidentiality of information and protection of the privacy of individuals should also be contained in the civil registration law. Determination of who shall be entitled to copies of vital records and who shall have access to information from the register about individuals other than themselves should be clearly set out in the law or in supporting regulations. Included in these provisions should be appropriate mechanisms for the transfer of files of vital records among government agencies for authorized purposes, and procedures for access to or release of files for approved research, consistent with overall confidentiality protection, particularly to the vital statistics system for the production of continuous vital statistics.

²¹ United Nations (1998c) presents a model civil registration law.

(b) Organizational structures for civil registration

306. As indicated above, the terms of the administrative arrangement of civil registration-related work should be stated clearly in the civil registration legislation. Depending on the judicial, political and administrative structures of a country, as well as its tradition, the system may be either centralized or decentralized.

(i) Centralized civil registration system

307. A centralized system should have a central agency with national responsibility for directing, coordinating and monitoring nationwide civil registration work. An office with such duties can promote national standards and uniform registration procedures for all vital events occurring within the country and among all groups of the population (United Nations, 1998d).

308. Under the centralized arrangement, the national registration agency should exercise both administrative and technical direction over the network of subnational and local civil registration offices. It should establish local registration offices, provide written materials to local registrars designed to guide their daily work, coordinate the registration procedures throughout the system, and supervise and evaluate the registration work of the local offices to ensure that it satisfies legal and statistics requirements.

309. The central office should be responsible for coordination with other governmental agencies that support the civil registration system, including the health services which serve as informants of the occurrence of vital events and as certifiers of causes of death, the courts, and the statistical service that compiles the registration data and publishes vital statistics.

(ii) Decentralized civil registration system (ibid.)

310. In a decentralized system, civil registration can be administered at the level of the major civil divisions, such as the State, province or department. At the capital city or town of each major division, a central civil registration office should be established to direct and monitor the civil registration work of the major division. Many countries with a federated political system, a large territory or large population have adopted a decentralized administration for civil registration.

311. Countries with a decentralized system for civil registration should adopt uniform legal provisions and procedures for civil registration. In general, countries having decentralized systems have made provisions for outlining a model law and its regulations so that each major civil division may promulgate its own laws and regulations but in close conformity with the recommended model. There needs to be an agency at the national level to enforce minimum standards or to work cooperatively with the decentralized offices to ensure generally uniform practices and procedures of civil registration and comparable vital statistics throughout the country.

(iii) Operational units within the system

312. Regardless of the type of administrative arrangement at the national level, the work of civil registration should be carried out by local civil registration offices. For purposes of supervision and control, there may be subnational civil registration offices established to sustain the relationship between the national and the local offices. Closely associated with the local registration office are the primary registration areas and secondary registration units.

(c) Type of agency administering civil registration

313. When a country's geography and administrative organization permit, responsibility for the registration of vital events should be vested in official local agencies which are directly dependent, insofar as registration matters are concerned, on a national office which can coordinate, unify, supervise and promote registration efficiency to the degree necessary to satisfy both legal and statistical needs.

314. Although it is recognized that the goal of administrative efficiency should not be the sole factor determining the type of organization for registration which a country might establish, there are advantages, under some circumstances, to the centralization of registration under a national authority. Centralized control facilitates standardization of forms, procedures and methods. If properly administered, it should also stimulate improved registration by means of technical coordination, advice and assistance to registrars, monitoring and evaluation. The uniform interpretation of the registration law, the development of comparable procedures at a specified standard of excellence and the adherence to a definite time schedule for reporting vital events can all be established and maintained more easily through a system of central control.

315. The type of organization adopted for registration purposes must be in accord with the conditions in the country and also must be established within the framework of the existing governmental or other formal structures. In particular, the facilities of health departments should be employed to assist in registration by notifying the registrar of the occurrence of births, foetal deaths and deaths. Similarly, some countries draw upon the assistance of the church or other organized religious bodies which require proof of civil registration as a prerequisite to the conduct of ecclesiastical functions, such as baptisms, marriages and funerals.

3. Integration and coordination in the civil registration system

316. The issue of integration and coordination in the civil registration system is an important consideration as regards smooth and efficient operation. While many of the considerations set out below were discussed in chapter II of part one as essential for the integration and coordination of a vital statistics system, they are discussed again here because of their applicability and importance to civil registration as well as to vital statistics. Whether the structure is centralized or decentralized, coordination and integration processes must be built into the civil registration and vital statistics systems.

(a) Uniform legislation and regulation nationwide

317. Regardless of whether a centralized or decentralized registration system model is in use within a country, it is essential that there be in place uniform registration laws and regulations which establish the basic policies and procedures that must apply in every part of the country. Without such uniform standards and requirements, completeness of registration may not be achieved in some areas and the interpretation of vital statistics and their comparability, nationally as well as internationally, will be imperfect.

318. Provision for uniform registration throughout the country is desirable even when the extent of compliance with the registration law is apt to vary among different regions or sectors of the population. To limit compulsory registration to one segment of the population, however large that segment might be, is not recommended,

except in countries where unsatisfactory conditions prevail. Where compliance with registration requirements is still at an early stage of development, adjustments should be made by the responsible agency for vital statistics, at the statistical collection or tabulation levels, so as to safeguard the quality of the resulting statistics.

(b) Inter-agency coordination committee

319. The clear delineation of duties should be supplemented by arrangements for the coordination of needs and services among the official agencies concerned with the registration of events for legal purposes, those responsible for compiling information on vital events for statistical purposes, and those that use those data for administrative or analytic purposes in connection with economic and social matters, or for planning, operating and evaluating public-health programmes, maintaining population registers, personal identification files, etc.

320. Coordination with respect to coverage, definitions, classification schemes and tabulation programmes should also be maintained with the authorities responsible for the population census, sample demographic surveys, population registers, migration statistics and public-health statistics, and with the agencies responsible for social and economic statistics in general.

321. The coordinating mechanism established to achieve these objectives should have a direct relationship with the agency responsible for the general coordination of the national system of statistics and with that responsible for planning economic and social development.

322. It is neither efficient nor effective to attempt to carry out these inter-agency coordination functions through a series of bilateral meetings, committees or communications with other agencies, one at a time. Rather, an inter-agency coordinating committee should be established, comprising representatives from each involved or interested agency.

(c) Other coordination, liaison and communication within the civil registration system and with users

323. In addition to external coordination, coordination within the civil registration system is essential so as to ensure that uniform processes and practices are followed at every level. Regardless of whether the system is centralized or decentralized, good communication among the various offices involved in civil registration and in the production of vital statistics is required in order that high standards of quality may be established and maintained. The communication links must function in both directions: from the local offices to the central authority and from the central authority to the field offices. In addition, communications must be good between those working in the registration domain and those working on vital statistics production and analysis.

324. A number of communications techniques can be effective in both civil registration and vital statistics systems, including the use of periodic workshops, conferences and national conventions and newsletters and the employment of travelling field consultants. Contemporary Internet-based networks and media represent an ideal platform for establishing real-time and effective communication among various offices and institutions. Representatives of other entities outside the system should be included in the communications network when coordination with other agencies and disciplines is appropriate. For example, representatives of the above-mentioned

inter-agency coordinating committee should be included within appropriate areas of the communications networks.

4. Designation of responsibilities and organization of civil registration at the local level

(a) Recommendations regarding local civil registrars

(i) Appointment and status of the local civil registrar

325. The local civil registrar is the official authorized by law to register the occurrence of vital events and to represent the legal authority of government in the field of civil registration. Since registration functions involve the general public on a daily basis, the local civil registrar is responsible for maintaining a constant and continuous relationship with the community. The efficiency and completeness of registration are contingent upon the capability, attitude and expertise of the registrars in the fulfilment of their obligations. Because of the important role of the local registrar in the civil registration system, the civil registration authorities must exercise care in selecting and appointing suitable registrars and deputies within each primary or secondary local registration office.

326. For a civil registration system to be successful and serve the needs of the general public, local civil registrars must be employed full-time, enjoy the status and benefits of the civil service and be adequately paid for their work.

327. To be able to produce complete, accurate and timely registration, registrars must enjoy recognition and standing in the communities they serve. This will enable them to carry out their responsibilities faithfully and to remain informed of vital events as they occur, through cooperative arrangements with knowledgeable persons, such as personnel in hospitals, clinics and health centres, as well as funeral directors, church officials and court clerks.

(ii) Duties and responsibilities of the local civil registrar

328. The duties and responsibilities of the registrar should be clearly stated under civil registration law and should typically include conduct or oversight of the following functions:

- (a)* Recording specific information regarding vital events according to established methods and procedures;
- (b)* Ensuring compliance with registration law;
- (c)* Ensuring the accuracy and completeness of each record;
- (d)* Adopting such measures as are required to enable the public to be informed of the necessity, procedures and requirements of registration, and the value of vital statistics;
- (e)* Taking custody of records;
- (f)* Ensuring the completion of a statistical report for each registered vital event and its transmission according to a regular time schedule to the compiling agency, for data processing and dissemination;
- (g)* Issuing certificates or copies of the vital records upon request;
- (h)* Providing customer services;
- (i)* In the case of death registration, ensuring that the certification of the cause of death is part of the documentation.

329. Where there are factors related to distance, terrain or transportation which make it difficult or impossible for informants to visit the registration office to register vital events, provision should be made for registrars to carry out their official functions on an itinerant basis, preferably by making regular rounds within their jurisdiction to enable households to register such events as may have occurred since the registrar's last visit.

330. The local registrar's functions should also encompass activities designed by the system's management to promote and evaluate the efficiency of the system, such as implementing mass publicity programmes in vernacular languages, securing support from local leaders to inform local opinion, encouraging control of burial grounds to ensure burial permits are secured before burials occur and developing evaluation procedures designed to measure the degree of completeness of registration.

331. Support necessary for carrying out such activities may, in many instances, be provided by the statistical service and the health department.

332. In order to carry out their required duties, the local civil registrars should either reside in or maintain local offices in the areas of registration to which they are assigned. The registrars should be in their offices on the days and at the hours approved by the civil registration laws or regulations. Besides demonstrating familiarity with these laws and regulations, the registrars should inform the public of their obligations in order to ensure complete and prompt registration. It is strongly recommended that with a view to improving the coverage and quality of vital events registration, the local registrars play an active rather than a passive role.

333. In the registration domain, registrars are responsible for having knowledge of and receiving reports on all live births, deaths, foetal deaths, marriages and divorces, as well as any other vital events that may be legally subject to registration in their respective areas; and they must be familiar with registration law and assume responsibility for interpretation of that law and for securing compliance with it. They must also publicize the work of their offices and the obligations of the public in order to ensure complete and prompt registration. Registrars are responsible for overseeing the completion of written records describing each event, the critical examination of those records and the certification of accuracy by the informant; and they must take steps to obtain missing and handle apparently incorrect data. The registrars must assume custody of the legal records, provide for searches of files, and issue burial permits and certified copies of records. Further, they must issue complaints against those who fail to register vital events and perform any other registration functions that, by law, may be required of the office of the registrar.

334. To meet official statistical needs, registrars must ensure the completion and forwarding of a statistical report for each vital event registered or otherwise provide the required data in an acceptable format (e.g., electronic) to the appropriate authorities charged with the compilation of vital statistics. This should be carried out in a timely, periodic fashion but should be so scheduled as to allow sufficient time to secure a maximum number of registrations and to check and verify the completeness and accuracy of the reported data. At the same time, the schedule for submitting the statistical reports or data should allow the statistical authorities sufficient time to produce the needed current vital statistics. The registrars may also be required to inform local health authorities of the occurrence of certain vital events, such as live births and deaths from specified causes. Further, the registrars have to ensure the completeness of the submission to the statistical office, especially for causes of death, in the case of registration of death.

(iii) Improving the efficiency of local registrars

335. A civil registrar, whether local or national, must be familiar with the laws and regulations related to civil registration as well as with the methods and procedures of vital statistics data collection, reporting and compilation. Civil registrars must undergo a basic orientation and receive training in registration and statistical reporting before they are assigned to their duty stations. Routine inspection of their work is required. The visits in this regard fulfil not only an educational but also a motivational objective. Equally important is the provision of the appropriate current manuals of procedures. From time to time, they must also be given in-service training in order to keep their work up to date.

336. The national registration authority or its equivalent should take steps to provide guidance and instruction for registrars in carrying out their duties and responsibilities, including the issuance and updating of manuals and the provision of periodic training classes. Overall guidance should likewise be provided on how to improve the system. It is the local registrars who, as the bastions of the registration system, must carry out their responsibilities in such a manner as to not only maintain but improve the system.

337. The establishment of a nationwide professional association of civil registrars and vital statisticians for the purpose of promoting, inter alia, the exchanging of views on the administration of registration laws, and devising strategies for the improvement of registration, is an important means for improving the quality of the work of registrars, statisticians and health workers and researchers. This approach is advantageous for both centralized and decentralized civil registration systems and especially useful when a country's administration of civil registration is decentralized. A single professional association is particularly useful in bringing all the personnel engaged in registration and analysis of a country's vital events together, either physically or through written communication, so as to promote uniformity, good registration practices, problem-solving and professionalism.

(iv) Penalties for failure to comply with the law, rules and regulations

338. The civil registrar, as a public servant, is expected to faithfully carry out the provisions of the law and all applicable rules and regulations. Therefore, there must be penalties prescribed in the civil registration law for failure to do so. In criminal cases, the highest registration authority (e.g., the registrar general) is accountable to the competent law enforcement authorities. Penalties should be spelled out in the law in cases where the registrar:

- (a)* Fails to register a vital event or its characteristics, as reported by the informant;
- (b)* Loses, damages or alters any registered records or permits such loss, damage or alteration to occur;
- (c)* Fails to provide registrants with adequate protection of privacy and confidentiality;
- (d)* Has been found guilty of violating the provisions of the civil registration law or its rules and regulations;
- (e)* Fails to fill out and submit statistical documentation.

339. While it is essential for the system to provide penalties for failures of compliance, it is equally important for local registrars to be encouraged, through the provision of incentives, to do their best in supporting and improving the system.

Such incentives as the granting of permanent civil service status, career development and training opportunities, merit-based promotions, and special awards and other forms of recognition for outstanding work, are considered important contributors to the development of a corps of expert, reliable and dependable local registrars.

(b) Recommendations for local registration units

(i) Primary registration areas: number and size of primary registration units

340. A primary registration area (unit) is that part of the territory of a country that is entrusted to a local civil registrar for the recording of the vital events occurring therein. Each primary registration area is therefore the jurisdictional territory of one of the local civil registrars. The size of the primary registration area, in terms of both geographical area and population, should be such that the registrar in charge can give that area the attention required to produce complete and timely registration. It should be managed by one local registrar and should be easily accessible to the public it serves.

341. The proper determination of the number of local civil registration offices and the selection of their locations are important considerations for the efficient operation of the whole civil registration system. The boundaries of the primary registration area should be made to coincide with those of minor civil divisions of the country. However, as the needs of civil registration are not always the same as those of general administration, the adjustment of registration area boundaries must be viewed as an important step towards ensuring accessibility of local offices and promoting the completeness and timeliness of registration. The management of civil registration should make adjustments to the primary registration units, if necessary, by redefining their boundaries or by forming new units, where appropriate.

342. Local registration offices should be established in adequate numbers and be so located as to ensure that they are easily accessible to the public; and they should be kept open for business during convenient hours so that informants can comply with registration requirements within the time allowed by law.

343. Determination of the number of local offices, both primary and secondary, that may be needed by a country should take into account the following factors: (a) the area's population size; (b) staff resources available to perform the registration work and availability of staff training; (c) material resources available to each office; (d) accessibility, including factors such as distance and topography, transportation facilities and climate; (e) literacy level of the population; (f) degree of simplicity of procedures; and (g) quality and adequacy of basic documents.

344. How many primary registration units a country should have and what their optimal sizes should be are closely related issues. If there are not enough registration offices, the geographical area that each unit is to cover will be larger than desirable. Added to the travel-related inconveniences will be difficulties associated with office accessibility, which means that completeness of registration will not be achieved. On the other hand, the establishment of too many local offices would hinder the supervision of registration work and would be inefficient and costly. Furthermore, the availability of local civil registrars with adequate qualifications is always limited.

345. Ensuring that a registration office is easily accessible to every segment of the population is the first step towards achieving complete registration. If an

individual must travel a great distance, suffering inconvenience and incurring personal expense, in order to register an event, registration may be delayed or neglected entirely. If the registration office is open for only a few hours daily or only on certain days of the week, its accessibility to the public becomes seriously limited and compliance with requirements may be difficult to achieve. For this reason, civil codes or administrative practice should maximize to the fullest extent possible the number of hours and days of the week during which the civil registration office is open to the public for business.

346. The size of the registration unit in terms of both area and population density should be such that the registrar can give to that unit the attention required to produce accurate and universal registration. Such attention may involve remaining informed by one means or another of all the events occurring in the area, or simply handling expeditiously all requests for registration searches and certified copies. For a superintendent registrar, this may entail the capacity to check on or examine periodically the work of subordinate registrars. For every registrar, it means being informed of the events that have occurred, recording them accurately and promptly in the official registers, and completing and transmitting the statistical reports on a timely basis. Falling behind schedule, with the resultant backlog of work, is to be rigorously avoided.

(ii) Secondary (subsidiary) registration unit

347. In order to improve the registration coverage of live births, deaths and foetal deaths, countries may set up additional civil registration offices (called secondary or subsidiary registration units) at selected locations where the number of vital events is large enough to warrant an additional unit, such as hospitals and other health facilities within the jurisdiction of a primary unit. The establishment of a secondary registration office should entail the appointment of a responsible registrar; and a clear definition of the boundaries of the registration area, which may sometimes cover localities outside the hospital precincts, must exist.

(iii) Mobile registration units for remote places

348. For those areas of the country where the population density is too low to justify setting up a permanent registration unit or where the accessibility to an existing registration unit is limited by terrain or distance, consideration should be given to establishing a mobile (by land, sea or air) registration unit. Such a unit would travel to predetermined places according to a fixed and well publicized schedule and remain in each such place long enough to collect and record the required registration data for the vital events that will have occurred since its last visit.

5. Designation of a legally responsible informant for each type of event

349. The informant is required by law to report to the local registrar the occurrence of a vital event, its characteristics, the persons directly concerned with the event and their characteristics. In the absence of documentary evidence, the informant may serve as a witness to the occurrence of the event.

350. Where vital events occur in institutions (e.g., births in hospitals or maternity clinics, deaths in nursing homes or hospitals, etc.), the most effective approach is to designate the institution as the informant. Where this is the case, the head of the institution usually designates certain staff members to be responsible for gather-

ing the necessary personal particulars and the required medical and other information from the institution's records and for ensuring that the particular vital events occurring in the institution are reported to the registrar. The designation of institutions as informants for vital events occurring within their jurisdiction is particularly effective in countries or regions within countries where a significant proportion of events occur in institutions (e.g., hospital births in metropolitan areas). In the case of deaths, some countries have found it useful to require the funeral director to collect the personal particulars about the decedent from the next of kin and to provide the information to the registrar. This does not affect the responsibility of the medical certifier of causes of death, who must still provide cause-of-death information in the internationally prescribed format.

351. The importance of the informant lies in the fact that the registrar can legally record a vital event only on the basis of a legally designated informant's declaration, either verbally or in writing. The informant must be able to supply not only the accurate information necessary for registration, e.g., for legal purposes, but also the particulars required for statistical purposes.

352. The designation of an informant for each type of vital event should be established clearly and unequivocally in the civil registration law to ensure that there will be one and only one person primarily responsible for providing the information needed for the registration. Notwithstanding, the law may designate alternative informants and establish the order in which each of them must assume his or her responsibilities. Unless the informants are aware that they are required by law to report the vital event to the local registrar and that no one else shares their responsibility, they cannot be expected to comply.

353. Registration authorities should make provisions to permanently publicize issues related to where, how and when registration should be done.²²

354. In connection with the registration of a birth, death or foetal death, it is important to note that the informant's function is one of declaration, which is not to be confused with the supplementary function of medical certification of live birth or of cause of death or foetal death. The declaration of the fact of birth or death should be obligatory or compulsory for a designated informant, and the certified cause of death or foetal death should always be a necessary part of the registration information, as it is an essential statistical item. Usually, the responsibility for reporting the occurrence of a death falls on the relative closest to the deceased, who is a layperson, while the responsibility for certifying the cause of death necessarily falls upon the attending physician or, in cases where a medical-legal officer is legally involved, upon the coroner or medical examiner who took charge of the case.

355. The appropriate informant or source of information, and suggested alternates, in priority order of preference for the different types of vital event, are given below.

Live birth and foetal death

1. The head of the institution (or designee) if the birth occurred in an institution
OR
2. The mother
3. The father

²² Guidance on these issues is provided in the *Handbook on Civil Registration and Vital Statistics Systems: Developing Information, Education and Communication* (United Nations publication, Sales No. E.98.XVII.4) (United Nations, 1998a).

4. The attendant at the delivery
5. The nearest relative of the mother
6. Any other adult person having knowledge of the facts

Infant death

1. The head of the institution (or designee) if the death occurred in an institution
OR
2. The mother
3. The father
4. The nearest relative of the mother
5. Any other adult person having knowledge of the facts

Death of an adult person

1. The head of the institution (or designee) if the death occurred in an institution
OR
2. The nearest relative (e.g., the surviving spouse or partner; or a brother, a sister, the father or mother of the decedent)
3. Any other adult person having knowledge of the facts

Marriage

1. The bride and the bridegroom

Divorce

1. Either one of the parties
2. The petitioner of divorce

F. The civil registration process

356. In reporting the occurrence of a vital event, the informant contacts the local civil registrar's office, in most cases in person, to request the registration of a vital event within the time limit stipulated by law.

357. Each of the steps that constitute the registration process is described below.

1. Place of registration

358. The registration of a vital event can be by the place of occurrence or by the place of usual residence. Whichever norm is adopted, it is important that the civil registration law clearly state the place of registration for each type of event. The place of usual residence is the geographical location (or address) where the specified person usually resides. While there are usually no problems in determining the place of occurrence, there may be difficulties in determining the place of usual residence. For example, some persons may have more than one residence (e.g., businessmen, students living away from their parental home or members of the armed forces), others may have no usual place of residence (e.g., vagrants who live as permanent transients), while still others may be seeking a residence (e.g., refugees). The treatment of all such cases should be clearly stated in the registration law. Most countries have adopted the place of occurrence as a norm for the registration of births, deaths and foetal deaths.

359. Registration of vital events by place of occurrence facilitates and accelerates the registration process. However, registration by place of residence gives a better

picture of the demographic changes in the resident population. The two options are not mutually exclusive. First of all, most vital events tend to occur in the place of residence itself. Second, in the recording of information, it is important to obtain both place of occurrence and place of residence. Therefore, tabulations by both places can be produced. In the case of marriages and divorces, tabulations by place of occurrence are the usual practice, since place of previous residence of either or both of the parties is of limited interest.

360. For statistical as well as legal purposes, it is recommended that, in the registration of the place of usual residence for each specified vital event, the place of residence of the following persons be obtained:

<i>Vital event</i>	<i>Place of residence of</i>
Live birth	The mother
Foetal death	The mother
Infant death	The mother or the infant
Death	The decedent

2. Time allowed for registration

361. The time allowed for registration is the period of time within which the informant must report the occurrence of a vital event and its characteristics to the registrar. The period of time should be specified in the civil registration law for each type of vital event.

362. A shorter period of time allowed for registration is preferable to a longer one. A principal reason for this preference is that the informant may forget details of the event or may fail to report the event when the allowed period is too long, leading to misreporting or underreporting of events. For deaths and foetal deaths, registration should take place as soon as possible for reasons of public health and because the burial or cremation permit should be issued by the registrar only after the death registration is completed.

363. Because each type of vital event is different from the other types, the time allowed for registration need not be the same for each of them. However, a requirement for timely reporting, as soon as possible after the event, should be established. It is preferable that uniform procedures and time periods be applied throughout the country and the maximum period allowed between the occurrence and the obligatory registration of a vital event be as short as possible so as to facilitate current and accurate registration. A grace period of up to one year after the event has occurred may be allowed for if there are extenuating circumstances.

3. Cost of current registration

364. So that full registration coverage can be attained, it is recommended that when registration of a birth, marriage, divorce, foetal death or death occurs within the time period prescribed by registration law, no fee be charged. Fees charged should be related to the purpose of issuance, for example, of certified copies of vital records. Fees may apply in cases of delayed registration of vital events as provided in registration legislation. For individuals, fees may be related to the extent of the delay or to the nature of the information, e.g., name changes, legitimations, adoptions and the establishment of filiation. Minor corrections due to clerical errors discovered at the time of registration, burial or cremation should be permitted free of charge. As

regards certificates requested by public agencies as part of their normal duties, copies may be provided free of charge.

4. Proof required for the registration of vital events

365. The registration process begins when the civil registrar receives proof of the occurrence of a vital event from an informant. Depending upon the type of event and its circumstances, proof may encompass legal documents, medical certificates, witnesses, a personal declaration or a combination thereof.

366. Documentary evidence is, in general, more reliable than that provided by a witness. Therefore, the witness should always be accepted as providing supplementary proof of the event. However, documentary evidence is not always available. For example, a medical certificate may not have been issued if a birth occurred without medical attendance. In the absence of documentary evidence and when the local registrar is a trained official, it may be possible to empower him to determine when proof provided by a witness should be acceptable and when registration should be accepted solely on the basis of the information supplied by the informant.

367. In the registration of divorces, annulments of marriage and judicial separations, a transcript of the judicial pronouncement or the decree granting the event is needed as proof before the event can be registered. Similar legal documents may be needed for the registration of recognitions, legitimations and adoptions. It should be borne in mind that these types of proof cannot be replaced by that of witness(es) or by the sole declaration of an informant. In the case of marriage registrations, a marriage licence is generally required.

368. Documentary evidence presented to the civil registrar is generally prepared by different agencies for various purposes. Therefore, in the process of registration, the local civil registrar has to be familiar with all types of documents and their design and purpose, so as not to be deceived. In some cases, for certain types of vital events, the legal document, the medical certificate and the statistical report are combined in a single form. Thus, the same form may be used as proof of the occurrence of a vital event, as a registration record and as a statistical report. In other cases, the legal document and the medical certificate may contain useful information but may not be fully satisfactory for registration and vital statistics purposes. In such cases, it is advisable for the civil registration administration to approach the relevant agencies that issue the forms in question to request that they improve those forms' design to enable them to meet a multiplicity of needs. At the same time, the issue of registration and statistical information should not impose a burden on those who are responsible for preparing the document.

5. Provision for late and delayed registration

369. A late registration is the registration of a vital event after the legally specified time period but within the grace period. As indicated above (para. 363), the grace period is usually considered to be one year following the vital event.

370. Delayed registration is the registration of a vital event after the grace period has expired. Even in the best of civil registration systems, it is likely that delayed registrations will occur. Depending on the extent of the delay, these registrations may result in omissions from the tabulated vital statistics if they are made after the file of records for a particular year has been subjected to final processing.

371. The civil registration laws should make provisions for the handling of late and delayed registrations by the type of vital events and by the length of the period of delay. These provisions should indicate the required documentary evidence which may be acceptable. A scale of fees may also be established in accordance with the length of delay: the longer the delay, the larger the fee.

372. There are several issues that contribute to delayed or late registration: some relate to the operation of the civil registration office and others to the community itself. As regards the registration office, proper and timely registration tends to be delayed if the registration proceedings are too intricate, the cost of registration is too high or the registration offices are not easily accessible. As regards the community, delayed or late registration is likely to occur when the general public is not aware of the requirement for or lacks in interest in registration.

373. Efforts to reduce delayed registration must be made by the management of civil registration. The improvement of the efficiency of the civil registration system is of primary importance. Care must be exercised in setting sanctions, particularly penal ones, for delayed registration. Contrary to what might be expected, sanctions discourage registration and entail the risk of keeping important segments of the population from registering vital events or lead to false declarations of important data, particularly the date of occurrence. More effective results can be obtained through educational programmes aimed at the public as well as from the introduction of incentive measures aimed at raising the community's interest in the timely registration of vital events (United Nations, 1998a).

6. The vital event registration record

374. A vital event registration record registers the information on the occurrence of a certain type of vital event. It contains information on certain characteristics of the event and on the persons related to the event. A vital event registration record has legal value and its status is also dynamic, i.e., it is subject to corrections and amendments throughout the lifetime of the individuals concerned.

375. In the process of registration, a local registrar, upon receiving proofs from the informant on the occurrence of a vital event, must, as a general rule, prepare two documents—a vital event registration record and the corresponding statistical report. The registration record becomes a part of the registration files. Owing to its many uses, it should be properly stored and permanently preserved. The statistical report, once filled in and checked for the accuracy and completeness of the topics and themes required, is forwarded to the agency responsible for compiling vital statistics. These are the two most important documents in civil registration. As civil registration becomes computerized, however, these two components are actually merging into one computerized input in the system. However, in the cases where civil registration relies on manual entries, there is a need to ensure uniform procedures for the preparation of these records. This issue concerning the vital event registration record is discussed below. Some countries may prefer, however, to use a combined form for both legal and statistical purposes, in which case the statistical report is a duplicate of the vital event record. Regardless of the medium used in preparing the vital event registration record, it is essential that the original and one copy be available for the compilation of the central and local civil registration files. It is also important that the forms be standardized throughout the country. In countries where the registration document and the statistical report data are combined on a single form, a clear distinction should be made between the legal and the statistical components. This

is important given that certified copies of the legal portion of the records are subsequently prepared from the combined forms; items that are relevant only for statistical purposes must not be reproduced on certified copies of the records.

376. Specific provisions need to be included in the civil registration regulations to indicate that a duplicate of the registration record has the same legal value as the original one.

377. The decision to adopt a specific type of registration document is a critical matter demanding careful consideration, since there are both advantages and disadvantages associated with each type of document. The amount of available space and the design and selection of furniture and other means of storing and preserving documents must be taken into consideration, as well as the characteristics of the documents themselves.

(a) Ways and means of preparing records of vital events

378. The present revision of principles and recommendations for a vital statistics system strongly—and unambiguously—endorses the development of computerized civil registration systems and the use of contemporary technologies in developing and maintaining both civil registration and vital statistics components. However, since it is a fact that, in a number of circumstances, manual techniques are used to register vital events, we have chosen to briefly examine the registers produced using those techniques—i.e., the book register, the loose-leaf (single sheet) register and the card register.

379. *Book register.* In a book register, preprinted blank registration forms are bound together as a book in hard-cover, enabling each vital record to be entered consecutively as it is reported. Thus, the records of vital events are filed in the order in which they have been registered and not in the order in which they occurred. This option requires that the statistical report be prepared separately. Handwritten information is entered in the register and a duplicate book register must be manually prepared for backup purposes. This method increases the likelihood of introducing errors during the transcription process.

380. *Loose-leaf register or card register.* The loose-leaf and card registers have essentially the same characteristics. They differ only in the way the records are subsequently maintained and stored. Each vital event is recorded on an individual form. Duplicates of records can be prepared by use of carbon paper or sets of multi-copy forms or by photocopying. If properly designed, they can satisfy the information needs of both civil registration and vital statistics, i.e., the registration record may be used as the statistical report as well if a distinction between legal and statistical topics is maintained.

381. *Electronic registration records.* The registration and storage of vital records in electronic form, which constitute the most effective and appropriate method of civil registration, facilitate record linkages within and outside the system. The major advantages of an electronic system are: significantly reduced file storage space requirements; ease of amending or correcting records; speed of individual record retrieval; automated creation of certified copies of records; single data entry of both legal and statistical information, which allows for the configuration of a comprehensive civil registration database for the country; possibility of multiple user access to a single central file; automated production of an alphabetical and/or chronological index; monthly frequency runs from the master files to review the completeness of coverage and the accuracy of data items on the files; and effective and timely produc-

tion of accurate vital statistics from the registration files (or statistical files for further processing by the vital statistics agency). However, the use of an electronic system for civil registration introduces several issues which must be considered such as: the possible need for permissive legislation; the need for diligent and thorough computer system analysis and design before other steps in the automation process can be taken; constant updates as the technology develops; the need for computer equipment; the cost of the equipment; the availability and costs of appropriate software for the system, including controls for authorized access to the files and adequate backup and protection of the files; and the need for appropriate training of staff and maintenance of equipment and electronic files.

382. It has to be emphasized that one of the major functions of the civil registration system is to provide the population with comprehensive services, such as issuing of birth and death certificates which are a basis for all the other legal documents an individual might need over their lifetime. In that context, only electronic integrated systems for registering vital events and issuing the accompanying documentation provide fast, reliable and holistic solutions. In a number of countries, civil registration offices provide a “bundle” of services that are made possible through the use of electronic systems. For example, by registering a birth, the registration office simultaneously communicates with the local health institution, informing them of the services they may need to provide to the mother and the newborn.

(b) Storing and preserving records of vital events

(i) Space and storage considerations

383. The fact that civil registration is a continuous exercise requires that the issue of storage of records be given serious consideration, especially as those records accumulate over the years. Space requirements in terms of storing the records have always to be assessed regardless of which format of recording is employed—manual or electronic.

384. Equally important in terms of storing the original records is the fact that adequate measures have to be developed for sorting the duplicate or backup copies of these original records. It is recommended that storing duplicate records be conducted in a physical location different from the one at which the original records are stored.

(ii) Preservation methods and safety

385. Safekeeping of records must be one of the highest priorities of the registration system owing to the importance of the records. All types of stored materials are subject to loss or deterioration over time. The storage of cards in metal cabinets, especially if locked, is undoubtedly safer than storage of books or binders on open shelves. If open shelves are used, the books and binders should be kept in locked rooms away from the public areas. In the case of electronic records, there is a need to develop regular updates of the storage media, as technologies change rapidly over time.

386. The life of paper and card records is finite and closely related to the quality of the stock itself as well as to the storage environment. Humidity, light, insects, rodents and fire, as well as simple wear and tear, are the enemies of such records. Policies for the restoration of deteriorated registration records should be in place among other protecting measures.

387. Food and beverage spills are also a threat to stored documents, regardless of the type of storage. Drinking or eating in the vicinity of registration files must be strictly prohibited.

388. Fires and natural disasters, such as floods and earthquakes, must also be considered in plans for safekeeping and preserving vital records. Standards must be in place for use at the registration authority and at each local registration office.

389. Safety also refers to protection against theft as well as misplacement or destruction. In addition, all types of documents are vulnerable to fraudulent alteration. If records are paper-based, fraudulent alteration can be minimized by using a special type of paper.

390. In addition to precautionary steps devised to guard against any of these or other threats to the safety and integrity of registration files, it is essential to plan for a “worst case” scenario, i.e., the case where, in spite of the procedures in place to protect records, an adverse event still occurs. The best line of defence is to have in place a procedure for making duplicate copies of files and storing them in a different location from the original files.

391. Regardless of the medium used for backing up files, procedures need to be instituted to update the backup files so that they are able to reflect additions, amendments, deletions or other changes made to the originals or to working copies of the records so that the original files can be reconstructed accurately if the need arises

(iii) **Need for central storage and preservation of vital records**

392. Vital records are legal documents needed, both by individuals and by society, for a wide variety of purposes, over extended periods of time. They must be adequately stored and preserved to facilitate their retrieval. If copies of a record are needed but the local whereabouts of the files are unknown to the applicant, locating the record may become a daunting task. The risk of irreparable loss is minimized, and the convenience of accessibility is enhanced, when all vital records for the country are kept in a well-protected central file, with backup copies safely stored in the local registration areas and in archives. If secondary or backup files are maintained at their local point of origin, the local registration offices function as off-site storage facilities, which can be called upon to assist in the recreation of the central file, should that be necessary.

(c) Storage and preservation of other related registration documents

393. Ancillary documents, such as court orders, adoption papers, documentary proofs submitted for the correction of errors, omissions, changes of civil status and other amendments to the original vital event registration record, must receive the same protection and preservation as the vital records to which they pertain.

(d) Recommended policies for the release of information on individual vital event records²³

394. There should be a policy directive, established in law and regulations, stating that information on individual vital event records is not to be disclosed except to specifically authorized persons, such as the registrants themselves; their legal representatives; a close relative, such as a spouse, parent or a son or daughter; or other person having a direct and tangible right to the facts contained in the record.

²³ Guidance on these issues is provided in United Nations (1998b).

395. Procedures for sharing files with other authorized official agencies, including any restrictions on use and permitted disclosures, should be spelled out in advance in a document jointly signed by the highest authority for civil registration, e.g., the registrar general, and the head of the sharing agency.

396. Similarly, requests for disclosures for research purposes of vital records information identifying individuals or institutions should be submitted to the registrar general for approval. Approvals should be based on compliance with the criteria for such disclosures which should be clearly set out in regulations.

(e) Content of the vital record for legal purposes

397. The content of vital registration documents must meet the requirements of the registration law. A minimal approach is to include only that information that is sufficient to provide legal proof of an event, i.e., the personal particulars, the date and place of the occurrence of the event and the place of usual residence. However, the content of the vital record may be used not only for juridical but also for statistical purposes. If this is the case, both statistical and legal data must be included in the layout of the record (for a detailed list of the recommended items and their definitions for statistical reporting purposes, see part one).

398. The topics recommended for inclusion in the vital records of births, deaths and marriages, either by themselves, so as to constitute a minimal legal document, or in combination with the statistical items set out in part one, are listed in annex I.

399. Some of the items serve a dual purpose and appear here as well as in the list of statistical items: they are important legal descriptors of an event and its circumstances but are essential to the statistical presentation and analysis as well. Recommended legal topics for other vital events may be suggested by those listed here (e.g., for foetal deaths, a combination of topics from the lists for live births and for deaths should be used, while topics for the divorce record may be derived from those appearing on the marriage record). The concepts and definitions of the topics should be the same as those utilized for statistical purposes.

(f) Numbering vital records

400. Registration records of each type should be numbered consecutively on an annual basis. A numbering system is essential for identifying each event registration record, as it is one of the bases for record searching and preparing an index.

401. For countries that use a personal identification number system or plan to develop such a system, a unique identification number may be assigned to each individual, at the time of his or her birth registration or at the time he or she enters into the registration files for the first time (e.g., a resident alien). This number may then be used in all subsequent vital event registration records of the person(s) concerned, as well as in a wide variety of other documentation acquired by the individual during his lifetime (e.g., passport, driver's licence, social security card, etc.). Such a number may be constructed from a series of digits derived from various characteristics that are unique to the specific vital event, including a code for the geographical place of occurrence, a numerical representation of the date of occurrence of the event and the sequential number given to the record in the register.

402. Such a numbering system has other advantages as well: when such a number appears on originals of records as well as copies, it serves as a quick identifier of the local registration office, the date of the event and the sequential location

of the record in the files. Also, it significantly enhances the quality of record linkages. This numbering system may also be helpful in spotting forged or improperly altered records if the number is inconsistent with other data on the record. However, safeguards should be provided to prevent misuse of this number and the violation of confidentiality by others.

403. The actual number of digits of the identifier number depends on how many items are to be represented, the number of digits needed to represent each component item and the number of events needing sequential numbering each year. Allowance for the potentially maximum size of this number is particularly important if electronic data processing is to be used in either the civil registration or the vital statistics system.

7. Complementary notations (additions) in vital event registration records

404. A civil registration record should reflect the civil status of the registered person. If that civil status or name changes, the record should be modified in such a way to show the change, reflecting the dynamic characteristic of the vital registration record.

405. Divorces, annulments of marriage and judicial separations of marriage and complementary notations in the marriage registration record should be made upon presentation of the judicial pronouncement of such an event by the informant. When the above-mentioned events occur at a place other than the place of marriage registration and events are to be registered by place of occurrence, provision should be made for notifying the original place of marriage registration about those changes so that complementary notations can be made in the marriage record.

406. The fact of death, especially of infants and children, should be noted on the birth registration record as a means of protecting against one type of fraudulent use of copies of the birth record, as some individuals seek false identities. The birth record, in particular, is subject to such abuse because agencies accept it as an identification document.

407. Similarly, registration of recognitions, legitimations, adoptions, change of name(s) and surname(s) calls for complementary notations in the corresponding birth registration record. Some countries therefore may choose not to prepare separate individual records for those events, except for adoptions, since they should be kept confidential with respect to the adoptee.²⁴

408. Complementary notations to civil registration records should be authorized by the courts or entered only if authorized by a regulation or other administrative directive.

409. Additions or changes to the registration records must be made in such a way as not to alter any of the original entries. Therefore, it is of paramount importance that the layout of the registration record allow ample space for entering those additions. Furthermore, it is important that the changes be made in duplicate so that copies can be forwarded to the central storage place and other archives. While the principles are the same as for paper records, the methods employed for making additions or changes to electronic records may differ. Annotations in computer or disk files can be made in an online mode in a section of the record designed for annota-

²⁴ See examples in paras. 504, 507, 508 and 510 of United Nations (1998d) for guidance on these issues.

tions. Annotations for microfilmed record files can be made by creating a separate roll of microfilm. Next, a method must be developed for sending the searcher to the location of the annotated record in the new roll of microfilm.²⁵

8. Amendments (corrections) to vital records²⁶

410. Civil registration records may require amendment if they are found to contain clerical or other errors made at the time of registration. Provision should be made in the registration law and regulations for the correction of errors, specifying who may make the corrections and under what circumstances they may be made. There are three sources of authority through which corrections may be made.

411. Authority to make amendments to records may be vested solely in courts with appropriate jurisdiction, especially where corrections involve legal aspects of registration, such as dates of occurrence. In cases where there could be some question regarding or dispute over the correctness of an entry and the discrepancy is not clearly an inadvertent or clerical error, corrections must be made only upon the issuance of a judicial resolution. Generally, however, judicial proceedings are slow, complex and costly. Under this type of arrangement, the correction of errors in registration records is a difficult process.

412. Authority for making amendments may rest with the civil registration authority itself, which is the legal custodian of vital records and any associated reports of individual vital records. This type of arrangement makes the process of correcting errors simpler, quicker and less costly. The civil registration agency has a specific interest in the accuracy and authenticity of registration and such an arrangement provides a further opportunity for the central agency to supervise and monitor the work of the local registrars.

413. Authority for making amendments may involve a combination of the above two approaches, where an administrative procedure is used to correct apparent errors and a judicial process is adopted when there are legal implications or matters of dispute.

414. Any correction in a vital event record, regardless of the medium used, should be made in such a way as to ensure that every copy, either active or archival, is amended to reflect the changes. This requires the making of duplicate copies of the changes, to be forwarded to all locations that maintain active or archival copies of the files.

9. Recommendations for issuing certified copies of vital event registration records

415. An important function of civil registrars is the issuing of registration certificates for various legal, administrative and other purposes. Each certificate of the records that have been carefully registered, stored and preserved constitutes testimony of the particulars set forth therein in all courts of law and in public offices. Because of the evidentiary nature of vital records certificates, civil registration legislation should include specification of the method of issuance.

416. As a deterrent to fraud and counterfeit, safety paper (paper that has been specially prepared to readily disclose erasures) should be used for certificates if possi-

25 United Nations (1998d), paras. 505-511.

26 Ibid., paras. 496-503.

ble, although this does increase cost. Paper with intaglio-printed borders (i.e., raised borders, such as those found on traveller's cheques) is available from a limited number of companies that produce such documents. Every certificate should be authenticated by a certification statement and the signature of the civil registrar or other designated persons within the civil registration system. An embossed raised official seal should be placed on top of the signature or elsewhere on the certificate to add to its authenticity and to make it harder to prepare false documents.

417. Care must be taken to ensure that only authorized persons have access to copies of the records. For example, it is recommended that certified copies of vital records be issued only to the registrant, his or her spouse, children, parents or guardian, or their respective authorized representative. Others may be authorized to obtain copies when they demonstrate that the record is needed for the determination or protection of his or her personal property rights.²⁷

418. Access to vital records information for official administrative purposes may also be permitted under controlled circumstances. Official agencies can, upon request made to the registrar, be furnished with copies of records or data, provided that the information is to be used solely in the conduct of their official duties and that any disclosures of information that might identify a person (or institution) have been specifically authorized by law, regulation or written agreement with the registrar general. Similarly, access for research purposes may be permitted provided that adequate safeguards for protecting the confidentiality in respect of the persons involved are written into the law and regulations.

10. Linkages of vital records within the registration system

419. There are both statistical and administrative reasons for linking records within the registration system. This is best illustrated in the case of the linking of infant death records to birth records by matching records of infant deaths in the death file with the corresponding record in the live-birth file, which allows information from the birth record, such as birth weight, gestational age and other characteristics of mother and infant at birth, to be combined with information from the death record, especially the cause(s) of death. The combination of data from the two kinds of records produces a data set richer in valuable statistical information than could be obtained from the two files separately. In addition, the quality of the civil registration system may be improved by such linking through the identification of unregistered births and the detection of inconsistencies in the reporting of items that appear on both the live-birth and death records.

420. The linking of infant death records to birth records can also be carried out as a means of preventing a particular kind of fraudulent use of birth records. A person wishing to obtain a false identity might apply for a copy of the birth certificate of an infant of the same sex who had died but who, had it lived, would now be about the same age as the fraudulent applicant. A copy of the birth record would then be issued and used to establish a false identity, whose risk of discovery would be lower than in the case where the identity assumed was that of a living person. To protect against this deceit, many vital record offices link infant death records with the corresponding birth record and "flag" the birth record with the word "deceased". Similarly, the sequential registration number from the death record is entered on the birth record. These entries serve as warnings to registration offices to exercise caution when receiving requests for copies of these flagged records.

²⁷ See United Nations (1998b) for the presentation of a comprehensive elaboration.

421. Other record-linking combinations within the civil registration system—such as linking birth records with marriage records of the parents and marriage records with divorce records—are less common but they may nevertheless have a useful statistical potential.

422. The establishment of the criteria for linking files can be complex, as it may involve assumptions about the probability of making a true match when all of the common variables in two records do not fully coincide. A universal numbering system is a major aid in assessing potential matches. Of course, not every record in the file will have a matching record in the other file. For example, not every infant whose death occurred in the jurisdiction of the civil registry was necessarily born in the same jurisdiction. Furthermore, the files from more than one year may have to be searched for matches; for example, infants may have been born in the same year as their death or the previous year.

11. Linkages of vital records with records of other systems

423. Matching may take place not only within the records of the civil registration system but also between civil registration databases and those of outside users. A birth defects registry may wish to match its records against the birth file for completeness checks. A cancer registry may wish to match its survivor records against the death records system. The voter registration unit, jury selection bureau or personal identification bureau may wish to purge their records of deceased persons by matching them against the death files. Outside researchers following a cohort will need to match cases lost to follow up against the death files. A study of health costs may wish to match social service or medical billing records against the birth or the death system. A population register relies heavily on vital event records to update its files.

424. Linking of birth and death records from appropriate annual files with records from a decennial census is a method, although usually an expensive one, of assessing the quality of data for items common to both the vital record and the census questionnaire, and also a well-recognized technique for examining measures of undercoverage in the census and/or completeness of registration.

425. Whenever record linking is employed, special consideration should be given to issues of privacy and confidentiality. Even when linking is done electronically, there are opportunities for inappropriate and inadvertent disclosures which must be anticipated and prevented to the fullest extent possible.

426. Contemporary approaches to civil registration that rely on well-developed computer systems provide a powerful opportunity to link and match records from different databases, thus allowing for the creation of sources of statistics that were not available before. For example, linking the records from the registration of births with the medical records of the mother before and after giving birth offers the possibility of acquiring a detailed understanding of the mother's health profile and the details of the process of giving birth and postnatal care. By the same token, application for a driver's licence does not require submission of a birth certificate, as this information can be accessed directly from the civil registration system. Therefore, as civil registration becomes computerized, linking and matching the records with other governmental databases for statistical and non-statistical purposes will substantially—and unavoidably—increase, resulting in a requirement that this procedure be regulated through appropriate legal instruments.

12. Recording, reporting and collecting civil registration data for statistical purposes

(a) Types of statistical reporting forms and content

427. At the time of registration, the local registrar has to prepare a statistical report for each vital event registered. The information for this report, taken from the medical certificate and any other evidentiary documents presented to the registrar, is to be provided by the informant. Data should be as accurate, timely and complete as possible.

428. The exact modalities for statistical reporting will depend on whether the civil registration is functioning in manual, computerized or mixed mode. The contemporary approach, based on a network of computers that enable communication between offices, would not differentiate between records for registration only and for statistical purposes, as one record would carry the information needed to satisfy both objectives. The only important consideration would be to ensure that, when the record is transferred from the registration to the statistical office, the name is removed, while the other unique identifiers, such as the identification number, remain, so as to meet the confidentiality and privacy requirements.

429. In countries with mainly manual operations, the statistical report form might be part of the registration form, i.e., the form would be designed for both purposes. This allows the local registrar to deal with only one type of recording form in the registration process, thus avoiding transcription that is likely to introduce errors.

430. In other countries, the registration form and the statistical report constitute two separate documents. In countries where legal provisions forbid the collection from civil registration documents of certain information on individuals, such as medical particulars, race or legitimacy, a separate statistical form provides a means for the collection of these and other items for statistical purposes. Furthermore, most countries now have statistical laws that guarantee the confidentiality of statistical information on an individual basis. If the registration and statistical forms are separate documents, it may be easier to obtain information for statistical purposes and to enforce confidentiality provisions.

431. Details of the content of the statistical report in respect of each type of vital event are discussed in part one.

432. The forms of the statistical report for a vital event should be uniform within the entire country. The standardization of format is as important in connection with the statistical report as it is in connection with the legal register. Such standardization is also an important factor in achieving greater efficiency in statistical processing.

433. National uniformity of reports on each event will be of help in standardizing instructions to registrars, a consideration that should not be overlooked when establishing the design for statistical reports.

434. Separate statistical reports for each type of event promote efficiency in reporting for statistical purposes, and help to bring about the completeness and accuracy of individual items of information. Multiple event-type statistical reports are not recommended.

(b) The statistical reporting process

(i) Principles of statistical reporting

435. A statistical report should be made out on every event that is legally registered, regardless of the timeliness of the registration or the procedure by which the legal record has been established. Statistical reporting of every vital event on a fixed time schedule is the cornerstone of the vital statistics system.

436. Every geographical area or ethnic group for which registration records are required should be included in the statistical reporting process. Emphasis should be placed on statistical recording and reporting of all events that occur, irrespective of either the degree of completeness of registration coverage or the extent of data available.

437. The emphasis on adhering to the principle of total inclusion of registered events in the statistical reporting flow is a response, especially, to the tendency on the part of some countries to limit statistical reporting to areas for which they assume registration and reporting are at least moderately complete. One reason why reports from every geographical area and population group should be collected is that there is a need to assess the data in connection with plans and programmes for future improvement of both the registration and vital statistics systems. The establishment of criteria of completeness as a prerequisite for inclusion in tabulations is an accepted means of improving the adequacy of the resulting statistics, but this should not be a bar to reporting, even where the quality and quantity of reports may be deficient. The exemption of an area or a group of the population from the obligation to report does not promote future completeness of registration or reporting for the area but, instead, acts as a deterrent.

438. Another reason for promoting unrestricted reporting lies in the fact that even fragmentary data for certain areas are better than none, especially as an aid to public-health programmes, where the need may be for individual reports or where even approximate figures for geographical subdivisions may be useful.

439. Reports on vital events for statistical purposes should be collected centrally by the agency that is responsible for the statistical compilation.

440. It is critical that vital statistics at subnational levels be produced, and provision should be made either for channelling original statistical reports through local, State or provincial departments of government or for supplying departments at those levels with copies of the reports. Regardless of which path is used, the need for timeliness of the data at both the national and subnational levels must be taken into consideration.

441. Every possible administrative procedure should be employed for enabling the prompt receipt by the central vital statistical office of statistical reports from every reporting area in order to ensure that complete, detailed and timely tabulations of vital statistics can be prepared.

442. It is essential that reports be received promptly so that statistical processing can begin as soon as possible. Indeed, every delay in reporting decreases the potential effectiveness of the query programme for accounting for and correcting deficiencies. The more time allowed to elapse between registration and querying, the less of a chance there will be of either locating or obtaining from informants the correct or necessary additional information.

443. To establish a proper time schedule for reporting, it will be necessary to consider not only the desirability of current reporting but also, from a practical

standpoint, those characteristics of the country that may deter prompt reporting. Poor communication and transportation facilities, isolation of parts of the country, effects of climatic conditions, etc., need to be taken into consideration in establishing a realistic time frame.

444. Once the time schedule is established, the receiving office must diligently control the receipt of reports. Control must be exercised so as to promote promptness, completeness and accuracy of reporting. Not only must reports be received on time but care must also be exercised to see that returns are received from every geographical reporting unit and that the frequencies reported are consistent with those of equivalent reporting periods in the past.

(ii) **Improvement of completeness, accuracy and timeliness for statistical purposes**

445. It is critical that the capacity exist to produce qualitative or quantitative indications of the degree of completeness and timeliness of registration for each geographical reporting area and also, where pertinent, for various significant segments of the population (e.g., various ethnic groups).

446. Each item on the statistical report should be accompanied by a clear, explicit and simple definition for the guidance of the person recording the information.

447. An appropriate continuous querying procedure should be established and maintained with respect to all data collected for statistical purposes, particularly with respect to missing entries or terms of doubtful meaning (such as the vague terms that may be used in reporting cause of death). This serves both to clarify the facts concerning the event and to educate the informant and the recording agent regarding reporting requirements.

448. Continuous training and instruction of both registrars and medical personnel for the purpose of improving basic data are an important component of an effective vital statistics system.

G. Computerization of the civil registration system²⁸

449. Contemporary requirements placed on the civil registration system in terms of providing services to the population and the technological environment call for complete and comprehensive computerization of all registration operations and production of vital statistics. The computerization of civil registration is even more imperative taking into consideration that other government functions are increasingly relying on computer technology, reflecting the development of so-called e-government. With the introduction and the massive use of the Internet, populations expect similar functionality in the delivery of services by the government as well.

450. As civil registration is designed to be permanent, continuous, compulsory and universal, it is recommended that policies focused on the development of a computerized civil registration system be designed jointly with all the agencies concerned, including the agency responsible for the production of vital statistics. Any changes in the recording, processing, storing and transmission of events/information will have an impact on the other main users of registration data, such as the ministry of health, the population registration agency, the identification service and the elec-

²⁸ Guidance on these issues is provided in United Nations (1998e).

toral services. The main users should therefore be consulted and kept informed from the outset of any changes and developments associated with establishing a computer-based system.

451. In the planning of a computerized civil registration system, several major decisions need to be taken. One can establish a checklist of activities for a plan for eventual computerization even when the implementation is to be limited to a portion of the system. This type of planning makes the inclusion of new actions and events a transparent process. The process is extensively discussed by the United Nations (1998e) under the following headings: (a) defining the framework of civil registration and vital statistics systems, including the preparation of a detailed overview of the current civil registration and vital statistics system and the identification of the events to be included and the setting of priorities for their computerization based on available resources; (b) defining a unique key to be used in the civil registration system, leading to the assignment of an identification number to each individual; (c) defining the objectives and purposes of computerization (it is advisable that the system design include the conversion process); (d) establishing the organization that will handle the computerization of the civil registration system; (e) deciding on an overall development and operational strategy; (f) deciding on the hardware and software configuration and procurement procedures; (g) inviting external contracts; (h) choosing a conversion/initialization strategy; and (i) testing and documenting system functionality.

Chapter III

Use of population registers for vital statistics purposes

452. Population registers have consolidated their status as a reality in several countries, especially those of Northern Europe, where they have become an important source of information for various statistical surveys, including the population census. Population registers have been effectively used as a statistical data source for decades and they may be considered the logical product of the evolution of a vital statistics system.

453. The interest in population registers dates back to the nineteenth century, when the International Statistical Congress had recommended their introduction.²⁹ Some forms of population registers already existed in various societies at that time, and several countries subsequently established such a system, in the nineteenth and twentieth centuries. However, full exploitation of the population register as a statistical source has become more feasible with the introduction of computerization.

454. The term “population register” was defined in 1969, in the publication entitled *Methodology and Evaluation of Population Registers and Similar Systems* (United Nations, 1969), as “an individualized data system, that is, a mechanism of continuous recording, and/or of coordinated linkage, of selected information pertaining to each member of the resident population of a country in such a way to provide the possibility of determining up-to-date information concerning the size and characteristics of that population at selected time intervals” (chap. I.A). Thus, the population register is the product of a continuous process, in which notifications of certain events, which may have been recorded originally in different administrative systems, are automatically linked to it on a current basis. The method and sources of updating should cover all changes so that the characteristics of individuals in the register remain current. Because of the nature of a population register, its organization, as well as its operation, should have a legal basis.

455. It has to be stressed that the primary function of the population register is to provide reliable information for the administrative purposes of government, particularly for programme planning, budgeting and taxation. The registers are also useful in other administrative areas, such as establishing personal identification, voting, education and military service, social insurance and welfare, and for police and court reference. Register information is also utilized for issuing documents needed for the admission of children to nurseries, kindergartens and schools and the assignment of residents to health clinics (United Nations, 1991, para. 476).

456. In the context of the current version of the principles and recommendations, population registers are considered only from the perspective of their relationship with the civil registration and vital statistics system. However, a few observations are necessary to demonstrate the potential and drawbacks of such a system for the provision of statistical information. Such observations are closely related to the definition of the population register given above. As regards population registers, this

²⁹ See *Report of the Official Delegates to the International Statistical Congress held at St. Petersburg in August, 1872* (Washington, D.C., Government Printing Office, 1875), p. 46.

publication does not cover issues of content, procedures, responsibilities and rights of data subjects, nor does it analyse in depth the pros and cons of their establishment in countries where such a source does not exist.

457. In general terms, a population register is not required to be a physical list (either in paper or electronic format) of single individuals available in a defined place. A population register can indeed be a network of local registers, but they must be linked in a coordinated way. Further, the single record of a population register may well refer to units other than individuals (e.g., families), but without preventing the information related to a single person from always being retrievable. To assist in locating a record for a particular person, household or family in a population register, an identification number could be provided for each entity.

458. At the minimum, a population register includes a list of individuals with whom the local and/or national administration(s) of the country need to communicate. Although the national population register may very well be a virtual entity based on the linkage of population registers established at the local level (decentralized system), the overall geographical coverage must be of the entire territory of the country. If this condition is not met, the national population register will not be an appropriate system for the production of statistical data for the country.

459. Likewise for the territory, the entire population must be included in the main population register(s), either central or local. On the other hand, a population register may induce over-coverage errors if data are not properly filtered during the data compilation process. For instance, a decentralized system based on local registers may incur a higher risk of duplication of records of individuals when summing up data at the national level.

460. Statistics on population and vital events should refer to the usually resident population. While for administrative purposes it is certainly legitimate to include in the population register persons who are not usual residents of the country (e.g., citizens living abroad, temporary residents, etc.), for statistical purposes care must be taken to identify the correct population of reference, especially if the statistics are used for international purposes and comparisons. The term “resident population” may indeed reflect various concepts of population and hence may refer, e.g., to the legal or registered (resident) population. However, the right of stay in the country (determining the legal or *de jure* population) or the simple registration of persons (who then make up the registered population) should not be considered sufficient criteria for identifying the usually resident population for international statistical purposes. Appropriate efforts should be undertaken to identify the usually resident population.

461. Although the usually resident population is the ultimate target for the compilation of internationally comparable statistics about and based on population, other categories of persons may be of interest. For instance, it may be useful to store information about former resident individuals (who either are deceased or have emigrated or disappeared), both for the correct computation of statistics and clearly—for migrants only—for keeping open the possibility of reattributing the same record to that person in case of return migration, re-immigration or circular migration. Temporary visitors may also be registered, either to estimate the present (*de facto*) population in areas of interest (e.g., areas with intensive tourism) or to monitor the shifts from a temporary to a usually resident profile.

462. For the sake of carrying out a proper statistical computation, if the population register contains information about repeatable events (e.g., live births, marriages, etc.), immigrants should be asked to provide information about the relevant

personal events that occurred in their past. For instance: a woman of childbearing age who gave birth abroad to two children but immigrated without them would be otherwise classified as childless, and statistics based on parity would be biased; a person whose previous marriage (although dissolved) was not recorded would be classified as a first-time marrying person in case of a marriage in the country; and in the case where the title of an immigrant's field of study was not registered or translated in the national system, that immigrant would not be characterized by the proper educational profile.

463. It is important to distinguish between registration of an individual in the population register and the inclusion of that record in the computation of internationally comparable statistics. While for national purposes, the listing of a person in the register in accordance with national regulation may be required, for international statistical purposes, only those meeting the requirements of usual residence should be included. For instance, persons who have left the country but are still holding a permanent residence permit can very well be listed in the population register, but they should be excluded from the computation of statistics. Particular care should then be applied to properly classifying registered persons who have emigrated, especially in those countries where there is no incentive to declare the emigration to the authorities.

464. It may be the case that, for national purposes or for specific studies and analyses, concepts of population other than that based on the usually resident population are used for the compilation of national statistics. However, the international comparability of statistics requires the adoption of the usually resident population concept. Therefore, for statistics intended for use at the international level, care should be taken to identify those records of the population registers that comply with the statistical definition based on the usually resident concept. To prevent any user confusion, the recommended approach is to adopt the same definition for national and international purposes, based on the usually resident concept.

465. It may be useful to distinguish between an administrative population register, whose main purpose is keeping track of individuals for government purposes, and a statistical population register, derived from the administrative one, whose purpose is to provide statistical information on the population. The two registers are not necessarily maintained by the same authority and they may be linked to different networks. For instance, the statistical register would not require the names of individuals. In this context, it is advisable to establish a personal identification number (PIN): in addition to being widely used in the national data system and in the society itself, it also facilitates the linkage between records of different registers.

466. In those countries where the responsibilities for the population register, the civil registration system and the vital statistics system fall under different agencies, it is important that the statistical view be taken into account when the relevant authority proceeds to make changes in the administrative register that it is responsible for maintaining.

467. It is of paramount importance for the quality and the usefulness itself of a population register to be continuously upgraded. For this purpose, the authority operating the population register must receive timely information at least about live births, deaths and changes of residence (including immigrants and emigrants). An efficient connection with the civil registration authority is therefore a fundamental element for the proper functioning of the population register.

468. Basic characteristics that may be included in a population register are date and place of birth, sex, date and place of death, date of arrival/departure,

citizenship(s) and marital status. Depending on the possibility of proper linking with other registers, much additional information may be added to the single record, such as language(s), ethnicity, educational attainment, parity, activity status and occupation. In order to be useful, any additional information must be kept up to date. If complete, population registers can produce data on both internal and international migration through the recording of changes of residence as well as the recording of international arrivals and departures.

469. It is not required that additional information be physically recorded in the population register. What is necessary is the coordinated linkage of the population register with any other register containing that information. These other registers may also be structured differently, for instance, they may have in their single records units other than individuals, or they may refer only to registers of subset(s) of the population, such as the employed, students and retirees. The more registers are linked, the higher the possibility that the timing of their updates may be a risk factor for the quality of the information. Care should be taken to synchronize the operation of updating across all registers concerned.

470. For registers whose record unit is the individual, it is recommended that, in the selected information, there be included the family/household to which the person belongs, as well as links to partner(s), ascendants and descendants. Besides serving as an important basis for fertility statistics and analyses, these data would also allow for the reconstruction of the information about families and households, as well as for the conduct of studies based on genetics, genealogical linkages and life course.

471. Population registers report on the characteristics descriptive, at any given moment, of the individuals, i.e., they provide information about the state of the person. Those characteristics can change or remain unchanged over time. For those changing states of the individual, each modification occurs through an event. For instance, marital status may change through the occurrence of marriage, divorce or death; parity may change through the occurrence of a live birth; educational attainment, through the successful attainment of a title in a field of study, etc. The continuous updating of a register of states thus requires the link to registers of events. Registers of events are usually part of the civil registration system of a country.

472. Some countries have separate agencies for the population register, for civil registration and for vital statistics. It is recommended that, in such a situation, births, deaths, marriages, divorces and other vital events recorded by the civil registration system be used as the basis for updating the population register. This provides an opportunity for both programmes to share and compare information while meeting their own separate objectives. The information on vital events should be transmitted to the agency responsible for vital statistics.

473. In some countries, the production of vital statistics is the responsibility of the population registration agency. In this instance, the agency is concerned not only with the registration of various vital events and their changes but also with the updating of the register and the compilation of vital statistics. The essential advantage of such an arrangement lies in a more timely production process and simplified maintenance; however, it is not very common.

474. In a more common arrangement, different agencies are responsible for different functions, and the absence of comprehensive and continued coordination among agencies might result in discrepancies in the outputs of these agencies. Hence, it is necessary to ensure, at the data-collection level, that just one form, such as a multipart form, is used to record the data and that copies are sent to each

organization for entry into its system. Thus, the same source documents serve as input into the respective systems.

475. The experience of some countries has shown that when a single record is used for both population register and vital statistics purposes, one of the most difficult tasks is handling confidential medical data on births, deaths and foetal deaths.³⁰

476. The population register and the civil registration system contain common data elements, the use of which requires a method for record linkage between the population register and the civil registration databases. Both systems have personal identifying information in the database, such as name, age or birth date, sex or place of residence. The linkage then becomes a task for computer matching, since the volume of records would make any manual approach very difficult. The use of unique personal identifiers simplifies the matching process.

477. In the case where vital statistics are produced separately and independently from population registers and civil registration, discrepancies may be displayed. For instance, civil registration may report all the events occurring in the country in the given period (*de facto* concept), while the population register may allow only those occurring to usual residents; or only a part of the certificates may be transmitted to the population register, etc. Mismatching between the two sources should be thoroughly investigated to identify the cause(s) and implement the necessary corrective actions.

478. A great advantage of computing vital statistics from population registers is the possibility of calculating directly specific demographic rates with potentially no numerator-denominator bias. For instance, it could be possible to compute specific fertility rates for employed and/or immigrant women, parity progression ratios, life expectancy by educational attainment, indicators on mixed marriages by ethnic group/foreign background, divorce rates by socioeconomic class of the spouses, etc. This requires full matching between civil registration and population register data as well as the same level of detail of information in the two sources, meaning that the certificate of the event (birth, etc.) must contain the same topics—with the same classification—as those available in the population register. In general, the use of the population register provides a broader opportunity to correctly identify the population at risk of an event.

479. The linkage of the population register with the civil registration system allows the reconstruction of the history of life events of the single individuals. Whether the date of the events is properly recorded, this high level of detail can be used also for estimation both of the duration of a demographic state (e.g., duration of the state of “married” or of “parity one”, etc.) and of the related probabilities of transition, as well as for longitudinal studies. Further, it may allow the definition of specific geographical aggregates of interest, such as population living in the coastal areas, or in particular disadvantaged localities, whose boundaries do not necessarily conform to the administrative boundaries.

480. In cases where the national legislation requires the registration of a person only after a defined period of time, rules should be established to deal with events occurring to the person in the pre-registration period, as well as those occurring in the period before the acknowledgement of the registered person as usual resident. For instance, a person may be required to register only for stays in the country that are over three months duration and may be recognized to be a usual resident only after

30 A discussion of this issue is presented in *Handbook of Vital Statistics Systems and Methods*, vol. I, *Legal, Organizational and Technical Aspects*, Studies in Methods, Series F, No. 35 (United Nations publication, Sales No. E.91.XVII.5), para. 505.

12 months have passed. If an event occurs either in the first 3 months of the stay or in the following period up to 12 months, there is the risk that this event will not be included in the pertinent statistics, because through the link with the population register the status of the person will be determined to be still temporary. It is recommended that the implementation of the concept of usual residence be based not only on the recorded duration of stay, but also on the intention of stay, which could be derived from proper evidence (e.g., a visa issued for a period of at least one year, an asylum application, etc.). This should reduce the number of cases of persons who, for an interval of time that may extend to one year, can be classified as a resident neither in the country of origin nor in that of destination.

481. The more information included in the population register, the richer the variety of possible analyses of population structures and dynamics, but at the same time, the greater the concerns about confidentiality and the more complex the issue of management. Gathering considerable information about individuals in a single system, including sensitive medical data on foetal deaths and causes of deaths, raises fears concerning disclosure as well as acquisition of too much knowledge regarding individual lives. It is highly recommended that countries put in place all the regulations, systems and practices needed to prevent any misuse of this important statistical source and to ensure that the authorities always practise transparency when using the population register. Further, the development of such a system may benefit from a progressive implementation, entailing, at the beginning, inclusion of only a minimum amount of information, so as to enable a full understanding of the efficient functioning of the population register and its acceptance by the society.

482. The use of the population register for vital statistical purposes entails linking events to the pertinent population at risk. The timeliness of the updating of the population register and the accuracy of the information recorded therein are thus factors critical to the quality of the statistics to be computed. The continuous and intensive administrative use of registers is an important means of ensuring their quality, since the everyday use of those registers in the society can facilitate the detection of errors. If the statistical and administrative functions of the population register are separated, an efficient system must be put in place to ensure perfect synchronization. Further, excellent coordination with the national and/or local authorities owning the vital events registers and a reliable technical infrastructure, based on computerization, are then required. In cases, where concerns about intrusion into the private lives of persons and about confidentiality risks may be spreading among the public, action should be undertaken to demonstrate the advantages of the system. Only widespread acceptance by the population can transform the population register into a reliable statistical source.

483. In practice, a population register cannot be deemed as such without being linked with the registration of vital events, which constitute information fundamental to its updating, together with the changes of address. In this respect, population registers are a kind of “continuous census”, encompassing the structure of the population at any given point in time, with all modifications occurring within it on a moment-to-moment basis. In a perfect system, the accounting of the demographic balance would be intrinsically correct for any given interval of time, be it a year, a month, a week, etc.; in fact, however, factors such as registration delays, lack of coordination, difference in definitions, among several others, may diminish the quality of the population register.

484. In conclusion, making the civil registration system a vital component of a computerized population register would offer the most appropriate and advanced

means of generating relevant, accurate, timely and comprehensive vital statistics. While building such a system would be resource-intensive at first, the dividends would extend over a prolonged period of time.

Chapter IV

The role of health institutions

485. Health institutions have a critical—and dual—role in the vital statistics system. First, health institutions act as informants of the occurrence of births, foetal deaths and deaths; and second, the certification of causes of death can be performed only by physicians attached to health institutions. In addition to these functions carried out within the framework of the vital statistics system, information collected by health institutions is crucial in generating health statistics which, in turn, provide irreplaceable information regarding the overall health of the population, and the functioning and the needs of the public-health system.

A. The informant function

486. In contemporary societies, more and more births and deaths are occurring in health institutions or involve some kind of services from the health system, which places hospitals and clinics in a unique position with respect to compiling relevant information regarding the event and informing the civil registration system of its occurrence.

487. A number of countries specifically designate—through the civil registration law—the health institution or its head as responsible for acting as an informant of births, foetal deaths and deaths occurring in the institution. In practice, this regulation is often translated into establishing a civil registrar office in each hospital and clinic whose function is to make the process of informing simple and straightforward. Once the information is delivered to the civil registration office, the parents (in cases of birth) or relatives (in cases of death) are instructed to contact the office to obtain the relevant birth or death certificate. The responsibility of the civil registration system to prepare and submit the information to the statistical authorities remains in place.

488. Even when, in accordance with the civil registration regulation, an individual is designated as being responsible for informing of the occurrence of a vital event, the role of a hospital or clinic where the event occurred is equally important, as it would provide certification that the event actually took place. This responsibility often consists in providing the informant (a parent in cases of birth or relatives in cases of death) with written certification of the occurrence of the event and its characteristics. Within the civil registration office, the informant is issued the appropriate certificate and the registrar proceeds to compile and submit the necessary information for statistical purposes.

489. Clearly, the role of health institutions is critical for the proper and reliable registration of vital events. However, it does not include the authority for issuing a birth or death certificate. Such authority is vested only in the civil registration system for the sole purpose of ensuring the legitimacy of the registration, inasmuch as it has considerable legal significance for an individual during his or her lifetime or for his or her descendants. Assigning such additional responsibility to health institutions would have an adverse impact on the performance of their primary function, which is to provide health services to the population.

490. In certain circumstances, health institutions may be tasked to provide the information regarding the occurrence of a vital event for statistical purposes to either the ministry in charge of health or the national statistical service. While this process does not involve the civil registration component, as the legal dimension would be lacking, it enables the production of vital statistics and is put in place when the civil registration system is weak and/or non-functional. Since (as elaborated in para. 287 above) civil registration has an irreplaceable function in terms of the legal protection of individuals, all efforts must be made to establish a universal, compulsory and continuous civil registration system.

B. Certification of cause of death function

491. The death certificate is an essential document which not only provides a final and permanent confirmation of the fact of death but also enables the inheritance and settlement of an estate and, in many jurisdictions, the burial of the deceased, as well as other entitlements pursuant to the legal arrangements in force (such as a pension). Equally important, from a general point of view, are the circumstances and medical causes of death, which explains the requirement that the civil registrar issues a death certificate only if the notification of the cause of death is accompanied by a filled-out medical certificate of cause of death.

492. This information from a death certificate is used to assess the relative contributions of different diseases to mortality. Statistical information on deaths by underlying cause is important for monitoring the health of the population, designing and evaluating public-health interventions, recognizing priorities for medical research and health services, planning health services and assessing the effectiveness of those services. Death certificate data are used extensively in research on the health effects of exposure to a wide range of risk factors associated with the environment, the workplace, medical and surgical care, and other areas (United Kingdom of Great Britain and Northern Ireland, 2010).

493. These mortality data are valuable to physicians indirectly, through their influence on the funding that supports medical and health research which may alter clinical practice, and directly, as a research tool. Research activities include identifying disease aetiology, evaluating diagnostic and therapeutic techniques, examining medical or mental health problems that may affect specific groups of people, and establishing the areas where medical research can have the greatest impact on reducing mortality (United States of America, Centers for Disease Control and Prevention (2003)).

494. In order to provide a comprehensive and comparable tool for identifying causes of death and diseases in general, WHO developed the *International Statistical Classification of Diseases and Related Health Problems* (ICD) (WHO, 2011),³¹ currently in its tenth revision. The purpose of the Classification is to permit the systematic recording, analysis, interpretation and comparison of mortality and morbidity data collected in different countries and areas and at different times. The Classification is designed to translate diagnoses of diseases and other health problems from words into an alphanumeric code, which permits easy storage, retrieval and analysis of data (ibid.). It has to be emphasized that the original use of the Classification was to categorize causes of mortality as recorded at the time of the registration of death and only later was its scope extended to include diagnoses for morbidity.

31 See also footnote 3 above.

495. From the standpoint of prevention of death, it is necessary to break the chain of events or to effect a cure at some point. The most effective public-health approach entails the objective of preventing the precipitating cause from operating. For this purpose, the underlying cause of death has been defined as “(a) the disease or injury which initiated the train of morbid events leading directly to death, or (b) the circumstances of the accident or violence which produced the fatal injury” (ibid., sect. 4.1.2).

496. The above principle can be applied uniformly and comprehensively by using the medical certification form recommended by the World Health Assembly (see below). It is the responsibility of the medical practitioner signing the death certificate to indicate which morbid conditions led directly to death and noting any antecedent conditions having given rise to this cause.

International Form of Medical Certificate of Cause of Death

Cause of death	Approximate interval between onset and death
I	
Disease or condition directly leading to death* a)
due to (or as consequence of)	
Antecedent causes	
(b)
due to (or as consequence of)	
Morbid conditions, if any, giving rise to the above causes, stating the underlying condition last (c)
due to (or as consequence of)	
(d)
II	
Other significant conditions contributing to the death, but not related to the disease or condition causing it
.....
* This does not mean the mode of dying, e.g., heart failure, respiratory failure. It means the disease, injury, or complication that caused death.	

497. The medical certificate displayed above is designed to facilitate the selection of the underlying cause of death when two or more causes are recorded. Part I of the form covers diseases related to the train of events leading directly to death and part II covers unrelated but contributory conditions. The condition recorded on the lowest line used in part I of the certificate is usually the underlying cause of death.

498. Once the form has been filled out and signed by the medical practitioner, it is the responsibility of the civil registrar to ensure that the form (either in paper

or electronic format, depending on the prevailing system) is combined with other information needed for statistical purposes and submitted to the statistical authorities for processing and the production of vital statistics. It is of critical importance to emphasize that the cause of death as specified by the medical practitioner may be disclosed to the closest relatives only and that the civil registrar has to ensure the complete confidentiality of this information.

499. In several circumstances, e.g., when deaths occur at home or where health institutions are scarce, it is not possible to obtain a medical certification of the cause of death and for that purpose WHO developed international standards on the use of verbal autopsy (World Health Organization, 2007). Verbal autopsy is an interview carried out with family members and/or caregivers of the deceased using a structured questionnaire to elicit signs and symptoms and other pertinent information which can later be used to assign a probable underlying cause of death. Verbal autopsy is an essential public-health tool for obtaining a reasonable direct estimation of the cause structure of mortality at a community or population level, although it may not be an accurate method for attributing causes of death at the individual level (*ibid.*).

500. For this purpose, verbal autopsies involve the use, by a trained interviewer, of a questionnaire designed to enable him or her to collect information about signs, symptoms and demographic characteristics for a recently deceased person from an individual familiar with the deceased. Under the WHO standards for verbal autopsy, any of three questionnaires may be introduced: for a death of a child aged under four weeks, for a death of a child aged four weeks to 14 years, and for a death of a person aged 15 years or above.

501. Should the verbal autopsy method be part of civil registration in cases where there is no possibility of obtaining a medical certification of the cause of death? In this regard, it should be pointed out that the verbal autopsy method is fairly complex; the interview needed for the filling out of the appropriate questionnaire is time-consuming; the training of civil registrars in conducting a verbal autopsy has to be comprehensive; and cultural traditions might not favour such an engagement with a government official. All of these factors, as well as the need to conduct thorough holistic testing in sample areas, must be taken into account when attempting to answer the above question.

Chapter V

Population censuses and surveys as a source of vital statistics

502. There is no substitute for a well-designed and well-maintained civil registration system as a source of data on vital events for the production of vital statistics. However, as outlined in the introduction to part two (see paras. 276-278 above), a complete vital statistics system requires complementary data sources to enable the conduct of an in-depth analysis of population. Yet, in countries where civil registration is lacking, deficient or insufficiently reliable, alternative sources such as population censuses and household and demographic sample surveys are often used to gather information on the incidence of vital events and to estimate or calculate vital rates. Where civil registration is well established and well maintained, these sources of demographic data supplement civil registration by providing independent estimates of demographic parameters which can be used to evaluate the level of completeness of civil registration and vital statistics, and also constitute complementary repositories of demographic and health data. Moreover, population censuses are essential for providing the denominators necessary for calculating vital rates and ratios in combination with civil registration data (numerators). Civil registration data alone do not, therefore, establish the population at risk for the calculation of most vital statistics rates. In particular, the utilization of population census data, adjusted for any underenumeration and age misreporting, as denominators is indispensable when the civil registration system is not accompanied by a population register.

503. Population censuses and sample surveys may provide estimates of recent levels of fertility, mortality and foetal mortality. They can also provide information on marital status of populations and the timing of the first marriage, which can be used to estimate indirectly the incidence of marriage and divorce in populations. However, these data sources are not a substitute for a civil registration system, since they cannot provide such details as estimates of mortality by cause of death. In addition, these sources provide very limited data on vital events themselves, since their investigations focus on the household as a unit and not on individuals, so that information on vital events is collected merely as characterizing household members. A universal and well-maintained civil registration system remains the single best source of information on vital events for administrative, demographic and epidemiological purposes.

504. The present chapter provides an overview of sources of data on vital events other than from the civil registration system. Given that more detailed discussions of these sources of vital statistics are available elsewhere, efforts are made, whenever possible, to provide the appropriate references. The chapter is divided into three sections: section A discusses the various sources of demographic and related data; section B briefly examines available topics, concepts and definitions; and section C describes demographic parameters that can be estimated within the context of specific topics from these sources, and includes an overview of estimation techniques.

A. Complementary sources of a vital statistics system

505. Besides a civil registration system, there are two other principal means for determining the incidences of vital events needed to estimate vital statistics rates, namely, population censuses and household sample surveys. Each of these methods has its own advantages and limitations, which should be kept in mind by users when employing the data on vital events derived through the application of such methods. It should be recognized that the methods used to estimate demographic parameters and rates from these sources of data are based on assumptions regarding and approximations of the relationships between various demographic characteristics of the population, especially those utilizing indirect techniques, and caution needs to be exercised in regard to their use, particularly in the analysis of trends and precise levels.

506. In addition to conventional sources of data, there are non-conventional ones, such as sample registration and the demographic surveillance system. Both data-collection methods are important sources of vital statistics. Sample registration systems are used in some countries where civil registration systems are not fully developed. They record vital events for selected sample registration areas on a continuous basis. The main drawback of this method is that it does not provide estimates of vital rates for small areas.

507. A typical demographic surveillance system (DSS) monitors births, deaths, causes of death, migration, and other health and socioeconomic indicators within a defined population over time. The demographic surveillance system is not a replacement for civil registration systems. Rather, it should serve as a short- to medium-term means of obtaining data for health and population planning at regional levels—with possible extrapolation to national levels, given that the sites are carefully selected so as to be nationally representative.

1. Population censuses

508. A population census is defined as “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” (United Nations, 2008, para. 1.4). The essential features of population censuses are individual enumeration, universality within a defined territory, simultaneity and defined periodicity (*ibid.*, para. 1.8). Data from population censuses can be used to estimate vital rates—mortality and fertility—and to obtain other characteristics of population, such as size and distribution by age and sex, among others. In addition, population censuses furnish data on numerators and denominators to the lowest geographical area, which allow for planning and follow-up on microlevels. Censuses provide the sample frame for demographic and health surveys and other specialized studies. Finally, population data from censuses by age and sex are the basis for production of annual population estimates by age and sex, which then provide the denominators of population at risk for the calculation of vital statistics and rates based on the civil registration system.

509. Population censuses have certain disadvantages with regard to the study of vital events, however. They are prone to generating non-sampling errors and are poor mechanisms for gathering detailed data in specific fields, such as health, epidemiology, nutrition and income. Although basic information on individuals is collected through censuses, population censuses alone cannot serve the legal purposes

of administrative records. Since the data collected in censuses are not normally organized to provide documentation for individuals or designed for the retrieval of individual information to meet legal and administrative objectives, administrative purposes are poorly served by these types of data. In addition, data collected from censuses are subject to retrospective recall problems, misstatements of age and reference-period errors. Another limitation lies in the frequency with which the censuses are conducted (usually every 10 years), which is not great enough to provide the regular feedback needed for the proper managing and monitoring of population and development programmes. Data from population censuses should be supplemented by large-sample and/or small, tailor-designed surveys when detailed and more specialized studies are needed.

510. Since census data are needed to provide the denominators (the population at risk) for the calculation of vital rates and ratios for numerators based on data from the civil registration system, it is important for civil registration officers to familiarize themselves with the census procedures in their countries, as well as globally. For example, *Principles and Recommendations for Population and Housing Censuses: Revision 2* (United Nations, 2008) and other United Nations handbooks³² offer guidance on census operations and the content of censuses, including illustrative tabulations and definitions of concepts and terms used. These publications are revised and updated at intervals to incorporate developments in census data collection, processing and dissemination. It is particularly important that both civil registration systems and census programmes closely coordinate their definitions, concepts, coding systems classifications and tabulation plans to ensure perfect coherence between numerators and denominators.

2. Household sample surveys

511. Household sample surveys are among the most flexible of all data-gathering mechanisms. In principle, almost any subject can be explored, and the level of detail can be adapted to the requirements of the investigation. Compared with censuses, sample surveys have distinct advantages. The principal strength is the sharp focus that sample surveys can provide in the context of generating data on vital events in order to estimate demographic parameters. Questions and probes are generally more detailed than in population censuses. Moreover, because of the smaller number of respondents and field operations involved, sample surveys tend to employ fieldworkers who are better qualified and better trained than those in the population censuses.

512. Household sample surveys provide, depending on their design, a basis for updating census information at the national level or for broad geographical and administrative divisions. The relationship between population censuses—which provide an infrequent but geographically detailed cross-section—and household/demographic sample surveys—which offer a relatively more frequent time series and greater information—is essentially a complementary one. Sample survey information provides a basis for broadly monitoring continuous changes in demographic parameters, depending on the design and size of the sample, at the national and regional levels.

513. The quality of data obtained from sample surveys is usually better than that for data collected in a census, mainly because better-qualified and -trained

32 For a complete list of methodological guidelines, see <http://unstats.un.org/unsd/censuskb20/KnowledgebaseCategory16.aspx>.

fieldworkers are employed, based on the fact that only a sample of the population is covered. Sample surveys also target questions to appropriate respondents, while in censuses, the head of household may answer the majority of questions. Furthermore, quality and operational control procedures are usually carried out more efficiently. Surveys are also more suitable than censuses for the phrasing of questions in the most desirable way and for using probing questions, since there is more time available for each interview.

514. Sample surveys, however, have a number of limitations in terms of generating vital statistics. Surveys suffer from not only the same type of errors as population censuses (misstatement of age, retrospective recall problems, reference-period error, etc.) but also sampling errors. In addition, sample surveys usually allow for the estimation of demographic parameters only at country level, or in some cases, depending on the sample size, at the level of major civil divisions (regions, provinces, States) and/or by type of residence (urban/rural). Therefore surveys are not suitable for deriving small-area estimates and evaluating programmes implemented at local level.

515. If questions on vital events and other demographic characteristics are included in multipurpose household surveys that also cover such topics as employment, income and expenditure, and living standards, it is possible to produce estimates of demographic variables by socioeconomic subgroups. Household and demographic sample surveys also enable individual-level data analysis for the study of relationships between vital events, such as marriage and childbearing, and other events (e.g., migration) and between vital elements and individual and household characteristics (e.g., level of education).

516. For the purpose of collecting demographic information, there are three types of household sample surveys that are generally used in countries: single-round surveys, multi-round surveys and dual-records systems. The first two types of survey designs are distinguished by the number of interviews conducted with each respondent. The third type of survey can either be single-round or multi-round and is designed to improve the coverage of reporting of vital events by two independent systems of data collection.

(a) Single-round household sample surveys

517. In a single-round survey, each respondent is interviewed only once. A single-round survey is also known as a cross-sectional survey. Depending on the use of the data to be collected, the availability of funds, human resources and the time frame, countries may follow several strategies. They can conduct a specialized survey or include a specific set of questions in other multipurpose national sample surveys.

518. Examples of specialized surveys include the World Fertility Surveys³³ and the Demographic and Health Surveys.³⁴ In specialized surveys, a birth history or a pregnancy history is often included for each woman of reproductive age. Such information is used to derive estimates on fertility and infant/child mortality. Some surveys also ask questions regarding survival of siblings for measures on adult or even maternal mortality, although the quality of data is questionable in many countries. Specialized surveys can also be an appropriate instrument for data collection on marriage, union formation and marital status. Questions on marriage and union formation can be asked in a more detailed manner, allowing for a richer analysis

³³ World Fertility Surveys were conducted in more than 40 countries in the 1970s and early 1980s.

³⁴ Conduct of Demographic and Health Surveys started in the mid-1980s.

of the phenomenon of marriage in different cultural settings. For example, in the World Fertility Surveys programme, many countries included a full marriage history, including dates of the first and subsequent marriages, and type and dates of marriage that ended, by reason for dissolution (death, divorce or separation). The detailed data on marriage allowed for a richer analysis of patterns of family formation and dissolution and remarriage. Furthermore, in countries where the civil registration system covers only formal marriages, but where consensual unions or other types of unions are common, surveys can provide information on the prevalence and types of these unions. Moreover, surveys are a major source of information on the prevalence of polygamous unions.

(b) Multi-round household sample survey method

519. In multi-round surveys, each respondent is interviewed more than once. The second and subsequent visits serve as follow-up. This type of survey is also called a follow-up demographic or longitudinal survey. At the initial interviews, the usual residents of the household are identified and their demographic and other characteristics are recorded. At each follow-up visit, the aim is to obtain information on changes in the composition of the household due to births, deaths, migration and changes in marital status that have occurred since the previous interview.

520. The advantage of this type of survey data source is that the reinterviews permit the correction of inconsistent data collected in previous rounds. Retrospective questions in later survey rounds also enable the estimation of demographic parameters for further cross-checking of estimates from earlier rounds. Some countries have used this method to evaluate two approaches to measuring fertility and mortality.

521. The drawbacks of this method are related to timing, cost and administration. The duration of the fieldwork itself is never less than two years, to allow sufficient time between two rounds of the survey, to which the time required for advance planning and data processing must be added. The cost is large compared with that of a single-round retrospective survey because of the need to maintain well-trained staff during the whole period of the fieldwork. On the administrative side, a number of surveys taken in various countries have proved the difficulty of maintaining high standards of quality, since the commitment of the interviewers, the enthusiasm and the quality of supervision inevitably deteriorate with the passing of time. Moreover, the results from these types of surveys have also been unsatisfactory, particularly in the reporting of deaths. Deaths, including deaths occurring to heads of households, are subject to omission, for several reasons. Deaths occurring to the heads of households often lead to the dissolution of those households, which creates problems in respect of locating individuals in the sample of households in subsequent rounds.³⁵

(c) Dual-records system

522. A dual-records system is a system of demographic data collection that uses two independent types of data-collection activity to record the same events occurring in a certain period of time and in a defined area, so that events missed by one type of activity may be picked up by the other. One data-collection system may be the civil registration system. The other system is normally a multi-round household survey where, in each repeated visit after the initial interview, the interviewers ask retrospective questions on vital events that have occurred since the last visit.

³⁵ See United Nations (1992b): *The Follow-up Method in Demographic Sample Surveys*, Studies in Methods, Series F, No. 41, United Nations publication, Sales No. E.91.XVII.11.

After each interview round, case-by-case matching is carried out in order to identify: (a) the events recorded by both activities; (b) the events recorded only by civil registration; and (c) the events recorded only in the survey. After the matching procedure has been carried out, it becomes possible to estimate the number of events that may have been missed by both types of activities.

523. The dual-records system has been used in some countries. Although it tends to be costly, it can nevertheless provide valuable information on the level of completeness of ongoing civil registration and the degree of content error in both the survey and registration. In addition, dual-records systems enable better estimates to be made of fertility and mortality.

524. A major constraint on developing a dual-records system is the cost and maintenance of the independence of the two collection sources. Moreover, the dual-records system, like other household sample surveys, provides estimates of vital rates only at the level of major geographical divisions and at national level, which means that it is not suitable for local use and evaluation.

B. Available information on vital events and rates

525. Presented above was a brief review of various sources of fertility, mortality and morbidity data. The present section provides a brief examination of how those data can be used to derive the number of births, deaths and marriages, along with fertility and mortality rates and ratios.

526. As discussed earlier, in countries where birth and death registrations are complete, one can use a simple direct approach to estimate fertility and mortality level. A number of textbooks are available that discuss these methods and their limitations in detail (see, e.g., Swanson, Siegel and Shryock, 2004). However, in cases where birth and death registrations are incomplete or suffer from other sources of errors, direct estimation procedures fail to provide the desired results. In such cases, indirect estimation techniques can be used to determine a probable level of fertility and mortality. It should be kept in mind, however, that these indirect techniques are based on the observed relationship between various parameters and hence should be used with caution. Sometimes, owing to changes in established relationships resulting from such factors as use of contraception, it may be found that the underlying assumptions no longer apply in most countries and that the estimations for parameters are therefore distorted.

1. Live births

(a) Current fertility

527. Through information from censuses and sample surveys about live births in the recent past, the purpose can be achieved of obtaining aggregate vital statistics regarding current fertility, usually per annum. Data on the number of live births within the 12 months preceding the census can serve in estimating current fertility, particularly as a supplement to vital rates, or as a substitute for those rates in cases where birth registration is defective or inadequate. Age-specific fertility rates by 5-year age groups of women, obtained from information on births accumulated for women of childbearing age, within the 12-month period before the census, make it possible to obtain the total fertility rate for a given period. In countries lacking adequate data from civil registration, sample surveys have become a major source of

information for estimating national fertility levels, but surveys usually do not permit the derivation of reliable estimates at the subnational level.

*(i) Date of birth of last child born alive*³⁶

528. Information on date of birth (day, month and year) of the last child born alive and on the sex of the child is used for estimating current fertility. This information can be used to derive both national and subnational fertility estimates. At the processing stage, an estimate of the number of live births during the 12 months immediately preceding the census or survey date can be derived from information on “date of birth of last child born alive”. For estimating current age-specific fertility rates and other fertility measures, the data provided by this approach are more accurate than information derived from questions on the number of births to a woman during the 12 months immediately preceding the census or survey. However, information on the date of birth of the last child born alive does not produce complete data on the total number of children born alive during the 12-month period. Even if there are no errors in reported information on the last live-born child, this item provides the number of women who had at least one live-born child during the 12-month period, not the number of births, since a small proportion of women will have had more than one child in a year.

529. The information needs to be collected for women only between 15 and 50 years of age who have reported having at least one live birth during their lifetime. Also, the information should be collected for all the marital or union status categories of women for whom data on children ever born by sex are collected. If the data on children ever born are collected for a sample of women, information on date of birth for the last child born alive should be collected for the same sample.

530. A census question on “date of birth of last child born alive” should always be paired with a simple follow-up question about whether the child is still alive, which yields data that can be used for studying child mortality. Although this pair of questions does not produce a valid estimate of the infant mortality rate (since the numerator excludes infant deaths occurring below age 1 in the past 12 months among children born from one to two years before the census date), it can provide useful information on differences in child survival by age of mother or other socio-economic characteristics.

(ii) Live births within 12 months preceding the census or survey

531. The most straightforward means of enumerating live births is to ask, in the course of a census or survey, questions regarding the live births that occurred in a preceding period of 12 months in the household. Such direct retrospective questions on live births in the past 12 months are currently avoided, however, because responses are subject to mistaken recall of events in the reference period and other errors of recall and misunderstanding.

(b) Lifetime fertility: children ever born alive

532. Even the most focused and best-worded questions posed to obtain retrospective reports of births in the last 12 months, on the basis of asking women the date of birth of their last live-born child, still yields disappointing results. This is because errors in terms of dates, the age of women, omission of births and, generally, exact

36 See United Nations (2008), paras. 2.188-2.191.

recall of events, in particular by older women, still occur.³⁷ In addition, some women may have had more than one live birth in 12 months and only the last is counted. Collection of data on children ever born to the woman in her entire lifetime for correction of the current age-specific fertility rates is preferred (for a detailed discussion of such methodologies, see paras. 550-551 below).

533. Children ever born are all the children born alive to the woman concerned up to the time of the inquiry. In case of multiple births, each live-born child is counted separately.

534. In order to improve the data collected, it is advisable that a sequence of questions be included to improve the completeness of coverage and to assist the respondent in recalling her children ever born alive, on the following topics and in the following order: (a) “the total number of sons ever born alive during the lifetime of the woman”, (b) “the total number of sons living (surviving) at the time of the census”, (c) “the total number of sons born alive who have died before the census date”, (d) “the total number of daughters ever born alive during the lifetime of the woman”, (e) “the total number of daughters living (surviving) at the time of the census”, and (f) “the total number of daughters born alive who have died before the census date” (United Nations, 2008, para. 2.182). The responses to topics (b), (c), (e) and (f) allow for a checking of the responses to (a) and (d). Inconsistencies in the figures, if any, can sometimes be resolved during the interview. In sample surveys, additional questions may be added on whether the sons or daughters are living with the respondent or elsewhere so as to improve coverage.

535. Information on lifetime fertility on the basis of questions regarding all children ever born alive should be asked of all women 15 years and over, regardless of marital status. If, for cultural reasons, it is not feasible to ask these questions of single women, then the questions should be asked at least of all women 15 years and over who have ever been married, which would include currently married women, as well as currently widowed, divorced or separated women. In either case, the group of women from whom the data were collected should be clearly described in the census or survey report in order to prevent any error of analysis due to misinterpretation of the status of the women included.

536. In some countries, the information on children ever born and children surviving can be distorted by errors in respect of the reported number of children or the reported age of women, so that cross-classification can be erroneous. Such distributions will cause gross errors of estimation of fertility (United Nations, 1983, chap. II).

(c) Birth history data from surveys

537. A birth history consists of a list of all the children a woman has had, living and deceased, together with certain information about those children, including their date of birth, sex and whether they were one of multiple births. Birth histories are by far the most intensive form of questioning used in demographic data-collection operations. Their use has generally been restricted to samples of 5,000-10,000 women, though they have occasionally been used in larger surveys and sometimes even in population censuses. Birth histories are an important source of information on fertility as well as on infant and child mortality.

³⁷ See United Nations (1983): *Manual X: Indirect Techniques for Demographic Estimation*, Population Studies, Series A, No. 81 (United Nations publication, Sales No. E.83.XIII.2), pp. 31-41.

538. Errors from birth history data involve the misreporting of dates of birth, which shifts the dates of significant numbers of births from the years immediately prior to the survey to earlier years. The effect is to understate the level of fertility in the years immediately prior to the survey and overstate the level for earlier years. The result will be to create the appearance of a decline in fertility when fertility was in fact constant (or even increasing) or to exaggerate a real decline.

539. There is also age-selection error when birth histories are collected only for women under age 50, as they usually are. The data exclude births to women who were age 49 years or older one year prior to the survey, births to women who were 48 years of age or older two years prior to the survey, and so on for each successive year prior to the survey.

2. Deaths

(a) Child mortality

540. Information on deaths can be obtained from special questions in censuses and surveys (including a dual-records system). Infant and child mortality can be estimated from information on deaths during the 12 months preceding the inquiry by sex of the child and age of the mother; summary birth histories that collect information on the number of children ever born to the women and number of surviving children according to the age of mother (see paras. 537-539 above) or duration of conjugal union; or date of birth of the last live birth and whether the child is surviving, as well as, if deceased, date of death of the child. Specialized sample surveys can collect full birth histories with questions on the survival status of each child and the age at last birthday or age at death, as appropriate. Details of utilization of these data for estimation of mortality are given under the section dealing with techniques for estimating vital rates.

(b) Adult mortality

541. Adult mortality may also be estimated using censuses and surveys, although results tend to be less satisfactory than for the estimation of fertility and infant and child mortality. Adult mortality can be estimated directly by collecting information on deaths in the household by sex and age, using the population by sex and age derived from the inquiry as the denominator. Adult mortality can also be estimated indirectly from questions on maternal or paternal orphanhood or survival of siblings. If certain assumptions are met, adult survival probabilities can also be derived for the interim period between two censuses using population counts by age and sex from the two censuses.

(c) Maternal mortality³⁸

542. In addition to measuring child and adult mortality, population censuses and household surveys have been used in some countries to measure mortality occurring during pregnancy, childbirth and puerperium. Two widely used approaches entail taking a full sibling history and obtaining information on recent household deaths.

38 K. H. Hill, "Maternal mortality", in "Tools for demographic estimation", T. A. Moultrie and others, eds. (Paris, International Union for the Scientific Study of Population, 2012). Available from <http://demographicsestimation.iussp.org/content/maternal-mortality-0>.

543. Obtaining a full sibling history involves complex and detailed data collection. Very thorough training and close supervision of field staff will be required if the process is to be carried out successfully. It is therefore not an appropriate methodology for inclusion in a census. The full sibling history method has been used in Demographic and Health Surveys since 1991. In the Surveys, the information collected for each sibling comprises name; sex; whether still alive; if still alive, age in years; and if dead, number of years that have elapsed since the sibling died and age at death. For women of reproductive age, there are additional questions to determine whether the sister died (a) while pregnant; (b) during childbirth; or (c) within 42 days or two months of the end of a pregnancy.

544. Often, in censuses or large household surveys, a common format is designed to elicit information on household deaths, namely, whether any of the usual household members died in the past 12 months, including their name, sex and age at death; and if the death is of a woman of reproductive age, the timing of death relative to pregnancy, i.e., whether the deceased died while pregnant, during delivery or in the six weeks (or sometimes the two months) after the end of pregnancy. These questions on recent deaths identify deaths occurring during pregnancy, childbirth and puerperium. Sometimes, attempts are made to follow up reported deaths of women of reproductive age (or a sample of such deaths) with a verbal autopsy designed to identify true maternal deaths.

3. Characterization of marital status in a population

545. Information on marital status can be obtained from censuses and surveys. The legal acts of marriage and divorce that are recorded in civil registration reflect only some dimensions of the dynamics of couple formation, dissolution and co-residence (United Nations, 1991, para. 520). For example, unions and separations that are consensual and not legally sanctioned—de facto unions and de facto separations—are rarely registered. In contrast, such non-statutory states can be captured and documented on the basis of censuses and surveys, which can also include information on the status of the population with respect to the share of customary marriages (which are binding under customary law) and of consensual unions (which are extra-legal). Similarly, some aspects of marital status, such as age at marriage, are more easily derived from censuses and surveys than from the processing of registration data. Accordingly, it is advisable that a census or survey, wherever it is possible to obtain detailed data from individuals and households, include for every individual, information on current marital status (married, widowed, legally separated or divorced), adapted to the prevailing conditions of the country. In each case, these characteristics should be delineated according to age (United Nations, 2008, para. 2.149) and sex. Although censuses and sample surveys are good sources of marital status data, in many countries of the world, the range of marital status categories included do not adequately capture the prevalence of statutory marriage combined with relatively stable de facto unions outside marriage, owing to the reluctance of individuals and households to provide such data.

546. In addition, censuses and surveys can provide information on date at first marriage, or alternatively, on age at first marriage and first marriage duration (*ibid.*, para. 2.169; and United Nations, 1983, chap. II).

547. Data on marital status from censuses and surveys can be used to derive estimates of mean age at marriage, proportion of married, widowed, divorced and

married but separated and other statuses. However, these data cannot be utilized to estimate marriage and divorce rates.

C. Indirect techniques for estimation of vital rates and ratios

548. Data obtained from censuses and surveys are subject to errors at all stages of data collection, i.e., from the planning stages through data processing and dissemination. In order to correct such errors, data users as well as researchers have developed techniques to evaluate data and produce plausible estimates. These techniques are sometimes developed with the objective of transforming information on mortality and fertility indicators into conventional measures of these variables, such as age-specific birth and death rates. In addition, indirect techniques are developed with the objective of adjusting and correcting the data derived from surveys and censuses. The latter methods are based on several hypotheses and assumptions, as well as on mathematical and demographic models, and utilize data from surveys and censuses to generate different kinds of estimates of fertility and mortality (child, infant, adult and maternal). In the absence of accurate and timely data, indirect estimates have provided the most important information available in many developing countries.

549. In order to assist countries, the United Nations published *Manual X: Indirect Techniques for Demographic Estimation* (United Nations, 1983), for utilization in estimating fertility and mortality in the absence of direct and reliable estimates. The *Manual* is undergoing revisions and updates within the framework of a joint International Union for the Scientific Study of Population (IUSSP) and United Nations Population Fund (UNFPA) project. The revision utilizes material from *Manual X* and the details of methodology development; and the content of the partially completed project are available online.³⁹ This includes the basic hypotheses underlying the various indirect methods and the presentation of examples of how to apply the methods, including some guidance on the interpretation of the results. A broad description of several key indirect techniques is set out below along with their advantages and disadvantages.

1. Estimates of fertility

(a) Children ever born

550. Fertility estimates can be made based on data on the number of children ever born alive obtained from censuses and surveys. This measure, in conjunction with data on the age of women or the duration of marriage, yields estimates of total fertility by age or by duration of marriage. Because of the nature of the data used, these are measures of the average lifetime fertility experience of women in the population and have no precise time reference.

(b) Children ever born and births in the past year

551. Data on children born alive, with data on births in the past year, number of women by age and total population, collected from censuses and surveys, can be used to estimate age-specific rates, crude birth rates, total fertility rates, and gross

³⁹ See <http://demographicestimation.iussp.org/>.

and net reproduction rates. In order to improve the quality of data on current fertility, all women of reproductive age are asked a question on the date of birth of their last child born alive instead of the traditional question on births in the past year. Since, as previously discussed, data contain errors, a number of methods for adjusting the data have been proposed, such as that of adjusting the level upward to correspond with the level of the experience of fertility of all women in their younger ages, that is, under age 35. This group is regarded as providing the most accurate information. Moreover, a number of improvements were introduced to the original method, also methods of adjusting data and calculation of these rates are explained in chapter II of *Manual X*.⁴⁰ There are limitations associated with the method of using data found on children ever born and on births in the last year, one of the biggest being the assumption of stable fertility in the past, which may not hold in many countries. There are methods being developed that allow a more relaxed assumption regarding constant fertility. However, one still has to be cautious when using this method to derive fertility estimates.

(c) “Own-children” method

552. Another means of estimating fertility from census information requires linking each child enumerated in a household to his or her natural mother. When the mother-child link has been established and age-reporting of both mothers and children is of good quality, the “own-children” method can provide estimates of fertility for a period of years preceding the survey. In essence, information on the child’s age and the mother’s age are used to estimate a series of annual fertility rates for years prior to the census.⁴¹ In cases where it is difficult to ascertain the identity of the natural mother, one may use as a proxy the relationship to head of household or to the reference person of household, or children living, to establish the identity of the natural mother. The reliability of the estimates produced depends, among other things, on the proportion of mothers enumerated in the same household questionnaire as their own children, the accuracy of age-reporting for both mothers and their children, and the accuracy of available estimates of mortality for women and children.

(d) Reverse survival method

553. The reverse survival method may be used to derive births and birth rates, based on the simple observation that the number of births in any of the cohorts equals the number of survivors at the time of the census plus the number in the cohort who died before the census reference time. The number of persons is known from the census age distribution. The number of deaths is estimated from knowledge of the level of infant and child mortality.

40 Ibid.; see also Arriaga (1983).

41 See Cho Lee-Jay, “The own-children approach to fertility estimation: an elaboration”, in “International Population Conference” (Liège, Belgium, International Union for the Scientific Study of Population, 1973), vol. 2; and United Nations (1983), chap. VIII.

2. Estimates of mortality

(a) Childhood mortality

554. Data on children ever born and children surviving collected in censuses and surveys are used to estimate infant and child mortality by converting the proportions of children who have died for women of known ages, using life-table models, into probabilities of dying before attaining a certain age of childhood so as to estimate infant and child mortality. The method is one of the tools most frequently used to estimate child mortality in the absence of reliable civil registration data, and has been elaborated by researchers into a number of variants: for providing estimates when based on duration of marriage (where age data are poor) or under conditions of declining mortality and fertility, and for employing mortality information obtained from successive censuses. When the determination of ever-born and surviving children is made for sex of offspring separately, it is possible to estimate sex differentials in infant and child mortality.⁴² This method allows for the estimation of the time period, before the census or survey, in which death occurred.

(b) Adult mortality

555. Adult mortality may be estimated using various methods based on data from population censuses and sample surveys, including the death distribution methods, the orphanhood method and the survival-of-siblings method. Adult mortality estimates vary greatly depending on the methods used and the sources of data from which the estimates are derived. Estimates also vary by the quality of data and to what extent the assumptions underlying each method are confirmed. Of equal importance is the need to carefully measure any one estimate against those derived from other sources or by using other methods. Details of each method and the assumptions associated therewith are not provided in the present publication. However, users are encouraged to pursue the subject further by examining sources listed in the references.

556. Recent household deaths by age and sex, obtained from population censuses and household surveys, can be evaluated for completeness using the death distribution methods. These methods estimate the completeness of the reporting of deaths relative to an estimate of the population and permit the derivation of an adjusted death rate. Both the Brass growth balance method (or the general growth balance method which uses data from two censuses with less restrictive assumptions) and the Preston-Coale method (or the more general synthetic extinct generations

⁴² See William Brass, *Methods for estimating fertility and mortality from limited and defective data* (Chapel Hill, North Carolina, International Program of Laboratories for Population Statistics, University of North Carolina at Chapel Hill, 1975). The methodology is elaborated in *Manual X* (United Nations, 1983), chap. III; the census recommendations may be found in *Principles and Recommendations for Population and Housing Censuses, Revision 1*, Statistical Papers, Series M, No. 67/Rev.1 (United Nations publication, Sales No. E.98.XVII.8), paras. 2.126-2.132 and 2.142; and the guidelines regarding specific census questions may be found in *Handbook of Population and Housing Censuses*, part II, *Demographic and Social Characteristics*, Series F, No. 54 (United Nations publication, Sales No. E.91.XVII.9) (United Nations, 1992a).

method) belong to the family of death distribution methods. These methods require data on deaths by age and sex as well as on population by age and sex.⁴³

557. The basic orphanhood method estimates the mortality of adult women and men indirectly from data on the survival status of respondents' mothers and fathers, respectively. In order to apply the method, censuses and surveys must, at a minimum, have included the questions, Is your mother alive? and/or Is your father alive? Once data on orphanhood have been collected in two successive inquiries, it is possible to derive synthetic cohort measures of parental survival for the intervening period and, from them, estimate life table measures for this period. Synthetic cohort methods can provide estimates of adult mortality for a clearly defined and relatively up-to-date period. This is especially useful in countries experiencing generalized HIV epidemics, where the level of adult mortality is likely to have changed abruptly in the few decades. One advantage that the orphanhood method has over approaches entailing questions about deaths in households is that it allows adult mortality to be estimated in moderately sized inquiries. In contrast, only censuses or unusually large surveys can yield estimates based on deaths in the year before the inquiry that are useful. Moreover, the method does not assume that the population is closed to migration. However, the results derived from it will not be representative for small States or subnational areas where a substantial proportion of the population are in-migrants or have emigrated.⁴⁴

558. Adult mortality may also be estimated from data supplied by adults on the survival of their adult siblings (that is, brothers and sisters). To compute such estimates indirectly, respondents are asked how many of their brothers and/or sisters lived to age 15 and how many of those brothers and/or sisters are still alive. These data are tabulated by the age group of the respondents. Mortality can be estimated from them without the requirement that respondents recall the dates when deaths occurred or the ages at death of deceased individuals. Information on the survival of brothers is used to estimate the mortality of men and information on the survival of sisters is used to estimate the mortality of women.

559. The direct method for computing adult mortality estimates from data on survival of siblings can be applied only when an inquiry has collected full sibling histories. In the collection of such histories, each respondent is asked for the name, sex, age, survival status and, if dead, age at and year of death of each of their siblings

⁴³ See:

—R. E. Dorrington, "Brass growth balance", in "Tools for demographic estimation", T. A. Moultrie and others, eds. (Paris, International Union for the Scientific Study of Population, 2012). Available from <http://demographicestimation.iussp.org/content/brass-growth-balance>.

—R. E. Dorrington, "Preston-Coale method", in "Tools for demographic estimation", T. A. Moultrie and others, eds. (Paris, International Union for the Scientific Study of Population, 2012). Available from <http://demographicestimation.iussp.org/content/preston-coale-method>.

—R. E. Dorrington, "Synthetic extinct generations", in "Tools for demographic estimation", T. A. Moultrie and others, eds. (Paris, International Union for the Scientific Study of Population, 2012). Available from <http://demographicestimation.iussp.org/content/synthetic-extinct-generations>.

—R. E. Dorrington, "General growth balance", in "Tools for demographic estimation", T. A. Moultrie and others, eds. (Paris, International Union for the Scientific Study of Population, 2012). Available from <http://demographicestimation.iussp.org/content/general-growth-balance>.

⁴⁴ I. M. Timaeus, "Indirect estimation from orphanhood in multiple inquiries", in "Tools for demographic estimation", T. A. Moultrie and others, eds. (Paris, International Union for the Scientific Study of Population, 2012). Available from <http://demographicestimation.iussp.org/content/orphanhood-multiple-inquiries>.

born to the same mother. Collecting sibling histories is a complex process. Thorough training and close supervision of field staff will be required if the process is to be carried out successfully. It is not an appropriate methodology for use in a census.⁴⁵

(c) Maternal mortality⁴⁶

560. As indicated above in paragraphs 542-544, sibling histories in household surveys and household deaths collected in censuses and large household surveys can be used to produce estimates of pregnancy-related death. Careful evaluation of data quality and explanations are needed, however, when using these methods. For example, it is widely believed that sibling histories tend to underreport mortality, particularly deaths further back in the past. No attempt should be made to interpret trends in mortality occurring during pregnancy, childbirth and puerperium within a single data set. For the method based on recent household deaths, it is commonly considered that responses to questions on household deaths and on births in the year before a census or survey tend to underreport numbers of events. Careful evaluation of coverage of both types of event is essential.

3. Advantages and limitations of indirect techniques

561. The major advantage of the indirect methods of estimation is the relative ease with which fertility and mortality rates can be derived once the required demographic data are available from censuses or surveys. In the absence of accurate and timely data from civil registration, the indirect techniques produce plausible estimates of vital rates to fill the data gaps in this area.

562. However, although these techniques have been tested on data obtained from statistically developed countries, they may not work in all cases because of, e.g., the violation of underlying assumptions. In addition, quality of data varies from one data source to another, depending on numerous factors, including those related to planning and implementation of these surveys and censuses.

563. Household surveys provide estimates at the country and major divisions levels only, and because they do not produce annual estimations of rates, may be of a limited value for monitoring and evaluation of population and health programmes.

(a) Fertility estimates

564. The availability from the censuses of data on children ever born alive or on the age distribution of children under 10 years of age enables fertility studies using indirect methods, such as the own-children method and other techniques.

565. Regarding lifetime fertility, in addition to the reporting problems, there will be cases where children are missed because the mother died prior to the census or the survey. Unless the fertility pattern of mothers who did not survive is similar to that of those who were enumerated, the results will be biased. Another important limitation of some of these methods is that they require constant fertility in the past; hence, unless fertility has indeed been constant, these estimates will overstate the

⁴⁵ I. M. Timaeus, "Estimation of adult mortality from sibling histories", in "Tools for demographic estimation", T. A. Moultrie and others, eds. (Paris, International Union for the Scientific Study of Population, 2012). Available from <http://demographicestimation.iussp.org/content/sibling-histories>.

⁴⁶ K. H. Hill, "Maternal mortality". See footnote 38.

fertility level during its period of decline and understate the level in the period of increasing fertility.

(b) Mortality estimates

566. Data by age of mother on children born alive and still living, which provide mortality estimates for the childhood period, are available from a number of population censuses and single-round retrospective surveys. The advantage of using census data for this purpose is that the data are available for the country as a whole as well as for the major political subdivisions so as to satisfy some of the public-health programme needs. The estimation of adult mortality derived from recent household deaths, orphanhood or sibling histories seems to be less satisfactory than that obtained for infant mortality. Recent household deaths reporting often leads to high level of omissions and special efforts are needed to avoid underreporting. Questions such as, Is your mother (or father) still alive?, are questions of fact which the respondent should be able to answer accurately in the context of the orphanhood method. There are exceptions, however—cases where the child was abandoned early in life and the whereabouts of the father or the mother is not known. A child born out of wedlock may not know the identity of the father. An adopted child's response may apply to the adoptive parents rather than to the natural ones. Deaths of childless couples will be missed. Overcounts may occur in the case of parents with more than one child among the respondents. In addition, the reference periods for indirect estimates can be determined only approximately with the available methods.

4. Conclusion

567. There is no single source or approach that adequately serves the needs for vital statistics for a variety of uses. Estimates of fertility and mortality from data collected in population censuses and household and demographic surveys are valuable and complementary to the direct and continuous information recorded in the civil registration system and other administrative records. When the civil registration system is incomplete or its data are defective, censuses and surveys provide planners with plausible demographic estimates to be utilized in socioeconomic planning; they are not substitutes, however, for a well-established system, which provides data that are free of coverage and sampling errors.

568. In population censuses or sample surveys, data on live-born children should, preferably, be collected for each woman of childbearing age or over who is a member of the household at the time of inquiry, regardless of her marital status and irrespective of where she was residing at the time of birth of her children. Special care should be taken to ensure the inclusion of deceased children.

569. If it is not feasible to obtain information for never-married women in a population census or sample survey, information on total live births should be collected at least for all women 15 years of age and over who are currently married, consensually married, widowed, separated or divorced. Whatever the group of women for whom the data have been collected, these women should be clearly described so as to prevent ambiguities from impacting the analysis of the results—especially if, as is often the case in statistically less developed countries, the available data for estimating fertility are defective.

570. What topics any country selects for investigation will depend on its information needs and on the resources available. Particular attention needs to be given to the number and types of questions whose inclusion in the survey or population

census questionnaire would be practicable. The inclusion of too many items usually has an adverse effect on the quality of the data to be collected. Therefore, limiting the number of questions and the length of time necessary to complete each questionnaire is desirable and will result in an improvement in the quality and usefulness of the information collected.

Part three

Key elements of the vital statistics system

Chapter I

Quality assurance and assessment of civil registration and register-based vital statistics

571. The present chapter provides recommendations on some of the practices adopted to assess the quality of civil registration data and the quality of vital statistics based on those data, including field actions that closely monitor the records of vital events and query-related practices carried out at the time of registration and whose goal is to ensure that omissions and errors are caught early enough to allow the rectifications to be incorporated in the original records. The evaluation of vital statistics from other sources that are components of the vital statistics system has been discussed in part two.

A. Quality assurance and assessment: basic framework

572. Because of the importance of civil registration information and register-based vital statistics, both on an individual record basis and in aggregated form, the maintenance of high standards of quality should be a major and continuing concern to those responsible for the administration of the systems. Therefore, adequately funded evaluation activities of civil registration and vital statistics systems must be regarded as essential components of the management, operation and maintenance functions of such systems. Such critical evaluations are necessary for the strengthening and improvement of systems that have deficiencies and for maintaining high standards of quality in those systems that are functioning satisfactorily.

573. Quality assurance encompasses the steps taken at each stage of the operations of civil registration and vital statistics systems to ensure that all vital events occurring within the country are registered without duplication, that all related information is accurately recorded, and that the compilation and processing of recorded vital events result in the proper and timely production of vital statistics. Quality assurance is considered an integral part of the functioning of civil registration and vital statistics systems and should be conducted on a regular basis. Persons responsible for quality assurance are usually those who are working within different domains of both systems.

574. Quality assessment entails specific studies that aim to answer specific questions of quality as it applies to the civil registration and vital statistics systems. These questions could relate to the coverage of the registration of a vital event at the country level or in a smaller area; the accuracy of one of the variables recorded or published in vital statistics; or the overall status of civil registration and vital statistics systems. Quality assessment can be conducted regularly or on an ad hoc basis.

575. The responsibility for the establishment and execution of methods of assessment should be vested in an independent agency capable of undertaking evaluation. If field operations or sample surveys are to be undertaken for these purposes,

close collaboration and cooperation between the agency conducting the evaluation and the registration office are essential. Mutual cooperation and collaboration in major evaluation operations will promote better coordination and evaluation. In addition, they will help to build trust, enhance the better utilization of resources and reduce overlapping of work and therefore wastage of resources.

B. Quality assurance and assessment: standards

576. The quality of data should be measured according to the standards of completeness, correctness, availability and timeliness, as described below:

- (a) *Complete* registration has been achieved when every vital event that has occurred to the members of the population of a particular country (or area), within a specified time period, has been registered in the system, i.e., has a vital event registration record. This means that the system has attained 100 per cent coverage. Any deviation from complete coverage is measured by “coverage error”. Vital statistics from registration data are complete when, in addition to registration of each event, there is a vital statistical report, which is forwarded to the agency responsible for the compilation and production of vital statistics;
- (b) *Correctness or accuracy* of registration is achieved when data items for each vital event on the vital record have been accurately and completely filled in, i.e., when there are no response errors or missing items. The measurement of any deviation from correctness is called “content error”. In register-based vital statistics, accuracy means that data items in the statistical report have been accurately and completely filled in and no errors have been introduced during the transcription of data from the vital records to the statistical report (if this is the case) or during the processing stages (coding, editing, imputation and tabulation);
- (c) *Availability* means that data that have been collected, filed, processed and stored in each system (civil registration and vital statistics) are accessible to users in a user-friendly format, upon request;
- (d) *Timeliness* in registration means that every event that has occurred in the country (or area) has been reported for registration within the legally stipulated time allowance. In register-based vital statistics, it means that for every timely registered event, a statistical report form has been forwarded to the agency responsible for vital statistics within the fixed time schedule established by the vital statistics programme. It also implies that the production, publication and dissemination of the vital statistics have been carried out promptly enough to ensure that users’ needs are served.

Consequently the evaluation of quality of data should address the level of completeness of the civil registration and vital statistics, correctness or accuracy of each item of data, as well as availability and timeliness of registration and statistics. Note that the four criteria do not carry the same weight for assessment purposes. Completeness and accuracy, for example, should not be jeopardized in order to achieve timeliness. Note that the four criteria do not carry the same weight for assessment purposes. Completeness and accuracy, for example, should not be jeopardized in order to achieve timeliness.

C. Quality assurance

577. As an integral part of the civil registration system, the steps that constitute quality assurance should be followed by the registration authority on a regular basis to ensure that: (a) all local registration areas have carried out the required registration functions; (b) every vital event occurring to members of the population in a given area has a record in the system; and (c) all local offices transmit the records to a higher-level registration office, according to established procedures. When local offices do not report registered events, serious problems arise. Therefore, it is important for the registration authority to evaluate the performance of each local office with regard to sending records to regional offices. Even when all registration offices have carried out their work so that geographical coverage is complete, there are other quantitative and qualitative issues of registration which should be evaluated on a regular basis. A detailed discussion on quality assurance for the civil registration system has been provided in part two.

578. Similarly, to ensure that registered-based vital statistics are complete and accurate, quality assurance steps should also be taken by offices responsible for the compilation and dissemination of vital statistics. A system that is thorough in its approach, with a clear delineation of responsibilities for the receipt and control of received records within the vital statistics system, is essential to ensuring the appropriate transmittal of statistical reports through administrative channels. Careful monitoring of statistical returns from local registrars is necessary for the detection of problems in statistical reporting. The audit system must have procedures in place to ensure that: (a) statistical reports from the registration areas are received on a timely basis; (b) every registration area has reported its data; and (c) the frequencies of each type of vital event reported are close to the expected values for the same time period (e.g., in terms of similarities between present and past numbers of events for each registration area). For example, the absence of reports for a period of time (a week, a month, etc.) may indicate a breakdown in the reporting system. A log of the serial registration numbers of the received reports should be monitored for unexplained gaps or duplication in numbering. The statistical report should carry the same number as that of the registration record in order to facilitate the audit process. Questions about receipt and control of statistical reports should be resolved with the cooperation of local registrars as soon as they are noted.

D. Quality assessment methods

1. Direct method: matching of records

579 The direct method for the evaluation of the completeness of civil registration coverage and register-based vital statistics entails matching registration records with records containing some or all of the same information from an independent source. Several independent data sources, such as those described below, may be used for making a direct evaluation. Some sources will obviously provide more complete or unbiased information on vital events than others. A direct method can provide useful information on the sources of underreporting, particularly if the test is carefully designed, and can also improve registration by identifying unregistered vital events.

(a) Use of civil registration records

580. One readily available source of records for the evaluation of birth registration is the register of deaths. Use of this source is mainly limited to verifying the birth registration of all infant deaths. Although it is possible, in principle, to verify the birth registration of all deaths, regardless of age at death, the mobility of the population makes the matching of birth records against the death records of adults extremely difficult to accomplish.

581. The matching of infant death records with birth records can be carried out on a routine basis. When a match is found, the birth record can be routinely marked “deceased” to prevent the use of the decedent’s birth certificate to obtain fraudulent identification documents.

582. Some countries may experience problems with the birth/infant death match if there is a likelihood that infants that die shortly after birth or in isolated areas are not reported.

(b) Use of administrative and social records

583. Birth and death records can be matched against a variety of other lists, such as school enrolments, and hospital, baptism and burial records. Although none of these sources can be regarded as providing complete lists of all births or deaths, each set of records can be useful in detecting underreporting of certain types of vital events. Because of their selectivity, however, matching based on any one of these lists should not be used to estimate the overall level of registration completeness.

584. This kind of matching should be carried out at higher levels of the civil registration office administering the system, in cooperation with local offices and related agencies. Because this operation involves a number of other organizations, including the vital statistics system, it is recommended that it be carried out on an ad hoc basis.

(c) Use of lists obtained from population censuses and surveys

585. Data from both population censuses and surveys can be used to compile lists of live births or deaths in order to obtain estimates of registration completeness. The independent lists, when matched against vital events registers, can provide indications of errors in registration and can lead to estimations of underregistration. The matching of census and survey records with those of civil registration may be carried out on a sample basis at either the national or the local level.

(d) The dual-records system

586. An extension of the direct matching technique, known as the dual-records system, uses two independent procedures to collect information on vital events: the civil registration system (source 1) and the survey (source 2). Information from the two sources is matched, resulting in three classes of events: those recorded in both systems (matched events); those recorded in source 1 but not in source 2; and those recorded in source 2 but not in source 1. Assuming independence between the two data sources and applying the Chandrasekaran-Deming formula (Chandrasekaran and Deming, 1949; and Marks, Seltzer and Krotki, 1974), a fourth class of events may be estimated, that is, those not recorded by either procedure. The sum of the four types of events provides an estimate of the total number of events. The use

of this technique to evaluate registration coverage can result in significant improvements in the long term.⁴⁷

587. The direct evaluation of response error in vital statistics data from civil registration can be also achieved by matching a sample of vital statistical reports with an independent set of records. For example, death records might be matched with corresponding census records for a sample of persons who died shortly after the census date. Selected items from the death record, such as age, marital status and occupation, may be compared with those same items from the census to evaluate the agreement between the two data sources.

588 Cause-of-death data can be evaluated by comparing a sample of death statistics reports with corresponding autopsy reports or hospital records or by reinterviewing the medical certifier. For deaths due to accidents, suicide and homicide, official police records may be used as an independent source of information. The correct application of international rules for assigning underlying cause of death codes can be assessed through the circulation among countries for comparative coding purposes of a “standard” set of medical certifications of causes of death. Guidance on, and assistance in coordinating, this kind of assessment may be obtained from one of the Collaborating Centres for the WHO Family of International Classifications of diseases listed in the current version of the International Classification of Diseases.⁴⁸

589. Incorrect editing, coding and processing of vital statistics data constitute another important source of error. The detection of coding errors can be achieved by having two different groups of coders code the same set of statistical reports. Such independent recoding of records, either on a 100 per cent basis or through the use of a sample, should be routinely carried out as a means of verification of the coding process. A very low level of discrepancy between the results of the original coders and those of the verifiers can be tolerated in the statistical system, but otherwise discrepancies should be evaluated and adjusted.

590. Other assessments of the qualitative accuracy of information for vital statistics may be undertaken through the use of special sample surveys designed to facilitate interviews with informants and others involved in the provision of registration and vital statistics data. For example, a sample of birth records could be selected and a questionnaire sent to the mothers to obtain confirmation of the originally provided information; similarly, based on a sample of death certificates, a questionnaire might be designed for the purpose of reinterviewing the informant and/or the medical certifier of the cause of death.

2. Indirect methods

(a) Comparison of trends

591. The total number of vital events registered and reported to the statistical agency in any given period (e.g., a month, a quarter or a year) can be compared with the number registered and reported in a previous time period of similar duration. In most cases, the total number in the later time period will not differ greatly from that in the corresponding previous period, unless some notable event, such as a war, major natural disaster or epidemic has taken place. Such a comparison should be an important component of the routine audit system and monthly frequencies of vital

⁴⁷ For a summary of the process and specific country applications, see United Nations (1991).

⁴⁸ See <http://apps.who.int/classifications/icd10/browse/2010/en>.

events can be produced rapidly, by place of registration, for this purpose. The method is easy to apply, and can be used by the local registrars to assess their own work, or at the national level to assess national and subnational totals or to query local registrars regarding discrepancies that appear significant. Seasonal variations will limit the comparability of totals for periods under one year unless the same seasonal periods are compared. In general, the method assesses the correctness of total events registered only within broad limits and usually cannot be used to estimate the number of unregistered events.

(b) Delayed registration

592. Regular monitoring of the interval between the date of occurrence and the date of registration of events can provide useful information on the timeliness of civil registration and the completeness of statistical reporting. The proportion of total registrations that are delayed (or late) provides a rough but easily obtainable estimate of underreporting in previous time periods. Depending on the length of the delay and the cut-off date for inclusion of vital statistical reports in statistical tabulations, delayed and late registrations can have a substantial impact on the completeness of vital statistics. Through continuous measurement of the delay between occurrence and registration, it is possible to infer whether the operation of the system is improving or deteriorating.

593. Similarly, delays in the transmission of vital statistical reports to the compiling agency may affect the completeness of annual statistics. Regardless of the size of the country and any difficulties in communications, delays in the transmission of statistical reports should occur rarely and every effort should be made to make this process as efficient as possible.

594. Information on late or delayed registrations or on delayed transmission of information can provide insight into other aspects of the vital statistics system as well. For example, for systems relying on health personnel for the notification of events or for the actual registration of events, a table showing registration or transmission delays by type of place of birth or death (health facility/non-health facility) may provide some information on the degree of cooperation of health personnel in the registration and reporting process.

(c) Comparison with census data

595. If estimates of migration are available, the “balancing equation” can be used to compare intercensal population growth (the difference between two successive censuses) with intercensal births, deaths and net migration. If censuses as well as vital and migration records are considered reliable, intercensal growth should equal the sum of intercensal births and number of immigrants minus intercensal deaths and number of emigrants. Assuming that census and migration data are accurate, the difference between this sum and intercensal growth will be due to the underregistration of vital events.⁴⁹

596. In developing countries, these assumptions are often not confirmed because of deficiencies in migration statistics. On the other hand, in countries where migration is negligible, the method may yield reasonable results. The technique will provide only an approximate measure of error—one where it will not be possible to separate out the degree of underregistration of births and deaths.

⁴⁹ See <http://demographicestimation.iussp.org/>.

597. Comparing the results of a single census with registered births provides another means of evaluating the completeness of birth registration. In this approach, the number of children under 1 year of age enumerated in the census is compared with the number of live births registered in the 12 months preceding the census, thereby allowing for the number of deaths of these children during those months. The technique provides only a rough measure of underregistration, since the difference between the data from one source and those from the other may be due in part to incomplete registration of births and infant deaths, errors in the statement of age of enumerated infants, or census underenumeration of infants. Problems of infant underenumeration and age misstatement, which are particularly important in developing countries, greatly limit the usefulness of this method.

(d) Comparisons of rates observed in similar populations or in previous periods

598. Crude birth and death rates can be compared with rates from similar populations known to have good registration coverage. A significant difference between the rates derived from the two sources may indicate problems of underregistration, although other factors, such as differences between the age structures of the populations, may also render the comparison problematic. Comparing data with those from only one other country, as well as actual annual fluctuations in rates of one or both of the countries being compared, may also make it difficult to draw firm conclusions about the level of completeness. At best, such comparisons provide only a general measure of underreporting. However, if large differences are found, this technique may be valuable as providing a warning that further examination of the data is warranted.

599. Similarly, age-specific fertility or mortality rates can be compared with the same rates observed in a similar population or in a previous period. In this case, however, differences may be due to problems in both the numerator (registered births or deaths by age) and the denominator (age-specific census count or population estimate). However, such comparisons can provide, in this case as well, an early warning that something may be amiss in the data and that additional checking is called for.

(e) Incomplete data methods: indirect techniques

600. An increasing need for basic demographic measures, combined with the poor quality of civil registration and vital statistics systems in most developing countries, has led to the development of indirect techniques for the estimation of these measures from incomplete or deficient data. The results obtained from application of such methods can also be used to evaluate registration coverage in various ways: (a) birth or death rates estimated through use of methods dealing with incomplete data can be compared with vital rates obtained from civil registration data; (b) demographic relationships used in methods dealing with incomplete data may be adapted to assess the quality of civil registration and vital statistics data; and (c) incomplete data methods can be applied to directly estimate the level of underregistration of vital events. A detailed treatment of these techniques can be found in the IUSSP revision of *Manual X*.⁵⁰

50 Ibid.

(f) Questions in sample surveys on birth registration

601. Sample surveys implemented in some countries have included questions on whether the child who is under 5 years of age has a birth certificate, and whether the child was registered with the civil registration authority; and sometimes a birth certificate is asked for. Based on the answers, an estimate of birth registration coverage may be derived. These questions have been implemented in the United Nations Children's Fund (UNICEF) Multiple Indicator Cluster Surveys and the Demographic and Health Surveys. It should be noted that registration does not always translate into statistics. There are situations where vital events are registered but not all the data are compiled into statistics. Therefore, the coverage obtained from questions on sample surveys refers only to registration and not to statistics.

602. A few countries have also included similar questions in their population census questionnaires. This practice is generally not recommended, however, because it is unlikely that reliable estimates will be obtained owing to respondents' confidentiality concerns.

(g) Other indirect assessment methods

603. A variety of techniques are available for the evaluation of the qualitative accuracy of vital statistics data that involve examination of the internal consistency of the data. For example, comparing the number of early infant deaths with the number of late foetal deaths may reveal that a misunderstanding exists regarding the definition of a live birth. Statistics on reported ages can be analysed for evidence of age heaping (a preference for ages expressed in numerals ending in 0, 5 or an even digit), using such techniques as Myers' blended method (see Shryock, Siegel and Larmon, 1971). A large proportion of "unknowns" in any frequency distribution indicates that the distribution should not be considered reliable.

E. Direct versus indirect assessment

604. Both direct and indirect techniques are available to evaluate the completeness and accuracy of vital statistics data. In general, indirect methods indicate whether incompleteness or inaccuracies exist, while direct methods not only assess the coverage and accuracy of data but also point to likely sources of the problems.

1. Direct methods**(a) Advantages**

605. The direct methods of evaluation are generally considered to produce an accurate estimate of registration completeness if the requirements of both independence and quality of the two sources are met. They measure the level of completeness of registration by directly comparing registration records with records from another source, and they may also indicate the sources of under- or overregistration.

606. The direct method can be applied either at the national level or at the lowest level of local registration. The local registration offices, on their own initiative or in collaboration with higher registration and/or vital statistics offices, can conduct various types of evaluation using direct methods to improve the quality of registration and statistical reporting.

(b) Limitations

607. Despite the advantages of direct methods in evaluating registration completeness, they do have some limitations. The choice of an independent source of records can affect the accuracy of the estimates. In the case of the dual-records system, the requirement for the independence of the two data sources, which is necessary for the successful application of the formula, may never be achieved in practice; and there may be a tendency to overestimate the number of events because of errors in matching or coverage.

608. In direct comparisons, the matching procedures for records from two sources may present serious difficulties. If not automated, the matching process can be slow and laborious and the selection of appropriate matching criteria is not always a straightforward process.

609. The introduction of computer matching has greatly reduced the quantity of work previously carried out manually. However, the specification of the detailed rules for computer matching requires even more precision than that needed in a manual process: every possible situation must be anticipated in advance and a decision rule designed for each one. To reduce the complexities of rules for computer matching, a compromise approach may be adopted, whereby the computer flags equivocal or questionable matches and sets them aside for human review. In addition, for studies using several rounds of data collection, changes in the quality of data collected over time may require manual verification of the matched records, with possible modification of the matching rules for subsequent rounds of data collection.

610. Other important limitations of direct methods are their cost and the amount of time needed to carry them out. Manual matching of records requires a considerable amount of clerical time, while automated matching requires extensive preparation; thus, the verification of a sample of matched records through a manual review is highly advisable. The cost of obtaining an independent list of records must also be taken into consideration, and timeliness is also a concern. The duration of the study can vary greatly, depending on the source of the independent list of records and the specific methodology used.

2. Indirect methods**(a) Advantages**

611. One important advantage of indirect methods is that the level of completeness of vital statistics can be readily assessed as soon as data become available. Several methods can be applied at the local, regional and national levels, which provide a means of identifying the geographical location of any problems. Their ease of application makes these methods suitable for several purposes, such as the regular monitoring of completeness levels, and the provision of estimates of completeness for campaigns designed to promote improvements in civil registration.

(b) Limitations

612. The applicability of indirect methods is limited by a variety of necessary assumptions and other requirements. For example, some of the methods require a stable population, that is, constant fertility and mortality over a period of time. Owing to declines in both fertility and mortality, the number of countries for which these techniques are suitable is therefore small. On the other hand, the methods that

do not require the assumption of stability do require reliable data from two censuses, which makes the indirect methods unsuitable for countries that do not have such data. Other limitations of these methods include the assumptions of a closed population (or accurate migration statistics), no variation by age in the completeness of death registration, and accurate age reporting for deaths and for the population. In many countries, these conditions are not met. Furthermore, the estimates of complete death registration provided by these methods are always dependent on the degree of completeness of census enumeration. This makes the determination of the absolute level of underregistration problematic in many cases.

613. Some of the limitations of indirect methods can be partially overcome. For example, since a much higher rate of underreporting of deaths is known to exist among infants and children than among adults in some developing countries, these methods can be limited to estimating death registration completeness at 10 years of age and above. By restricting the analysis to such a selection of age groups, the assumption that there is no variation in completeness of registration by age may be acceptable. Such adjustments in methodology reduce the vulnerability of the methods to violations of some basic assumptions, but no modifications have been devised to reduce the impact of violations of others (Bennett and Horiuchi, 1981).

F. Choosing appropriate methods for assessing completeness and qualitative accuracy of registration and register-based vital statistics

614. A variety of direct and indirect methods for the evaluation of completeness and accuracy of registration and register-based vital statistics have been described above. The selection of the most appropriate method(s), whether direct or indirect, will depend on various factors, including the needs of the analyst and the resources available for the study in the country concerned. In general, direct methods that match individual registration records provide information on quality of registration, in terms of coverage and accuracy, as have been discussed earlier. Indirect methods, with the exception of direct questioning in sample surveys about birth registration, work with statistical tabulations generated from civil registration. Therefore, most indirect methods assess quality of vital statistics.

615. In countries where vital statistics are compiled fully from civil registration, all methods—direct and indirect—measure the quality of civil registration and vital statistics. However, coverage and accuracy of vital statistics are affected not only by under- or overreporting of registration information, but also by the steps in the production of vital statistics involving the transfer or statistical reporting of information from the civil registration system to the statistical service and by transcription of registration information into electronic format. Therefore, the coverage and accuracy of the civil registration system do not always correspond to the coverage and accuracy of register-based vital statistics. When the two systems do not correspond completely, measures of quality of one system cannot be used to represent another. For example, if the direct matching method is used, the measure obtained can refer only to the quality of civil registration. Similarly, if indirect methods based on vital statistics are used, the measure can refer only to the quality of vital statistics. On the other hand, if both direct and indirect methods are used, a measurement can be obtained of how well civil registration records are compiled into vital statistics.

616. Usually, when an evaluation study is conducted, it is not possible to use all of the above-mentioned methods, owing to constraints on time and/or resources. The following section discusses various factors that need to be considered when designing an evaluation study. Recommendations are also provided on the assessment methods that are appropriate for different situations and for meeting the requirements in the country.

1. Objectives

617. The objectives of the study should be clearly stated, in terms, for example, of whether the results will be used for promoting improvements in registration, pinpointing specific problems or for other purposes. How the study findings will be applied may, in large part, dictate the choice of method. If the objective is to promote overall registration improvement, it may be sufficient to address coverage problems in general terms and use the findings as a means of encouraging the cooperation of the public, local registrars and collaborating agencies. In this case, indirect evaluation methods will suffice. Similarly, indirect methods can be used for routine monitoring of completeness levels. In cases where the goal is to identify and eliminate specific coverage problems, direct methods are usually more appropriate.

2. Degree of precision

618. The required level of precision for the assessment of completeness or qualitative accuracy should be ascertained in advance. In some cases, an approximate estimate will suffice. The level of accuracy required will be partly a function of the level of completeness or quality of the registration system. If reporting of vital events is grossly deficient, an adequate estimate obtained through an indirect method usually will suffice. If the major problems have been resolved but significant minor problems still remain, direct methods may be the best way to identify them. Once a registration system attains a high level of coverage and quality, indirect methods are generally employed on a regular basis to ensure that coverage and data accuracy do not deteriorate.

3. Timeliness

619. An important determinant in selecting the most suitable method is the time frame within which the results are needed. If the objective of the study is to verify that a problem is developing, the results need to be made available as soon as possible. In general, this calls for the use of an indirect method, although direct evaluation may be feasible if a reasonably complete administrative list of events is readily available. On the other hand, if the study is part of a long-term registration development plan, more specific—albeit more time-consuming—direct method techniques may be considered.

4. Type of event to be studied

620. The study may evaluate births or deaths; a specific subset of these events, such as infant deaths; or more than one type of vital event. Many of the methods described above are highly appropriate for a specific type of event. Care should be taken to select appropriate methods for the proposed study. If several types of events are to be covered in the study, a variety of evaluation methods may be required.

5. Assessing completeness and/or qualitative accuracy of civil registration and register-based vital statistics

621. The study may be limited to an evaluation of completeness and/or to an assessment of the accuracy of vital statistics or may encompass both functions. Both indirect and direct methods can be used to assess the completeness of registration of vital events as well as data accuracy. Direct methods provide more precise estimates of the accuracy of vital statistics, particularly of such items as cause of death. In addition, direct methods are required, if it is necessary to identify the source of a problem.

6. Resources

622. Other decisive factors are the level of funding available for the evaluation study, the availability of skilled analysts, the types of other data sources that can be used for the study and the degree of their accuracy. Ultimately, the choice of an evaluation method may be dictated by the available resources. The cost of direct evaluation may be very high in the context of expected funding levels, particularly if data collection in the field is required in order to construct a separate list of events. If the necessary questions can be added to an upcoming census or survey, the data-collection costs can be reduced. Even when the costs are high, the results of a direct evaluation usually justify the expenditure. The quality of available data also is an important factor. If the available administrative lists or data from a census or survey are grossly incomplete, indirect methods may be preferred. Finally, skilled personnel must be available to carry out the study: the level of expertise of available staff may in fact dictate the choice of the method to be applied, particularly if an indirect method is to be used.

Chapter II

Recommended strategies for improving civil registration and vital statistics systems

623. It has been emphasized that improvement in the vital statistics system is contingent on the establishment of a reliable civil registration system, since most vital statistics are generated through the civil registration system. Therefore, it is of paramount importance that all efforts be made to improve and strengthen civil registration. The present chapter briefly describes some of the steps Governments may undertake to improve the civil registration system. However, these are only some of the many activities that proved useful in countries that have improved their systems—they do not by any means cover all the steps needed for such improvement. Activities described in this chapter include engaging high-level political figures in improving civil registration; periodic training of staff and others peripherally involved with civil registration and vital statistics systems; outreach and communications with government officials, professional groups and the general public; continuous performance monitoring; and maximum use of current and new information technologies as they pertain to the operation of the systems.

A. Engaging high-level political figures

624. In recent years, efforts related to engaging ministers at the regional level have been introduced as a tool for improving civil registration and bringing this issue to the forefront of political and government agendas. Such a process in Africa, which is in progress, is resulting in a major commitment by all Governments to improving civil registration and vital statistics.

625. The process was initiated through the organization and conduct of a Regional Workshop on Civil Registration and Vital Statistics Systems in Africa, held in Dar es Salaam, United Republic of Tanzania, from 29 June to 3 July 2009. The Workshop was attended by 140 representatives of national civil registration offices and national statistical offices of 40 countries in Africa, as well as international and regional organizations and training centres. It was pointed out that in the majority of countries in Africa, and in almost all countries in sub-Saharan Africa, the civil registration system operates on a sporadic and incomplete basis; and that, consequently, there are no adequate systems in those countries enabling citizens to be recognized by the State. Moreover, owing to the low coverage of civil registration systems in most African countries, important vital rates, such as life expectancy at birth, and infant and child mortality, cannot be generated from vital statistics. This has resulted in the undertaking of household surveys and censuses to fill information gaps; however, these largely ad hoc exercises and interim measures should not be regarded as long-term solutions to the issues associated with producing accurate vital statistics.

626. The Workshop therefore called upon all Governments of Africa to take appropriate measures in providing necessary resources and support to civil registration and vital statistics systems; it also recommended exploring the possibility of

organizing a high-level ministerial conference on improving civil registration as soon as possible to maintain the momentum.⁵¹

627. As a follow-up to this initiative, the First Conference of African Ministers Responsible for Civil Registration was held in Addis Ababa, Ethiopia, on 13 and 14 August 2010. The theme of the Conference was entitled “Towards improved civil status information for efficient public administration and generation of vital statistics for national development and Millennium Development Goals monitoring in Africa”. In the Conference declaration, all participating Governments pledged to make civil registration and vital statistics a major priority.

628. The process of implementing the declaration entailed the development of a framework known as the Africa Programme on Accelerated Improvement of the Civil Registration and Vital Statistics System (APAI-CRVS). The overall objective of this programme is to provide management and programmatic guidance within the context of the regional agenda for reforming and improving civil registration and vital statistics systems—and specifically to provide more comprehensive and more holistic guidance on institutional and operational linkages, workflows and management mechanisms so as to encompass the interdisciplinary and intersectoral interfaces of civil registration and vital statistics systems.

629. As the implementation of the framework remains under way, the outcome is still in the making. However, the fact that participation is being mobilized at the highest government levels augurs well for the attainment of a significant improvement in the quality of civil registration and vital statistics. The fact that this is a regional endeavour—a joint rather than an individual effort—is advantageous in respect of ensuring the support of donors.

B. Training and other strategies for improving civil registration and vital statistics systems⁵²

1. Training

630. To be effective, a country’s civil registration and vital statistics systems should be established within its public administration sector. If the goal of producing vital statistics from the civil registration system is to be attained, that system must be permanent and continuous. This can be achieved by establishing clearly defined legal procedures for compulsory registration. The close involvement of civil society in supporting the establishment and maintenance of civil registration systems is essential.

631. Training of registration and vital statistics staff contributes significantly to the strengthening of the civil registration and vital statistics systems. Training programmes provide the knowledge and skills necessary for the efficient performance of the required functions. Through a better understanding by staff of what is expected, errors are reduced and morale is improved. Periodic training and retraining also provide opportunities for the staff to provide feedback on problems and possible alternative procedures and solutions.

632. Well-designed training provides a cost-effective means of focusing on the needs of specific parts of the civil registration operation or particular geographical

51 See Economic Commission for Africa, African Centre for Statistics, “Report and documentation of the Regional Workshop on Civil Registration and Vital Statistics Systems in Africa, Dar es Salaam, 29 June-3 July 2009”.

52 See also United Nations (1991).

regions, such as urban and rural registration areas. It is also important that statistical personnel be well informed about the operation and the strengths and weaknesses of the civil registration system. Similarly, civil registration staff need to understand the uses and importance of statistical items, and the requirements in this regard for completeness and accuracy. The training plan should distinguish between internal training, which is oriented towards civil registrars, vital statisticians and other technical and administrative personnel, and external training, which is oriented towards policymakers, local officials, medical and health personnel and others impacted by and impacting the quality and uses of civil registration and vital statistics. Internal training should emphasize techniques, methods and skills, and should address issues of professional roles and functions. External training should be designed to inform groups about the needs and functions of civil registration and vital statistics systems, and should seek to develop improved understanding and cooperation. External training is a crucial improvement mechanism and should not be neglected: an environment characterized by cooperation and support is essential to its success. In the case, for example, of medical and health personnel who provide data to the system, the quality of the information is dependent on their understanding of the importance of accurate data and the uses to which they will be put. For these reasons, both internal and external training programmes should be an integral part of the civil registration and vital statistics systems. The responsibility for these programmes, which should be carried out on a regular rather than an ad hoc basis, must be shared between both systems.⁵³

2. Seminars and workshops

633. Seminars and workshops for personnel from within the systems should be scheduled periodically to enable an exchange of views on problems encountered in civil registration and vital statistics operations. Participation at the meetings should be as wide as possible and should include personnel involved in data processing, data retrieval and archiving and persons from outside the systems to promote the introduction of fresh ideas and approaches.

3. Feedback from users

634. It is important that public support be secured and that the concerns and needs of users of the civil registration and vital statistics systems be addressed, since promoting and developing a supportive constituency from outside the civil registration and vital statistics systems is key to improvement. One method of obtaining user feedback is through surveys (for further discussion related to obtaining user feedback, see paras. 638-644 below).

4. National and regional civil registration and vital statistics committees

635. National and regional civil registration and vital statistics committees provide an appropriate forum for the demonstration of the leadership and authority required to enable needed improvements in civil registration and vital statistics systems. The objectives of such committees should include the organizing of necessary support for improvements and the coordination of the participation of inter-

⁵³ For specific details on training programmes, see United Nations (1998d), paras. 259-271.

ested technical, professional and governmental groups. Membership of such national and regional civil registration and vital statistics committees should foster a balance between addressing the concerns and interests of users and the general public, and meeting the needs of those seeking advice on technical issues requiring the knowledge and expertise of specialists.

5. Development and implementation of action plans for improvement

636. The steps necessary for the implementation of an action plan to improve registration and vital statistics should be based on factual knowledge of the current situation of the civil registration and vital statistics systems. There are a number of subactivities that might be necessary under the plan; each of these should be specified, with an appropriate time reference indicated. The overall plan will probably span a number of years. Early stages or short-term activities might be implemented within the first year and involve the planning for a new system, the design for an evaluation study, the drafting of new legislation or regulations, etc. The intermediate term might include activities requiring more preparation and refinement or relying on pilot studies or evaluation methods and budget authorization. These activities might be implemented in one to three years after the implementation of the short-term activities. Activities of an even longer term might be of a more complex nature and require considerable technical changes either in the organization of the system or in its operations.

637. It is important that the action plan be devised with care and that the time frames for each required step not reflect undue optimism. The plan should be reviewed and approved by all agencies and organizations that will be involved in its implementation.

C. Public education, information and communication for effective civil registration and vital statistics systems⁵⁴

638. The cost of public education campaigns in large countries with several languages and sociocultural differences can present an extreme challenge. This suggests the advisability of linking the civil registration and vital statistics public education campaign with the publicity campaigns of other programmes in such areas as immunization, prenatal health care, family planning and food rationing.

639. If the civil registration and vital statistics systems are to function properly, then it is essential that the understanding and cooperation of the several groups of persons who are involved in one way or another with the systems be secured. These groups encompass: the general public; representatives of institutions, professions and agencies; senior government officials; and personnel working directly within the registration or vital statistics systems.

1. Government officials

640. Senior government officials, under whose jurisdiction civil registration and vital statistics fall, should be made aware, preferably by special in-person briefings, of the importance of civil registration and vital statistics systems to the general

⁵⁴ Ibid.; further, comprehensive guidelines are provided in United Nations (1998a).

public and to the government and its several programmes that rely on these systems. They should be informed of the dependency of vital statistics on the registration system (or other interim processes such as ad hoc sample surveys for gathering data) and need to be aware of the need for an acceptable level of data quality to ensure statistical reliability. Senior government officials should be involved at an early stage in any major initiatives to improve the systems and their support must be enlisted for activities having budgetary implications; and should also be kept informed, on a timely basis, of the results of evaluations of the systems to ensure a good level of understanding of strengths, weaknesses and probable future requirements. Communications with high-level government officials should be designed specifically for these individuals and should be as concise as possible. Engaging high government officials at regional level is another strategy to be considered (see sect. A above).

2. The general public

641. The general public is the “target population”, comprising individuals whose vital events have been or will be registered; and they may from time to time serve as informants by providing information regarding a vital event. They will use the registration system to obtain legal documents or to otherwise document the vital events occurring to themselves or other family members. Therefore, the public should be made aware, on a long-term, continuous basis, not only of the requirements for registration of vital events but also of the value and benefits that accrue to them through utilization of the registration system. Without the public’s being motivated to register events promptly and accurately, civil registration and vital statistics systems will not function properly. Every effort should be made to inform the members of the public of: the reasons why they should practise timely and accurate registration; their obligations in this regard; and the benefits of compliance for both individuals and society. The general public needs to know where, when and how to register vital events, and needs to appreciate why they must do so. Communications carrying these messages, aimed at educating the general public, may be brief and transmitted by radio, television, posters, pamphlets or other media. The messages should include not only an enumeration of the important uses of civil registration and the benefits to individuals but also a short description of how, when and where this simple process is to be carried out.

3. Members of institutions, professions and agencies

642. This group includes those who may participate directly or indirectly in the civil registration and vital statistics process but whose principal duties are outside the systems, including physicians, health workers, midwives, clinic and hospital personnel, educational officials such as directors of medical schools and schools of public health, marriage officers, divorce officers and local government authorities dealing with civil registration. Where appropriate, job descriptions for persons in this group should specifically include their responsibilities under the civil registration and vital statistics systems. An educational campaign designed for members of this group should emphasize their part in the overall success of the system and reinforce awareness of their specific responsibilities and duties, including a step-by-step description of the required procedures. In addition, educational materials should emphasize the value of educating the public, in order to help members of this group perform their role as educators of that segment of the public representing their clientele.

643. Before the launching of a public education campaign, midwives and birth attendants, as well as leaders who may be responsible for birth registration in their villages, should become fully involved. They should receive training to develop an understanding of the reasons for registering the birth of a child and when, where and how the process may be accomplished, so as to enable them to convey this information to expectant and new mothers.

644. Appropriate international organizations should be encouraged to assist countries in sharing experiences related to civil registration practices. The dissemination of one country's knowledge among others, with the details of successes and failures being shared as part of a learning process, is an important means of fostering the adoption of techniques for improvement of the system.

D. Evaluation studies⁵⁵

645. Evaluation or performance monitoring should be part of the operation of the civil registration and vital statistics systems. If this function is not already a component of those systems, there should be a designated evaluation unit within each system, as a component part of an improvement strategy. This unit should be responsible for organizing evaluation studies, using the appropriate methodologies described in part three, chapter I, above, as well as external evaluation, internal evaluation, pilot studies and demonstration area projects.

1. External evaluation method

646. The objective of an external evaluation study is to obtain feedback on the opinions and perceptions of the users of the services of the civil registration and vital statistics systems. With this methodology, information on attitudes and perceptions, as well as more factual data on the operation of the systems, can be collected.

647. This method draws on techniques originally developed to carry out market research studies and is often practised with informal "focus groups", i.e., groups comprising individuals brought together to discuss their uses and perceptions of the systems. The external methodology may also be more formal, based on a statistical survey of a representative sample of the groups or individuals whose opinions are sought, and usually employs a structured questionnaire or survey instrument. This approach has not been used extensively in civil registration and vital statistics systems evaluations, although it is a common evaluation tool in other settings, such as in the industrial and trade sectors.

2. Internal evaluation methods

648. Internal evaluation methods focus on the internal functioning of the systems. There are generally two types: (a) evaluations that emphasize production (output) measures and (b) evaluations that use attitudinal and qualitative measures.

(a) Performance measure evaluation

649. In performance measure evaluations, a set of evaluative criteria are utilized to examine the performance of the systems in terms of staff, cost and operation.

⁵⁵ Comprehensive guidelines are provided in United Nations (1998a).

In effect, these measures monitor input and output measures of the systems. The cost factor, including the cost of collecting the raw data, the cost of processing the data and the cost of disseminating vital statistics to users, may be used to illustrate the process. In most countries, the raw data are simply by-products of the legal registration of vital events and the collection cost may not be a major concern. However, the processing and dissemination costs of vital statistics require careful scrutiny, which is especially important when a decision is necessary regarding the selection of specific new equipment and new procedures.

650. In addition, the adequacy and quality of civil registration and vital statistics can be examined with respect to completeness, correctness of content, availability of tabulations, timeliness of information and statistics, and continuity over time (see part three, chap. I).

(b) Attitudinal measure evaluation

651. The measurement of attitudes towards and perceptions of the systems may or may not give the same picture as an evaluation of its technical performance. Surveys can be conducted to uncover problems as perceived by users of and contributors to the systems as well as by personnel of the civil registration and vital statistics systems. Information obtained in this way is useful for improving efficiency, responsiveness to user needs, designing training and public relations campaigns, and assisting in priority-setting for future action.

3. Pilot studies and demonstration area projects

652. The evaluation of new practices or improvement strategies may be accomplished through the use of pilot studies and demonstration area projects for test purposes before full implementation takes place.

653. A pilot study examines the feasibility of introducing a change in procedures and its potential contribution to efficiency and quality. It may be used to examine new modes of registration, data flow, data-processing innovations, etc.

654. The demonstration area approach provides a mechanism for fielding a new innovation or improvement effort on a manageable scale in a country that is seeking to modify and upgrade its civil registration and vital statistics systems. Demonstrations may focus on the feasibility of new or modified procedures, or on estimating the resources needed to extend these changes to a regional or national scale, or on both.

655. The success of either pilot studies or demonstration areas is largely dependent on a country's ability to carry over, to the national level, the experiences and lessons learned. Sustained national commitment over time is essential to the success of this approach. It is critical that there be a reasonable expectation that the procedure being tested or demonstrated can be used throughout the country and that it not be heavily dependent on external funding. For such projects to be successful, there must be sufficient national commitment to providing the resources needed to sustain the approach.

656. Countries intending to use this approach have to be both realistic in terms of the goals they set and committed to sustaining or extending the experiences of the demonstrations to a national scale.

E. Use of information technology and automation

657. The level of sophistication of information technology and analysis contribute substantially to the levels of timeliness and quality. New technologies offer potentially significant benefits to the civil registration and vital statistics systems: they may increase efficiency in operations and timeliness, improve the quality of the records collected and the safety of the documents in storage, extend services, improve services provided to the public, etc. Registration and vital statistics systems should routinely monitor the emerging technologies and techniques to assess their applicability to current systems. There are both benefits and costs associated with innovations. Systematic monitoring of emerging technologies provides the civil registration and vital statistics systems with an opportunity to enhance awareness of new technologies and to assess them in terms of cost-effectiveness.

658. New technology for use in civil registration and vital statistics systems, as in other disciplines, becomes available on a regular basis. Some advances offer an improvement applicable to one particular area of the system. Other strategies are more global in their impact on civil registration and vital statistics. It is important for officials in the domain of civil registration and vital statistics officials to remain aware at all times of advances that hold out the possibility of generating improvement in the systems.⁵⁶

659. It is therefore essential for the management of the civil registration and vital statistics systems that there be built into the systems a component for reviewing currently available information technology, automation and communications systems. This will enable the systems to keep pace with the rapid changes occurring in this field and to benefit from them.

56 Ibid.

Annex I

Information required for judicial and administrative purposes

Live birth record

Characteristics of the registration record

Name of the local civil registration office and its geographical code

Number of the record

Date of registration

Characteristics of the child

Name

Sex

Assigned personal identification number

Characteristics of the event

Date and time of occurrence

Place of occurrence

Type of birth (i.e., single or multiple issue)

Attendant at birth (i.e., the person who assisted the mother in delivering a live-born child)

Characteristics of the mother

Name

Personal identification number

Age or date of birth

Place of usual residence

Nationality/ethnic group or citizenship

Place of birth

Marital status

Characteristics of the father

Name

Personal identification number

Age or date of birth

Place of usual residence

Nationality/ethnic group or citizenship

Place of birth

Marital status

Characteristics of the informant

Name

Personal identification number (optional)

Place of usual residence

Relationship to the child

Documentation presented by the informant

Medical certificate issued by a physician or midwife (or, alternatively, names and individual identification numbers of witnesses to the event)

Remarks and signatures

Signatures of informant and local registrar

Space for complementary notations and remarks and for official stamps

Death record

Characteristics of the registration record

Name of the local civil registration office and its geographical code

Number of the record

Date of registration

Characteristics of the decedent

Name

Personal identification number

Sex

Age at death or date of birth

Place of usual residence (of the mother if an infant death)

Nationality/ethnic group or citizenship

Place of birth

Marital status

Characteristics of the event

Date and time of occurrence

Place of occurrence

Cause of death

Characteristics of the informant

Name

Personal identification number (optional)

Place of usual residence

Relationship to the decedent

Documentation presented by the informant

Type of certification and certifier of the cause of death

Names and individual identification numbers of witnesses to the death

Remarks and signatures

Signatures of informant and local registrar

Space for complementary notations and remarks and for official stamps

Marriage record

Characteristics of the registration record

Name of the local civil registration office and its geographical code

Number of the record

Date of registration

Characteristics of bride and groom (separately for each)

Name

Personal identification number

Previous marital status

Number of previous marriages

Age or date of birth

Place of usual residence

Nationality/ethnic group or citizenship

Place of birth

Characteristics of the event

Date of occurrence

Place of occurrence

Type of marriage (e.g., civil, religious, civil and religious, customary, etc.)

Witnesses

Names

Place of residence

Remarks and signatures

Signatures of bride, groom, witnesses and local registrar

Space for complementary notations and remarks and for official stamps

Annex II

Annual tabulation programme of vital statistics compiled from civil registration data

Outlines of essential tables

I. Elements of an annual tabulation programme

A. Introduction

1. For national and subnational purposes, an annual programme of tabulation of vital statistics should provide data classified in accordance with the needs of a study of the incidence, patterns, time trends and geographical differentials of the most important characteristics and determinants of fertility, mortality, foetal mortality, nuptiality and divorce, together with the exploration of their interrelationships. In addition, the programme should include tabulations needed, for administrative purposes, to evaluate the quality of vital statistics, including the completeness and timeliness of registration and the accuracy of the content of the registration records (or the reporting forms for statistical purposes, as the case may be). The tabulation programme should also seek to meet the requirements of international organizations and, wherever possible, conform to recommendations for achieving international comparability.

2. The design of the tabulation programme should maximize the utilization of available information. In the formulation of the tabulation programme, the focus should be on the need for each tabulation, the possibility of using available tabulation facilities or software ordinarily available to the statistical services of the country, and the need to prepare and disseminate vital statistics information in a timely fashion in printed format or on electronic media for users within and outside the government.

3. The design of the tabulation programme should also take account of the quality of basic data with respect to accuracy and completeness of coverage (see part one, chap. IV.D, para. 240, and part three, chap. I). An extensive tabulation programme is useful only when the degree of completeness of registration is 90 per cent and over. Short of that, tabulations should be limited to simpler tables, with emphasis on the need to achieve improvements in the completeness of registration and the accuracy of the contents of the reporting of statistical information.

4. Table titles need to be designed in such a way as to reflect, as far as possible, the content of the table, its scope and coverage. Whenever needed, it is important that any deviation or procedure followed to create derived variables shown in the tables is properly documented and footnoted.

5. The minimum list of tabulations set out in section II below is limited to tabulations appropriate to data collected by the civil registration method. The tabulation

plan is intended to serve only as a guide to the preparation of vital statistics. The list is structured by type of vital event and is followed in section III by a set of outlines of the tables listed which present time series of vital events, basic vital statistics rates and the full range of vital events for the country and its civil divisions. The entire list may be useful for countries with good regional coverage of civil registration. Tabulations that are appropriate for countries with less than 90 per cent registration coverage are those that provide the distribution of each type of vital event by place of occurrence and place of residence, for the country as a whole and for its civil divisions.

B. Scope and objectives of tabulations

6. The purposes of the tabulations described below are twofold. They are designed mainly to acquaint users with the types of tables that the vital statistics office would be able to prepare for the purposes of both presenting data and evaluating the quality of vital statistics; that is, the goals would be:

- To provide examples of basic tabulations that may be produced annually from the topics recommended in part one, chapter III, and that meet minimum national data needs and enhance international comparability
- To present tabulations for administrative purposes that would be used to evaluate the level of registration completeness and to promote the comparison of current results with those obtained in previous years in order to identify changes in levels and patterns, errors due to incomplete receipt of records from the registration office, delayed transmissions, etc.

7. The tabulations described below should be regarded as the basis of a suggested minimum basic annual programme. The set does not include all of the topics shown in the list provided in part one, chapter III, but focuses instead on those topics that are regarded as constituents of a minimum list designed to meet specific users and country needs. The tabulations are offered as a guide to countries, which may need to modify and expand the set for their own needs. It should be noted that a country's vital statistics are more useful for administrative and planning, as well as for general research purposes, if they are tabulated in relation to the significant social and economic groups that are identifiable within that country. Regional and other geographical subdivisions, such as major or minor civil divisions or urban/rural residence, are important in distinguishing levels, patterns and changes in vital statistics.

8. Vital statistics rates that measure the levels and patterns of fertility, mortality, marriage and divorce are usually calculated using denominators comprising counts of population groups within which the events counted in the numerators occurred (population at risk). For most rates, the denominators are usually obtained from separate data sources, such as population censuses, population registers (if available) and population estimates. Therefore, it is essential that close attention be given to the harmonization of definitions and classifications used in the sources from which numerators and denominators are obtained.

C. Tabulation principles

9. Tabulation principles have been provided in part one, paragraphs 240-256, and should be taken into account in preparing the annual tabulation programme. Some essential concepts are set out below.

10. *Universality.* It is stipulated in the law that each vital event occurring within the geographical area concerned must be registered once and only once within the time period. Therefore, statistical tabulations should encompass the entire geographical area and include events for all population groups within the area occurring during the specified time period (see paras. 34, 241 and 242).

11. Tabulation of data for a country should generally relate only to events occurring within its boundaries. Events occurring outside the boundaries need to be included only when they relate to persons included in the population denominator for potential national rates, such as deaths to tourists or the armed forces occurring outside the country. For countries that wish to implement this principle, provision should be made for international or bilateral exchange of records so that events occurring to residents of other countries can be excluded from occurrence data (see also para. 243).

12. In the event that the registration area is limited to one part of the country, the tabulation programme and the level of geographical detail shown need to be limited.

13. *Tabulation by date of occurrence.* Although preliminary tabulations may be presented by date of registration in order to prepare them as quickly as possible, final tabulations for the calendar period should be based on events that actually occurred during the period, regardless of their date of registration (see paras. 244-251).

14. *Tabulations by place of occurrence and place of residence.* Final annual tabulations should be prepared by place of residence. For tabulations of events for the country as a whole, there is generally relatively little difference between place of occurrence and place of residence. Final tabulations for geographical areas smaller than the total national territory, major civil divisions, minor civil divisions and cities should, for analytical purposes, be prepared according to place of usual residence. However, as discussed in paragraphs 252-255, place-of-occurrence tabulations required for administrative purposes or evaluation of registration coverage need to be prepared (see para. 255, for designation of the place of residence of the reference person for each type of event).

D. Minimum contents of an annual vital statistics report

15. An annual vital statistics report for a country needs to include, as a minimum, the necessary tabulations and appropriate rates and ratios (see paras. 258-264); and text noting the qualifications of the data necessary for the interpretation and understanding of those data by their users, including descriptions of data quality and completeness, the methods used to evaluate the data, the definitions and classifications used in data collection and preparation of tabulations, and the sources of the denominators used to calculate vital rates.

16. In cases where a comprehensive system does not exist, some modification of the principles set forth in part one, chapter IV, paragraphs 240-256, will be necessary and a more limited tabulation programme will need to be adopted. The practice of limiting detailed tabulations to areas of known registration completeness is recommended. It is nevertheless important to tabulate statistics and evaluate coverage on an annual basis. Activities through which vital statistics are regularly processed may serve as a tool for promoting coordination within the system, between the ministry responsible for civil registration and that ministry vested with the authority to prepare vital statistics.

17. In order to facilitate a summary appraisal of the scope of the tabulation programme, the minimum list set out in section II below provides the title of each suggested tabulation for live births, deaths, infant deaths, foetal deaths, confinements (live births plus foetal deaths), marriages, divorces and summary tables. Most of the tabulations, including uses and detailed specifications, are illustrated in section III. Specifications have been harmonized with specifications for population censuses and specifications contained in the *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision*,^a as well as with the recommendations of the United Nations Educational, Scientific and Cultural Organization (UNESCO) on the classification of education and those of the International Labour Organization on economic activity.

18. Both analytical tables and tables for administrative purposes are presented. Analytical tables are tables prepared for users of vital statistics for research purposes (to measure changes in the level and patterns of vital events, etc.), for establishing health, education and social service facilities or for epidemiological monitoring. Tables for administrative purposes are those used, for example, to assist in the evaluation of completeness of registration, timeliness and accuracy of content.

19. Vital statistics compiled from registration data are basic tools for designing, evaluating and monitoring health and administrative programmes targeted at the population. Therefore, most of the tabulations are designed to provide data for three levels of civil divisions: the country as a whole, major civil divisions and minor civil divisions. If countries have intermediate civil divisions, this constitutes a category that must be included. Furthermore, urban/rural data and data for specific ethnic or national groups, as appropriate, should be included in the tabulation programme. However, it is the overall number of vital events that, in many instances, will determine the level of geographical disaggregation of each tabulation.

20. Information technology offers unlimited facilities for record linkages in the vital statistics system. For instance, infant death records can be linked to the corresponding live-birth records to enlarge the number of available variables in order to enable the undertaking of more in-depth studies. To that end, countries may wish to design special tabulations.

^a Geneva, World Health Organization, 1992. Please note that since its original issue, ICD-10 has had three updates, the most recent being that of 2010.

II. Minimum list of tabulations^b

A. Live births (LB)

LB-1	Live births by place of occurrence and sex of child
LB-2	Live births by place of occurrence and place of usual residence of mother
LB-3	Live births by place of registration, month of occurrence and month of registration
LB-4	Live births by month, place of occurrence and place of usual residence of mother
LB-5	Live births by age, place of usual residence and marital status of mother
LB-6	Live births by age of father
LB-7	Live births by place of usual residence, age and educational attainment of mother
LB-8	Live births by educational attainment and age of mother, and live-birth order
LB-9	Live births by place of usual residence and age of mother, sex of child and live-birth order
LB-10	Live births by live-birth order and interval between last and previous live births to mother
LB-11	Live births by place of birth, place of usual residence and age of mother
LB-12	Live births by place of usual residence and age of mother and legitimacy status
LB-13	Live births by place of occurrence, site of delivery and attendant at birth
LB-14	Live births by site of delivery, attendant at birth and birth weight
LB-15	Live births by birth weight and place of usual residence and educational attainment of mother
LB-16	Live births by gestational age, place of usual residence of mother and birth weight
LB-17	Live births by birth weight, place of usual residence of mother and month in which prenatal care began
LB-18	Live births by age and place of usual residence of mother and month in which prenatal care began
LB-19	Live births by live-birth order, place of usual residence of mother and month in which prenatal care began
LB-20	Live births by place of usual residence of mother and duration of residence at the current usual residence

^b Tabulations are numbered sequentially under each type of vital event in the list. Tabulation formats are illustrated below. Tabulations LB-6, DE-10 and 13, FD-2, 3 and 7, LB-FD-1, 2 and 3, MA-5 and DI-1, 6 and 7 were not selected for formatted illustration.

B. Deaths (DE)

DE-1	Deaths by place of usual residence and sex of decedent
DE-2	Deaths by place of occurrence and place of usual residence and sex of decedent
DE-3	Deaths by month and place of occurrence and place of usual residence of decedent
DE-4	Deaths by place of registration, month of occurrence and month of registration
DE-5	Deaths by place of occurrence and site of occurrence
DE-6	Deaths by place of usual residence, age and sex of decedent
DE-7	Deaths by age, sex, place of usual residence and marital status of decedent
DE-8	Deaths by place of usual residence, age, sex and educational attainment of decedent
DE-9	Deaths by sex, cause of death, place of usual residence and age of decedent
DE-10	Deaths by month of occurrence and cause of death
DE-11	Deaths by place of occurrence, sex of decedent and type of certification
DE-12	Maternal deaths by cause of death and age of woman
DE-13	Deaths by age and type of usual activity of decedent

C. Infant deaths (ID)

ID-1	Infant deaths by place of occurrence and place of usual residence of mother
ID-2	Infant deaths by month of occurrence and sex and age of child
ID-3	Infant deaths by place of usual residence of mother and age and sex of child
ID-4	Infant deaths by cause of death, place of usual residence of mother and sex and age of child
ID-5	Infant deaths by place of usual residence of mother and incidence of birth registration

D. Foetal deaths (FD)

FD-1	Foetal deaths by age and place of usual residence of mother and sex of foetus
FD-2	Foetal deaths by sex and legitimacy status of foetus
FD-3	Foetal deaths by age of mother and legitimacy status and sex of foetus
FD-4	Foetal deaths by place of usual residence of mother, sex and birth weight
FD-5	Foetal deaths by place of usual residence of the mother and gestational age and birth weight
FD-6	Foetal deaths by age and place of usual residence of mother and birth weight
FD-7	Foetal deaths by sex and gestational age
FD-8	Foetal deaths by age of the mother and total birth order (live births plus foetal deaths)
FD-9	Foetal deaths by month of pregnancy in which prenatal care began, and number of visits and place of usual residence of the mother
FD-10	Foetal deaths by place of occurrence and type of certification

E. Live births and foetal deaths (LB-FD)

LB-FD-1	Confinements by type of birth and status of issue (live-born or born dead)
LB-FD-2	Confinements by birth order and birth weight, for each type of birth
LB-FD-3	Confinements by type of birth and age of mother, for each sex

F. Marriages (MA)

MA-1	Marriages by place of usual residence of groom and month of occurrence
MA-2	Marriages by place of usual residence of groom and age of bride and of groom
MA-3	Marriages by age and previous marital status of bride and of groom
MA-4	Marriages by educational attainment of bride and of groom
MA-5	Marriages by occupation of bride and of groom

G. Divorces (DI)

DI-1	Divorces by place of usual residence of husband
DI-2	Divorces by age of husband and wife
DI-3	Divorces by duration of marriage and age of husband and of wife
DI-4	Divorces by duration of marriage and number of dependent children
DI-5	Divorces by educational attainment of husband and of wife
DI-6	Divorces by occupation of husband and of wife
DI-7	Divorces by number of previous marriages of husband and of wife

H. Summary tables (ST)

ST-1	Live births, deaths, infant deaths, foetal deaths, marriages and divorces by place of usual residence
ST-2	Crude birth rate, crude death rate, infant mortality rate by sex, foetal mortality rate, crude marriage rate and crude divorce rate, by place of usual residence
ST-3	Time series of live births by place of usual residence of mother (past 10 years)
ST-4	Time series of deaths by place of usual residence of decedent (past 10 years)
ST-5	Time series of infant deaths by place of usual residence of mother (past 10 years)
ST-6	Time series of foetal deaths by place of usual residence of mother (past 10 years)
ST-7	Time series of marriages by place of usual residence of groom (past 10 years)
ST-8	Time series of divorces by place of usual residence of husband (past 10 years)
ST-9	Times series of vital events in the country (past 10 years)

Table LB-1
Live births by place of occurrence and sex of child

<i>Place of occurrence</i>	<i>Sex of child</i>			
	<i>Both sexes</i>	<i>Male</i>	<i>Female</i>	<i>Not stated</i>
Total	Classifications:			
Urban	<p>(a) Place of occurrence: (i) total country; (ii) each major civil division; (iii) each minor civil division; (iv) each principal locality. Distinguish urban and rural for (i), (ii) and (iii) and as may be required for national use. If birth registration coverage is less than 90 per cent complete, then use only major and minor civil divisions that register births.</p> <p>(b) Sex: male; female; not stated.</p> <hr/> <p>Note:</p> <p>Counts of the numbers of live births by place of occurrence are useful for the planning and evaluation of medical facilities and manpower, as well as other health and social programmes, and may also be used to monitor the workload and performance of the civil registration system in each civil division. Unusual changes in counts of births or in the ratio of male to female births may indicate registration problems or changes in the availability of medical care or health and hospital facilities.</p>			
Rural				
Major civil division				
Urban				
Rural				
Minor civil division				
Urban				
Rural				
City or town				
...				

Table LB-2
Live births by place of occurrence and place of usual residence of mother

<i>Place of occurrence</i>	<i>Total</i>	<i>Place of usual residence of mother</i>		
		<i>Same as place of occurrence</i>	<i>Other</i>	<i>Not stated</i>
Total	Classifications:			
Urban	<p>(a) Place of occurrence: (i) total country; (ii) each major civil division; (iii) each minor civil division; (iv) each principal locality. Distinguish urban and rural for (i), (ii), (iii) and as may be required for national use.</p> <p>(b) Place of usual residence of mother: same as place of occurrence, other, not stated.</p> <hr/> <p>Note:</p> <p>Counts of the numbers of live births by place of occurrence and place of residence of mother are used to obtain information on whether mothers are giving birth in the same civil division as that of their residence or in another geographical location. The number of births by place of residence is also useful for programme planning, evaluation and research in many fields of application, such as health, education and housing; population estimation and projection; and social and economic policy. The numbers of live births for each civil division of residence and for the country as a whole form the numerators of the calculations of crude birth rates when related to the appropriate denominator of estimated mid-year population. Care must be taken in the interpretation of crude birth rates when either the numerator is incomplete or the population estimates are inaccurate, or both.</p>			
Rural				
Major civil division				
Urban				
Rural				
Minor civil division				
Urban				
Rural				
City or town				
...				

Table LB-3

Live births by place of registration, month of occurrence and month of registration

<i>Place of registration and month of occurrence</i>	<i>Month of registration</i>						
	<i>Total</i>	<i>January</i>	<i>February</i>	<i>...</i>	<i>November</i>	<i>December</i>	<i>Not stated</i>
Total	Classifications:						
January	(a) Place of registration: (i) total country; (ii) each major civil division.						
February	Distinguish urban and rural for (i) and (ii). Countries may wish to extend the breakdown to (iii) each minor civil division.						
March	(b) Month of registration/occurrence: January, February, March, April,						
April	May, June, July, August, September, October, November, December,						
May	not stated.						
June	Note:						
July	Information on time lags between date of birth and date of registration is useful for the assessment of the functioning of the registration system, and should be reviewed by month and place of registration to identify registration delays in particular geographical areas of the country or delays with a seasonal pattern.						
August							
September							
October							
November							
December							
Not stated							
Major civil division (as for total)							
...							

Table LB-4
Live births by month, place of occurrence and place of usual residence of mother

<i>Place and month of occurrence</i>	<i>Total</i>	<i>Place of usual residence of mother</i>		
		<i>Same as place of occurrence</i>	<i>Other</i>	<i>Not stated</i>
Total		Classifications:		
January		(a) Place of occurrence: (i) total country; (ii) each major civil division. Distinguish urban and rural for (i) and (ii) and as may be required for national use.		
February				
March		(b) Place of usual residence of mother: same as place of occurrence; other; not stated.		
April				
May		(c) Month of occurrence: January, February, March, April, May, June, July, August, September, October, November, December, not stated.		
June				
July		Note:		
August		Information on the month of occurrence of live births represents information that is required to establish time series and seasonal patterns important for short-term forecasting, for vaccination and immunization programmes and for monitoring the reporting flows of vital records from registration units to the compiling office. The tabulations of live births by month also allow for the calculation of crude birth rates by both place of occurrence and place of usual residence at national and subnational levels. The denominator used to calculate such crude rates is usually the mid-year total population, developed from population censuses and adjusted for the time elapsed since the last census.		
September				
October				
November				
December				
Not stated				
Major civil division (as for total)				
...				

Table LB-5

Live births by age, place of usual residence and marital status of mother

<i>Age and place of usual residence of mother</i>	<i>Marital status of mother</i>						
	<i>Total</i>	<i>Single</i>	<i>Lawfully married</i>	<i>Other unions</i>	<i>Widowed</i>	<i>Divorced</i>	<i>Separated</i>
Total	Classifications:						
Under 15 years	(a) Place of usual residence of mother: (i) total country; (ii) each major civil division; (iii) each minor civil division. Distinguish urban and rural for (i), (ii) and (iii) and as may be required for national use.						
15-19							
20-24							
25-29	(b) Marital status of mother: (i) single (never married); (ii) lawfully married; (iii) religious marriage, consensual union and customary union; (iv) widowed and not remarried; (v) divorced and not remarried; (vi) married but legally separated; (vii) not stated. Some countries may wish to tabulate this table for the father and should therefore decide on the age grouping for the father.						
30-34							
35-39							
40-44							
45-49							
50 and over	(c) Age of mother: under 15 years, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 and over, not stated.						
Not stated	Note:						
Urban	The tabulation of live births by age of mother, both alone and in conjunction with other items such as birth order, marital status and occupation, is essential to the study of fertility and fertility differentials and is useful in formulating welfare and social policy, including family planning.						
Under 15 years							
15-19							
20-24							
25-29							
30-34							
35-39							
40-44							
45-49							
50 and over							
Not stated							
Rural							
Under 15 years							
15-19							
20-24							
25-29							
30-34							
35-39							
40-44							
45-49							
50 and over							
Not stated							
Major civil division (as for total)							
Minor civil division (as for total)							
...							

Table LB-7
Live births by place of usual residence, age and educational attainment of mother

<i>Place of usual residence and age of mother</i>	<i>Education attainment of mother</i>							
	<i>No Total schooling</i>	<i>ISCED level 1</i>	<i>ISCED level 2</i>	<i>ISCED level 3</i>	<i>ISCED level 4</i>	<i>ISCED level 5</i>	<i>ISCED level 6</i>	<i>Not stated</i>
Total	Classifications:							
Under 15 years	(a) Place of usual residence of mother: (i) total country; (ii) each major civil division; (iii) each minor civil division. Distinguish urban and rural for (i), (ii), and (iii) and as may be required for national use.							
15-19								
20-24	(b) Age of mother: under 15 years, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 and over, not stated.							
25-29								
30-34	(c) Educational attainment of mother: no schooling; ISCED level 1: Primary education; ISCED level 2: Lower secondary education; ISCED level 3: Upper secondary education; ISCED level 4: Post-secondary education; ISCED level 5: First stage of tertiary education (not leading directly to an advanced research qualification); ISCED level 6: Second stage of tertiary education (leading to an advanced research qualification); level of education not stated.							
35-39								
40-44								
45-49								
50 and over								
Not stated	Note:							
Major civil division (as for total)	The education level of the mother provides information on the socio-economic status of the family necessary for social policy purposes and family planning in particular. The statistics on live births by usual place of residence, age and education of the mother allows for the study of differentials in age-fertility rates by education at both the national and subnational levels. The denominator used to calculate such detailed fertility schedules is usually provided by population censuses, adjusted for the time elapsed since the last census, e.g., the mid-year total population by same age groups and levels of education.							
...								
	Abbreviation:							
	ISCED = UNESCO International Standard Classification of Education.							

Table LB-8

Live births by educational attainment and age of mother, and live-birth order

<i>Educational attainment and age of mother</i>	<i>Live-birth order</i>						
	<i>Total</i>	<i>First</i>	<i>Second</i>	<i>Third</i>	<i>...</i>	<i>Tenth and over</i>	<i>Not stated</i>
Total	Classifications:						
Under 15 years	(a) Age of mother: under 15 years, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 and over, not stated.						
15-19	(b) Educational attainment of mother: no schooling; ISCED level 1: Primary education; ISCED level 2: Lower secondary education; ISCED level 3: Upper secondary education; ISCED level 4: Post-secondary education; ISCED level 5: First stage of tertiary education (not leading directly to an advanced research qualification); ISCED level 6: Second stage of tertiary education (leading to an advanced research qualification); level of education not stated						
20-24	(c) Live-birth order: (i) first; (ii) second; (iii) third; (iv) fourth;						
25-29	(v) fifth; (vi) sixth; (vii) seventh; (viii) eighth; (ix) ninth; (x) tenth and over; (xi) not stated.						
30-34	Note:						
35-39	The live-birth order combined with the age of the mother allows analysis of current fertility patterns and fertility changes. Additional value for analysis and forecasting lies in tabulating live-birth order by age of mother in combination with socioeconomic variables, such as the educational attainment of the mother.						
40-44	Abbreviation:						
45-49	ISCED = UNESCO International Standard Classification of Education.						
50 and over							
Not stated							
No schooling (as for total)							
ISCED level 1: Primary education (as for total)							
ISCED level 2: Lower secondary education (as for total)							
ISCED level 3: Upper secondary education (as for total)							
ISCED level 4: Post- secondary education (as for total)							
ISCED level 5: First stage of tertiary education (as for total)							
ISCED level 6: Second stage of tertiary education (as for total)							
Education not stated							
...							

Table LB-9

Live births by place of usual residence and age of mother, sex of child and live-birth order

<i>Sex of child, and age and place of usual residence of mother</i>	<i>Live-birth order</i>						
	<i>Total</i>	<i>First</i>	<i>Second</i>	<i>Third</i>	<i>...</i>	<i>Tenth and over</i>	<i>Not stated</i>
Total	Classifications:						
Both sexes	(a) Place of usual residence of mother: (i) total country; (ii) each major civil division; (iii) each minor civil division. Distinguish urban and rural for (i), (ii) and (iii) and as may be required for national use.						
Under 15 years	(b) Sex: male, female.						
15-19	(c) Age of mother: under 15 years, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 and over, not stated.						
20-24	(d) Live-birth order: (i) first; (ii) second; (iii) third; (iv) fourth; (v) fifth;						
25-29	(vi) sixth; (vii) seventh; (viii) eighth; (ix) ninth; (x) tenth and over; (xi) not stated.						
30-34	Note:						
35-39	This tabulation provides relevant information for calculating first-birth fertility schedules, all-births fertility rates and teenage childbearing estimates, as well as for studying the impact of self-selection with regard to the sex of the child on the patterns of live births. The denominator used to calculate such rates is the female population by age, usually provided by population censuses, adjusted for the time elapsed since the last census, e.g., the mid-year total population.						
40-44							
45-49							
50 and over							
Not stated							
Male (as for total)							
Female (as for total)							
Major civil division (as for total)							
...							

Table LB-10

Live births by live-birth order and interval between last and previous live births to mother

Live-birth order of the last live birth	Interval between last and previous live births										
	Under									10 years and over	Not stated
	12 months	12-17 months	18-23 months	24-29 months	30-35 months	3 years	4 years	5-9 years			
Total	Classifications:										
First	(a) Live-birth order: (i) first; (ii) second; (iii) third; (iv) fourth; (v) fifth; (vi) sixth; (vii) seventh; (viii) eighth; (ix) ninth; (x) tenth and over; (xi) not stated.										
Second											
Third	(b) Interval between last and previous live births: (i) under 12 months; (ii) 12-17 months; (iii) 18-23 months; (iv) 24-29 months; (v) 30-35 months; (vi) 3 years; (vii) 4 years; (viii) 5-9 years; (ix) 10 years and over; (x) not stated.										
Fourth											
Fifth											
Sixth	Note:										
Seventh	This tabulation provides information necessary in the study of fertility patterns and family planning practices. It is also of interest for social work and welfare policy and, in connection with mortality data, for medical research.										
Eighth											
Ninth											
Tenth and over											
Not stated											
...											

Table LB-11

Live births by place of birth, place of usual residence and age of mother

Place of usual residence, place of birth of mother	Age of mother (in years)										
	Under									50 and over	Not stated
	Total	15	15-19	20-24	25-29	30-34	35-39	40-44	45-49		
Total	Classifications:										
Each major civil division or country where mother was born, all others, and place of birth of mother not stated	(a) Place of usual residence of mother: (i) total country; (ii) each major civil division. Distinguish urban and rural for (i) and (ii) and as may be required for national use.										
	(b) Place of birth of mother: each major civil division or country where mother was born, all others, and place of birth of mother not stated.										
	(c) Age of mother: under 15 years, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 and over, not stated.										
Major civil division (as for total)	Note:										
	This tabulation provides data necessary to study fertility differentials by mothers born in different places (or countries). Data should be presented for each major civil division within the country, or for each country where data are available and numbers are sufficient to allow the calculation of reliable estimates.										
...											

Table LB-12
Live births by place of usual residence and age of mother and legitimacy status

<i>Place of usual residence and age of mother</i>	<i>Legitimacy status</i>			
	<i>Total</i>	<i>Born within wedlock</i>	<i>Born out of wedlock</i>	<i>Not stated</i>
Total	Classifications:			
Under 15 years	(a) Place of usual residence of mother: (i) total country; (ii) each major civil division.			
15-19	(b) Age of mother: under 15 years, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50 and over, not stated.			
20-24	(c) Legitimacy status: (i) born within wedlock (legitimate); (ii) born out of wedlock (illegitimate).			
25-29				
30-34				
35-39	Note:			
40-44	Statistics of live births by wedlock status are used to ascertain levels and trends in age-specific out-of-wedlock births, which are important for planning and evaluating public-health and social welfare programmes. Frequencies and rates of live births by wedlock status and age of mother are analytical measures useful in describing patterns of out-of-wedlock births.			
45-49				
50 and over				
Not stated				
Major civil division (as for total)				
...				

Table LB-13.
Live births by place of occurrence, site of delivery and attendant at birth

<i>Place of occurrence and site of delivery</i>	<i>Attendant at birth</i>						
	<i>Total</i>	<i>Physician</i>	<i>Nurse</i>	<i>Nurse-midwife</i>	<i>Midwife</i>	<i>Other paramedical personnel</i>	<i>Layperson</i>
Total	Classifications:						
Hospital	(a) Place of occurrence: (i) total country; (ii) each major civil division.						
Other institutions	(b) Site of delivery: (i) hospital; (ii) other institutions; (iii) private home; (iv) other.						
Private home	(c) Attendant at birth: (i) physician; (ii) nurse; (iii) nurse-midwife; (iv) midwife; (v) other paramedical personnel; (vi) layperson; (vii) not stated.						
Other							
Major civil division (as for total)	Note:						
...	The tabulation by place of occurrence cross-classified by attendant at birth and site of delivery provides information useful for the evaluation of the utilization of medical-care facilities and resources. Statistics on live birth by site of delivery and attendant at birth are of great use in evaluating the need for medical services and for providing insight into patterns of infant mortality.						

Table LB-14

Live births by site of delivery, attendant at birth and birth weight

<i>Site of delivery and attendant at birth</i>	<i>Birth weight (grams)</i>						
	<i>Total</i>	<i>Under 500</i>	<i>500-999</i>	<i>1,000-1,499</i>	<i>... 4,500-4,999</i>	<i>5,000 and over</i>	<i>Not stated</i>
Total	Classifications:						
Physician	(a) Site of delivery: (i) hospital; (ii) other institutions; (iii) private home; (iv) other.						
Nurse	(b) Attendant at birth: (i) physician; (ii) nurse; (iii) nurse-midwife; (iv) midwife; (v) other paramedical personnel; (vi) traditional birth attendant; (vii) layperson; (viii) not stated.						
Nurse-midwife	(c) Birth weight (grams): (i) under 500; (ii) 500-999; (iii) 1,000-1,499; (iv) 1,500-1,999; (v) 2,000-2,499; (vi) 2,500-2,999; (vii) 3,000-3,499; (viii) 3,500-3,999; (ix) 4,000-4,499; (x) 4,500-4,999; (xi) 5,000 and over; (xii) not stated.						
Midwife							
Other paramedical personnel							
Traditional birth attendant							
Layperson	Note:						
Not stated	Counts of live births and corresponding percentage distributions by site of delivery, attendant at birth and birth weight provide information about the use of medical facilities and trained attendants in the birth process and indicate if high-risk (e.g., low weight) foetuses are receiving adequate care during the perinatal period. These counts may be used as denominators in detailed analyses of perinatal, neonatal and infant mortality.						
Hospital (as for total)							
Other institutions (as for total)							
Private home (as for total)							
Other (as for total)							
...							

Table LB-15

Live births by birth weight and place of usual residence and educational attainment of mother

<i>Place of usual residence of mother and birth weight</i>	<i>Education attainment of mother</i>								
	<i>Total</i>	<i>No schooling</i>	<i>ISCED level 1</i>	<i>ISCED level 2</i>	<i>ISCED level 3</i>	<i>ISCED level 4</i>	<i>ISCED level 5</i>	<i>ISCED level 6</i>	<i>Not stated</i>
Total	Classifications:								
Under 500 grams	(a) Place of usual residence of mother: (i) total country; (ii) each major civil division; (iii) each minor civil division. Distinguish urban and rural for (i), (ii) and (iii) and as may be required for national use.								
500-999									
1,000-1,499	(b) Educational attainment of mother: no schooling; ISCED level 1: Primary education; ISCED level 2: Lower secondary education; ISCED level 3: Upper secondary education; ISCED level 4: Post-secondary education; ISCED level 5: First stage of tertiary education (not leading directly to an advanced research qualification); ISCED level 6: Second stage of tertiary education (leading to an advanced research qualification); level of education not stated.								
1,500-1,999									
2,000-2,499									
2,500-2,999									
3,000-3,499									
3,500-3,999	(c) Birth weight (grams): (i) under 500; (ii) 500-999; (iii) 1,000-1,499; (iv) 1,500-1,999; (v) 2,000-2,499; (vi) 2,500-2,999; (vii) 3,000-3,499; (viii) 3,500-3,999; (ix) 4,000-4,499; (x) 4,500-4,999; (xi) 5,000 and over; (xii) not stated.								
4,000-4,499									
4,500-4,999									
5,000 and over	Note:								
Not stated	Birth weight can provide information needed for the study of infant mortality and health during infancy and childhood, since low birth weight is associated with an increased risk of health and developmental problems during infancy and is highly correlated with infant mortality. Statistics on birth weight cross-classified by socioeconomic statistics of the family, as measured by the level of education of the mother, for example, are particularly important for targeting sub-population groups in need of prenatal care and medical services after birth. This information indicates the relationship between family socioeconomic status and infant health (measured by the rate of low birth weight and infant mortality).								
Major civil division (as for total)									
...									
	Abbreviation:								
	ISCED = UNESCO International Standard Classification of Education.								

Table LB-16

Live births by gestational age, place of usual residence of mother and birth weight

Place of usual residence of mother and gestational age	Birth weight (grams)							
	Total	Under 500	500-999	1,000-1,499	...	4,500-4,999	5,000 and over	Not stated
Total	Classifications:							
Under 20 weeks	(a) Place of usual residence of mother: (i) total country; (ii) each major civil division.							
20-21	(b) Gestational age (weeks): (i) under 20; (ii) 20-21; (iii) 22-27; (iv) 28-31; (v) 32-35; (vi) 36; (vii) 37-41; (viii) 42 and over; (ix) not stated.							
22-27								
28-31	(c) Birth weight (grams): (i) under 500; (ii) 500-999; (iii) 1,000-1,499;							
32-35	(iv) 1,500-1,999; (v) 2,000-2,499; (vi) 2,500-2,999; (vii) 3,000-3,499; (viii)							
36	3,500-3,999; (ix) 4,000-4,499; (x) 4,500-4,999; (xi) 5,000 and over; (xii)							
37-41	not stated.							
42 and over	Note:							
Not stated	This tabulation provides information important for health research and for policies on medical care for mothers and newborns. It also allows the calculation of weight-specific rates of neonatal, perinatal and infant mortality, in conjunction with data on foetal deaths (by weight and gestational age) and on infant deaths. For example, neonatal and infant mortality are closely related to birth weight.							
Major civil division (as for total)								
...								

Table LB-17

Live births by birth weight, place of usual residence of mother and month in which prenatal care began

Place of usual residence of mother and birth weight	Month in which prenatal care began											
	First trimester			Second trimester				Third trimester			No prenatal care	Not stated
	Total	M1	M2	M3	Total	M4	M5	M6	Total	M7		
Total	Classifications:											
Under 500 grams	(a) Place of usual residence of mother: (i) total country; (ii) each major civil division.											
500-999	(b) Birth weight (grams): (i) under 500; (ii) 500-999; (iii) 1,000-1,499;											
1,000-1,499	(iv) 1,500-1,999; (v) 2,000-2,499; (vi) 2,500-2,999; (vii) 3,000-3,499;											
1,500-1,999	(viii) 3,500-3,999; (ix) 4,000-4,499; (x) 4,500-4,999; (xi) 5,000 and over;											
2,000-2,499	(xii) not stated.											
2,500-2,999	(c) Month in which prenatal care began: (i) single month; (ii) each trimester totals; (iii) no prenatal care; (iv) not stated.											
3,000-3,499	Note:											
3,500-3,999	The relationship between birth weight and prenatal care is an important measure of the adequacy of medical care for mothers and newborns. Infant mortality is closely related to birth weight, which, in turn, is correlated with adequate prenatal care.											
4,000-4,499												
4,500-4,999												
5,000 and over												
Not stated												
Major civil division (as for total)												
...												

Table LB-18
Live births by age and place of usual residence of mother and by month in which prenatal care began

<i>Age and place of usual residence of mother</i>	<i>Month in which prenatal care began</i>											<i>No prenatal care</i>	<i>Not stated</i>	
	<i>First trimester</i>			<i>Second trimester</i>			<i>Third trimester</i>							
	<i>Total</i>	<i>M1</i>	<i>M2</i>	<i>M3</i>	<i>Total</i>	<i>M4</i>	<i>M5</i>	<i>M6</i>	<i>Total</i>	<i>M7</i>	<i>M8</i>			<i>M9</i>
Total	Classifications:													
Under 15 years	(a) Place of usual residence of mother: (i) total country; (ii) each major civil division.													
15-19	(b) Age of mother: (i) under 15 years; (ii) 15-19; (iii) 20-24; (iv) 25-29;													
20-24	(v) 30-34; (vi) 35-39; (vii) 40-44; (viii) 45-49; (ix) 50 and over; (x) not													
25-29	stated.													
30-34	(c) Month in which prenatal care began: (i) single month; (ii) each													
35-39	trimester total; (iii) no prenatal care; (iv) not stated.													
40-44	Note:													
45-49	There is a strong relationship between adequate prenatal care and													
50 and over	pregnancy outcome. This tabulation would indicate the need for more													
Not stated	public-health education and staff in areas where prenatal care is often													
Major civil division	started late in pregnancy or is not received. Combination with age of													
(as for total)	mother allows a more in-depth analysis and more effective action in													
...	areas where prenatal attention starts later.													

Table LB-19

Live births by live-birth order, place of usual residence of mother and month in which prenatal care began

Place of usual residence of mother and live-birth order	Month in which prenatal care began											
	First trimester			Second trimester				Third trimester			No prenatal care	Not stated
	Total	M1	M2 M3	Total	M4	M5 M6	Total	M7	M8 M9			
Total	Classifications:											
First	(a) Place of usual residence of mother: (i) total country; (ii) each major civil division.											
Second	(b) Live birth order: (i) first; (ii) second; (iii) third; (iv) fourth; (v) fifth;											
Third	(vi) sixth; (vii) seventh; (viii) eighth; (ix) ninth; (x) tenth and over; (xi) not stated.											
Fourth	(c) Month in which prenatal care began: (i) single month, (ii) each trimester total; (iii) no prenatal care; (iv) not stated.											
Fifth	Note:											
Sixth	There is a strong relationship between adequate prenatal care and pregnancy outcome. This tabulation would indicate the need for more public-health education and staff in areas where prenatal care is often started late in pregnancy or is not received. The combination with birth order allows a more in-depth analysis and more effective action through studying the differences related to experience in pregnancy.											
Seventh												
Eighth												
Ninth												
Tenth and over												
Not stated												
Major civil division (as for total)												
...												

Table LB-20

Live births by place of usual residence of mother and duration of residence at the current usual residence

Place of usual residence of mother	Duration of residence							
	Residents					Others		
	Less than 1 year	1-4 years	5-9 years	10 years and over	Not stated	Transients or visitors	Persons whose status as residents, transients or visitors is not given	
Total	Classifications:							
Major civil division	(a) Place of usual residence of mother: (i) total country; (ii) each major civil division.							
...	(b) Duration of residence: residents with duration categories of (i) less than 1 year; (ii) 1-4 years; (iii) 5-9 years; (iv) 10 years and over; (v) not stated; and transients or visitors; and persons whose status as residents, transients or visitors is not given.							
	Note:							
	This tabulation would distinguish live births that occurred to mothers who have been living in their usual residence for a certain period of time with those to persons who had moved in recently. The tabulation is more relevant for countries that have a large number of migrants.							

Table DE-1
Deaths by place of usual residence and sex of decedent

Place of usual residence and urban/rural distribution	Sex			
	Both sexes	Male	Female	Not stated
Total	Classifications:			
Urban	(a) Place of usual residence: (i) total country; (ii) each major civil division; (iii) each minor civil division. Distinguish urban and rural for (i), (ii) and (iii).			
Rural	(b) Sex: male; female; not stated.			
Major civil division	Note:			
Urban	This tabulation provides data needed for studying the geographical distribution of deaths. These data are used to calculate crude death rates at national and subnational levels.			
Rural	The denominator is usually obtained from population census figures, adjusted for the time elapsed since the last census.			
Minor civil division				
Urban				
Rural				
...				

Table DE-2
Deaths by place of occurrence and place of usual residence and sex of decedent

Place of occurrence	Place of usual residence											
	Total			Same as place of occurrence			Other			Not stated		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
Total	Classifications:											
Urban	(a) Place of occurrence: (i) total country; (ii) each major civil division; (iii) each minor civil division. Distinguish urban and rural for (i), (ii) and (iii).											
Rural	(b) Place of usual residence: (i) total country; (ii) each major civil division; (iii) each minor civil division. Distinguish urban and rural for (i), (ii) and (iii).											
Major civil division (as for total)	(c) Sex: male; female; not stated.											
...	Note:											
	The comparison of deaths by place of occurrence and place of usual residence for each sex is useful for administrative purposes and for interpreting patterns of mortality and the distribution of medical facilities.											

Table DE-3

Deaths by month and place of occurrence and place of usual residence of decedent

<i>Place and month of occurrence</i>	<i>Total</i>	<i>Place of usual residence of decedent</i>		
		<i>Same as place of occurrence</i>	<i>Other</i>	<i>Not stated</i>
Total		Classifications:		
January		(a) Place of occurrence: (i) country; (ii) each major civil division.		
February		Distinguish urban and rural for (i) and (ii). Countries may wish to		
March		extend the breakdown to (iii) each minor civil division.		
April		(b) Month of occurrence: January, February, March, April, May,		
May		June, July, August, September, October, November, December,		
June		not stated.		
July		(c) Place of usual residence: (i) same as place of occurrence;		
August		(ii) other; (iii) not stated.		
September		Note:		
October		The comparison of deaths by place of occurrence and place of		
November		residence by month is useful for administrative purposes and		
December		for interpreting geographical and temporal (seasonal) patterns		
Not stated		of mortality and the distribution of medical facilities in relation		
Major civil division		to place of residence and place of death. Frequencies of deaths		
(as for total)		broken down to the smaller civil divisions by month of occur-		
...		rence can assist in monitoring the performance of the civil		
		registration system.		

Table DE-4
Deaths by place of registration, month of occurrence and month of registration

<i>Place of registration and month of occurrence</i>	<i>Total</i>	<i>Month of registration</i>					
		<i>January</i>	<i>February</i>	<i>...</i>	<i>November</i>	<i>December</i>	<i>Not stated</i>
Total		Classifications:					
January		(a) Place of registration: (i) country; (ii) each major civil division. Distinguish urban and rural for (i) and (ii). Countries may wish to extend the breakdown to (iii) each minor civil division.					
February		(b) Month of occurrence/registration: January, February, March, April, May, June, July, August, September, October, November, December, not stated.					
March		Note:					
April		Time lags between date of death and date of registration are useful measures of the functioning of the registration system, and should be reviewed by month and place of registration to identify registration delays in particular geographical areas of the country, or delays with a seasonal pattern.					
May							
June							
July							
August							
September							
October							
November							
December							
Not stated							
Major civil division (as for total)							
...							

Table DE-5
Deaths by place of occurrence and site of occurrence

<i>Place of occurrence</i>	<i>Total</i>	<i>Site of occurrence (type of place of occurrence)</i>				<i>Not stated</i>
		<i>Hospital</i>	<i>Other institutions</i>	<i>Private home</i>	<i>Other</i>	
Total		Classifications:				
Urban		(a) Place of occurrence: (i) country; (ii) each major civil division. Distinguish urban and rural for (i) and (ii). Countries may wish to extend the breakdown to (iii) each minor civil division.				
Rural		(b) Site of occurrence: (i) hospital; (ii) other institutions; (iii) private home; (iv) other; (v) not stated.				
Major civil division		Note:				
Urban		This tabulation is useful for the analysis of the numbers of deaths occurring in hospitals, in other institutions, in public places and at home for each geographical subdivision of the country. Such data are helpful in planning for medical facilities and health manpower.				
Rural						
Minor civil division						
Urban						
Rural						
...						

Table DE-6

Deaths by place of usual residence, age and sex of decedent

<i>Age (in years) and place of usual residence and urban/rural residence</i>	<i>Sex</i>			
	<i>Both sexes</i>	<i>Male</i>	<i>Female</i>	<i>Not stated</i>
Total	Classifications:			
Under 1 year	(a) Place of usual residence: (i) country; (ii) each major civil division. Distinguish urban and rural for (i) and (ii). Countries may wish to extend the breakdown to (iii) each minor civil division.			
1				
2				
3	(b) Sex: male; female.			
4				
1-4	(c) Age: under 1 year, 2 years, 3 years, single years to 9 years, 5-year groups from 10 to 99, 100 years and over, not stated. Countries may wish to produce this table for single years of age, in particular to allow for the calculation of complete life tables.			
5				
6				
7	Note:			
8	The comparison of deaths by place of occurrence and place of residence for each sex is useful for administrative purposes and for interpreting patterns of mortality and the distribution of medical facilities. It is also necessary for the construction of life tables and net reproduction rates. In addition, in conjunction with the other components of population change, it is useful for demographic projections by the component method.			
9				
5-9				
10-14				
15-19				
20-24				
...				
95-99				
100 and over				
Not stated				
Urban (as for total)				
Rural (as for total)				
Major civil division (as for total)				
...				

Table DE-7
Deaths by age, sex, place of usual residence and marital status of decedent

<i>Age, sex and place of usual residence of decedent</i>	<i>Marital status of decedent</i>						
	<i>Total</i>	<i>Single</i>	<i>Lawfully married</i>	<i>Other unions</i>	<i>Widowed</i>	<i>Divorced</i>	<i>Separated</i>
Total	Classifications:						
Both sexes	(a) Place of usual residence: (i) country; (ii) each major civil division. Countries may wish to extend the breakdown to (iii) each minor civil division.						
Under 15 years	(b) Sex: male; female.						
15-19	(c) Age: under 15 years, 5-year age groups to 84 years, 85 and over, not stated.						
20-24	(d) Marital status: (i) single (never married); (ii) lawfully married (civil marriage); (iii) other unions (religious marriages, consensual and customary unions); (iv) widowed and not remarried; (v) divorced and not remarried; (vi) married but legally separated; (vii) not stated.						
25-29							
30-34							
...							
80-84							
85 and over							
Not stated	Note:						
Male (as for both sexes)	Age and sex are important determinants of mortality. Information on the distribution of these variables by place of residence and marital status allows the calculation of age, sex and marital status-specific mortality rates by place of residence for a variety of epidemiological analyses, including studies of the levels and trends in widowhood.						
Female (as for both sexes)							
Major civil division (as for total)							
...							

Table DE-8.

Deaths by place of usual residence, age, sex and educational attainment of decedent

<i>Place of usual residence, age and sex of decedent</i>	<i>Education attainment of decedent</i>								
	<i>Total</i>	<i>No schooling</i>	<i>ISCED level 1</i>	<i>ISCED level 2</i>	<i>ISCED level 3</i>	<i>ISCED level 4</i>	<i>ISCED level 5</i>	<i>ISCED level 6</i>	<i>Not stated</i>
Total	Classifications:								
Both sexes	(a) Place of usual residence: (i) total country; (ii) each major civil division. Distinguish urban and rural for (i) and (ii). Countries may wish to extend the breakdown to (iii) each minor civil division.								
Under 15 years	(b) Sex: male; female.								
15-19	(c) Age: under 15 years, 5-year age groups to 84 years, 85 and over, not stated.								
20-24	(d) Educational attainment of decedent: no schooling; ISCED level 1: Primary education; ISCED level 2: Lower secondary education; ISCED level 3: Upper secondary education; ISCED level 4: Post-secondary education; ISCED level 5: First stage of tertiary education (not leading directly to an advanced research qualification); ISCED level 6: Second stage of tertiary education (leading to an advanced research qualification); level of education not stated.								
25-29									
30-34									
...									
80-84									
85 and over									
Not stated									
Male (as for both sexes)	Note:								
Female (as for both sexes)	The educational level of the decedent cross-classified by age and sex provides information on the differentials of mortality by socio-economic status necessary for health planning purposes.								
Major civil division (as for total)	Abbreviation:								
...	ISCED = UNESCO International Standard Classification of Education.								

Table DE-9
Deaths by sex, cause of death, place of usual residence and age of decedent

Sex and cause of death and place of usual residence of decedent	Age (in years)											85 and over	Not stated
	All ages	Under 1	1	2	3	4	5-9	10-14	15-19	...	80-84		
Total	Classifications:												
Both sexes	(a) Cause of death: classification of cause of death should be based on the latest revision of the <i>International Statistical Classification of Diseases and Related Health Problems</i> . However, care should be exercised in comparing trends by causes of death. Countries may prepare a working table using the detailed list of three-character categories, with or without four-character subcategories. For publication of data and international comparison, tabulations should be made in accordance with mortality tabulation list 1 or mortality tabulation list 2. <i>In countries where medical certification of cause of death is incomplete or limited to certain areas, figures for cause of death not medically certified should be published separately.</i>												
Causes of death should be in accordance with the International Statistical Classification of Diseases													
a. Mortality tabulation list 1													
b. Mortality tabulation list 2													
Male (as for both sexes)	(b) Place of usual residence: (i) country; (ii) each major civil division. Countries may wish to distinguish urban and rural for (i) and (ii).												
Female (as for both sexes)	(c) Sex: male; female.												
Major civil division (optional) (as for total)	(d) Age: under 1 year, 1 year, 2 years, 3 years, 4 years, 5-year age groups from 5 to 84 years, 85 years and over, not stated.												
...	Note: Analyses of deaths based on age, sex, cause and place of residence of the decedent are among the most basic and indispensable tools in public health and demography. For those deaths whose underlying cause was certified by a physician, a useful condensed list of causes based on World Health Organization recommendations should be used for tabulation and data dissemination. Statistics of deaths by place of residence and classified by age, sex and cause of death are primary indicators of the health of the population, and serve as guides in health promotion, planning and evaluation, as well as important bases of other social programmes and population analyses. The most important application of such data is in providing information for the determination of public-health policy.												

Table DE-11

Deaths by place of occurrence, sex of decedent and type of certification

Place of occurrence	Type of certification							
	Total		Medically certified		Other		Not stated	
	Male	Female	Male	Female	Male	Female	Male	Female
Total	Classifications:							
Major civil division	(a) Place of occurrence: (i) country; (ii) each major civil division. Countries may wish to distinguish urban and rural for (i) and (ii).							
Minor civil division	(b) Sex: male; female.							
...	(c) Type of certification: (i) medically certified; (ii) other; (iii) not stated.							
	Note:							
	Information by type of certification enables a broad evaluation of quality of mortality statistics. It is also helpful in the distribution of health facilities in the country.							

Table DE-12

Maternal deaths by cause of death and age of woman

Cause of death and place of usual residence	Age of women (in years)										
	Total	Under								50 and over	Not stated
		15	15-19	20-24	25-29	30-34	35-39	40-44	45-49		
Total	Classifications:										
Causes of death in accordance with the International Statistical Classification of Diseases related to pregnancy or aggravated by the pregnancy or its management except for accidental or incidental causes	(a) Cause of death: classification of cause of death should be based on the latest revision of the <i>International Statistical Classification of Diseases and Related Health Problems</i> . However, care should be exercised in comparing trends by causes of death. Countries may prepare a working table using the detailed list of three-character categories, with or without four-character subcategories. For publication of data and international comparison, tabulations should be made in accordance with mortality tabulation list 1 or mortality tabulation list 2. <i>In countries where medical certification of cause of death is incomplete or limited to certain areas, figures for cause of death not medically certified should be published separately.</i>										
Major civil division (optional) (as for total)	(b) Place of usual residence: (i) country; (ii) each major civil division. Countries may wish to distinguish urban and rural for (i) and (ii).										
...	(c) Sex: male; female.										
	(d) Age: under 1 year, 1 year, 2 years, 3 years, 4 years, 5-year age groups from 5 to 84 years, 85 years and over, not stated.										
	Note:										
	Analyses of deaths based on age, sex, cause and place of residence of the decedent are among the most basic and indispensable tools in public health and demography. For those deaths whose underlying cause was certified by a physician, a useful condensed list of causes based on World Health Organization recommendations should be used for tabulation and data dissemination. Statistics of deaths by place of residence and classified by age, sex and cause of death are primary indicators of the health of the population, and serve as guides in health promotion, planning and evaluation, and as important bases of other social programmes and population analyses. The most important application of such data is in providing information for the determination of public-health policy.										

Table ID-1

Infant deaths by place of occurrence and place of usual residence of mother

<i>Place of occurrence</i>	<i>Total</i>	<i>Place of usual residence of mother</i>		
		<i>Same as place of occurrence</i>	<i>Other</i>	<i>Not stated</i>
Total		Classifications:		
Major civil division		(a) Place of occurrence: (i) country; (ii) each major civil division. Countries may wish to extend the breakdown to		
Minor civil division		(iii) minor civil division and major cities and towns.		
...		(b) Place of usual residence of the mother: same as place of occurrence, other, not stated.		
		Note:		
		This tabulation provides data used to estimate the level and patterns of infant deaths by sex, that is, deaths occurring before 1 year of age, and to calculate infant mortality rates. The infant mortality rate is an important indicator of the health of infants and is closely related to such factors as maternal health, quality and access to medical care, socioeconomic conditions and public-health practices. Statistics on infant deaths, classified by place of occurrence, allow the study of the geographical distribution of infant deaths, while information on the place of residence of the mother reflects social or environmental factors that could explain some disparities in infant death rates. These statistics are also useful for planning medical and public-health facilities and child health services.		

Table ID-2

Infant deaths by month of occurrence and sex and age of child

<i>Month of occurrence and sex of child</i>	<i>Total</i>	<i>Age of child</i>			<i>Not stated</i>
		<i>Under 7 days</i>	<i>7 to 27 days</i>	<i>28 days to under 1 year</i>	
Total		Classifications:			
January		(a) Month of occurrence: January, February, March, April, May, June, July, August, September, October, November, December, not stated.			
February		(b) Sex: male; female; not stated.			
March		(c) Age of the child: (i) under 7 days; (ii) 7 to 27 days; (iii) 28 days to under 1 year; (iv) not stated.			
April		Note:			
May		The tabulation of infant deaths by month of occurrence is useful for analytical purposes, such as for finding seasonal patterns in the distribution of infant deaths, as well as for monitoring purposes.			
June					
July					
August					
September					
October					
November					
December					
Not stated					
Male (as for total)					
Female (as for total)					
...					

Table ID-3

Infant deaths by place of usual residence of mother and age and sex of child

<i>Place of usual residence of mother and age of child</i>	<i>Sex</i>			
	<i>Both sexes</i>	<i>Male</i>	<i>Female</i>	<i>Not stated</i>
Total	Classifications:			
Under 1 day	(a) Place of usual residence of mother: (i) total country;			
1 day	(ii) each major civil division. Countries may wish to extend the			
2 days	breakdown to principal cities or towns.			
3 days	(b) Age of the infant: classification of the age of the infant			
4 days	should be based on the latest revision of the <i>International Sta-</i>			
5 days	<i>tistical Classification of Diseases and Related Health Problems.</i>			
6 days	(c) Sex: male; female.			
7-13 days	Note:			
14-20 days	The tabulation of infant deaths by specific age is in accord-			
21-27 days	ance with World Health Organization recommendations for			
28 days and up and not	special statistics for infant mortality. Age is an important vari-			
including 2 months	able in the study of infant mortality. The impact of biological			
2 months	versus environmental factors can be seen in the proportion			
3 months	of infants who die shortly after birth (e.g., under 1 day, less			
4 months	than 1 week or less than 1 month) compared with those who			
...	survive the first month of life but die before attaining 1 year			
11 months	of age. These data are essential for the calculation of such key			
Not stated	public-health measures as the perinatal mortality rate, the			
Major civil division	neonatal mortality rate and the infant mortality rate.			
(as for total)				
...				

Table ID-4

Infant deaths by cause of death, place of usual residence of mother and sex and age of child

Place of usual residence of mother, sex and cause of death	Age at death										
	All ages	Under 1 day	1 day	2 days	6 days	7-13 days	14-20 days	21-27 days	28 days	2 months	11 months
Total	Classifications:										
Both sexes	(a) Place of usual residence of mother: (i) total country; (ii) each major civil division. Countries may wish to extend the breakdown to principal cities or towns.										
Causes of death for infant mortality in accordance with the International Statistical Classification of Diseases for infant and child mortality	(b) Age of the infant: classification of the age of the infant should be based on the latest revision of the <i>International Statistical Classification of Diseases and Related Health Problems</i> .										
a. Mortality tabulation list 3	(c) Sex: male; female.										
b. Mortality tabulation list 4	(d) Cause of death: classification of cause of death should be based on the <i>International Statistical Classification of Diseases and Related Health Problems</i> . However, care should be exercised in comparing trends by causes of death. Countries may prepare a working table using the detailed list of three-character categories, with or without four-character subcategories. For publication of data and international comparison, tabulations should be made in accordance with mortality tabulation list 3 or 4 for infant and child mortality.										
Male (as for both sexes)	Note:										
Female (as for both sexes)	This is a key tabulation for the investigation of infant mortality and the public-health programmes aimed at its reduction. Epidemiological analyses by geographical areas of the country seeking patterns of preventable causes are essential for the elimination or reduction of deaths to infants from controllable causes.										
Major civil division (optional) (same as for total)											
...											

Table ID-5

Infant deaths by place of usual residence of mother and incidence of birth registration

<i>Place of usual residence of mother</i>	<i>Total</i>	<i>Birth registration</i>		
		<i>Birth registered</i>	<i>Birth not registered</i>	<i>Not stated</i>
Total	Classifications:			
Major civil division	(a) Place of usual residence of mother: (i) total country; (ii) each major civil division. Countries may wish to extend the breakdown to principal cities or towns.			
Minor civil division	(b) Birth registration: (i) birth registered; (ii) birth not registered; (iii) not stated.			
...	Note: This is a useful tabulation for monitoring birth registration. Although only a portion of the births not registered are shown, this tabulation is an important tool for the assessment of the completeness of birth registration. It also provides information useful for establishing linkages of infant and live-birth records for purposes of research on infant mortality.			

Table FD-1

Foetal deaths by age and place of usual residence of mother and sex of foetus

<i>Age and place of usual residence of mother</i>	<i>Sex of foetus</i>			
	<i>Both sexes</i>	<i>Male</i>	<i>Female</i>	<i>Not stated</i>
Total	Classifications:			
Under 15 years	(a) Place of usual residence of mother as may be required for national use: (i) total country; (ii) each major civil division (optional).			
15-19	(b) Age of mother (years): (i) under 15; (ii) 15-19; (iii) 20-24;			
20-24	(iv) 25-29; (v) 30-34; (vi) 35-39; (vii) 40-44; (viii) 45-49; (ix) 50			
25-29	and over; (x) not stated.			
30-34	(c) Sex of foetus: (i) male, (ii) female, (iii) unknown, (iv) not			
35-39	stated.			
40-44	Note:			
45-49	This tabulation is useful in medical research focused on			
50 and over	women's histories of foetal death, particularly as a proxy			
Not stated	measurement of pregnancy wastage. Public-health pro-			
Major civil division	grammes aimed at improved maternal health and the reduc-			
(optional)	tion of perinatal mortality use these data for planning and			
(as for total)	evaluation.			
...				

Table FD-4
Foetal deaths by place of usual residence of mother, sex and birth weight

Place of usual residence of mother and sex	Birth weight (grams)						Not stated
	Total	Under 500	500-999	1,000-1,499	... 4,500-4,999	5,000 and over	
Total	Classifications:						
Both sexes	(a) Place of usual residence of mother, as may be required for national use: (i) total country; (ii) each major civil division; (iii) minor civil division (optional). Countries may wish to extend the breakdown to principal cities or towns.						
Male	(b) Sex of foetus: male; female.						
Female	(c) Birth weight (grams): (i) under 500; (ii) 500-999; (iii) 1,000-1,499; (iv) 1,500-1,999; (v) 2,000-2,499; (vi) 2,500-2,999; (vii) 3,000-3,499; (viii) 3,500-3,999; (ix) 4,000-4,499; (x) 4,500-4,999; (xi) 5,000 and over; (xii) not stated.						
Major civil division (as for total)							
Minor civil division (optional) (as for total)							
...	Note: Information on reportable foetal deaths is a component in the measurement of perinatal mortality as well as a proxy measurement of pregnancy wastage. Public-health programmes aimed at improved maternal health and the reduction of perinatal mortality use these figures for planning and evaluation.						

Table FD-5
Foetal deaths by place of usual residence of mother and gestational age and birth weight

Place of usual residence of mother and gestational age	Birth weight (grams)						Not stated
	Total	Under 500	500-999	1,000-1,499	... 4,500-4,999	5,000 and over	
Total	Classifications:						
Under 20 weeks	(a) Place of usual residence of mother, as may be required for national use: (i) total country; (ii) each major civil division (optional).						
20-21	(b) Gestational age (weeks): (i) under 20; (ii) 20-21; (iii) 22-27; (iv) 28-31; (v) 32-35; (vi) 36; (vii) 37-41; (viii) 42 and over; (ix) not stated.						
22-27	(c) Birth weight (grams): (i) under 500; (ii) 500-999; (iii) 1,000-1,499; (iv) 1,500-1,999; (v) 2,000-2,499; (vi) 2,500-2,999; (vii) 3,000-3,499; (viii) 3,500-3,999; (ix) 4,000-4,499; (x) 4,500-4,999; (xi) 5,000 and over; (xii) not stated.						
28-31							
32-35							
36							
37-41							
42 and over							
Not stated	Note: Data from this tabulation are useful in medical research centred on women's histories of foetal death, particularly as a proxy measurement of pregnancy wastage. Detailed analysis of foetal deaths by gestational age and birth weight would help to improve the understanding of the problem of pregnancy wastage and would be useful in the study of low birth weight infants. Public-health programmes aimed at improved maternal health and the reduction of perinatal mortality use these data for planning and evaluation.						
Major civil division (as for total)							
...							

Table FD-6

Foetal deaths by age and place of usual residence of mother and birth weight

<i>Age and place of usual residence of mother</i>	<i>Birth weight (grams)</i>							
	<i>Total</i>	<i>Under 500</i>	<i>500-999</i>	<i>1,000-1,499</i>	<i>...</i>	<i>4,500-4,999</i>	<i>5,000 and over</i>	<i>Not stated</i>
Total	Classifications:							
Under 15 years	(a) Place of usual residence of mother, as may be required for national use: (i) total country; (ii) each major civil division.							
15-19	(b) Age of mother (years): (i) under 15; (ii) 15-19; (iii) 20-24; (iv) 25-29; (v) 30-34; (vi) 35-39; (vii) 40-44; (viii) 45-49; (ix) 50 and over; (x) not stated.							
20-24	(c) Birth weight (grams): (i) under 500; (ii) 500-999; (iii) 1,000-1,499; (iv) 1,500-1,999; (v) 2,000-2,499; (vi) 2,500-2,999; (vii) 3,000-3,499; (viii) 3,500-3,999; (ix) 4,000-4,499; (x) 4,500-4,999;							
25-29	(xi) 5,000 and over; (xii) not stated.							
30-34								
35-39								
40-44								
45-49								
50 and over								
Not stated								
Major civil division (as for total)								
...								

Table FD-8

Foetal deaths by age of mother and total birth order (live births plus foetal deaths)

<i>Age of mother</i>	<i>Total birth order (live births plus foetal deaths)</i>						
	<i>Total</i>	<i>First</i>	<i>Second</i>	<i>Third</i>	<i>...</i>	<i>Tenth and over</i>	<i>Not stated</i>
Total	Classifications:						
Under 15 years	(a) Age of mother (years): (i) under 15; (ii) 15-19; (iii) 20-24; (iv) 25-29; (v) 30-34; (vi) 35-39; (vii) 40-44; (viii) 45-49; (ix) 50 and over; (x) not stated.						
15-19	(b) Total birth order (live births plus foetal deaths): (i) first; (ii) second; (iii) third; (iv) fourth; (v) fifth; (vi) sixth; (vii) seventh; (viii) eighth; (ix) ninth; (x) tenth and over; (xi) not stated.						
20-24							
25-29							
30-34							
35-39	Note:						
40-44	This tabulation is useful for medical research focused on women's histories of foetal death, particularly as regards the possibility of a "proneness" to foetal death.						
45-49							
50 and over							
Not stated							
...							

Table FD-9

Foetal deaths by month of pregnancy in which prenatal care began, and number of visits and place of usual residence of mother

<i>Number of visits and place of usual residence of mother</i>	<i>Month in which prenatal care began</i>					
	<i>First trimester</i>			<i>Second trimester</i>		
	<i>Total</i>	<i>M1</i>	<i>M2 M3</i>	<i>Total</i>	<i>M4 M5 M6</i>	<i>Total</i>
	<i>M7 M8 M9</i>	<i>No prenatal care</i>	<i>Not stated</i>			
Total	Classifications:					
1-3 visits	(a) Place of usual residence of mother: (i) total country; (ii) each major civil division. Countries may wish to extend the breakdown to					
4-6	(iii) minor civil divisions and major cities and towns.					
7-9	(b) Month of pregnancy in which prenatal care began: single month, each trimester total, no prenatal care, not stated.					
10 and over	(c) Number of visits: 1-3, 4-6, 7-9, 10 and over, not stated.					
Major civil division (as for total)	Note:					
...	There is a strong relationship between adequate prenatal care and pregnancy outcome. Together, these topics can be used to assess the adequacy of prenatal care and their impact on the outcome of the pregnancy. Data from this tabulation would also indicate the need for more public-health education and staff in areas where prenatal care is often started late in pregnancy or is not received.					

Table FD-10

Foetal deaths by place of occurrence and type of certification

<i>Place of occurrence</i>	<i>Type of certification</i>			
	<i>Total</i>	<i>Medically certified</i>	<i>Other</i>	<i>Not stated</i>
Total	Classifications:			
Major civil division	(a) Place of occurrence: (i) country; (ii) each major civil division.			
...	(b) Type of certification: (i) medically certified; (ii) other; (iii) not stated.			
	Note:			
	The type of certification of foetal death is useful in assessing the quality and reliability of the registration of cause of death and other items collected in each civil division, such as birth weight and gestational age.			

Table MA-1

Marriages by place of usual residence of groom and month of occurrence

<i>Place of usual residence of groom</i>	<i>Month of registration</i>						
	<i>Total</i>	<i>January</i>	<i>February</i>	<i>...</i>	<i>November</i>	<i>December</i>	<i>Not stated</i>
Total	Classifications:						
Major civil division (as for total)	(a) Place of usual residence of groom: (i) total country; (ii) each major civil division; (iii) each minor civil division (optional). Countries may wish to extend the breakdown up to principal cities or towns.						
Minor civil division (as for total)	(b) Month of occurrence: January, February, March, April, May, June, July, August, September, October, November, December, not stated.						
...	Note: This tabulation will show the seasonal variation in marriages, which is common in some cultures. This information is useful in sociocultural studies, and also for the analysis and projections of consumption patterns, as carried out, for example, in marketing research. It also serves as an administrative tool for checking on seasonal swings in workloads for registration offices within the civil divisions of the country.						

Table MA-2

Marriages by place of usual residence of groom and age of bride and of groom

<i>Place of usual residence and age of groom</i>	<i>Age of bride (in years)</i>								
	<i>All ages</i>	<i>Under 15</i>	<i>15-19</i>	<i>20-24</i>	<i>25-29</i>	<i>...</i>	<i>70-74</i>	<i>75 and over</i>	<i>Not stated</i>
Total	Classifications:								
All ages	(a) Place of usual residence of groom: (i) total country; (ii) each major civil division; (iii) each minor civil division (optional). Countries may wish to extend the breakdown to principal cities or towns.								
Under 15	(b) Age: under 15 years, 5-year age groups from 15 to 74, 75 and over, not stated.								
15-19	Note:								
20-24	Information on age at marriage for brides and grooms has sociological implications for future completed family size and is useful for planning in such fields as economics and education, as well as in the study of geographical differentials in patterns of family formation.								
25-29									
.									
.									
.									
70-74									
75 and over									
Not stated									
Major civil division (as for total)									
Minor civil division (as for total)									
...									

Table MA-3
Marriages by age and previous marital status of bride and of groom

Age	Previous marital status						
	Total	Single	Lawfully married	Other unions	Widowed	Divorced	Separated
All ages	Bride						
Under 15 years	Classifications:						
15-19	(a) Age: under 15 years, 5-year age groups from 15 to 74, 75 and over, not stated.						
20-24	(b) Previous marital status: (i) single (never married); (ii) lawfully married; (iii) other unions (religious marriages, consensual and customary unions); (iv) widowed and not remarried; (v) divorced and not remarried; (vi) separated; (vii) not stated.						
25-29							
30-34							
35-39							
40-44							
45-49	Note:						
50-54	Previous marital status of bride and of groom is an essential item of information for the analysis of nuptiality patterns. It is useful in demographic and social studies of family patterns, and also as an indicator of family stability. The introduction of age into the "previous marital status" tabulation increases the significance of this item considerably for the analysis of both marriage patterns and fertility.						
55-59							
60-64							
65-69							
70-74							
75 and over							
Not stated							
...							
All ages	Groom						
Under 15 years	Classifications:						
15-19	(a) Age: under 15 years, 5-year age groups from 15 to 74, 75 and over, not stated.						
20-24	(b) Previous marital status: (i) single (never married); (ii) lawfully married; (iii) other unions (religious marriages, consensual and customary unions), (iv) widowed and not remarried; (v) divorced and not remarried; (vi) separated; (vii) not stated.						
25-29							
30-34							
35-39							
40-44							
45-49	Note:						
50-54	Previous marital status of bride and of groom is an essential item of information for the analysis of nuptiality patterns. It is useful in demographic and social studies of family patterns, and also as an indicator of family stability. The introduction of age into the "previous marital status" tabulation increases the significance of this item considerably for the analysis of both marriage patterns and fertility.						
55-59							
60-64							
65-69							
70-74							
75 and over							
Not stated							
...							

Table MA-4

Marriages by educational attainment of bride and of groom

<i>Educational attainment of groom</i>	<i>Educational attainment of bride</i>								
	<i>No schooling</i>	<i>ISCED level 1</i>	<i>ISCED level 2</i>	<i>ISCED level 3</i>	<i>ISCED level 4</i>	<i>ISCED level 5</i>	<i>ISCED level 6</i>	<i>Not stated</i>	
Total	Classifications:								
No schooling	(a) Educational attainment: (i) no schooling; (ii) primary education not completed; (iii) primary education completed; (iv) secondary education not completed; (v) secondary education completed; (vi) higher education not completed; (vii) higher education completed; (viii) education; (ix) not stated.								
ISCED level 1: Primary education	Note:								
ISCED level 2: Lower secondary education	Information on the relation between the educational attainment of the bride and that of the groom is important for sociological and cultural studies, especially in family formation-related studies.								
ISCED level 3: Upper secondary education	Abbreviation:								
ISCED level 4: Post-secondary education	ISCED = UNESCO International Standard Classification of Education.								
ISCED level 5: First stage of tertiary education									
ISCED level 6: Second stage of tertiary education									
Education not stated									
...									

Table DI-2

Divorces by age of husband and of wife

<i>Age of husband (in years)</i>	<i>All ages</i>	<i>Age of wife (in years)</i>								
		<i>Under 15</i>	<i>15-19</i>	<i>20-24</i>	<i>25-29</i>	<i>30-34</i>	<i>...</i>	<i>65-69</i>	<i>70-74</i>	<i>75 and over</i>
All ages	Classifications:									
Under 15	(a) Age: under 15 years, 5-year age groups from 15 to 74, 75 and over, not stated.									
15-19	Note:									
20-24	This tabulation is used to establish age patterns of divorced couples and is also used in the sociological study of age of, and age differences between, husbands and wives as factors in the stability or instability of marriages.									
25-29										
30-34										
35-39										
40-44										
45-49										
50-54										
55-59										
60-64										
65-69										
70-74										
75 and over										
...										

Table DI-3
Divorces by duration of marriage and age of husband and of wife

Duration of marriage	Age (in years)										
	All ages	Under 15	15-19	20-24	25-29	30-34	...	65-69	70-74	75 and over	Not stated
Total	Wife										
Under 1 year	Classifications:										
1	(a) Age: under 15 years, 5-year age groups from 15 to 74, 75 and over, not stated.										
2											
3	(b) Duration of marriage: under 1 year, single years to 9 years, 5-year groups to 29 years, 30 and over, not stated.										
4											
5	Note:										
6	This tabulation is used to enable a more complete study of marital instability by making it possible to include duration of marriage as an additional explanatory variable. Also in the study of the duration of marriages in cases of divorce involving women of childbearing age, it is an important element for understanding the effect of marital instability on the potential fertility of the population.										
7											
8											
9											
10-14											
15-19											
20-24											
25-29											
30 and over											
Not stated											
...											
Total	Husband										
Under 1 year	Classifications:										
1	(a) Age: under 15 years, 5-year age groups from 15 to 74, 75 and over, not stated.										
2											
3	(b) Duration of marriage: under 1 year, single years to 9 years, 5-year groups to 29 years, 30 and over, not stated.										
4											
5	Note:										
6	This tabulation is used to enable a more complete study of marital instability by making it possible to include duration of marriage as an additional explanatory variable. Also in the study of the duration of marriages in cases of divorce involving women of childbearing age, it is an important element for understanding the effect of marital instability on the potential fertility of the population.										
7											
8											
9											
10-14											
15-19											
20-24											
25-29											
30 and over											
Not stated											
...											

Table DI-4

Divorces by duration of marriage and number of dependent children

<i>Duration of marriage (in years)</i>	<i>Number of dependent children</i>							
	<i>Total</i>	<i>0</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>...</i>	<i>7 and over</i>	<i>Not stated</i>
Total	Classifications:							
Under 1 year	(a) Duration of marriage: under 1 year, single years to 9 years, 5-year groups to 29 years, 30 and over, not stated.							
1	(b) Number of dependent children: (i) none; (ii) 1; (iii) 2; (iv) 3;							
2	(v) 4; (vi) 5; (vii) 6; (viii) 7 and over; (ix) not stated.							
3	Note:							
4	Duration of marriage for divorcing couples is a measure							
5	of marriage stability, while information on the numbers of							
6	dependent children offers insight into the social, psycho-							
7	logical and economic impact of divorce on society. Data							
8	from this table are important in the administration of social							
9	policy to the extent that such policy must address the issue							
10-14	of providing assistance to children from broken marriages.							
15-19								
20-24								
25-29								
30 and over								
Not stated								
...								

Table DI-5

Divorces by educational attainment of husband and of wife

<i>Educational attainment of husband</i>	<i>Educational attainment of wife</i>							
	<i>No schooling</i>	<i>ISCED level 1</i>	<i>ISCED level 2</i>	<i>ISCED level 3</i>	<i>ISCED level 4</i>	<i>ISCED level 5</i>	<i>ISCED level 6</i>	<i>Not stated</i>
Total	Classifications:							
No schooling	(a) Educational attainment: (i) no schooling; (ii) primary educa-							
ISCED level 1: Primary education	tion not completed; (iii) primary education completed;							
ISCED level 2: Lower secondary education	(iv) secondary education not completed; (v) secondary educa-							
ISCED level 3: Upper secondary education	tion completed; (vi) higher education not completed;							
ISCED level 4: Post-secondary education	(vii) higher education completed; (viii) education; (ix) not							
ISCED level 5: First stage of tertiary education	stated.							
ISCED level 6: Second stage of tertiary education	Note:							
Education not stated	The educational attainment of divorced couples gives informa-							
...	tion useful for sociological and cultural studies. Comparison							
	of these data with data on the educational attainment of the							
	bride and the groom in marriages is useful for studies of family							
	instability.							
	Abbreviation:							
	ISCED = UNESCO International Standard Classification of							
	Education.							

Table ST-1
Live births, deaths, infant deaths, foetal deaths, marriages and divorces by place of usual residence

<i>Place of usual residence</i>	<i>Live births</i>		<i>Deaths</i>		<i>Infant deaths</i>		<i>Foetal deaths</i>		<i>Marriages Divorces</i>	
	<i>Total</i>	<i>Male</i>	<i>Total</i>	<i>Female</i>	<i>Total</i>	<i>Male</i>	<i>Total</i>	<i>Female</i>	<i>Marriages</i>	<i>Divorces</i>
Total	Classifications:									
Urban	(a) Place of usual residence: (i) total country; (ii) each major civil division; (iii) each minor civil division (optional); (iv) each principal locality (optional). Distinguish urban and rural for (i), (ii) and (iii) and as may be required for national use. Place of usual residence is defined as follows:									
Rural	<ul style="list-style-type: none"> • For births and infant deaths: place of usual residence of mother • For deaths: place of usual residence of decedent • For maternal deaths: place of usual residence of woman • For marriages: place of usual residence of groom • For divorces: place of usual residence of husband. 									
Major civil division										
Urban										
Rural										
Minor civil division										
Urban										
Rural	(b) Sex: male; female.									
...	Note: It is highly useful for those administering health and population programmes to be able to retrieve, at a glance, information on the total number of each type of vital events that have occurred in a particular year and on their distribution by civil divisions. Information from this tabulation is the source of the numerators used in calculating infant and foetal mortality rates for the country and its civil divisions when the numerators are related to the appropriate denominators, i.e., the total number of live births, and the total number of live births plus the total number of foetal deaths, respectively. The tabulation also provides the numerators—as related to the appropriate denominators (usually provided by population censuses, adjusted for the time elapsed since the last census), e.g., the mid-year total population—for the calculation of crude birth, death, marriage and divorce rates by place of residence.									

Table ST-2

Crude birth rate, crude death rate, infant mortality rate by sex, foetal mortality rate, crude marriage rate and crude divorce rate, by place of usual residence

Place of usual residence	Crude birth rate	Crude death rate	Infant mortality rate			Foetal mortality rate	Crude marriage rate	Crude divorce rate
			Total	Male	Female			
Total	Classifications:							
Major civil division	(a) Place of usual residence: (i) total country; (ii) each major civil division; (iii) each minor civil division (optional); (iv) each principal locality (optional). Distinguish urban and rural for (i), (ii) and (iii) and as may be required for national use. Place of usual residence is defined as follows:							
...	<ul style="list-style-type: none"> • For births and infant deaths: place of usual residence of mother • For deaths: place of usual residence of decedent • For maternal deaths: place of usual residence of woman • For marriages: place of usual residence of groom • For divorces: place of usual residence of husband. 							
	(b) Sex: male; female.							
	Note:							
	This tabulation provides a wealth of information for use in the calculation of the natural population growth rate, for the country as a whole and for its major civil divisions. The infant mortality rates by sex and place of residence are important indicators for the assessment of the health situation and social development. Also, crude marriage and divorce rates for each major civil division are important indicators of family formation and family instability. Continuous information on these events, for the country as a whole and for its civil divisions, is essential in population and health policy formulation, and in programme monitoring and evaluation.							

Table ST-3
Time series of live births by place of usual residence of mother (past 10 years)

<i>Place of usual residence of mother</i>	<i>Year of occurrence (y)</i>									
	<i>y-9</i>	<i>y-8</i>	<i>y-7</i>	<i>y-6</i>	<i>y-5</i>	<i>y-4</i>	<i>y-3</i>	<i>y-2</i>	<i>y-1</i>	<i>y</i>
Total	Classifications:									
Urban	(a) Place of usual residence of mother: (i) total country;									
Rural	(ii) each major civil division; (iii) each minor civil division									
Major civil division	(optional); (iv) each principal locality. Distinguish urban									
Urban	and rural for (i), (ii) and (iii) and as may be required for									
Rural	national use.									
Minor civil division	(b) Year of occurrence: past 10 years.									
Urban	Note:									
Rural	Information on the total number of live-born children in									
City or town	current and recent years facilitates in a single tabulation									
...	a comparison between years for the country as a whole									
	and for its civil divisions. Observations of the changes									
	over time in the absolute numbers of live births is use-									
	ful with respect to the provision of public health and									
	educational and social services throughout the country.									
	Information on the total number of live births in each									
	year provides, for each civil division of residence, and for									
	the country as a whole, the numerators—as related to									
	the appropriate denominators for the mid-year esti-									
	mated population—for the calculation of time series of									
	crude birth rates. Caution should be exercised in inter-									
	preting the crude birth rates when either the numerator									
	is incomplete or the figure for the mid-year population is									
	inaccurate, or both.									

Table ST-4

Time series of deaths by place of usual residence of decedent (past 10 years)

<i>Place of usual residence of decedent</i>	<i>Year of occurrence (y)</i>									
	<i>y-9</i>	<i>y-8</i>	<i>y-7</i>	<i>y-6</i>	<i>y-5</i>	<i>y-4</i>	<i>y-3</i>	<i>y-2</i>	<i>y-1</i>	<i>y</i>
Total	Classifications:									
Urban	(a) Place of usual residence of decedent: (i) total country;									
Rural	(ii) each major civil division; (iii) each minor civil division									
Major civil division	(optional); (iv) each principal locality (optional). Distinguish urban and rural for (i), (ii) and (iii) and as may be required for national use.									
Urban	(b) Year of occurrence: past 10 years.									
Rural										
Minor civil division	Note:									
Urban	The information about deaths in current and recent years in a single tabulation allows for a comparison between years of the incidence of deaths for the country as a whole and for its civil divisions. It is useful to observe the changes over time in the absolute numbers of death as regards the provision of health-care services throughout the country. Information on the total number of deaths for each year, for each civil division of residence and for the country as a whole, is the source of the numerators, as related to the appropriate denominators for mid-year estimated population, for the calculation of crude death rates. However, caution should be exercised in interpreting crude death rates when either the numerator is incomplete or the figure for mid-year population is inaccurate, or both.									
Rural										
...										

Table ST-5
Time series of infant deaths by place of usual residence of mother (past 10 years)

Place of usual residence of mother	Year of occurrence (y)									
	y-9	y-8	y-7	y-6	y-5	y-4	y-3	y-2	y-1	y
Total	Classifications:									
Urban	(a) Place of usual residence of mother: (i) total country;									
Rural	(ii) each major civil division; (iii) each minor civil division									
Major civil division	(optional); (iv) each principal locality. Distinguish urban and									
Urban	rural for (i), (ii) and (iii) and as may be required for national									
Rural	use.									
Minor civil division	(b) Year of occurrence: past 10 years.									
Urban	Note:									
Rural	Information on infant deaths in the current and recent									
...	years in a single tabulation allows for the comparison of the									
	incidences of infant deaths between years for the country and									
	its major and minor civil divisions. Observation of the									
	changes over time in the absolute numbers of infant deaths									
	is useful in terms of the provision of public health-care ser-									
	vices throughout the country. Information on the total num-									
	ber of infant deaths for each year, for each civil division of									
	residence and for the country as a whole, is the source of the									
	numerators—as related to the appropriate denominators for									
	live births that have occurred in the same years as are given									
	in table ST-3—for the calculation of infant mortality rates.									

Table ST-6
Time series of foetal deaths by place of usual residence of mother (past 10 years)

Place of usual residence of mother	Year of occurrence (y)									
	y-9	y-8	y-7	y-6	y-5	y-4	y-3	y-2	y-1	y
Total	Classifications:									
Urban	(a) Place of usual residence of mother: (i) total country;									
Rural	(ii) each major civil division; (iii) each minor civil division									
Major civil division	(optional); (iv) each principal locality. Distinguish urban and									
Urban	rural for (i), (ii) and (iii) and as may be required for national									
Rural	use.									
Minor civil division	(b) Year of occurrence: past 10 years.									
Urban	Note:									
Rural	The information on foetal deaths in current and recent									
...	years in a single tabulation allows for a comparison of foetal									
	deaths between years for the country and its civil divisions.									
	It is useful to observe the changes over time in the abso-									
	lute numbers of foetal deaths in the context of providing									
	education and prenatal health-care services throughout the									
	country. Information on the total number of foetal deaths									
	for each year, for each civil division of residence and for the									
	country as a whole, is the source of the numerators—as									
	related to the appropriate denominators for live births plus									
	foetal deaths for the calculations of foetal rates same years									
	given in table ST-3 and the present table—for the calculation									
	of foetal death rates.									

Table ST-7

Time series of marriages by place of usual residence of groom (past 10 years)

<i>Place of usual residence of groom</i>	<i>Year of occurrence (y)</i>									
	<i>y-9</i>	<i>y-8</i>	<i>y-7</i>	<i>y-6</i>	<i>y-5</i>	<i>y-4</i>	<i>y-3</i>	<i>y-2</i>	<i>y-1</i>	<i>y</i>
Total	Classifications:									
Urban	(a) Place of usual residence of groom: (i) total country;									
Rural	(ii) each major civil division; (iii) each minor civil division									
Major civil division	(optional); (iv) each principal locality (optional). Distinguish									
Urban	urban and rural for (i), (ii) and (iii) and as may be required for									
Rural	national use.									
Minor civil division	Note:									
Urban	Information about the current and recent years of total num-									
Rural	bers of contractual marriages in a single tabulation allows									
City or town	for a comparison between years for the country and its civil									
...	divisions. It is useful to observe the changes over time of the									
	absolute numbers of marriages. Information on the numbers									
	of marriages for each year, for civil division of residence and									
	for the country as a whole, provides the numerators—as									
	related to the appropriate denominators for the estimated									
	mid-year population—for the calculation of crude marriage									
	rates. Caution should be exercised in interpreting crude mar-									
	riage rates when either the numerator is incomplete or the									
	figure for the mid-year population is inaccurate, or both.									

Table ST-8

Time series of divorces by place of usual residence of husband (past 10 years)

<i>Place of usual residence of groom</i>	<i>Year of occurrence (y)</i>									
	<i>y-9</i>	<i>y-8</i>	<i>y-7</i>	<i>y-6</i>	<i>y-5</i>	<i>y-4</i>	<i>y-3</i>	<i>y-2</i>	<i>y-1</i>	<i>y</i>
Total	Classifications:									
Urban	(a) Place of usual residence of husband: (i) total country;									
Rural	(ii) each major civil division; (iii) each minor civil division									
Major civil division	(optional); (iv) each principal locality (optional). Distinguish									
Urban	urban and rural for (i), (ii) and (iii) and as may be required for									
Rural	national use.									
Minor civil division	Note:									
Urban	Information about the current and recent years of total									
Rural	numbers of dissolution of marriages by divorce in a single									
City or town	tabulation allows comparison between years for the country									
...	and its civil divisions. It is useful to observe the changes over									
	time in the absolute numbers of divorces. Information on the									
	numbers of divorces for each year, for civil divisions of resi-									
	dence and for the country as a whole, provides the numera-									
	tors—as related to the appropriate denominators for the									
	estimated mid-year population—for the calculation of crude									
	divorce rates. Caution should be exercised in interpreting									
	crude divorce rates when either the numerator is incomplete									
	or the figure for the mid-year population is inaccurate, or									
	both.									

Glossary

Accuracy of register-based vital statistics: Refers to the case where data items on the statistical report have been correctly and completely filled out and where no errors have been introduced during transcription of data from vital records onto the statistical report (if this was carried out) or during the processing stages (coding, editing, input, tabulation).

Accuracy of registration: Refers to the case where data items for each vital event on the vital record have been correctly and completely filled out, that is to say, the case where there are neither response errors nor missing items. The measurement of any deviation from correctness is called “content error”.

Adoption: The legal and voluntary taking in and treating as one’s own the child of other parents as provided by the laws of the country. By means of a judicial process, the adopted child, whether related or not to the adopter, acquires the rights and status of a biological child born to the adoptive parents.

Age: The interval of time between birth and the present time, expressed in *completed* units of solar time. Age is usually measured in completed years for adults and children and in completed months, weeks, days, hours or minutes of life, as appropriate, for infants or very young children.

Annulment: Invalidation or voiding of a legal marriage by a competent authority, according to the laws of the country, thereby conferring on the parties the status of never having been married to each other.

Apgar score: Measurement of an infant’s physical condition at one minute and five minutes after birth. The heart rate, respiration, muscle tone, colour and response to stimuli are scored as 0, 1 or 2. The maximum total score for a normal baby is 10.

Attendant at birth: The person who assisted the mother in delivering a live-born infant or a dead foetus.

Availability of data: The accessibility of data that have been collected, filed, processed and stored in the civil registration and vital statistics systems, in a user-friendly format, to users upon request.

Born in wedlock: Characterization of a live-born infant or dead foetus whose mother was legally married (through any recognized union by the laws or customs of the country) at the time of delivery. *See* Wedlock status of the mother at the time of the child’s birth.

Born out of wedlock: Characterization of a live-born infant or dead foetus whose mother was not legally married at the time of delivery (through any union recognized by the laws or customs of the country at the time of delivery). *See* Wedlock status of the mother at the time of the child’s birth.

Burial permit: The official document, usually issued only for a legally registered death, authorizing the removal of the dead body (corpse) to the cemetery or for other final disposal.

Causes of death: All diseases, morbid conditions or injuries that either resulted in or contributed to death, and the circumstances of the accident or violence that produced any such injuries. For vital statistics purposes, symptoms or modes of dying, such as heart failure and asthenia, are not considered to be causes of death. *See* Underlying cause of death.

Certifier (of cause of death): The person authorized by law to issue a certificate, in a prescribed format, stating the underlying and contributory causes of death, and other facts related to the event, for submission to the local registrar or other appropriate authority. The certifier is usually the physician who attended the deceased in his or her last illness; or, in the case of deaths of persons who were not attended during the last illness by a physician or who may have died owing to violence or injury, the medical-legal officer (e.g., the coroner or the medical examiner).

Civil registrar: The official authorized by law with the responsibility for carrying out the civil registration of vital events in a well-defined area (an entire country, or a county, district, municipality, parish, etc.) and for recording and reporting information on those vital events for legal and statistical purposes.

Civil registration: The continuous, permanent, compulsory and universal recording of the occurrence and characteristics of vital events pertaining to the population, as provided through decree or regulation in accordance with the legal requirements in each country. This process establishes and provides legal documentation for such events. The civil registration records are also the best source of vital statistics.

Civil registration method: The procedure employed in gathering the basic information on the incidence of vital events that have occurred to the population of a country (or area) within a specified time period and their characteristics, based upon which vital records with legal value are prepared and vital statistics are produced.

Civil registration system: The institutional, legal and technical settings established by government within which civil registration is conducted in a technically sound, coordinated and standardized manner throughout a country, taking into account cultural and social circumstances particular to that country. *See* Civil registration *and* Vital statistics system.

Compilation of vital statistics data: The process of condensing and summarizing information on vital events by classifying and tabulating the data within categories or groups in order to produce vital statistics according to a predetermined tabulation programme.

Complete civil registration: The registration in the civil registration system of every vital event that has occurred to the members of the population of a particular country (or area), within a specified period as a result of which every such event has a vital registration record and the system has attained 100 per cent coverage. Any deviation from complete coverage is measured by “coverage error”.

Coroner: The officer of a county, district, municipality, parish, etc., authorized by law to hold an inquest regarding deaths of persons who may have died by violence or injury or under suspicious circumstances, to determine if the death was due to non-natural causes, such as accident, suicide or homicide.

Crude birth rate: The vital statistics summary rate based on the number of live births occurring in a population during a given period of time, usually a calendar year, i.e., the number of live births occurring among the population of a given geographical area during a given year, per 1,000 mid-year total population of that area during the same year.

Crude death rate: The vital statistics summary rate based on the number of deaths occurring in a population during a given period of time, usually a calendar year, i.e., the number of deaths occurring among the population of a given geographical area during a given year, per 1,000 mid-year total population of that area during the same year.

Crude divorce rate: The vital statistics summary rate based on the number of divorces occurring in a population during a given period of time, usually a calendar year, i.e., the number of divorces occurring among the population of a given geographical area during a given year, per 1,000 mid-year total population of that area during the same year.

Crude marriage rate: The vital statistics summary rate based on the number of marriages occurring in a population during a given period of time, usually a calendar year, i.e., the number of marriages occurring among the population of a given geographical area during a given year, per 1,000 mid-year total population of that area during the same year.

Date of birth: The day, month and year of birth, including hours and minutes, if required, which information is used to determine age in completed units of time. *See Age.*

Date of occurrence: The exact date when an event occurred, which should be expressed in terms of the day, month and year, as well as the hour and minute, if appropriate (for live births, foetal deaths and deaths).

Date of registration: The day, month and year when an entry of registration of a vital event is made in the civil register.

Death: The permanent disappearance of all evidence of life at any time after the occurrence of live birth, i.e., the postnatal cessation of vital functions without capability of resuscitation. This definition excludes foetal deaths. *See Foetal death.*

Delayed civil registration: The registration of a vital event after the prescribed period determined in existing laws, rules or regulations (including any grace period, if specified). Late registration is the registration of a vital event after the prescribed time period but within a specified grace period. Since the grace period is usually considered to be one year following the vital event, delayed registration is usually considered to be the registration of a vital event one year or more after the vital event has occurred. *See Late civil registration.*

Descriptive epidemiology: The study of the occurrence of disease and other health-related phenomena in human populations. The usual focus is on the relationship of disease to basic variables, such as age, sex, race, ethnicity, geographical location, occupation and socioeconomic measures.

Divorce: The legal final dissolution of a marriage, that is, that separation of spouses that confers on the parties the right to remarriage under civil, religious and/or other provisions, according to the laws of each country. In the case where a country recognizes registered partnerships, a legal dissolution of a registered partnership constitutes the legal final dissolution of such a partnership, according to national laws, which confers on the parties the right to enter into another partnership or marriage.

Dual-records system: A method of collecting vital statistics data, mainly births and deaths, through household demographic sample surveys conducted on a continuous basis. A special case of the follow-up survey method, it allows for the validation of information from two independent reporting sources, utilization of each being based on survey techniques. Two independent records are established for each vital event occurring in the selected sample areas through continuous registration and a retrospective survey. The events reported in the two systems are then matched and the unmatched events are field-verified to ensure that the events belong to the sample area and have occurred within the reference period.

Epidemiology: The scientific study of the patterns, causes and effects of health and disease conditions in defined populations. As the cornerstone of public-health policy, it informs policy decisions and evidence-based medicine by identifying risk factors for disease and targets for preventive medicine. Epidemiologists participate in study design, collection and statistical analysis of data, and interpretation and dissemination of results (including peer review and occasional systematic review). Epidemiologists have helped develop the methodology used in clinical research, public-health studies and, to a lesser extent, basic research in the biological sciences.

Foetal death: The death prior to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the period of gestation. Death is indicated by the fact that after such separation, the foetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord or definite movement of voluntary muscles.

Foetal death rate: The vital statistics summary rate based on the number of foetal deaths relative to the total number of births (live births plus reported foetal deaths) occurring during a given period of time, usually a calendar year, in a given geographical area, i.e., the number of foetal deaths occurring in that area during a given year, per 1,000 total births (live births plus foetal deaths).

Foetal death ratio: The vital statistics rate based on the number of foetal deaths related to the total number of live births occurring during a given period of time, usually a calendar year, in a given geographical area, i.e., the number of foetal deaths occurring in that area during a given year, per 1,000 live births.

Gestational period: The interval in completed weeks between the first day of the last menstrual period of the mother and the day, month and year of delivery, irrespective of whether the product of conception is a live birth or is born showing no evidence of life (foetal death).

Infant death: The death of a live-born child under 1 year of age.

Infant mortality rate: The vital statistics summary rate based on the number of infant deaths occurring during the same period of time, usually a calendar year, i.e., the number of deaths of live-born children under 1 year of age occurring in a given geographical area during a given year, per 1,000 live births occurring among the population of that area during the same year.

Informant: The individual or institution whose responsibility, designated by law, is to report to the local registrar the *fact* of the occurrence of a vital event and to provide all the information on and all the characteristics of the event. On the basis of such a report, the event may be legally registered by the local registrar.

Judicial (legal) separation: The disunion of married persons, without there being conferred on the parties the right to remarriage, according to the laws of each country.

Late civil registration: The registration of a vital event after the legally specified time period but within a specified grace period. The grace period is usually considered to be one year following the vital event. *See* Delayed registration.

Legitimation: The formal vesting of a person with the same status and rights of a person born in wedlock, according to the laws of the country.

Live birth: The result of the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which after such separation breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord or definite movement of voluntary muscles, whether

or not the umbilical cord has been cut or the placenta is attached. Each product of such a birth is considered to be live-born.

Marriage: The act, ceremony or process by which the legal relationship of spouses is constituted. The legality of the union may be established by civil, religious or other means as recognized by the laws of each country. Countries may wish to expand the definition to cover civil unions if they are registered. In that case, registered partnership usually refers to a legal construct, entailing registration with the public authorities according to the laws of each country, that becomes the basis for legal conjugal obligations between two persons.

Maternal death: The death of a woman while pregnant or within 42 days after the termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from an accidental or an incidental cause.

Maternal mortality rate:^a The vital statistics rate based on the number of deaths due to maternal causes relative to the number of live births occurring during a given period of time, usually a calendar year—i.e., the number of deaths to women resulting from (a) direct obstetric complications of pregnancy, labour or the puerperium, (b) interventions, omissions or incorrect treatments or their results or (c) indirect obstetric conditions arising from previously existing disease or disease arising during pregnancy and that did not arise from any direct obstetric condition but was aggravated by the physiological effects of the pregnancy—occurring in a given geographical area during a given year, per 100,000 (or 10,000) live births in that area during the same year.

Neonatal death: The death of a live birth during the first 28 completed days of life.

Neonatal mortality rate: The vital statistics rate based on the number of infants who die in their first month of life relative to the number of live births during a given period of time, usually a calendar year, i.e., the number of infants dying at ages up to but less than 28 completed days of life, per 1,000 live births in a given geographical area during a given year.

Neonatal period: The period that commences at birth and ends 28 completed days after birth.

Notifier: The individual appointed by the local registrar to act as intermediary between the local registrar and the informant in providing all the information on and all the characteristics of an event that is to be legally registered by the local registrar.

Out-of-wedlock birth: A birth occurring to a mother who is not married at the time of delivery.

Perinatal period: The period that commences at 22 weeks (154 days) of gestation (the time when birth weight is normally 500 grams) and ends 7 completed days after birth.

Population-at-risk: (1) For vital statistics purposes, the population that is subject to the occurrence of a vital event, such as the total population in the case of deaths or the legally married population in the case of divorces. (2) For the calculation of specified vital statistics rates, the number (the denominator) by which the number of vital events (the numerator) is divided.

^a The term “rate”, although inexact in this context, is retained for the sake of continuity (see World Health Organization, 2011).

Population census: 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.

Population register: An individualized data system, that is, a mechanism of continuous recording, and/or of coordinated linkage, of selected information pertaining to each member of the resident population of a country in such a way as to offer the possibility of deriving up-to-date information concerning the size and characteristics of that population at selected time intervals.

Primary registration area (unit): Part of the territory of a country that is entrusted to a local civil registrar for the recording of the vital events occurring therein. Each primary registration area is therefore the jurisdictional territory of one of the local civil registrars.

Probability sample: A sample selected from a population by a method based on the theory of probability (through a random process), that is, a method entailing knowledge of the likelihood of any unit's being selected.

Qualitative error: An error arising from an ignorance or forgetting of the facts, refusal to reply to a question, failure to understand a question or failure, on the part of an interviewer, to put the question clearly or to record the answer properly.

Quality assessment of civil registration and vital statistics systems: Specific studies that aim at answering specific questions regarding the quality of civil registration and vital statistics systems.

Quality assurance of civil registration and vital statistics systems: The process comprising the steps taken at each stage of the operation of civil registration and vital statistics systems to ensure that all vital events that occurred within the country are registered without duplication, that all related information is accurately recorded and that data on recorded vital events are compiled and processed into vital statistics in a correct and timely manner.

Quality of a vital event record (report): The plausibility of the record (report) as the preferred legal proof of the fact that the event occurred, and its accuracy and the timeliness of its compilation for statistical purposes.

Quality of data: In the civil registration system or in the vital statistics system, the degree of completeness, correctness (accuracy), timeliness and availability of data. *See* Accuracy of register-based vital statistics, Accuracy of registration, Availability of data, Complete civil registration, Timeliness in register-based vital statistics, *and* Timeliness in registration.

Recognition: The legal acknowledgment, either voluntary or compulsory, of the paternity of a child born out of wedlock.

Record linkage: The process, usually computer-based, whereby information from two or more data files is merged into a new, combined file containing selected information about individuals or events that was not available in the separate records.

Sampling: The process of selecting a number of representative cases from all the cases in a particular group or population for the purpose of drawing inferences about the entire group or population.

Sampling error: A type of false or mistaken result obtained in a survey or experiment that is due to chance (random error), i.e., a result obtained from the

sample differing from the result that would have been obtained if the entire population had been studied.

Sampling frame: A collection of units (persons, households, institutions, events, etc.) from which a sample may be drawn.

Statistical reporting of vital events data: The transmission of statistical reports on vital events legally recorded to the agency responsible for the compilation of statistics on those events.

Timeliness in register-based vital statistics: A quality evidenced by the fact that for every vital event registered within the interval specified by legislation, a statistical report form has been forwarded to the agency responsible for the compilation of vital statistics within the established time schedule of the vital statistics programme, and that the production, publication and dissemination of those vital statistics have been prompt enough to serve the users' needs.

Timeliness in registration: The quality of a vital event report determined by the difference between the date of the event and the date of its registration when compared with the interval specified by legislation.

Underlying cause of death: The disease or injury that initiated the train of morbid events leading directly to death or the circumstances of the accident or violence that produced the fatal injury. The underlying cause of death is used as the basis for tabulation of mortality statistics.

Vital event: The occurrence of a live birth, death, foetal death, marriage, divorce, adoption, legitimation, recognition of parenthood, annulment of marriage or legal separation.

Vital event record: A legal document entered into the civil register that attests to the occurrence and characteristics of a vital event.

Vital statistical record: A document or record containing those items of information concerning an individual vital event that meet the needs of vital statistics compilation.

Vital statistics system: For the purposes of the present principles and recommendations, an integrated whole comprising a set of independent or interacting components—in this case, legal registration and statistical reporting of, and collection, compilation and dissemination of statistics pertaining to, vital events. The vital events of interest are: live births, adoptions, legitimations, recognitions, deaths and foetal deaths, and marriages, divorces, separations and annulments. *See* Vital event.

Wedlock status of the mother at the time of the child's birth: A topic derived from the marital status of the mother, which describes the status of a live-born child or dead foetus with respect to its being considered the lawful issue of a couple at the time of delivery.

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