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Principles and Recommendations for a Vital Statistics System

Revision 2

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Principles and Recommendations for a **Vital Statistics System**

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PREFACE

Principles and Recommendations for a Vital Statistics System, Revision 2 was adopted by the Statistical Commission at its thirtieth session, in 1999.[1] It updates *Principles and Recommendations for a Vital Statistics System, Revision 1* which was published in 1973.[2] It provides guidance in (*a*) improving civil registration; (*b*) enhancing coordination and communication between the authorities responsible for civil registration and vital statistics; (*c*) using census- and survey- based information on fertility and mortality; and (*d*) responding more effectively to new and emerging user requirements.

The present publication stresses the importance of and need for continuous, comprehensive and universal vital statistics to meet national needs in a timely manner. It also emphasizes the need to prepare, evaluate and disseminate vital statistics even if registration is not yet complete due to limited geographic coverage. In addition, it provides standard concepts, definitions, coding schemes, classifications and a minimum tabulation plan for possible national adoption. It also incorporates developments in information technology and communications which affect the further development of civil registration and vital statistics systems.

Civil registration is a major foundation for a legal system for establishing the rights and privileges of individuals in a country. Where it is comprehensively maintained, it is the main source of vital statistics. *Principles and Recommendations, Revision 2* provides guidelines for the establishment, proper management, operation and maintenance of civil registration. However, the focus of *Principles and Recommendations, Revision 2* is on the collection, compilation and dissemination of vital statistics. The specific administrative structures required are not emphasized because the specific operations of civil registration and vital statistics systems depend on administrative and legal arrangements that are matters of individual national concern.

Principles and Recommendations, Revision 2 is supplemented by the five-volume series *Handbooks on civil registration and vital statistics systems* (see introduction, para. 11), which is available in all six official languages of the United Nations.

Principles and Recommendations, Revision 2 includes the data requirements of United Nations international conferences and meetings on population, civil registration and vital statistics, and other economic and social fields. It also takes into account the *International Statistical Classification of Diseases and Health-Related Problems, Tenth Revision*,[3] the *International Standard Classification of Occupations (ISCO-88)*,[4] the *International Statistical Classification of Education (ISCED)*,[5] the *International Standard Industrial Classification of All Economic Activities, Revision 3 (ISIC, Rev. 3)*[6] and the *Principles and Recommendations for Population and Housing Censuses, Revision 1*.[7]

Account has also been taken of a wide variety of background materials and activities at the regional and international levels, including the national assessments undertaken by the United Nations Statistics Division in preparation for each of five regional United Nations workshops on strategies for accelerating the improvement of civil registration and vital statistics systems which were held in the 1990s.[8] National deliberations contributed materially to the present recommendations.

During the revision process, the United Nations Secretariat consulted a wide range of experts in the areas of civil registration, vital statistics, censuses and surveys, and in the specialized agencies of the United Nations. *Principles and Recommendations for a Vital Statistics System, Revision 2* reflects the broad consensus of experts and agency representatives.

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[1] See *Official Records of the Economic and Social Council, 1999, Supplement No.4* (E/1999/24), paras. 61and 70.

[2] United Nations publication, Sales No. E.73.XVII.9.

[3] Geneva, World Health Organization, 1992.

[4] Geneva, International Labour Organization, 1992.

[5] Paris, United Nations Educational, Scientific and Cultural Organization (document ISCED/WG/1).

[6] United Nations publication, Sales No. E.90.XVII.11.

[7] Ibid., Sales No. E.98.XVII.8.

[8] Workshops on strategies for accelerating the improvement of civil registration and vital statistics systems were conducted in Buenos Aires (1991), Damascus (1993), Beijing (1993), Addis Ababa (1994) and Morocco (1995) by the United Nations Statistics Division, with financial support from the United Nations Population Fund and the collaboration of the regional commissions. The Statistics Division is the focal point for the International Programme for Accelerating the Improvement of Civil Registration and Vital Statistics Systems, which was endorsed by the Statistical Commission in 1989.

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INTRODUCTION

1. *Principles and Recommendations for a Vital Statistics System, Revision 2* recognizes the basic role of national Governments in establishing, operating and maintaining reliable civil registration systems that produce legal documentation on vital events and their characteristics for their entire populations in order to protect their civil and human rights. It also recognizes the key role of Governments in utilizing this information and the vital statistics derived from the records to plan and implement effective social and economic programmes for the well-being of their populations. It is the second revision of principles and recommendations for a vital statistics system adopted by the United Nations Statistical Commission.

2. The original principles and recommendations for a vital statistics system, *Principles for a Vital Statistics System: Recommendations for the Improvement and Standardization of Vital Statistics*,[9] were adopted by the Statistical Commission in 1953 and were primarily designed as guides for countries whose vital statistics were already produced by a civil registration system or which were planning the adoption of this form of system. By focusing the principles and recommendations in that way, it was recognized that the conventional method of obtaining vital statistics data from registration records might be limited in statistically developing areas, and that, for those areas, other methods often provided useable data during a transitional or interim period, pending the development of a satisfactory civil registration system.

3. The first revision of the principles and recommendations, *Principles and Recommendations for a Vital Statistics System, Revision 1*[10] was adopted by the Statistical Commission in 1970 and issued in 1973 to reflect the experience of developing countries that recognized the need to develop the capacity to measure levels and trends in fertility and mortality even in the absence of complete and accurate civil registration systems. In that context, emphasis was placed on the use of surveys and censuses to complement incomplete registration systems for the production of vital statistics indicators as an interim source of information until national civil registration improved.

4. The major differences between the original principles and recommendations issued in 1953 and the first revision issued in 1973 consisted of (*a*) a broadening of the definition of a vital statistics system to include both the civil registration method and other techniques of obtaining data on vital events; (*b*) an expanded exposition of the use of vital records and vital statistics; (*c*) a greater emphasis on the need for the integration of a vital statistics system with other fields of statistics; and (*d*) an increased emphasis on the need to evaluate the completeness and accuracy of results.

5. The second revision of the principles and recommendations, *Principles and Recommendations for a Vital Statistics System, Revision 2*, was adopted by the Statistical Commission in 1999 to build on its two predecessors and update their material, as appropriate. Several considerations have prompted the second revision. It reflects experience (*a*) in improving civil registration, (*b*) in observing the need to coordinate and communicate between the authorities responsible for civil registration and vital statistics, (*c*) in using census and survey-based information on fertility and mortality and (*d*) in the need to respond more effectively to new and emerging user requirements. Recognizing the recent and rapid advances in information technology including electronic data storage, transmission, processing and dissemination, *Principles and Recommendations, Revision 2* notes that the use of new technologies can support the improvement of data collection and data capture in order to increase the capacity of civil registration and vital statistics systems to efficiently utilize financial and human resources at the national and sub national levels.

6. For example, rapid development and widespread availability and use of electronic computing equipment has made available compact, relatively inexpensive and powerful tools for data transmission, data editing and quality control, linkage between files, analysis, publication and information dissemination. Therefore, another reason for the second revision is the use of data capture in the civil registration system. It is now possible to maintain such information electronically, rather than simply in paper archives, a development that enhances the prospects for the timeliness and accuracy of vital statistics and could make it more cost-effective to create timely vital statistics.

7. Recognizing that the development of vital statistics is contingent on a complete and accurate civil registration system, supplemented by regular censuses and surveys, the objectives of *Principles and Recommendations, Revision 2* are essentially the same as those stated in the introduction to both the original principles and recommendations and the first revision, namely, to assist national statistical services in the development and improvement of national vital statistics and to promote the comparability of those statistics through time and between geographic places. The improved scope and reliability of vital statistics data, including their improved completeness, timeliness and accuracy, promotes their use as a basis

[9] United Nations publication, Sales No. 53.XVI.8.
[10] United Nations publication, Sales No.E.73.XVII.9.

for informed economic and social planning at the sub national, national and international levels.

8. In addition, *Principles and Recommendations, Revision 2* concentrates on the adoption of concepts and definitions and the use of internationally adopted classifications to produce standard statistics at the national and international levels. In recent decades the International Labour Organization (ILO), the World Health Organization (WHO), the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the United Nations have adopted new revisions of international classifications. Recognizing that implementation of those classifications in national sources of data and their use for statistical operations is a very complex process, guidance in their use in the preparation of vital statistics is provided. And recognizing that civil registration alone will never provide the requisite indicators needed to monitor social and economic development, *Principles and Recommendations, Revision 2* describes other sources of data for both the estimation of vital statistics and the estimation of denominators to calculate statistical rates and indicators.

9. *Principles and Recommendations, Revision 2* is primarily intended to assist in the design and operation of efficient and accurate civil registration and vital statistics systems. It focuses more on considerations directly affecting the collection, compilation and dissemination of quality data, record preparation and preservation, rather than on the precise administrative structure required. The specific operations of civil registration and vital statistics systems depend upon administrative and legal arrangements which are matters of individual national concern; however, some basic concepts are important to the successful operation and maintenance of the systems, regardless of the organizational and legal structure in which they function. In this regard, if there are particular administrative procedures which have proved to be effective in meeting the goals of effective systems, they have been indicated.

10. *Principles and Recommendations, Revision 2* does not establish mandatory requirements for Governments; it is mainly intended as a guide to countries in their development and appraisal of vital statistics systems that rely on sound civil registration systems, along with some considerations for supplementary methods, where needed. It is often expressed in general terms to permit worldwide application and adaptation to national needs and practices.

11. Guidelines for the implementation of *Principles and Recommendations, Revision 2* are provided in the five volume series *Handbooks on Civil Registration and Vital Statistics Systems*. Each of the *Handbooks* contributes specific procedural recommendations for effectively designing and operating the various aspects of effective civil registration and vital statistics systems, as indicated by their titles:

(*a*) *Handbook on Civil Registration and Vital Statistics Systems: Management, Operation and Maintenance*;[11]

(*b*) *Handbook on Civil Registration and Vital Statistics Systems: Preparation of a Legal Framework*;[12]

(*c*) *Handbook on Civil Registration and Vital Statistics Systems: Developing Information, Communication and Education*;[13]

(*d*) *Handbook on Civil Registration and Vital Statistics Systems: Policies and Protocols for the Release and Archiving of Individual Records*;[14]

(*e*) *Handbook on Civil Registration and Vital Statistics Systems: Computerization* (United Nations Publication}.[15]

Guidelines are also provided in the Handbook of Vital Statistics Systems and Methods, vol. I, Legal, Organizational and Technical Aspects (United Nations publication, Sales No. E.91.XVII.5), and vol. II, Review of National Practices (United Nations publication, Sales No. E.84.XVII.11).

12. *Principles and Recommendations, Revision 2* is divided into in six chapters. Chapter I outlines the justification of a vital statistics system, and indicates the objectives, uses and importance of civil registration and vital statistics systems. Chapter II focuses on the definition, characteristics and details of the vital statistics system, including sources of data, definition of vital events, topics to be collected, concepts and definitions, procedures for producing and disseminating information, and the necessary interface with the civil registration system. Chapter III covers the civil registration system. It has been broadened since the first revision, and concerns itself with the definition and specifics of the civil registration system; its characteristics; procedures for recording and reporting vital events; the storage and retrieval of records; and the relationship with the vital statistics system and population registers. Chapter IV recommends strategies for the improvement of civil registration and vital statistics systems, based on considerable work over the past decade on issues that promote the development of a universal, timely and accurate registration system. Chapter V addresses the evaluation of the quality and completeness of both civil registration and vital statistics. Chapter VI describes censuses and household surveys as complementary sources of vital statistics. Finally, a suggested minimum tabulation plan for vital statistics compiled from civil registration data is provided in the annex and a glossary of terms commonly used in civil registration and vital statistics systems concludes the publication.

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[11] United Nations publication, Sales No. E.98.XVII.11.
[12] Ibid., Sales No. E.98.XVII.7.
[13] Ibid., Sales No. E.98.XVII.4.
[14] Ibid., Sales No. E.98.XVII.6.
[15] Ibid., Sales No. E.98.XVII.10.

I. THE IMPORTANCE OF CIVIL REGISTRATION AND THE VITAL STATISTICS SYSTEM

A. Definition of a vital statistics system and sources of data

13. A vital statistics system is defined as the total process of (*a*) collecting information by civil registration or enumeration on the frequency of occurrence of specified and defined vital events, as well as relevant characteristics of the events themselves and of the person or persons concerned, and (*b*) compiling, processing, analysing, evaluating, presenting and disseminating these data in statistical form. The vital events of interest are: live births, adoptions, legitimations, recognitions; deaths and foetal deaths; and marriages, divorces, separations and annulments of marriage (see para. 57 below for definitions).

14. The main source of vital statistics is records of vital events from civil registration, which involves the continuous gathering of information on all relevant vital events occurring within the boundaries of a country, (for details, see chap. III). For the calculation of vital rates, civil registration data are usually complemented by census information, which also has national coverage. However, when civil registration data either do not exist or are deficient, countries have had recourse to data sources other than civil registration to estimate the necessary vital statistics. The use of complementary data sources has also been made to enrich and evaluate civil registration data or to gather information on demographic or epidemiological processes in a way that enriches the information obtained through civil registration.

15. Additional sources in 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. For some countries, the uses of these sources of data together with the application of indirect techniques of demographic estimation have been supplying some of the statistical indicators needed for planning purposes, mainly at the national level. But there is no substitute for the availability of continuous information on vital events as obtained from registration of vital events in civil registration. *Principles and Recommendations for a Vital Statistics System, Revision 2* therefore focuses mostly on the principles and recommendations related to improving the management, operation and maintenance of vital statistics systems, together with activities related to civil registration and the vital statistics data derived therefrom. Accuracy, timeliness and completeness are essential elements that countries should strive to attain in their systems. Allowance is made, as appropriate, for the use of other sources of complementary or alternative data.

B. Uses of vital statistics

16. Vital statistics are an essential input for the planning of human development. Knowledge of the size and characteristics of a country's population on a timely basis is a prerequisite to socioeconomic planning. Because a population increases by the addition of live births and decreases by the subtraction of deaths, 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. Information on the number of live births occurring over a 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 an understanding of the growth dynamics of the population concerned; an assessment of the human aspects of socioeconomic development; the measurement of the risks of dying for males and females at specific ages for insurance and social security purposes; and for population projections.

17. Vital statistics derived from civil registration are the only nationally representative source of information on mortality by cause of death. 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, thus helping to design prevention or intervention strategies. Although alternative sources of information have been developed for the measurement of fertility and the analysis of its determinants, there is to date no adequate substitute for civil registration data for the direct measurement of adult mortality and the analysis of causes of death and their relationship with the characteristics of those who die.

18. Vital statistics as generated from civil registration data are the only source providing the basis for a variety of in-depth epidemiological studies, including the estimation of risks of premature death by sex and age, the estimation of relative risks of death among different subpopulations and the analysis of trends in the risk of dying because of particular causes.

19. Vital statistics also encompass data on the occurrence of marriages, divorces, annulments and judicial separations. Data on those topics allow the analysis of nuptiality, and in

conjunction with information on fertility permit the study of family formation. Because of cultural variations in the degree to which marriage is formalized and the variation in the legally accepted modes of contracting marriage, statistics referring to this aspect of population dynamics are often not truly comparable between countries. In particular, consensual unions are rarely reflected in civil registration data. Nevertheless, as provided by civil registration, information on contracted marriages and the incidence of officially sanctioned marriage dissolution, whatever its form, is useful in allowing an assessment of the social impact that those parts of the family formation process may have on a population.

20. Single mothers and their children constitute a particularly vulnerable group in most populations. Appropriate provision of services for this group is likely to require adequate information on their number and changes in trends over time, which only a well established civil registration system can provide. A related issue is an assessment of the incidence of out-of-wedlock births.

21. When civil registration data on births, deaths and marriages are adequate, they provide a wealth of information for analysing the different facets of population dynamics and their correlates. However, even when data on a particular topic are less than adequate, the regularity of demographic processes, coupled with the availability of other sources of information, often provide a good basis for adjusting or correcting deficiencies of data derived from civil registration[16]. Incomplete or deficient information is better than no information at all.

22. Adequate civil registration data that 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. Of particular importance in this respect is the possibility of analysing separately the population dynamics of rural and urban areas or particular regions within a country that differ markedly among themselves and whose differences need to be taken into account in the planning of a wide array of services. That possibility can only be exploited if appropriate tabulations are made of vital statistics classified by usual place of residence.

23. Continuity in the availability of 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 the expectation of life at birth and the infant mortality rate.

[16] See United Nations, *Manual X: Indirect Techniques for Demographic Estimation* (United Nations publication, Sales No. 83.XIII.2).

24. Civil registration data also permit the occurrence of vital events related to a range of socio-economic characteristics of the persons experiencing such events. Those characteristics are generally recorded as part of the registration process, and can be provided in statistical form for further research, such as the analysis of differential mortality by age and sex according to occupation, education or ethnicity of the deceased; causes of death; and administrative units.

25. To meet legal, administrative and other needs, the vital statistics system must operate according to well defined principles which are universally applicable. Clear definitions and basic principles are essential for vital records in civil registration to have universal acceptance and for vital statistics to have widespread comparability, both geographically and over time. However, the system must be flexible enough to incorporate new methods or to adapt old ones in order to respond to new requirements. The rapid development and widespread availability and use of electronic computing has made available compact, relatively inexpensive and powerful tools for data transmission, data editing and quality control, linkage between files, analysis, publication and information dissemination.

C. USES OF VITAL RECORDS FROM A CIVIL REGISTRATION SYSTEM

26. Civil registration is the continuous, permanent, compulsory and universal recording of the occurrence and characteristics of events, including vital events, pertaining to the population, as provided by decree or regulation, in accordance with the legal requirements of a country. It therefore provides the ideal source from which to derive data for vital statistics on a regular basis.

27. Civil registration has a dual purpose – administrative and legal on the one hand, and statistical, demographic and epidemiological on the other. Those two purposes reinforce each other in a number of ways, but it is important to maintain their distinctiveness in discussing the uses and operation of civil registration.

28. For the individual, the civil registration records of birth provide essential legal documentation of identity and civil status, such as name, date, time and place of birth, parents' name and nationality, date of birth or age of parents, ancestry or lineage, sex and nationality (citizenship),[17] on which depend a wide array of individual and family rights and activi-

[17] A registered live birth record from civil registration provides a statement of the place of birth of the child and usually of one or both parents. Most countries grant nationality by place of birth. However, legal provisions governing nationality still differ from country to country and in some cases may require the registrant to exercise a choice upon reaching a particular age. Also, aliens may acquire nationality by satisfying residence or other requirements. Therefore, in those countries, a birth certificate from civil registers cannot provide evidence of nationality itself but does provide essential grounds on which nationality can be established.

ties, including eligibility for social programmes (e.g., family allowances, tax benefits, education services, care and protection of children, rights to insurance benefits, property and inheritance rights). Death records provide legal evidence of the fact and circumstances of death and the demographic characteristics of the decedent for the purposes of inheritance, insurance claims and other death benefits, for demonstrating the right of the surviving spouse to remarry and for the support of claims for other benefits which may be predicated on the death of an individual. Marriage and divorce records provide documentation for the establishment of the civil status of individuals for such purposes as receipt of alimony allowances, claims for tax benefits, provision and allocation of housing or other benefits related to the marital status of a couple, and changing nationality on the basis of marriage. In addition, records of divorce are important for establishing the right of an individual to remarry and to be released from financial and other obligations incurred by the other party.[18]

29. In addition to the documentation of name, parentage and nationality for every child, the written documentation of birth date—and consequently age—provides a source for a greater degree of accuracy in a wide range of age-related data needed for administrative purposes, as well as statistical and epidemiological uses derived from such sources as a census or population survey.

30. Live birth records are the basis for many community-based public health programmes for post-natal care of mother and child, and may be used, when needed, for programmes of vaccination and immunization, premature-baby care, assistance to disabled persons.

31. There are also a number of societal interests related to the use of vital records. Although, in general, the concerns of society overlap the uses of vital records by individuals, they also involve broader collective concepts of human development, human rights and the protection of children, women and the family.

32. Officially authenticated copies of births, deaths, marriages, divorces, annulments etc. are essential elements for maintaining a population register. Changes in physical, civil or geographic status of the family enter the population register through records of these events, as well as through records of change of residence.

33. Marriage records are used administratively as proof of the formation of a marital bond, and may be needed to initiate family-benefit programmes related to health, housing etc. They also serve to clear administrative files on programmes dependent on single marital status, alimony payments etc. Divorce records serve similar administrative purposes.

34. Death records are used to provide legal permission for burial or other disposal of deceased individuals. They can also provide information of epidemiological importance, and signal the need for preventive control measures. Death records are also necessary to clear a number of administrative files, such as disease-case registers, population registers, social security files, military service files, electoral rolls, identity files and tax registers.

35. Civil registration also has significance in other societal areas of interest, especially with regard to the establishment and maintenance of families as units of society. The registration of births, marriages and divorces, for instance, provides tangible proof of the official recognition of the family formation process, and can yield valuable insights about the evolution of that process through time.

36. Because of the increased national and international mobility of the population, vital records have taken on additional importance. For the migrant, it has become essential to have access to documents that can prove his or her civil status and nationality. To facilitate the process of identification, those documents should conform to internationally accepted standards, which is yet another reason to establish in each country a civil registration process capable of registering vital events on a current basis, including efficient procedures for providing documentation in cases where timely registration has not taken place.

37. Lastly, social benefits can also be accrued from the various ways in which vital records can be used for scientific inquiry. They can be the starting point for prospective and retrospective longitudinal studies, such as the follow-up of cohorts of children to determine the effects of diet, environment, socio-economic conditions or genetic makeup on growth and health status; longitudinal studies of the health status and needs of the elderly; or of follow-back of decedents to determine the relationship of exposure to environmental hazards or to unhealthy lifestyle practices on the causes of mortality.

38. The United Nations, in a number of ways, has officially endorsed the protective value of live birth, marriage and divorce records. The Universal Declaration of Human Rights (General Assembly resolution 217 A (III)), adopted in 1948, proclaimed in article 15 that (*a*) everyone has the right to a nationality, and (*b*) no one shall be arbitrarily deprived of his nationality or denied the right to change it. The basic right to a nationality provided by the Declaration, which depends on having one's birth legally recorded, was reinforced by the adoption in November 1959 of the Declaration of the Rights of the Child (General Assembly resolution 1386 (XIV)), in which the Assembly affirmed, in principle 3, that "The child shall be entitled from his birth to a name and a nationality". The International Covenant on Civil and Political Rights, in article 24, states that "Every child shall be registered immediately after birth and shall have a name". (see General Assembly resolution 2200 A (XXI), annex I, December 1996). This principle was further reinforced and emphasized, especially in

[18] For in-depth information on contributions of civil registration to the identity of persons and family organization, see *Handbook on Civil Registration and Vital Statistics Systems: Preparation of a Legal Framework* (United Nations publication, Sales No.E.98.XVII.7), paras. 171-192.

reference to the need for greater attention to the accurate and timely registration of female infants and the dissemination of statistics, in the recommendations of the World Summit on Children,[19] the International Conference on Population and Development[20] and the Fourth Conference on Women.[21]

39. As early as 1954, the General Assembly urged the establishment of a civil or other register in which all marriages and divorces should be recorded (see Assembly resolution 843 (IX)). In addition, article 3 of the Convention on Consent to Marriage, Minimum Age for Marriage and Registration of Marriage (General Assembly resolution 1763 A (XVII), annex 9, adopted and opened for signature on 7 November 1962) lays down that "All marriages shall be registered in an appropriate official register by the competent authority". In 1965, the General Assembly, in its resolution 2018 (XX), principle III, adopted a recommendation on the same subject. The substantive provisions of *Principles and Recommendations, Revision 2* are very similar to those of the Convention, although the Convention is more specific on the machinery for implementation in that it recommends that Member States bring the recommendation before the national authorities competent to enact legislation. Divorce registration was endorsed by the Economic and Social Council in its resolution 1068 F (XXXIX) of 16 July 1965.[22]

D. Strategic objectives for the registration and vital statistics systems

40. A fundamental and essential role of government is to design and implement administrative and legal procedures for registering and documenting vital events and their characteristics in order to address basic aspects of human development, including the application of civil and human rights of the population, as well as to utilize this information to support social and economic planning and analytical applications.

41. This core function of government requires commitment, leadership and direction at the highest level. A major component of this societal function is the establishment and maintenance of a civil registration system that accurately and continuously records the vital events pertaining to the population from birth to death, including live births, foetal deaths, infant deaths, marriages, divorces, legal separations, annulments of marriage, recognitions of children born out of wedlock, legitimations and deaths. These facts need to be recorded at the time they occur on a continuous basis and under strict national standards. Maintenance of the requisite system includes the preservation and retrieval of the records generated, which serve as a basis for sound administration of the country as well as the protection of their confidentiality. Potential legal uses of registration records include certified copies of live birth records for documenting proof of citizenship. Similarly, if citizenship is obtainable by statutory marriage to a citizen, the marriage certificate provides the documentary proof used in the process of obtaining citizenship. Thus, accuracy and completeness of birth and marriage registration is essential for individual, societal, political and human rights purposes. In addition, information collected at the time of registration is the best source for the compilation of vital statistics on live birth, death, foetal death, marriage and divorce.

42. The challenge of the new millennium is to ensure the production of vital statistics in a timely, complete and accurate way from civil registration data complemented and/or supplemented by data from other sources, incorporating details that may help Governments to remove social and health inequalities. Against this background, the strategic objectives for development and improvement of the sources and production of vital statistics are presented with four aims:

(*a*) To ensure that the recording of vital events in *civil registration* is complete, timely, and accurate and that mechanisms to provide records to statistical authorities are developed and maintained. Subsidiary objectives under this element relate to (i) suitable consultation and collaboration between registration and vital statistical offices, (ii) establishment of measurable standards of reliability, and (iii) improving methods of registration to reduce levels of under-coverage and response error;

(*b*) To ensure the *production of vital statistics* to meet users' needs with stated quality standards and a predetermined timetable. Subsidiary objectives include (i) producing outputs with a minimum of error suitable for the purposes for which the data are to be used, (ii) providing standard outputs for the main results and services for customized output, (iii) providing access to output, (iv) using geographical bases appropriate for collecting and referencing data for output, (v) improving methods of evaluation and the means to convey findings to users, and (vi) developing measures of quality and completeness of coverage;

(*c*) To ensure positive *impact on the public and on the staff of involved agencies* so that all aspects of collection, operation and dissemination of results fully comply with legal and ethical standards for protecting the confidentiality of individual responses and have the needed public support. In this regard, it is imperative that the public be fully informed about the objectives and value of civil registration records, the uses and importance of vital statistics and the rights and obligations of all concerned with the registration of each vital event. Similarly, staffs of involved agencies must be fully aware of their respective

[19] See A/45/625.

[20] See *Report of the International Conference on Population and Development, Cairo, 5-13 September 1994* (United Nations publication, Sales No. E.95.XIII.18).

[21] See *Report of the Fourth Conference on Women, Beijing, 4-15 September 1995* (United Nations publications, Sales No. E.96.IV.13).

[22] For comprehensive information on human rights and civil registration, see *Handbook on Civil Registration and Vital Statistics Systems: Preparation of a Legal Framework*, (United Nations publication, Sales No.E.98.XVII.7) , paras. 191-284.

responsibilities and duties, including such matters as (i) keeping completed forms and other records containing personal information safe and secure, (ii) implementing policies designed to safeguard the confidentiality of all vital records, (iii) producing required output in a manner consistent with the proper protection of personal information and adherence to established reliability standards for the release of data, and (iv) ensuring that public understanding and support of all aspects of civil registration and vital statistics systems is as high as possible;

(*d*) To ensure the development and maintenance of a *cost-effective* civil registration system in the defined content and quality requirements, including (i) a cost-effective data-collection system, (ii) use of efficient and reliable processing systems that are no more complex than necessary, (iii) use of contractual support for appropriate parts of the system where this would be cost-effective and consistent with the other strategic objectives, particularly the need to retain public confidence in the confidentiality of individual responses, (iv) making the system as self-sustaining as far as possible, and (v) use of development resources, where available, to develop efficient prototype systems which can accommodate change and give "value for the money" in the final systems.

II. THE VITAL STATISTICS SYSTEM

43. Vital statistics are preferably produced from information in a civil registration system, supplemented, as necessary, by information from household sample surveys, population censuses and sample registration, records from health services and other administrative records. Chapter II contains a description of the system, the methods of collecting information and the priorities for their use in producing vital statistics. Since countries must set the priorities for the topics collected from registered vital events, a list of topics, with recommended definitions, is included. Although an extensive list is provided, countries are cautioned to set their priorities based on national needs and available resources. Chapter II concludes with sections that describe the principles for the preparation of annual vital statistics from a civil registration system, for the presentation of results and dissemination, and finally, for the use of sampling in processing data for vital statistics.

A. SOURCES OF DATA FOR A VITAL STATISTICS SYSTEM

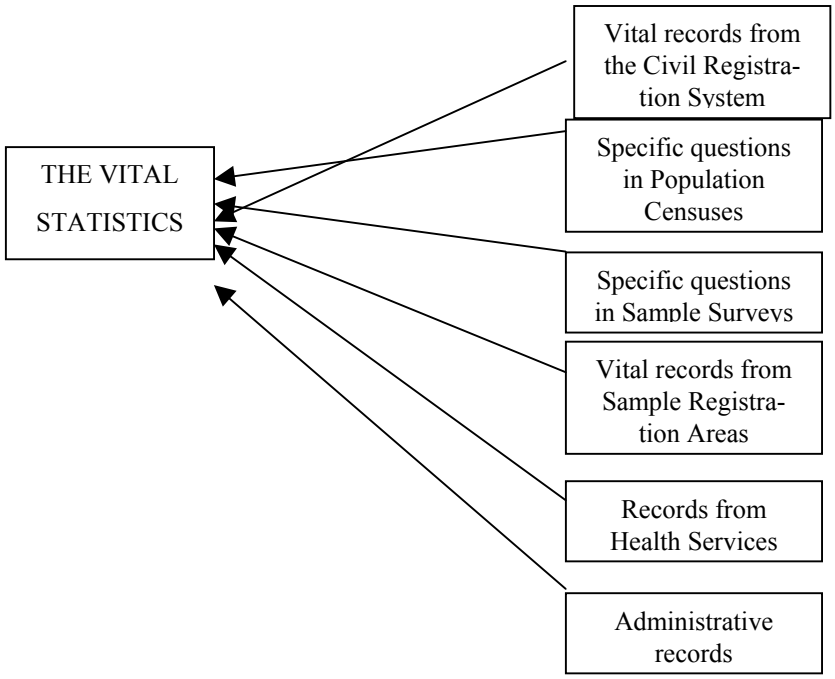
44. Information about the vital events occurring within the boundaries of a country, which comprise a vital statistics system, is preferably obtained through a civil registration system. The documentation of vital events through a civil registration system has great value and utility both for the economic and social development of countries and for the protection of individual rights and as evidence of personal particulars. For these reasons, records of vital events are considered as essential legal documents to be established and maintained under a continuous civil registration system. Because of the fundamental importance of civil registration records to the efficient operation of a vital statistics system, events not usually subject to civil registration, such as, migration and naturalization, are ordinarily excluded from the vital statistics system.

45. When civil registration data do not exist or are deficient, some countries may have recourse to data sources other than civil registration to estimate the necessary vital statistics. Fertility, mortality and nuptiality statistics may also be collected through sample registration areas, or through retrospective questions on fertility, mortality and nuptiality added in a population census or a household sample survey (for the use of these data sources for the preparation of vital statistics, see chap. VI). These data sources are also used to evaluate civil registration data or to gather information on demographic or epidemiological processes in a way that enhances the information obtained through civil registration. 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. However, there is no substitute for the availability of accurate, complete, timely and continuous information on vital events as obtained from civil registration. Civil registration is the method of choice as a source of data on vital events for the production of vital statistics, and other methods should not be exclusively relied upon except as temporary expedients until a satisfactory civil registration system is functioning. Even when civil registration functions optimally, it must be complemented by population censuses and surveys to provide data for the denominators to allow for the calculation of vital statistics rates.

46. The most important application of retrospective inquiries through field surveys, population censuses or other follow-up methods has been as an interim measure used to meet the urgent need for data on vital events in countries where civil registration is lacking, deficient or in the process of development.

47. Unlike the registration method, in which the statistical unit investigated is the event itself, i.e., live birth, death etc., sample surveys and population censuses employ households and their members as the enumeration units; information on past vital events is obtained only as a characteristic of selected members of the households. As a result, vital statistics from retrospective inquiries are limited by a) their periodic nature, which precludes the production of time series for vital statistics; and b) the quality of recollection of the timing or occurrence of an event.

SOURCES OF DATA FOR THE VITAL STATISTICS SYSTEM



B. PRIORITY IN METHOD OF COLLECTION

48. The recommended method of collection for the development and maintenance of a vital statistics system is to establish a reliable civil registration system capable of yielding comprehensive data for the production of vital statistics to meet appropriate needs for such data on a continuous basis. In working toward this goal, it may be necessary, on an interim basis, to utilize methods other than registration to produce useable estimates of the incidence of the events in question. The use of a sample survey or a complete enumeration of vital events through a population census may serve as a supplementary means of data collection in countries where a good civil registration system exists or as an interim measure of collecting the needed vital data in countries where civil registration is lacking, deficient or in the process of development (for additional discussion of methods of data collection and sources of vital events data other than through civil registration, see chap. VI).

49. Even though civil registration includes all vital events (live birth, foetal death, marriage, divorce, annulment, judicial separation of marriage, adoption, legitimation and recognition), the vital events which comprise a vital statistics system are live births, deaths, foetal deaths, marriages and divorces. In establishing or improving a vital statistics system, first priority should be given to setting up procedures for the registration of (*a*) live births and (*b*) deaths, followed closely by (*c*) foetal deaths, because it is these events that are basic to the measurement of population growth rates and directly related to the measurement of key health indicators, such as infant and childhood mortality and life expectancy. The increasing importance given to the registration of foetal deaths is in recognition of their importance in measuring perinatal mortality and pregnancy outcomes. In addition, it is recognized that, due to specific family patterns and cultural values, it may not be feasible, in some countries, to give a very high priority to the collection of data on marriage and divorce.

50. 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 because there is increasing health-related interest and need for information about foetal loss to assist in the measurement of pregnancy outcome, women's health, and mortality occurring just before, during and shortly after the birth process. The legal requirements for registration of foetal deaths vary considerably from country to country, but the World Health Organization recommends that, if possible, foetuses weighing at least 500 grams at delivery be included in the vital statistics of foetal mortality. Therefore, countries should seek to register foetal

deaths weighing 500 or more grams or, if weight is not available, foetal deaths occurring after 22 weeks of gestation are completed or of 25 centimetres crown-heel body length should be registered.[23]

51. A distinction should be made between the definition of the term "foetal death" and the registration requirements for such vital events. The definition is broadly inclusive and encompasses all products of conception which do not result in a live birth. Such events as "spontaneous abortion," "miscarriage," "early foetal death" and "late foetal death" are examples of vital events which are included under the umbrella of the definition. However, the WHO recommendation suggests that a minimum weight, gestational age or body length be established and that foetal deaths of less than the minimum need not be registered. It is important that the measurement of foetal development not be introduced into the definition of the event itself. For statistical purposes, priority is given to foetal deaths occurring after 28 weeks of gestation are completed.

52. Lower priority is given to collection of marriage statistics through civil registration because many marriages constituted by religious or tribal ceremonies and extra-legal consensual unions and temporary marriages often go unregistered. Data based on the registration of statutory marriages and in some instances of religious ceremonies may have value for administrative purposes, but the needs of demographers, sociologists, economists and other users are seldom met by such data. Population censuses and sample surveys may be 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), with recognition of the fact that, given their characteristics, the collection of information on these unions may be difficult to obtain through a civil registration system.

53. Arrangements for the registration of annulments, judicial separations, adoptions, legitimations and recognitions should have a lower priority than births, deaths, foetal deaths, marriage and divorce, although these, too, are an ultimate registration goal.

54. Where 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.

55. Because of the expanding use of information for the measurement of population change, the order of first priority recommended for the collection of vital events by field sample survey or population census is given to live births and deaths. Secondary priority is given to marriages. The collection of other vital events, such as foetal deaths, is not recommended because of the problems of accurately reporting the events.

[23] See WHO, *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision* (Geneva, 1992) vol. 2; in earlier years, first priority was given to births and deaths (See Economic and Social Council resolution 1307 (XIV), para. 2).

C. Recommended definitions of each vital event for statistical purposes

56. Civil registration takes into account many events. Since vital statistics are limited to live births, deaths, infant deaths, marriages and divorces, the definitions of each event on which data are to be collected for vital statistics purposes should conform with the definitions set out below. If the legal concepts or definitions in a country cannot be harmonized with the recommended definitions, provision should be made to report the events *for statistical purposes* in accordance with the recommended definitions or in accordance with definitions which do not differ in principle from them. If this is impossible, full description of divergences should be given wherever statistics of these events appear.

57. The recommended statistical definitions are as follows (the subsequent discussion of vital statistics does not include reference to annulment, judicial separation, adoption, legitimation or recognition):

- LIVE BIRTH is 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). [24]
- DEATH is the permanent disappearance of all evidence of life at any time after live birth has taken place (post-natal cessation of vital functions without capability of resuscitation) (This definition excludes foetal deaths, which are defined separately below).
- FOETAL DEATH [DEADBORN FOETUS] is 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 muscles[25] (note that this definition

[24] See ibid.
[25] See ibid.

broadly includes all terminations of pregnancy other than live births, as defined above).[26]

- MARRIAGE is the act, ceremony or process by which the legal relationship of husband and wife is constituted. The legality of the union may be established by civil, religious or other means as recognized by the laws of each country.
- DIVORCE is a final legal dissolution of a marriage, that is, that separation of husband and wife which confers on the parties the right to remarriage under civil, religious and/or other provisions, according to the laws of each country.
- ANNULMENT is 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 is the disunion of married persons, according to the laws of each country, without conferring on the parties the right to remarry.
- ADOPTION is the legal and voluntary taking and treating of the child of other parents as one's own, in so far as provided by the laws of each country.
- LEGITIMATION is 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 acknowledgment, either voluntarily or compulsorily, of the paternity of a child born out of wedlock.

D. Principles for the collection and compilation of vital statistics

1. *Universal coverage*

58. A vital statistics system should include all vital events occurring in every geographic area and in every population group comprising the national area.

59. If a sample registration system is employed rather than a complete civil registration process, the sample should be so designed as to be representative of every population group and of the national area and each subnational area which may be of interest.

[26] The legal requirements for the registration of foetal deaths vary from country to country. It is recommended that dead foetuses weighing 500 or more grams at birth (or those of 22 completed weeks of gestation or crown-heel body length of 25 or more centimetres 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 by 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 ibid.

2. *Continuity*

60. The principle of continuity in the collection and compilation of vital statistics should be observed in order that the data may reflect short-term fluctuations, including seasonal movements, as well as longer-term movements. Continuity is most easily achieved when civil registration is fully established, because monthly (or quarterly) and annual reporting become a routine part of the system. Where supplements to civil registration, such as sample surveys, are employed to obtain estimates of vital rates, special efforts may need to be made to ensure that data become available on a frequent and regular basis.

3. *Confidentiality*

61. Confidentiality of personal information in registration records and any associated statistical reports should be safeguarded insofar as consistent with the intended uses of these records for specific administrative and statistical purposes (see chap. III). 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 confidentiality for the individuals whose data contribute to the statistics. Similarly, access to the individual records themselves should be restricted to legally authorized individuals for specified permitted purposes.[27] 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.[27] In turn, the national authority which collects vital event data with a promise of confidentiality should expect full and accurate data to be reported by individuals, regardless of the sensitivity of the information.

4. *Regular dissemination*

62. The compilation of vital statistics should have as its ultimate minimum goal (*a*) the provision of total monthly or quarterly summary counts of live births, deaths, foetal deaths, marriages and divorces 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.[28] In planning the detailed tabulation programme, it is important to ensure that resources are available to complete it on a regularly established basis and on a time schedule that will ensure the effective use of the analysis

[27] See *Handbook on Civil Registration and Vital Statistics Systems: Policies and Protocols for the Release and Archiving of Individual Records* (United Nations publication, Sales No. E.98.XVII.6).

[28] See annex for a suggested tabulation plan to satisfy these recommendations.

of the interrelationship between demographic, economic and social factors to plan, operate and evaluate public health programmes, and for the purposes of the formulation and evaluation of economic and social plans. In so 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 to meet or approximate international standards.

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

63. The establishment of a national vital statistics system and its operation and maintenance are inherently governmental responsibilities to guarantee the production of basic vital statistics and their primary analysis and dissemination. As such, these responsibilities and their functions should be described in law and associated governmental regulations. The enabling legislation may vary in content from country to country but the legal framework should be consistent with the basic principles contained in *Principles and Recommendations, Revision 2*. The law and regulations governing the vital statistics system should clearly link the production of vital statistics with the civil registration system. In other words, the necessary basic data for vital statistics should originate from the civil registration system and continuously feed the vital statistics system (see chap. III).

64. Responsibility for the maintenance of standards for the design and conduct of the various operations by which vital statistics are collected, compiled, processed, published and disseminated should be assigned to a central government agency or agencies. The place of the agency or agencies in the administrative structure will depend on local circumstances, but the aim must be to achieve centralized and peripheral coordination amongst 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 which deal with such demographic factors as those in the economic, social or medical fields. Close coordination and collaboration is essential to ensure that concepts, definitions, classifications are the same across sources and that duplication of responsibility be eliminated.

65. The legal framework for the vital statistics system should establish an appropriate organizational structure or structures for the efficient management, operation and maintenance of the system. Typically, the overall structure is a centralized system, managed at the national level, with subnational offices at appropriate local levels. However, decentralized systems, in which the primary responsibility for civil registration and local vital statistics rests with subnational Governments, such as Governments of states or provinces, can be established. In the latter situation, a national organization would establish national standards and guidelines to be applied uniformly and compile overall statistics for the country from the data provided by the subnational entities.

66. Several alternatives may be considered in administering vital statistics programmes. One alternative is to place the vital statistics administration under the national statistical service. In this case, the vital statistics programme is a part of the general statistics programme. Another alternative is to place the vital statistics administration within the civil registration administration. A third alternative is to designate one or more government agencies to carry out different vital statistics functions related to the work of these agencies. For example, the health service agency may collect and process data on births, deaths and foetal deaths, while the general statistical service or the court system may compile marriage and divorce statistics. Other arrangements are possible, but in any case, it is essential 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 actual registration of events. Because of the separate administration of these functions, coordination among the responsible agencies is particularly important.

F. Integration and coordination in the vital statistics system

67. 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, the data of which must be logically consistent. The multiple sources of data used in social and economic planning and analyses makes it imperative that definitions of data elements both within a system (e.g., within the vital statistics system) and between systems (e.g., between the vital statistics system, the civil registration system, the sample surveys, the national census) be consistent.

68. While the arrangements within a given country will naturally depend on the administrative structure existing in that country, centralized coordination of statistical activities is desirable in order to ensure that the structure functions efficiently in producing statistics which are based on standard concepts, definitions and classifications that are embodied in tabulations, which on a timely basis meet the needs of the consumers without errors, duplications or omissions. The oversight of such coordination should be vested in a central statistics office.

69. In order to promote maximum coordination and compa-

rability of various official statistical series, an inter-agency coordinating committee (or committees) comprised of knowledgeable staff of the involved agencies should be established. Meetings should take place annually at a minimum, or more frequently if needed, to exchange information on forthcoming plans and modifications in each of the statistical activities.[29]

70. 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 to establish and maintain high standards of quality in the system. The communication links must function in both directions: 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 on the registration side and those working on the statistical and analytic side. 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 contributes to the identification of problems and to appropriate and uniform solutions to common issues. A good communication 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 of others outside of the vital statistics system, primarily from the civil registration system or the health ministry, when coordination with other agencies and disciplines is appropriate. For example, the same representatives to the inter-agency coordinating committee mentioned above should preferably be included in applicable parts of the communications networks.

71. To further internal and external consistency within and among statistical programmes, uniform legislation and regulations on a nationwide basis should be adopted for each national statistical programme. Care should be taken in the wording of such legislation to ensure that specific data elements in one data system are identically defined 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 demographic statistics sources in general, it is particularly important to coordinate the concepts, definitions, classifications and tabulations with those employed in population censuses, in sample field surveys, and in international migration statistics.

72. 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 divisions, urban and rural, and each common topic in the data sources (see Sect. G below 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 of time and over longer durations of time. Figures for births and other vital events used by countries for the purpose of computing vital rates and ratios should therefore refer to events occurring to residents and non-residents of the country separately in order to ensure consistency between the numerators and denominators of the ratios.[30]

73. Where international standards have been agreed upon, as in the field of population censuses[31] and in a number of fields of interest for the specialized agencies of the United Nations such as the classification of causes of death and the associated definitions of live birth and foetal death[32], the investigation of economic characteristics[33] and of education[34], 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.

G. Recommendations on topics to be investigated in a vital statistics system and their definitions

1. *Factors determining the selection of topics*

74. The selection of topics should be based primarily on their potential use for meeting national data requirements as

[29] See *Official Records of the World Health Organization* (Geneva, 1948). In the absence of a central office with appropriate responsibilities, coordination of vital statistics and health statistics systems may benefit from advice provided by experts outside the system comprising a national committee for vital and health statistics, recommended by the first World Health Assembly as early as 1948. The concept of national committees or committees or councils of a similar character has been endorsed by the Inter-American Statistical Institute and was noted by the United Nations Statistical Commission at its fifth session.

[30] Events occurring to non-residents while they are temporarily in the country should be distinguished from those occurring within the national territory to usual residents by including information on place of usual residence on vital records. Countries should set up procedures to incorporate those events that occur to residents while they are temporarily absent from the country. As these events should be taken into account (at least in the case of births and deaths) in updating the estimates of the total resident population, they should also be taken into account in compiling figures on vital events for use in computing selected resident vital rates for the resident population and vital rates for non-resident population.

[31] See *Principles and Recommendations for Population and Housing Censuses, Revision 1* (United Nations publication, Sales No. E.98.XVII.8).

[32] See WHO, International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (Geneva, 1992).

[33] See ILO, International Standard Classification of Occupations (ISCO-88) (Geneva, 1990).

[34] See UNESCO, International Statistical Classification of Education (document ISCED/WG/l).

well as on the need to establish and maintain regional and worldwide comparability, at least for the basic topics which countries can afford. To produce timely statistics, both human and financial resources are required. National and international objectives are seldom incompatible because international recommendations are generally based on a broad study of country experiences and practice.

75. To satisfy both national and international needs for vital statistics, provision should be made in all countries for the investigation of a common group of basic topics to which additional topics may be added by individual countries, if desired, to meet special national needs and interests not addressed by the common basic topics.

76. On the other hand, before topics can be selected for inclusion in the vital statistics system, they must be evaluated for their likelihood of producing useable and reliable data. Regardless of importance of a topic, if meaningful data of acceptable quality cannot be expected, the topic is not appropriate for collection through the vital statistics system. Respondents must be willing and able to provide adequate information; responses likely to evoke fear, local prejudice or superstition in the community should be avoided, if possible. However, because of the importance of some sensitive topics, the responses of informants should be afforded confidentiality protection, as described in paragraph 61 above.[35] Questions which are complicated or difficult for the average respondent to answer easily and accurately require careful consideration; if a topic is important and the vital statistics system is the best source for the information, the exact phrasing of the question(s) to be asked should be pretested on a small sample of respondents before incorporation into a nationwide system.

2. *List of topics to be investigated by the civil registration method*

77. Information on a wide variety of topics and themes can be obtained by the registration method, i.e., by the continuous recording of predefined events. Topics which may be collected by other methods, such as a household sample survey utilizing retrospective or follow-up questioning of a representative sample of the population, and by the retrospective questioning of the population by means of a complete census of the population are discussed in chapter VI.

78. Among the priority statistical units recommended for coverage through the civil registration method are the following vital events: live births, deaths, foetal deaths, marriages and divorces. The highest priority recommended for registration of these events is accorded to live births, deaths and foetal deaths, followed by marriages and divorces (see paras. 49-52 above) Information should be collected on the incidence of each event in time and on specified characteristics of each event and of the persons directly concerned with it.

79. Using the criteria for the selection of topics set forth above, a list has been drawn up of topics which may be investigated for each of these events (see para. 86 below).

80. This recommended list comprises two "collection priorities" in recognition of the fact that not all countries will be able to conform to the standard at the same time, or to operate at a uniform pace in achieving complete coverage of all recommended topics. The higher priority topics, indicated in **bold** typeface, are designed to constitute an immediate goal, while those not so indicated constitute a less urgent goal. In actual practice, this list of recommended topics will need to be supplemented by other information for judicial and administrative purposes to permit identification of the persons and events under consideration (see para. 423 below). This is accomplished by inclusion of, for example, (*a*) registration serial number and (*b*) place of registration, and also by inclusion of information on (*c*) identification of the registrar, (*d*) given names and surnames of the person or persons directly involved with the event, including personal identification number, if available, and (*e*) characteristics of the informant, including personal identification number if available, etc. No recommendations are made here concerning these items, although their importance is self-evident.

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

82. 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 as tabulation components and represent important information which is to be obtained from data collected on the statistical reports, as shown in the topics listed in paragraph 86 below.

83. Tabulations of the recorded information gathered via civil registration on the topics and characteristics recommended below normally show the number of events classified by various characteristics of the persons experiencing those events. Of special importance are tabulations by age and sex. Examples of key tabulations are provided in the annex. Users of vital statistics require not only absolute numbers but also rates and indicators that involve relating the number of events recorded to the size of a population-at-risk. An indicator of infant mortality, for in-

[35] See Handbook on Civil Registration and Vital Statistics Systems: Policies and Protocols for the Release and Archiving of Individual Records (United Nations publication, Sales No. E.98.XVII.6).

stance, is obtained by dividing the number of deaths to children under age 1 in a given calendar year by the total number of births occurring during that calendar year. It should be noted that birth cohorts should ideally be followed for one full year to obtain the number of children who did not survive their first year, but due to inherent problems of such follow-up in most cases, it can be approximated by dividing deaths to children under age 1 year during a specified period by births in that period. In addition, an indicator of fertility, the crude is obtained by dividing the total number of births occurring over a year by the estimated population at the middle of the year (the population-at-risk). Section iii of the list of topics: characteristics of population-at-risk below provides some guidance on the sources of appropriate denominators.

84. In the list of topics contained in paragraph 86 below, the numbers in parentheses after each topic refer to the topic numbers provided in the subsequent section on definitions and specifications of topics (see paras. 87-232 below).

85. Information obtained by means of civil registration is usually collected on a 100 per cent basis. However, in some situations it may be necessary to operate a sample registration system, as described in chapter VI. The list of recommended topics contained in paragraph 89 remains the same. Where resort is necessary to a sample registration system rather than to complete registration, the necessary information on the population-at-risk is usually obtained by means of a sample field inquiry.

86. A list of direct and derived topics to be investigated by the civil registration method is set out below. Derived topics and characteristics, which depend on the information collected from selected direct topics, are indicated in the right-hand column.

1. LIVE BIRTH

Direct topics	*Derived topics*

(i) Characteristics of the event - dates (time reference)

Date of occurrence (of birth) (1) (14)	
Date of registration (2)	

Geographic characteristics

Place of occurrence (3)	**Locality of occurrence** (4) **Urban/rural occurrence** (5)
Place of registration (3)	

Other characteristics

Type of birth (i.e. single, twin, triplet, quadruplet, or higher multiple delivery) (44)	
Attendant at birth (45)	
Type of place of occurrence (hospital, home, etc.) (52)	

(ii) Characteristics of the child and of the parents

(ii.a) Characteristics of the child

Sex (15)	
Birth weight (17)	

(ii.b) Characteristics of the mother

Date of birth (14) or **Age** (12)	**Age** (12) (derived only if date of birth is collected)
Marital status (33)	Child born in wedlock (Legitimacy status) (16)
Educational attainment (37)	
Literacy status (38)	
Ethnic and/or national group (39)	

Citizenship/nationality (40)	

Economic characteristics

Economic activity status (41)	Socio-economic status (43)
Usual occupation (42)	

Geographic characteristics

Place of usual residence (6)	**Locality of residence** (4) **Urban/rural residence** (5)
Duration of residence in usual place (7)	Migrant status (11)
Place of residence at a specified time in the past (9)	
Place of birth (10)	

Other characteristics of the mother

Date of last menstrual period of the mother (18) or Gestational age (19)	Gestational age (19) (derived only if date of last menstrual period is collected)
Number of prenatal visits (20)	
Month of pregnancy prenatal care began (21)	
Children born alive to mother during her entire life-time(23)	**Birth order or parity** (26)
Children born to mother during her entire lifetime and still living (24)	
Foetal deaths to mother during her entire lifetime (25)	
Date of last previous live birth (28)	Interval since last previous live birth (27)
Date of marriage (32)	**Duration of marriage** (31)

(ii.c) Characteristics of the father

Date of birth (14) or Age (12)	**Age** (12) (derived only if date of birth is collected)
Marital status (33)	
Educational attainment (37)	

Literacy status (38)	
Ethnic and/or national group (39)	
Citizenship/nationality (40)	

Economic characteristics

Economic activity status (41)	Socio-economic status (43)
Usual occupation (42)	

Geographic characteristics

Place of usual residence (6)	**Locality of residence** (4) **Urban/rural residence** (5)
Duration of residence in usual (present) place (7)	Migrant status (11)
Place of residence at a specified time in the past (9)	
Place of birth (10)	

(iii) Characteristics of population-at-risk (54)

To be obtained independently from population censuses,

population registers, sample surveys and inter-censal estimation procedures

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2. DEATH

(i) Characteristics of the event - dates (time reference)

Date of occurrence (1)	
Date of registration (2)	

Geographic characteristics

Place of occurrence (3)	**Locality of occurrence** (4) **Urban/rural occurrence** (5)
Place of registration (3)	

Other characteristics

Cause of death[a] (48)	
Manner of death (49)	
Whether autopsy findings were used to establish cause of death (50)	
Pregnancy-related death (for females 15-49 years of age) (51)	
Certifier (46)	**Type of certification** (47)
Attendant at birth (for deaths under one year of age) (45)	
Type of place of occurrence (hospital, home etc.) (52)	

(ii) Characteristics of the decedent

Personal characteristics

Date of birth (14) or Age (12)	**Age** (12) (derived only if date of birth is collected)
Sex (15)	
Marital status (33)	
Date of marriage (32)	Duration of marriage (31)

[a] The statistical report on the fact of death should include topics on the Medical Certificate of Cause of Death (see para. 220); see also *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision*, (Geneva, 1992), vol.2.

Children born alive to mother during her entire lifetime (for females of child-bearing age and over) (23)	
Children born to mother during her lifetime and still living (for females of child-bearing age and over) (24)	
Educational attainment (37)	Socio-economic status (43)
Literacy status (38)	
Ethnic (and/or national) group (39)	
Citizenship/nationality (40)	
Whether birth was registered (for deaths under one year of age) (22)	
Born in wedlock (for deaths under one year of age) (16)	Legitimacy status (for deaths under one year of age) (16)

Economic characteristics

Economic activity status (41)	Socio-economic status (43)
Usual occupation (42)	

Geographic characteristics

Place of usual residence (6) **Place of usual residence of the mother** (for deaths under one year of age) (6)	**Locality of residence** (4) **Urban/rural residence** (5)
Place of previous residence (8)	Migrant status (11)
Place of residence at specified time in the past (9)	
Place of birth (10)	

(iii) Characteristics of population-at-risk (54)

To be obtained independently from population censuses,

population registers, sample surveys and inter-censal estimation procedures

3. FOETAL DEATH

(i) Characteristics of the event - dates (time reference)

Date of occurrence (of foetal delivery) (1)	
Date of registration (2)	

Geographic characteristics

Place of occurrence (3)	**Locality of occurrence** (4) **Urban/rural occurrence** (5)
Place of registration (3)	

Other characteristics

Type of birth (i.e., single, twin, triplet, quadruplet, or higher multiple delivery) (44)	
Attendant at birth (45)	
Certifier (46)	Type of certification (47)
Cause of foetal death (48)	
Type of place of occurrence (hospital, home etc.) (52)	

(ii) Characteristics of the foetus and of the parents

(ii.a) Characteristics of the foetus

Sex (15)	
Born in wedlock (16)	Legitimacy status (16)
Weight at delivery (17)	
Date of last menstrual period of the mother (18) or Gestational age (19)	Gestational age (19) (derived only if date of last menstrual period is collected)

(ii. b) Characteristics of the mother

Date of birth (14) or **Age** (12)	**Age** (12) (derived only if date of birth is collected)

Number of prenatal visits (20)	
Month of pregnancy prenatal care began (21)	
Children born alive to mother during her entire lifetime (23)	Birth order or parity (26)
Children born to mother during her entire lifetime and still living (24)	
Foetal deaths to mother during her entire lifetime (25)	
Date of last previous live birth (28)	Interval since previous live birth (27)
Date of marriage (32) or **Duration of marriage** (31)	**Duration of marriage** (31) (derived only if date of marriage is collected)
Educational attainment (38)	Socio-economic status (43)
Literacy status (38)	
Ethnic (and/or national) group (39)	
Citizenship (nationality) (40)	
Economic characteristics	
Economic activity status (41)	Socio-economic status (43)
Usual occupation (42)	

Geographic characteristics

Place of usual residence (6)	**Locality of residence** (4) **Urban/rural residence** (5)
Place of birth (10)	Migrant status (11)

(ii.c) Characteristics of the father

Personal characteristics

Date of birth (14) or **Age** (12)	**Age** (12) (derived only if date of birth is collected)
Educational attainment (37)	Socio-economic status (43)
Literacy status (38)	

Ethnic (and/or national) group (39)	
Citizenship (40)	

Economic characteristics

Economic activity status (41)	Socio-economic status (43)
Usual occupation (42)	

Geographic characteristics

Place of usual residence (6)	**Locality of residence** (4) **Urban/rural residence** (5)
Place of birth (10)	Migrant status (11)

(iii) Characteristics of denominator (live births)

Information is obtained from the civil registration system

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4. MARRIAGE

(i) Characteristics of the event - dates (time reference)

Date of occurrence (of marriage) (1)	
Date of registration (2)	

Geographic characteristics

Place of occurrence (3)	**Locality of occurrence** (4) **Urban/rural occurrence** (5)
Place of registration (3)	

Other characteristics

Type of marriage (53)	

(ii) Characteristics of bride and groom (separately)

Personal characteristics

Date of birth (14) or **Age** (12)	**Age** (12) (derived only if date of birth is collected)
Marital status (previous) (33)	
Number of previous marriages (34)	Marriage order (35)
Educational attainment (37)	Socio-economic status (43)
Literacy status (38)	
Ethnic (and/or national) group (39)	
Citizenship (40)	

Economic characteristics

Economic activity status (41)	Socio-economic status (43)
Usual occupation (42)	

<table>
<tr><th colspan="2">Other characteristics</th></tr>
<tr><td>Place of usual residence (6)</td><td>Locality of residence (4)
Urban/rural residence (5)</td></tr>
<tr><td>Duration of residence in usual (present) place (7)</td><td rowspan="3">Migrant status (11)</td></tr>
<tr><td>Place of previous residence (8)</td></tr>
<tr><td>Place of residence at a specified time in the past (9)</td></tr>
<tr><td>Place of birth (10)</td><td></td></tr>
</table>

(iii.) Characteristics of population-at-risk (54)

To be obtained independently from population censuses, population registers, sample surveys and inter-censal estimation procedures

5. DIVORCE

(i) Characteristics of the event - dates (time reference)

Date of occurrence (of divorce) (1)	
Date of registration (2)	

Geographic characteristics

Place of occurrence (3)	**Locality of occurrence** (4) **Urban/rural occurrence** (5)
Place of registration (3)	**Locality of registration** (4)

(ii) Characteristics of divorcees (husband and wife separately)

Personal characteristics

Date of birth (14) or **Age** (12)	**Age** (12) (derived only if date of birth is collected)
Type of marriage being dissolved (53)	
Number of dependent children of divorced persons (30)	
Number of children born alive to the marriage being dissolved (29)	
Date of marriage (32) or **Duration of marriage being dissolved** (31)	**Duration of marriage** (31) (derived only if date of marriage is collected)
Mode of dissolution of previous marriages (36)	
Number of previous marriages (34)	Marriage order (35)
Educational attainment (37)	Socio-economic status (43)
Literacy status (38)	
Ethnic (and/or national) group (39)	
Citizenship (nationality) (40)	

Economic characteristics

Economic activity status (41)	Socio-economic status (43)
Usual occupation (42)	

Geographic characteristics

Place of usual residence (6)	**Locality of residence** (4) **Urban/rural residence** (5)
Duration of residence in usual (present) place (7)	Migrant status (11)
Place of previous residence (8)	
Place of residence at specified time in the past (9)	
Place of birth (10)	
Place of occurrence of marriage being dissolved (3)	

(iii.) Characteristics of population-at-risk (54)

To be obtained independently from population censuses, population registers, sample surveys and inter-censal estimation procedures.

3. Definitions and specifications of topics[36]

87. Each topic on the vital statistics report or vital record 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. In order to achieve international comparability, emphasis should first be given to providing definitions, followed by a recommendation that these 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.

88. The definitions and specifications given below apply both to the direct topics recommended above, and to derived topics which are based on one or more of the direct topics.[37] 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, sample surveys and sample registration systems, as appropriate.

[36] Specific classifications for each variable are given in the tabulation programme in the annex.

[37] Countries with more advanced vital statistics systems may consider the inclusion of other topics for health purposes in live birth and foetal death statistical reports. Such topics may be: medical risk factors for the pregnancy, obstetric procedures, congenital anomalies of live born child or foetal death, method of delivery, APGAR score, prenatal blood test, abnormal conditions of the new born etc. For an example, see the Colorado state (United States of America) live birth and foetal death certificates in *Handbook on Civil Registration and Vital Statistics Systems: Management, Operation and Maintenance* (United Nations publication, Sales No. 98.XVII.II).

(*a*) *Dates (time reference)*

(1) *Date of occurrence*

89. 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.

90. 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.

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

(2) *Date of registration*

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

93. 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 under-registration problem.

(*b*) *Geographic characteristics*

(3) *Place of occurrence and registration*[38]

94. Place of occurrence is the geographic location in the country: (*a*) locality and (*b*) major division or other geographic 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 for national use, and also to enable urban/rural distribution to be included in tabulations, where required. (see also locality (topic 4) and urban and rural (topic 5)). Countries should adopt procedures to handle the place of occurrence of vital events that may take place on moving vehicles, such as ships, airplanes, trains or cars.

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

(4) *Locality*

96. 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.[39] Localities should not be confused with the smallest civil divisions of a country. In some cases, the two may coincide. In others, however, even the smallest civil division may contain two or more localities.

97. In compiling vital statistics, the basis for geographic tabuation may be either place of occurrence, i.e., the locality, major civil division or other geographic 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 (for recommendations regarding the basis for vital statistics geographical tabulations, see annex).

98. The recommended classification of localities by size-class is as follows:

All localities
- 500,000 or more inhabitants
- 100,000 - 499,000 inhabitants
- 50,000 - 99,999 inhabitants
- 20,000 - 49,999 inhabitants
- 10,000 - 19,999 inhabitants
- 5,000 - 9,999 inhabitants
- 2,000 - 4,999 inhabitants
- 1,000 - 1,999 inhabitants
- 500 - 999 inhabitants
- 200 - 499 inhabitants
- Less than 200 inhabitants
- Population not in localities

99. As noted in the *Handbook of Household Surveys (Revised Edition)*[40], this comprehensive classification would usually be too detailed for the tabulation of survey results. Only when surveys are based on very large sample sizes would they have sufficient numbers to permit such detailed classification. For survey results, therefore, consideration may be given to a much more condensed classification.

[38] The national boundaries of the country existing at the time of occurrence of the event (or inquiry) should be recorded, as should the localities and civil divisions.

[39] See *Principles and Recommendations for Population and Housing Censuses, Revision 1 (*United Nations publication, Sales No. E. 98.XVII.8), paras. 1.2 and 2.49.

[40] United Nations publication, Sales No. E.83.XVII.13.

(5) *Urban and rural*

100. Urban/rural is a derived topic of high priority in a vital statistics system which is based on geographic information obtained from place of occurrence (topic 3) and place of usual residence (topic 6). Because of national differences in the characteristics which distinguish urban from rural areas, the distinction between urban and rural population is not amenable to a single definition applicable to all countries. For this reason, each country should decide which areas are to be classified as urban and which as rural, in accordance with their own circumstances.

101. For national purposes as well as for international comparability, the most appropriate unit of classification is the size of locality (as defined in para. 98 above) or, if this is not possible, the smallest administrative division of the country (for a discussion of definition and classification of locality as well as of the urban/ rural division, see locality (topic 4)).

102. It must be recognized, however, that a distinction by urban and rural based solely on the size of the population of localities does not always offer a satisfactory basis for classification, especially in highly industrialized countries. Some countries have developed a classification of localities based not on population size alone but on "socioeconomic structure of the population", in the localities.[41] Others have tried to express degrees of urbanization by use of indices of population density etc.

103. The difficulty of applying these criteria to vital statistics lies in the fact that data on the relevant variables are seldom available.

(6) *Place of usual residence*

104. Place of usual residence is the geographic 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 or a foetal death is the place where the mother usually resides (see para. 277).

105. Although most persons will have no difficulty in stating their place of usual residence, some confusion is bound to arise in a number of special cases, in which persons may appear to have more than one usual residence, such as persons who maintain two or more residences; students living at a school away from their parental home; 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 all such cases should be clearly set forth in the registration or enumeration instructions.

106. Problems may also arise with persons who have been for some time at the place where they are found at the time of inquiry but who do not consider themselves to be residents of this place because they intend to return to their previous residence at some future time. Displaced population and refugees are also in this category. The situation is similar with persons who have left the country temporarily but are expected to return after some time, e.g., civilian residents temporarily in another country as seasonal workers, merchants, seamen etc. In such instances, clearly stated time-limits of presence in or absence from a particular place must be set, in accordance with the prevailing circumstances in the country, to determine whether or not the person is usually resident at that place. Countries which have a nomadic population need to make special provisions for reporting place of residence for nomadic persons.

107. Information on place of usual residence should be collected in enough detail to enable tabulations to be made for the smallest geographic subdivisions of the country required by the tabulation plan and also for those residents and non-residents. To satisfy the requirements of the geographic classifications recommended in the tabulations contained in the annex, 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 (see also locality (topic 4) and urban and rural (topic 5)).

(7) *Duration of residence, in usual place*

108. 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 (topic 4), which is his/her place of usual residence (topic 6) at the time of occurrence of the event, and (*b*) the major or other civil division in which that locality is situated.

109. If, in the compilation of the incidence of birth, death, marriage and divorce according to geographic 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

[41] See, for example urban and total population by sex 1987-1996, notes to table 6 in United Nations, *Demographic Yearbook, 1996* (United Nations publication, Sales No. E/F.98.XIII.1). Latvia defines "urban" as: cities and urban - type localities, officially designated as such, usually according to the criteria of number of inhabitants and predominance of agricultural workers, or number of non-agricultural workers and their families; The Netherlands defines "urban" as municipalities with a population of 2,000 or more inhabitants, and "semi-urban" as municipalities with a population of less than 2,000 but with not more than 20 per-cent of their economically active male population engaged in agriculture.

events occurring to recent migrants.

110. 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.

111. 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 one 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*

112. Place of previous residence is the geographic 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. Where reliable data can be collected, countries may find it useful to ask for place of residence at a specified time in the past. Data on the place of previous residence without the duration of residence in usual place (topic 7) have only limited value in themselves because they do not provide information on the time of in-migration.

(9) *Place of residence at specified time in the past*

113. 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 for 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.

114. 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 probably 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.[42]

115. Accordingly, the criteria for selecting a suitable time reference for this question should be such that it will achieve a balance between a period long enough to produce a volume of changes of residence sufficient for study and one which will not unduly increase the number of multiple moves which may have taken place and the number of migrants who have died in the interval, these being the two imponderables which may tend to bias 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 of earlier residence because of 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 would tend to be due 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 population by place of residence may be useful since it might provide the components for the differencing method of estimating net migratory gains and losses over the interval.[43] The appropriate period in any particular instance will, of course, depend to a large extent on national circumstances.

116. 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.

(10) *Place of birth*

117. Place of birth is the geographic 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 to handle the place of birth for a newborn delivered in a moving vehicle, such as a ship, airplane, train or car.

118. 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 made. 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 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.

119. 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

[42] See Principles and Recommendations for Population and Housing Censuses, Revision 1 (United Nations publication, Sales No. E. 98.XVII.8), para. 2.40.

[43] See *National Programmes of Analysis of Population Census Data as an Aid to Planning and Policy Making* (United Nations publication, Sales No. 64.XIII.4), para. 49.

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 which have lost or gained territory and (*b*) the cost of coding a large number of specific foreign locations.

(11) *Migrant status*

120. Topics which provide information on the extent and direction of internal migration are: (*a*) place of birth (topic 10), (*b*) place of usual residence (topic 6), (*c*) place of previous residence (topic 8), (*d*) place of residence at specified time in the past (topic 9), and (*e*) duration of residence in usual (present) place (topic 7). "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 (for information on how to classify vital statistics according to "migrant" and "non-migrant" status, see place of residence at specified time in the past (topic 9)).

(*c*) *Personal characteristics*

(12) *Age*

121. 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 one year of age. Every effort should be made to ascertain the precise age of each person.

122. 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 use 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 is a direct topic when "date of birth" is not obtained (see date of birth (topic 14)).

123. Where exact age is unknown, estimated age may be recorded. To help arrive at 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; or significant political changes. Climatic and farming cycles, and religious or national festivals may also be used. Estimation of the age of an individual may also be attempted by employment of 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.

124. 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, an infant is considered to be one year old at birth and to become two years old at the succeeding New Year (it may be Chinese or Moslem), and then to continue 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. 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 15 and 49, with terminal groups of "under 15 years" and "50 years and over".

125. Infants' 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.

126. Age at death for 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 groups is not possible, efforts should be made to distinguish the following groups as a minimum: under one year (infants), 1-4 years (pre-school age) 5-14 years (school age), 15-49 years (childbearing age), 15-64 years (working ages) and 65 years and older (elderly persons).

127. Age of partners 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.

128. Age of divorcees should be classified in the same way as that of marriage partners.

129. The age distribution of population obtained from a population census and a sample survey is required in single years as well as in conventional 5-year age groups.

(13) *Age of surviving spouse (see age)*

(14) *Date of birth*

130. Date of birth should be expressed as the day,[44] month and year of birth (year should be specified in four digits) in detail equivalent to that given for date of occurrence of event in order that exact age may be determined in completed years, months, weeks, days, hours or minutes of life, as required. If it is not possible to establish date of birth, age as defined in topic 12 above should be recorded. When date of birth is recorded, age is a derived topic, calculated from the date of the event and the date of birth.

(15) *Sex*

131. Sex is a basic characteristic 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.

(16) *Child born in wedlock (wedlock status of the mother at the time of the child's birth)*

132. In accordance with the laws of the country, for statistical counting purposes, live births or foetal deaths may be labeled "born in wedlock" if the mother is married at the time of birth 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 on the statistical section of the form in order to avoid 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 not only are of value and use at the time of the vital event but also are 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 marital status of the mother or the derived wedlock status of a child or foetus, is recorded, and the way the information might be used or made available to others.

133. 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" group into those "with information on father" and those "without information on father".

134. 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 that there will be small possibility of distorting or biasing the statistics.

135. 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.

136. Therefore, regardless of the manner in which such information is recorded (via the vital record itself or on a separate statistical report), it is essential that there be in place a system 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 facts of the event, such as, names, dates, geographic locations etc. The short form might be the routine form of choice for providing copies except in circumstances where the entire form is required for a particular legal or administrative use.

(17) *Birth weight*[45]

137. Birth weight is the first weight of a foetus or newborn obtained immediately after birth. For live births, birth weight should preferably measured within the first hour of life before significant postnatal weight loss has occurred. The actual weight should be recorded to the degree of accuracy to which it is measured. Weight should not be recorded in groupings. Weight may be recorded in pounds and ounces if that is the measured value in the country; conversion to the gram classification should be done subsequently as part of the tabulation process. However, statistical tabulations include 500 gram groupings for birth weight.

138. Definitions of "low", "very low" and "extremely low" birth weight are not mutually exclusive categories. Below the

[44] For deaths to infants under one year, date of birth should also include the time of birth according to the detail reported for live birth.

[45] See WHO, *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision*, (Geneva, 1992), vol. 2.

set limits, they are all-inclusive and therefore overlap (i.e., "low" includes "very low" and "extremely low" and "very low" includes "extremely low"). Low birth weight is defined as follows:

Low birth weight = less than 2,500 grams (g) (up to and including 2,499 g);

Very low birth weight = less than 1,500 g (up to and including 1,499 g)

Extremely low birth weight = less than 1,000 g (up to and including 999 g).

(18) *Date of last menstrual period of mother*

139. 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 done at the time of registration of the event. The date should be recorded in full (day, month, year).

140. 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 to 286 completed days after the onset of the last normal menstrual period are considered to have occurred at 40 completed weeks of gestation).

141. For the purposes of calculation of gestational age from the date of the first day of the last normal menstrual period and the date of delivery, it is important to understand that the first day is day zero and not day one; days 0-6 therefore correspond to "completed week zero"; days 7-13 to "completed week one", and the 40th week of gestation corresponds to "completed week 39".

(19) *Gestational age*[46]

142. Gestational age or duration of pregnancy is a derived topic if "date of last menstrual period" is collected; if not, "gestational age" should be obtained directly. 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 labeled; 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".

(20) *Number of prenatal visits*

143. 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 uniformly apply 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".

(21) *Month in which pregnancy prenatal care began*

144. 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 for the health of the mother and, later, for the outcome of the pregnancy and for the newborn child as well. Responses to this topic should not be in terms of a named month but rather should be stated in terms of the number of months elapsed in the pregnancy prior to the first prenatal care visit, e.g., the care began in the 3rd month, 5th month etc. For purposes of tabulation and data presentation, groupings should be used in terms of trimesters of pregnancy, such as: 1st trimester; 2nd trimester; 3rd trimester; "no prenatal care"; and "not stated".

145. 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.

(22) *Was birth registered?*

146. This question provides information on live-birth registration and is asked concerning infants dying before the age of one year. Its purpose is to evaluate completeness of registration and to facilitate linking records between registers of births and of infant deaths.

(23) *Children born alive to mother during her entire lifetime*

147. This topic is defined to include all children born alive to the mother concerned up to the time of the present live birth or at the time of the woman's death (for females of childbearing ages 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.

148. 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 to obtain information on number of live-born issue from both current and previous marriages.

149. The collection of accurate data on the number of chil-

[46] Ibid.

dren 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 early in their infancy. Or because of misinterpretation of the term "children" they may omit offspring who are grown or have left the household. It is therefore recommended that, in obtaining 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 who have died. Any lack of consistency among the answers to these questions will indicate some error in the response, which can then be further probed.

150. Data on number of children born alive during lifetime of mother should be collected so as to permit classification of live births and foetal deaths by birth order and live birth order (see topic 26).[47]

(24) *Children born to mother during her entire lifetime and still living*

151. 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.

(25) *Foetal deaths during entire lifetime of woman*

152. 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 within wedlock or not, and whether born of the present or a previous marriage.

(26) *Birth order*

153. 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 to the mother or woman on children born alive (topic 23) and on foetal deaths (topic 25) during her entire lifetime.

154. 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 23 and 24) be used respectively. Similarly, should it be desired to restrict birth order to previous fetal deaths, the term "foetal-death order" should be used.

155. Data should be classified into single orders (1^{st}, 2^{nd}, 3^{rd} etc.) through 9^{th}, 10^{th} and over, and a not stated group.

(27) *Interval since last previous live birth*

156. 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 (see topic 28) and calculating the birth interval as part of the data processing stage.

157. 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 children born alive to mother (topic 23)).

158. Information about 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.

(28) *Date of last previous live birth*

159. Date of last previous live birth is the day, month and year of delivery of the most recent previous live birth (see also interval since last previous live birth (topic 27)).

(29) *Number of children born alive to the marriage being dissolved*

160. 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.

(30) *Number of dependent children of divorced persons*

161. 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.

162. "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 it seems nevertheless the proper reference for evaluating the relationship between number of dependent children and incidence of divorce. It also agrees with the time reference point of "number of chil-

[47] See *Methods of Estimating Basic Demographic Measures from Incomplete Data* (United Nations publication, Sales No. 67.XIII.2), chaps. II and V.

dren born alive to the marriage being dissolved" (topic 29).

(31) *Duration of marriage*

163. 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.

164. Information on duration of marriage may be secured either by obtaining the year, month and day of marriage, or by asking directly for duration of marriage in completed years. While the date method generally results in more accurate duration data, it requires an extra step during the data-processing phase to calculate it and it 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 a considerable proportion of the population is unlikely to be able to give the exact date. If necessary, duration may be estimated by the registrar, using the technique described in paragraph 123 above in connection with the investigation of age.

165. 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.

166. Information on duration of marriage should be collected in completed years 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.

(32) *Date of marriage*

167. Date of marriage is the day, month and year, for legitimate births or foetal deaths, of the marriage of the parents of the child or dead foetus, and in the case of divorces, of the marriage being dissolved (see also duration of marriage (topic 31)).

(33) *Marital status*

168. 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 married, consensual union and customary union, (*d*) widowed and not remarried, (*e*) divorced and not remarried and (*f*) married but legally separated.[48]

169. It is necessary to take into account customary unions (which are legal and binding under customary law) and extra-legal 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.

170. In countries that wish to distinguish between: (*a*) persons in lawful (contractual or civil) marriages, (*b*) 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.

171. 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 comprise an additional category; if its size is insignificant, the individuals should be classified according to their marital status before the annulled marriage took place.

172. If it is desired to have complete information on marital status, then this information should be collected and tabulated for persons of all ages, irrespective of the national minimum legal age or the customary age for marriage, because the population may include persons who have been married in other countries with different minimum marriage ages. In most countries, there are also likely to be persons who, because of special circumstances, have been permitted to marry below the legal minimum age.

173. Modifications of this classification which may need to be made to meet 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 statuses ranging from legal to consensual unions are found in varying degrees, 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 which will be required to meet national needs. For example, in countries which 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 in so far as possible.

174. The marital status categories described in paragraph 168 above do not provide complete information on the range of de facto unions of varying degrees of stability, which may be common in some countries, nor do they adequately describe the prevalence of formal marriage 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

[48] See *Principles and Recommendations of Population and Housing Censuses, Revision 1*, (United Nations publication, Sales No. E.98.XVII.8), paras. 2.96-2.103.

which 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.

(34) *Number of previous marriages*

175. 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.

(35) *Marriage order*

176. This is a derived topic which represents the rank order (i.e., first, second, third etc.) of the marriage being contracted or being dissolved. The information required to compute marriage order is provided by the topic on number of previous marriages.

(36) *Mode of dissolution of previous marriages*

177. A legal contract of marriage may be dissolved by: (*a*) the death of one of the spouses, (*b*) a divorce decree, and (*c*) cancellation (annulment) (for definitions of "marriage", "divorce" and "annulment", see para. 57 above).

178. 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).

(37) *Educational attainment*

179. 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.

180. 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 UNESCO International Standard Classification of Education (ISCED 1997):[49]

Level 0. Pre-primary education (e.g., nursery school, kindergarten, infant school), which provides education for children who are not old enough to enter a school at the first level. It has to be school-centred or centre-based.

Level 1. Primary education or first stage of basic education (e.g., elementary school, primary school), which provides, as its main function, instruction in basic tools of reading, writing and mathematics, along with an elementary understanding of such subjects as history, geography, natural science, social science, art and music. This level usually covers six years of full-time schooling.

Level 2. Lower secondary or second stage of basic education (e.g., middle school, secondary school, vocational or technical education school, which is based upon completion of Level 1, and provides general or specialized instruction or both. The end of this level often coincides with the end of compulsory education, in countries where this exists, and is typically designed to complete the provision of basic education.

Level 3. Upper secondary education (e.g., university, teachers college, higher professional), which requires, as a minimum condition of admission, the successful completion of some nine years of full time education at level 2.

Level 4. Post-secondary education. It serves to broaden the knowledge of participants who have already completed a programme at level 3, and includes pre-degree foundation courses or short vocational programmes that prepare for entry to level 5.

Level 5. First stage of tertiary education (not leading directly to an advanced research qualification). These programmes have a theoretical duration of at least two years;

Level 6. Second stage of tertiary education (leading to an advanced research qualification). Typically requires the submission of a thesis or dissertation of publishable quality which is the product of original research and represents a significant contribution to knowledge.

181. 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.

(38) *Literacy status*

182. 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.

[49] See UNESCO document 29C/20 (November 1997).

183. 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.

184. Data on literacy should be collected for all persons 10 years of age and 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 and over.

185. 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 37) should be considered as an alternative.

(39) *Ethnic and/or national group*

186. The specific ethnic and/or national groups of the population which 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., country 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 which it desires to categorize. By the nature of this topic, these categories and their definitions will vary widely from country to country; therefore, no internationally accepted criteria are possible.

187. Because of the difficulties of interpretation which 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.

(40) *Citizenship*

188. Citizenship (of parents, of decedents, brides, grooms and divorcees) is defined as the legal nationality of the person concerned. It should be noted that citizenship does not necessarily coincide with country of birth.

189. Data on citizenship should be collected so as to permit the characterization of the persons concerned as (*a*) citizens by birth, (*b*) those who acquired citizenship after birth through naturalization, option, marriage, declaration etc. and (*c*) aliens. Information on the country of citizenship of aliens 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.

190. 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.

191. 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.

(*d*) *Economic characteristics*

192. The economic characteristics which are considered useful indices of socioeconomic status are economic activity status and occupation.

193. It is extremely difficult to obtain accurate information on economic characteristics. Among the problems are (*a*) adoption of a suitable time reference, (*b*) establishment of a correspondence between the civil registration system and the population census and labour force sample surveys (LFSS), (*c*) appropriate phrasing of questions, and (*d*) the reluctance of persons to disclose economic information to others. The problem of achieving correspondence between vital statistics and population census data is a complex one because census or LFSS data may relate to conditions at a short period of time, whereas the information collected by means of a registration system is collected on a continuing basis, i.e., as events occur. On the other hand, not all vital statistics indices are related to population census or LFSS data.

194. Nevertheless, because of the importance of information on economic characteristics as indicators of socioeconomic status in many studies of interest to demographers, economists, sociologists, family planning and public health workers, the collection of data on economic activity status and occupation is recommended for inclusion in a vital statistics system. So as to achieve maximum conceptual agreement between the vital registration system and the census, its inclusion requires that the definitions and methods used in the population census be carefully studied and that the instructions to registrars give clear and precise definitions of the required concepts.

195. The definitions of the different economic characteristics given in paras. 196-210 below are adapted from *Princi-*

ples and Recommendations for Population and Housing Censuses, Revision 1.[50]

(41) *Economic activity status*

196. Economic activity status (of parents, of 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 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.

197. Particular attention should be given to groups which 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.

198. The minimum age limit adopted for the question on economic activity should be set in accordance with the conditions in each country but never higher than 15 years. Those countries which 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 highly industrialized countries, where employment of children is rare. In order to permit international comparisons of data on the economically active population, however, any tabulations 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.

199. The adoption of 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 for vital statistics purposes be the calendar year preceding the year of the vital event occurrence.[51]

200. 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.

201. The employed comprise all persons, including family workers, who worked during the time-reference period established for data on economic characteristics (see para. 199); 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.

202. 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 lay-off without pay. Where employment opportunities are very limited, the unemployed should also include persons who were not working and were available for work but were not actively seeking it because they believed that no jobs were open. The recorded data on the unemployed should distinguish persons who never worked before.

203. 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 home-makers.

204. Not usually economically active population comprises the following functional categories:

(*a*) Home-makers: 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 home-makers;

(*d*) Others: persons of either sex, not classified as usually economically active, who are receiving

[50] United Nations, publication, Sales No.E.98.XVII.8; see also the recommendations contained in resolution 1 adopted by the Thirteen International Conference of Labour Statisticians, Geneva, 1982.

[51] For other options based on a shorter reference period (one week), see *Principles and Recommendations for Population and Housing Censuses, Revision 1*, (United Nations publication, Sales No.E.98.XVII.9), paras. 2.165 – 2.211.

(*e*) public aid or private support, and all other persons not falling in any of the above categories, such as children not attending school.

205. 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 home-maker at the same time), the registration instructions should indicate the order of preference for recording persons in one or another of the categories.

(42) *Usual occupation*

206. 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.

207. Analysts and users of vital statistics data based on occupation should be cautioned in vital statistics publications that measures using vital events occurring to an occupation group in the numerator, divided by a census count of all persons in the population classified to that same occupation, 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., a proportional ratio instead of a rate (see para. 232 for a discussion of rates and ratios).

208. 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-88)[52] or its most recent update. If this is not possible, provision should be made for the categories of the classification employed to be convertible to ISCO-88 or at least to the minor (two-digit) groups of this classification. If national data are not classified in conformity with ISCO-88, an explanation of the differences should be given in vital statistics publications.

(43) *Socio-economic status*

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

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

(*e*) *Other characteristics (of the event)*

(44) *Type of birth*

211. 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 (1^{st} of 2, 2^{nd} of 2, 1^{st} of 3, etc.). For each member of a multiple birth, provision also should be made to indicate the sex of the other member(s) as well as his (their) condition with respect to being born alive or dead (foetal death).

(45) *Attendant at birth or delivery*

212. 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*) lay person, or (*g*) not stated.

(46) *Certifier*

213. The certifier is the person who certifies the fact of death or foetal death, and who in the case of death also certifies 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 layman.

214. 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 be 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,[53] which is reproduced in paragraph 220 be-

[52] Geneva, International Labour Organization, 1990.

[53] See WHO, *International Statistical Classification of Diseases and Related Health Problems,* Tenth Revision, (Geneva, 1992), vol. 2.

low. Whenever possible, a separate certificate of cause of perinatal death (foetal deaths and neonatal deaths) should be completed. The World Health Organization also provides the content and design of such a certificate.[54]

(47) *Type of certification*

215. Type of certification is a derived topic based on the identity of the certifier (see topic 46). It could by a physician, medical practitioner, coroner, medical-legal authority, midwife, nurse or lay person.

(48) *Cause of death*

216. 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".[55] Symptoms and modes of dying, such as heart failure or respiratory failure, are not considered to be causes of death for statistical purposes.

217. 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".[56]

218. The purpose of the definition of cause of death is to ensure that all the relevant information is recorded and that the certifier does not select some conditions for entry and reject others. 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.

219. In order to secure uniform application of the above principle, it is implicit that the medical certification form recommended by the World Health Assembly (see para. 220 below) should 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, which gave rise to this cause.[57]

220. Causes of death should be coded according to the international rules and guidelines and the List of three-character categories, preferably with the fourth-character subcategories, contained in the latest revision of the *International Statistical Classification of Diseases and Related Health Problems* (ICD).[58] The degree of detail in cross-classification by cause, sex, age, and area of territory will depend partly on the size of the numbers involved and the purpose and range of the statistics, and partly on the practical limits as regards the size of a particular table. The International Form of Medical Certificate of Cause of Death is set out below.

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[54] See ibid.
[55] See ibid.
[56] See ibid.
[57] See ibid.
[58] Currently the *Tenth Revision*; see ibid.

INTERNATIONAL FORM OF MEDICAL CERTIFICATE OF CAUSE OF DEATH

Cause of death	**Approximate interval between onset and death**
I Disease or condition directly (a) ..... leading to death* **Antecedent causes** (b) ..... Morbid conditions, if any, giving rise to the above cause, due to (or as a consequence of) stating the underlying conditions last (c) ..... due to (or as a 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 or respiratory failure. It means the disease, injury or complication that caused death.*	

221. The recommended groupings for the analysis of general mortality for international comparative purposes should be in accordance with the requirements of the latest revision of ICD[59] or with the current recommendations of the World Health Organization, such as:

(*a*) The ICD list of three-character categories, with or without four-character subcategories;

(*b*) The general mortality condensed list (mortality tabulation list 1);[60]

(*c*) The general mortality selected list (mortality tabulation list 2)[61]

222. The recommended groupings for analysis of infant and child mortality for international comparative purposes should be in accordance with one of the following:

(*a*) The ICD list of three-character categories, with or without four-character subcategories;

(*b*) The infant and child mortality condensed list (mortality tabulation list 3);[62]

(*c*) The infant and child mortality selected list (mortality tabulation list 4).[63]

223. In countries where medical certification is incomplete, statistics for deaths not medically certified should be published separately from those which have been medically certified.

(49) *Manner of death*

224. This topic is intended to give the certifier of a death the choice of indicating, in addition to the diagnosis or finding of

[59] Currently the *Tenth Revision*; see ibid.
[60] See ibid.
[61] See ibid.
[62] See ibid.
[63] See ibid.

the specific cause, that the death was due to one of the following: natural causes, accident, suicide, homicide or "manner undetermined".

225. 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., 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).

(50) *Whether autopsy findings were used*

226. This topic is intended to assist in the evaluation of the quality of cause of death data. The proportion of deaths which 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.

(51) *Pregnancy-related death*

227. A pregnancy-related death 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, the World Health Organization recommends the inclusion of an item on death certificates which would identify those women.[64] 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.

(52) *Type of place of occurrence*

228. 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 an other 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 or public byways, such as roads or sidewalks.

(53) *Type of marriage*

229. 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 and customary.

(54) *Population-at-risk*

230. 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., 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.

231. 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* in which 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 mid-point 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. of 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 deaths to children under age one occurring during the year and the denominator consists of live births occurring during the same year both from civil registration data).

232. 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 definition of the measure often uses a value in the denominator which is not a true population-at-risk (e.g., 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.

H. Principles for compiling and processing vital statistics based on a civil registration system

233. The principles proposed below are a fundamental element in a vital statistics system. It is important that the relation between tabulations from a comprehensive civil registration system and those from other sources of data be recognized with a view to obtaining the greatest possible conformity between them. For this reason, the principles are presented first in the form suitable to compilations from a comprehensive civil registration system, after which reference is

[64] See ibid.

made to certain differences imposed by the nature of the data collected in sample registration schemes and field surveys.

1. *Advance planning*

234. 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.

235. The statistical processing plan should address several issues. 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 set users' priorities and to attempt to meet those deemed most important. Third, long-range programming is needed because the execution of the statistical programme for a given year is 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 ensure the success of these programmes.

236. Vital statistics should be compiled, insofar as possible, for the total geographic area of the country, for each major or other minor civil division and for each principal town and city. They should also distinguish 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 enable the user to obtain vital statistics about individual areas of interest, in addition to showing variations among local areas in individual parts of the country. Modern computer technology greatly facilitates the utilization of vital statistics for analysing the information for local areas.

237. Every effort should be made to ensure that national vital statistics refer to the total population of the country. Where registration of vital events for important population sub-groups is less than 90 per cent complete or 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 the qualifications and limitations of the data wherever the statistics appear.

238. 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, insofar as possible, the identity of each important population sub-group be maintained in the tabulations.

2. *National centralized compilation from individual statistical reports (either paper-based or electronic)*[65]

239. 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 flexibility and adaptability to meet national and international requirements.

240. In order to produce 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 sub national 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.

(*a*) *Control of receipt of statistical reports*

241. The first step in developing controls is to establish a strict reporting schedule. This principle applies for both manual and electronic systems. Once established, the receiving office must diligently control the receipt of reports, addressing both the 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 frequencies reported are consistent with those reported during the preceding period.

(*b*) *Editing*

242. Editing of paper-based statistical records entails visual checking to ensure that the reports received by the central office are complete and accurate and errors are minimized. In a manual system, a critical examination by eye of each report should be made by trained staff to detect items that are missing, inconsistent, inappropriate or obscure. In an automated system, provision should be made for electronic scanning to detect such faulty items. Corrections should be made in consultation with the local civil registration office responsible for the errors.

(*c*) *Querying*

243. Items on the statistical report with missing, inconsistent or inappropriate responses should be questioned or "que-

[65] See *Handbook of Vital Statistics Systems and Methods*, vol.I, *Legal, Organizational and Technical Aspects,* (United Nations publication Sales No.E.91.XVII.5).

ried" by referring the item to the local registrar 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.

244. It is important that the appropriate reporting office or the person responsible for filling out the item in question be queried. If a direct query to this individual (for example, the physician or the midwife) is not possible from the national office, it may be necessary to contact the local registrars and request that they contact the appropriate source.

245. Once data have been queried, the corrected data must be transmitted to the central office (or subnational office if that is the case). How this is accomplished will vary from country to country and will be dependent on whether the system is manual or electronic. In some areas of the country, the local registrar may forward a corrected report. In others, the corrected information may be obtained over the telephone or other means. 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 that this happens.

(*d*) *Imputation of missing or inconsistent data items*

246. The querying procedure described in paragraphs 243-245 above will not always produce the missing or corrected information being sought. If that 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 registrant, or if the "race" information is missing, the code for the most common race group in the respondent's area of residence might be assigned.

247. Imputation should be the last aid to be employed to supply missing or obviously incorrect data, and should be employed only if the querying process described above has failed to produce the information being 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[66] but in any case imputation should not be undertaken unless querying has been first attempted.

(e) *Coding of data*

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

249. 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 instructions. Therefore, clearly written instructions, including the classifications to be used and definitions involved, should be developed. Wherever applicable, these should follow recommended international statistical classifications issued by such agencies as the ILO, UNESCO 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.

(*f*) *Converting data into electronically readable form*

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

251. 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. It can edit entries for "out-of-range" values, such as unlikely or impossible age or birth weight, and it can impute missing values based on a priori rules.[67]

252. If data are keyed into the computer, there is always a likelihood that inadvertent errors will occur as part of the

[66] See ibid., para. 306.

[67] See ibid.

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 a small sample of each batch of work is independently redone and the results compared with the transcribed results from the identical records resulting from the original data entry. If the discrepancy exceeds a preset limit, the entire batch should be done over (see paras. 256-262 below).

253. If the civil registration system is automated in the country, it is recommended that the data collection and data entry into electronic form for both registration and vital statistics be the responsibility of the civil registration authority, either at the central or subnational level. This approach requires the adoption of an individual form that meets the information needs of both civil registration and vital statistics.[68] 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 which provides for the appropriate confidentiality and protection of individually identifiable data.[69]

(*g*) *Tabulation using electronic equipment.*

254. Regardless of whether tabulations are prepared manually or by an automated process, certain basic principles apply (see paras. 263-278 below). However, the use of electronic equipment for tabulating may modify or combine some of the steps in the recommended procedures. When data have been coded, transcribed into electronic form, edited and verified, an automated system combines the posting and tabulating into one step, based on the programming of the computer to produce the required tables. Because of the high speed of processing and large memory and storage capacity of computers, a much larger number of tabulations, including complex cross-classifications, can be produced than would be feasible with a manual posting and tabulation process. However, to maximize the value of an automated system, careful advanced planning must take place among registration and vital statistics officials, on the one hand, and systems analysts and computer programmers on the other. Software is required which can, to the maximum extent possible, integrate data entry, editing and coding with the tabulation process. Few generalized computer program packages for producing vital statistics tabulations have been developed.

255. Countries may have to develop their own customized programs to suit their specific tabulation needs. However, some ready-to-use software packages designed for the tabulation of census and demographic survey data can be adaptable to the production of vital statistics. These packages have the additional advantage of producing tables ready to print.

(*h*) *Quality control*

256. In addition to errors introduced in the original statistical reports, mistakes may be introduced during coding, keying, sorting, posting and tabulation. They should be detected and corrected before the statistics are published.

257. 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.

258. 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.

259. If computer data processing is used, quality control can be exercised 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 re-keying 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 which have missing values, whose values are outside an acceptable range or which are 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. There are a few software packages developed for the editing and imputation of population census and demographic data that may also be used for checking the quality of vital statistics.

260. Regardless of the type of transcription, mechanical and manual or computerized, if the data will be used for the civil registration system as well as for vital statistics 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.

261. In manual or mechanical systems, data in posted tables can be verified by proofreading the tables. In 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". These may include the summation of marginal subtotals to the table total and checking the consistency among several tables. A final step in controlling errors in mechanical or manual tables is the technical review of tabulations for credibility, consistency and plausibility.

[68] See Handbook of Civil Registration and Vital Statistics Systems: Computerization. (United Nations publication, Sales No.E.98.XVII.10), para. 232.

[69] See *Handbook on Civil Registration and Vital Statistics Systems: Policies and Protocols for the Release and Archiving of Individual Records*. (United Nations publication, Sales No. E.98.XVII.6), para. 30 (e) (i).

262. If an automated system is used, it is important that the tables produced be critically inspected for credibility and consistency. It is possible that errors are introduced because of programming mistakes. Therefore, it is most critical that all tabulations be inspected by both statisticians as well as data-processing personnel in order to detect and correct as many errors as possible.

3. *Tabulation principles*

263. In preparing the tabulation plan, there needs to be enough detail provided to review the following criteria: first, the degree of coverage of the statistics it produces; second, the quality of those statistics in terms of the accuracy and completeness of the characteristics collected on each vital event; third, whether the tabulations are of sufficient detail to reveal important relationships; and fourth, the timeliness of its availability, including publications. In addition, governing principles in the preparation of tabulations are: (*a*) even if registration is not complete, prepare tabulations and provide users with the level of registration completeness; (*b*) where definitions diverge from those that are internationally accepted, present the definitions in easily understood language; and (*c*) prepare tabulations on a regular basis in a timely fashion. In order that all criteria may be met, the tabulation programme should be constructed in accordance with the basic principles provided below.

(*a*) *Tabulation coverage*

264. A basic requirement of a vital statistics system is that each vital event occurring within the geographical area covered by the system must be registered once and only once for legal purposes and reported for statistical purposes within the time period stipulated in the law, thus attaining 100 per cent coverage or universal coverage. Therefore, statistical tabulations should encompass the entire geographic 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 of the final counts of registered events. Every effort should be made so that this discrepancy can be kept to a minimum.

265. The practice of limiting detailed tabulations to areas of known completeness of coverage may be helpful in establishing and maintaining standards of quality, so long as it is an interim arrangement. The end must be complete geographical coverage of the entire population. Vital statistics derived from selected areas or groups of population are not representative of the whole. Therefore, countries with less than complete geographical coverage should consider methods to reduce the bias introduced by the selection process. Such methods may include the statistical adjustment of data for under-reporting or the collection of complementary data from sample areas or field surveys.

(*b*) *Time reference*

266. 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.

267. Final tabulations for any calendar period should be based on events which 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 date of occurrence, evaluation studies should be made 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.

268. For purposes of 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 show the extent to which counts of events registered during a period can be assumed to approximate those which actually occurred during that period.

269. Accordingly, final annual tabulations by date of registration are appropriate only for those countries where it is established that data on that basis may for all practical purposes be used interchangeably with those 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 by date of occurrence. It means also that date-of-occurrence statistics will need to be accompanied by a measure of the degree of under-registration. The reason for 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.

270. 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 which 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 date or "cut-off date".

271. 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 consider the number of offices through which the report must travel to reach the statistical authorities, the efficiency of communications and any other relevant factors.

272. 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 tabulations, since to ignore them will significantly bias the results.

(*c*) *Geographical reference*

273. Ordinarily, there is a relatively small difference between a country's resident population and the population present in that country at a given time. This is because persons traveling internationally or otherwise not in their customary place of residence, such as representatives of business, the military, diplomats and tourists, usually comprise 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 reports on vital events between the countries involved, it has become customary to consider the sum of vital events occurring within a country's national boundaries as a good approximation to the sum of those occurring among its residents.

274. Final tabulations for geographic areas less than the total national territory, such as major or other civil divisions and also for 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.

275. For provisional or advance tabulations, there is no problem of place of residence versus place of occurrence provided that these 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 geographic unit: (*a*) those occurring to persons with usual residence in the unit, and (*b*) those to persons with usual residence outside the unit.

276. As noted in paragraphs 104-107, the definition of usual place of residence is a difficult and complex one, varying according to national and local law. For statistical purposes, it is recommended that usual place of residence be defined in the same way as it is for purposes of the population census. This allows the computation of basic demographic rates by relating vital events to corresponding population groups.

277. For purposes of national and international uniformity and comparability, the determination of place of usual residence for purposes of tabulation should be made 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.

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

I. Presentation of results and data dissemination

1. *Annual publications*

279. 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, 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, CDs, diskettes, on-line or via other electronic media, as appropriate. A detailed review of the national tabulation programme, including outlines of essential tables is contained in the annex.

280. In the case of paper-based reports, clearly printed output and a pleasing format should be a goal. The content of the publication is also important. It is not sufficient to present statistical tables alone. Each set of tables should be accompanied by a clear explanatory text and, if possible, analysis. Of special importance are annotations to explain the limitations and qualifications of the data to increase their usefulness as source material. An analysis of the meaning of the data, including the calculation of vital rates, is also very desirable, as is the use of figures, maps and graphs to bring out important points.

281. It is of equal importance to take care in the presentation of annual data in electronic form. As in the case of printed reports, it is not sufficient to make available just the tabular information. Instructions for use of the electronic material should be prominently displayed and should be easy to understand. In addition, explanatory text, data qualifications and—if possible—analysis should be part of the electronic presentation, just as these should be part of a printed presentation.

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

283. Once vital statistics have been published, the next step is to make them available to the users to fulfill the purposes of

the entire system. 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 their willingness to support the system cannot be expected. Therefore, the provision of means for the timely dissemination of vital statistics should be a fundamental concern to the authority of the vital statistics system. In cases where the data are of doubtful or unknown quality, the statistics should still be made available but clearly labeled with appropriate caveats and qualifications to warn users about possible misinterpretations.

2. *Working tabulations*

284. It is useful to produce extensive cross-tabulations in detailed form, as a reference to obtain selected values. These tabulations do not lend themselves directly to publication. This may be due to the large size of the table or to the occurrence of many "zero value" cells making up the body of the tabulation. Often, such tables are condensed for publication purposes. However, these large tables should be kept as reference sources for responding to specialized requests for detailed information not appearing in publications. Users of vital statistics data should be made aware of the existence of unpublished tables and given guidance on how to obtain data from them.

3. *Monthly and quarterly bulletins*

285. Monthly and quarterly bulletins, in addition to the annual publication of data, serve several purposes. The data need not be exhaustive nor extensively cross-classified. However, selected totals on a monthly and quarterly basis can alert responsible officials on a relatively current basis of unusual changes in numbers of vital events or of grossly missing or miscoded data. 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. The 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 these tabulations as widely as annual publications.

4. *Electronic media for dissemination*

286. The public should be informed that, in addition to published data and unpublished tabulations, data may be available in electronic form on computer media (CDs, diskettes or on the Internet). It is becoming increasingly common for countries to use computerized input to the publication process. In such cases, electronic versions of the published tables can often be made available. In some countries, it is possible for data users to purchase copies of "public use" data tapes or disks or obtain downloadable files from the Internet. These computer files contain records of the statistical data from vital statistical report forms with the identifying information removed in order to protect the privacy of the individuals. It is important that the vital statistics agency publicize the availability of these types of information in order to provide the best service to the users of its data.

5. *Special tabulations on request*

287. Another service that can be offered by the vital statistics office is the production of special tabulations for users upon request. This service can be especially valuable if it is combined with analytic consulting to provide recommendations on how to best use and interpret vital statistics data. By making these types of service available to its users, the vital statistics programme can help to assure that its data will be appropriately used by those who need vital statistics information.

6. *Technical meetings*

288. If the vital statistics office makes data available on electronic media or is prepared to produce special tabulations on request, it is helpful to users or potential users of such services if the office periodically announces and holds open group meetings to discuss the contents and limitations of the data files and how best to use and interpret them. This helps to encourage proper and efficient use of vital statistics data by the public and tends to reduce the number of individual questions directed to the office when users encounter problems. Frequent users of vital statistics publications might also profit from participation in such periodic technical meetings.

7. *Directory of users*

289. In order to efficiently disseminate annual, quarterly and monthly publications only to those who have an interest and need for them, it is useful to maintain a directory of users which should include, in addition to names, mailing addresses, fax numbers and e-mail addresses, where available, information on specific categories of interest, such as annual natality only, annual mortality only, all annual vital statistics, quarterly and monthly data in addition to annual publications etc. Such an annotated directory can also be used to announce forthcoming technical meetings and to alert interested vital statistics users of the availability of special products, such as electronic media as they become available.

J. THE ROLE OF SAMPLING IN PROCESSING DATA FOR VITAL STATISTICS

290. This section reviews the role of sampling in the processing of vital statistics. The roles of sampling in the collection and evaluation of vital statistics data are not included here (but have been considered in chapters V and VI below, nor has any attempt been made to present the theoretical aspects of sampling as a statistical tool for estimation of population values. The advantages of sampling, such as reduced cost, improvement in timeliness of statistics and achievement

of higher quality data will be pointed out in connection with vital statistics data processing without formal proof. For theoretical considerations, standard texts on sampling theory and sample survey design and analysis should be consulted.[70]

291. Since the methods of processing vital statistics are the same whether data is collected from civil registers or from sample surveys, no distinction on this basis is made below.

1. *Quality control (sample verification)*

292. Wherever large-scale clerical operations are involved in data preparation, quality control techniques based on sampling are useful. Quality control methodology, using sample verification, can be used to check the accuracy of the clerical processes without the need to recheck the entire file. Any processes which involve the transcription of data by hand or via a keyboard and the coding of data from original form to machine readable form are susceptible to error.

293. Based on a randomly selected sample of records from each batch of work, verification of the clerical work can be accomplished without the need to repeat the operation on every record in the batch. Verification should always be done independently of the original work (i.e., by a different person who does not have access to the original clerical input.) If the error rate[71] found in the sample is below a predetermined level, the full batch of work is assumed to also have an error rate below the predetermined level. Therefore, the batch is deemed to have an acceptable level of error and is accepted for the next step of processing.

294. If the error rate in the sample exceeds the acceptable level, there are several possible strategies for dealing with the batch of work from which the sample was drawn. One practice is to have the entire batch fully reprocessed independently, which is repeated until the batch error rate is acceptable, or the reprocessing might be done by an expert, in which case no further checking needs to be done. Another approach for dealing with a batch with an unacceptable error rate is to have the remaining records, i.e., those not in the sample, processed by the verifier. In this latter approach, all discrepancies are submitted to a third verifier. For each discrepant record in the batch, there will be three results; if any two are in agreement, that agreement is taken as the correct entry. If no two agree (i.e., all three disagree), the work of the original clerk is accepted as correct.

295. The choice of an appropriate strategy when using statistical sampling in data processing is dependent on a variety of factors, particularly on the numbers and skill levels of the data-preparation staff available and the total numbers of records involved. However, unless the records volume is quite small, a sampling procedure for quality control will result in savings in time and in cost during the verification process, which requires the recoding, re-entry and comparison of all records.

2. *Tabulations*

(*a*) *Advance tabulations*

296. Systematic sampling of records from registers may be used to compile preliminary or provisional tabulations of vital statistics for current needs. Systematic sampling is carried out by choosing for the sample every n^{th} record in the file. Usually, such a sample of records can be coded, prepared for tabulation, and tabulated for provisional review of results much sooner than the entire file would be available. This is especially true when complex data coding, such as for causes of death, is involved and there is interest in having statistics available at the earliest point in time. An illustration of this kind of situation is in the field of mortality, where a preliminary examination of deaths tabulated by their causes can be quite useful on a timely basis to epidemiologists or others in health services.

297. Systematic sampling to produce advance tabulations also is useful as a means of periodic evaluation of the civil registration and vital statistics systems; unusual or unexpected results often indicate that records are missing or grossly miscoded (see also chap. V below).

(*b*) *Final tabulations*

298. Where the civil registration system is the source of vital statistics, the desired vital statistics should always be obtained by processing all statistical reports rather than a sample of them.

(*c*) *Tabulations for special purposes*

299. The use of a sample of records for special tabulations needed for research or special programmes (for example, for public health purposes) is a useful technique. Special studies may require more detailed tabulating of age, causes of death, socioeconomic characteristics or fertility data than would be available through a routine tabulation programme. If the fre quencies of the needed variables are not too small, processing of a sample of records might produce the needed detailed cross tabulations at a lower cost and perhaps with better quality.

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[70] See also *Handbook of Household Surveys*, (*Revised Edition*) (United Nations publication, Sales No.E.83.XVII.13), chap. IX; and report of the Interregional Workshop on the Methodology of Demographic Sample Surveys, in *Methodology of Demographic Sample Surveys* (United Nations publication, Sales No.E.71.XVII.11).

[71] The term "error rate", as used here, is really a "disagreement rate", with no presumption of correctness on the part of either the verifier or the original clerk.

III. THE CIVIL REGISTRATION SYSTEM AS A SOURCE OF VITAL STATISTICS DATA

300. Although the characteristics of a general system of vital statistics suggested in chapter II apply in substance to the civil registration method, some points will be repeated here in order to give a comprehensive review of the statistical requirements of the civil registration method.

A. DEFINITION OF CIVIL REGISTRATION, METHOD AND SYSTEM

301. 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 legal documents provided for by law. The usefulness of these records as the best source of vital statistics has been established. To implement a viable civil registration system, a brief description of the civil registration method and a civil registration system follows.

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

303. Vital statistics are incidence—not prevalence—statistics. That is, they are statistics which provide a measure of the occurrence of certain type of vital events to members of a specified population during a specified period of time, and provide this measure on a current basis. Experience has shown the civil registration method to be the only reliable one 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 information soon after the event occurs.

304. The continuous aspect of registration implies also that the procedure is permanent. Registration maintained for short periods and then allowed to lapse will not yield data and measures which are useful, either as current incidence statistics or as indicators of changes over time.

305. Legislation which makes registration compulsory is the best way to ensure 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 character of its observations, but also by its compulsory nature. Both provisions are fundamental to the successful operation and maintenance of the system.

306. A *system of civil registration* includes all institutional, legal technical settings needed to perform the civil registration functions in a technical, sound, coordinated and standardized manner throughout the country, taking into account cultural and social circumstances particular to the country.[72]

307. 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; 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

308. Every country should strive to establish and maintain a reliable civil registration system. The many advantages of such a system are summarized below.

1. *Legal and protective advantages to individuals*[73]

309. The safeguarding of human rights with respect to social status and benefits for every member of the population, particularly for children and youth, requires that each vital event be registered soon after it occurs. However valuable they may be for analytical purposes, none of the other methods of demographic data collection described in chapter VI can meet these requirements. In the case of sample registration schemes, only part of the population is covered, while in the case of the other described methods the processes are carried out for statistical purposes only.

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[72] See *Handbook on Civil Registration and Vital Statistics Systems: Management, Operation and Maintenance* (United Nations publication, Sales No.E.98.XVII.11), para. 23.

[73] For comprehensive information on uses of vital records and vital statistics, see *Handbook of Vital Statistics Systems and Methods*, vol. I, *Legal, Organizational and Technical Aspects* (United Nations publication, Sales No.E.91.XVII.5), paras. 80–112.

2. *Administrative advantages*

310. Full registration also 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 needing intervention or services on an individual basis, such as infants needing immunizations or health care, new mothers requiring post-partum care or households requiring public health services following a death from a contagious disease. Universal registration allows for the monitoring of causes of death, 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 needs for data and information for small civil or geographic divisions. Civil registration is the most cost-effective way to obtain data for smaller population areas on a continuous basis.

3. *Statistical advantages*

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

C. Recommended vital events to be registered

312. The vital events which are recommended for inclusion in a civil registration system are the same as those listed and defined in paragraph 57 above. It is important that the definitions of vital events for legal purposes coincide with those for vital statistics purposes to ensure national and international comparability. Such events include:

Live birth;
Foetal death;
Death;
Marriage;
Divorce;
Annulment;
Judicial separation;
Adoption;
Legitimation;
Recognition.

313. Although it remains an ultimate goal, not every country records all vital events or publishes the statistics for registered events. Some countries do not yet have the means or feel the need for registering 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 to the health of the population. Recording of foetal deaths and their characteristics should have the next highest priority, especially because of their value to the understanding of fertility, fecundity and pregnancy outcomes. However, it is recognized that registration of foetal deaths is not practical in some countries, especially those with less adequate registration of births or deaths. A possible alternative to registration is the requirement of a statistical report for each known foetal death, to be prepared by a medical, paramedical or any other person familiar with the circumstances.

314. Arrangements for the registration of annulments, judicial separations, adoptions, legitimations and recognitions should have a lower priority than marriages and divorces, although these too are an ultimate registration goal.

D. Characteristics of the civil registration method

315. The purpose of a civil registration system in a country 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 (see para. 302 above). Although civil registration is carried out primarily for the value of the resulting legal documents provided for by law, the usefulness of these records as a main source of vital statistics is universally recognized.

316. The civil registration method is characterized by the fact that it is continuous, permanent and compulsory. Other important characteristics include universal coverage of the population and the confidentiality of the information pertaining to individuals. In addition, the records generated by this method should be maintained in such a way that they can individually be retrieved as required.

1. *The compulsory nature of civil registration*

317. A civil registration system must be compulsory in order to assure the smooth running and effectiveness of the system in a country. While it is necessary for every country to establish a law on registration, it must be noted that the existence of such law is not a sufficient condition for the general public to report the occurrence of vital events. The compulsory nature of registration has to be linked to the idea of im-

posing some form of penalty for those who fail to comply with the 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 to have a legal basis for prosecution if general compliance with the registration law is to be achieved. Thus, the legal frame for civil registration becomes fundamental for its sound operation as a system that is coherent, coordinated and technically sound.

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

2. *Universal coverage*

319. In order to assure maximum value of the registration system to both individuals and to users of vital records and statistics information, registration requirements must apply to the entire population of the country, regardless of geographical location or subdivision of the population. 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 its residents temporarily abroad should also be registered.

3. *Continuity and permanence*

320. The continuity and permanence of the registration method requires the existence of an agency of sufficient administrative stability whose operation must not be limited by 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 continuity of registration and vital statistics data, a necessary characteristic for producing meaningful understanding of both current levels as well as trends in vital statistics measures.

4. *Confidentiality*

321. The civil registration method collects a variety of information about individuals within the population. While all of the information collected has importance, some data, when specifically identified with an individual, may be highly personal and sensitive. In order to elicit the full and honest provision of data to the system, the confidentiality of the information must be protected in such a way that those who provide information can be assured that it will be used only for the purposes described by law and/or in aggregated form where individuals are not identifiable.[74] However, confidentiality provisions should not interfere with administrative procedures.

322. Confidentiality provisions should not be so rigid as to exclude the use of the records for special studies, nor should they weaken their value as legal documents. Considering the wide administrative, public health and social uses made of accurate civil registration records, it is impossible to make the absolute guarantee of confidentiality which can be made in connection with purely statistical inquiries. However, confidentiality provisions can be spelled out in such a way that the records can be used for research without making public disclosure of 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.) do not necessarily need to include some or all of the statistical items.[75] Because of the importance of confidentiality to data quality as well as data usefulness, provision for confidentiality of information and protection of privacy of individuals should be made part of the civil registration law (see para. 419 below).

5. *Goal of the registration programme*

323. 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.

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

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

325. 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 the critical review and evaluation of the system.

326. In organizing, administering and maintaining a civil registration system, it is essential to give thought to the relationship between the registration function and the statistical

[74] For a comprehensive guide to design policies to protect individual information on vital records, see *Handbook on Civil Registration and Vital Statistics Systems: Policies and Protocols for the Release and Archiving of Individual Records* (United Nations publication, Sales No. E.98.XVII.6).
[75] Ibid.

function. These two functions 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, local government, health or justice. The responsibility for the production and primary analysis of vital statistics is typically found under the jurisdiction of the country's central statistical service, which in turn may 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 between 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, to operate successfully, whatever the organizational structure may be, 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*

327. Continuous, permanent recording of vital events can best be ensured by means of proper legislation and the establishment of mechanisms to enforce it nationwide. The legal framework is an essential component for the efficient management, operation and maintenance of the registration system. Owing to the great importance of the legal framework, countries should ensure that it is up to date since it provides the rules and regulations needed to continuously and permanently register events that affect the civil status of individuals. It also defines the administrative structure, the roles of different agencies and times possibilities for the collection of information, the production of vital statistics and the use of information to perform their duties. The civil registration law, a component in the legal framework, should specifically provide clear 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 in 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, storage and the preservation of records.[76]

328. Provision for confidentiality of information and protection of privacy of individuals should also be contained in the civil registration law. 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 described in the law or in supporting regulations. Included in these provisions should be appropriate mechanisms for the transfer of vital records files among government agencies for authorized purposes, and procedures for access or release of files for approved research, consistent with the overall confidentiality protections, particularly to the vital statistics system for the production of continuous vital statistics. [77]

(*b*) *Organizational structures for civil registration*

329. As indicated above, the administrative arrangement of civil registration 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 arrangement may be either centralized or decentralized.

(*i*) *Centralized civil registration system*

330. A centralized system should have a central agency with national responsibility for directing, coordinating and monitoring the 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.[78]

331. Under central arrangement, the national registration agency should exercise both administrative as well as technical direction over the network of subnational and local civil registration offices. It should establish the local registration offices, provide written materials to local registrars to guide their daily work, coordinate the registration procedures throughout the system, and supervise and evaluate the registration work of the local offices to satisfy legal and statistics requirements.

332. The central office should be responsible for coordinating with other governmental agencies that support the civil registration system, including the health services that may certify or otherwise report the occurrence of vital events, the courts that deal with marriages and divorces, and the statisti-

[76] A method for developing a legal framework for a national civil registration system that highlights its statistical function can be found in the *Handbook on Civil Registration and Vital Statistics Systems: the Preparation of a Legal Framework* (United Nations publication, Sales No.E.98.XVII.7), particularly Chaps. V and VI, that provide an example of an organic civil registration law and the regulations; see paras. 311–405.

[77] See *Handbook on Civil Registration and Vital Statistics Systems: Policies and Protocols for the Release and Archiving of Individual Records* (United Nations publication, Sales No. E.98.XVII.6).

[78] See *Handbook on Civil Registration and Vital Statistics Systems: Management, Operation and Maintenance* (United Nations publication, Sales No. E.98.XVII.11) paras. 22–117.

cal service that compiles the registration data and publishes vital statistics.

(*ii*) *Decentralized civil registration system*[79]

333. 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 can adopt a decentralized administration for civil registration.

334. Countries with a decentralized system for civil registration should adopt uniform legal provisions and procedures for civil registration. Many countries having decentralized systems have made provisions to outline 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.[80] There should 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*

335. 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 between the national and the local offices. Closely associated with the local registration office are the primary registration areas and secondary registration units (see paras. 364-370 below).

(*c*) *Type of agency administering civil registration*[81]

336. 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, in so far 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.

337. Although it is recognized that administrative efficiency is not 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 of reporting vital events can all be established and maintained more easily through a system of central control.

338. Countries which lack a national authority to control registration must devise alternate systems of management or oversight to achieve desired objectives of quality, timeliness, completeness of coverage and comparability of results.

339. The type of organization adopted for registration purposes must be in accordance with the conditions in the country and also be established within the framework of the existing governmental or other formal structures. In particular, the facilities of health departments may be employed to assist in registration, as is done in many countries where involved medical personnel notify 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 ecclesiastic functions, such as baptisms, marriages and funerals.

7. *Integration and coordination in the civil registration system*

340. Integration and coordination in the civil registration system is an important consideration for a smooth and efficient operation. Many of the points made below have been mentioned in chapter II as considerations for the integration and coordination of a vital statistics system but are repeated 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*

341. Regardless of whether a centralized or decentralized registration system model is in use in a country, it is essential that there be in place uniform registration laws and regulations which establish the basic policies and procedures which must apply in every part of the country. Without such uniform standards and requirements, completeness of registration may suffer in some areas and the interpretation of vital statistics and their comparability, nationally as well as internationally, will suffer.

342. Provision for uniform registration throughout the country is desirable even when compliance with the registration law is apt to vary in quality among different regions or sectors of the population. To limit compulsory registration to a seg-

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[79] See ibid.

[80] See United States, Department of Health and Human Services, *Model State Vital Statistics Act and Regulations,* Publication No. (PHS)95–1115. (Hyattsville, Maryland, 1995).

[81] See *Handbook on Civil Registration and Vital Statistics Systems: Management, Operational and Maintenance*, United Nations publication, Sales No.E.98.XVII.11).

ment of the population, however large this segment may 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*

343. The clear delineation of duties mentioned in paragraphs 324-339 above 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 vital events' information for statistical purposes and those that use these data for administrative or analytic purposes in connexion with economic and social matters, or for planning, operating and evaluating public health programmes, maintaining population registers, personal identification files etc.

344. 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.

345. 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.

346. 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, comprised of representatives from each involved or interested agency.

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

347. In addition to external coordination, coordination within the civil registration system is essential 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 to establish and maintain high standards of quality. The communication links must function in both directions: from the local offices to the central authority as well as from the central authority to the field offices. In addition, communications must be good between those working on the registration side and those working on vital statistics production and analysis.

348. A number of communications techniques can be effective in both civil registration and vital statistics systems. These include the use of periodic workshops, conferences and national conventions, newsletters and travelling field consultants. Also very effective, where conditions permit, is the use of electronic mail and communication via the Internet. Each of these contributes to the identification of problems and to appropriate and uniform solutions to common issues. A good communication system contributes to the establishment of teamwork within the system and helps to maintain good morale among the workers.

349. Representatives of others outside the system should be included in the communication network when coordination with other agencies and disciplines is appropriate. For example, representatives of the above mentioned inter-agency coordinating committee should be included in appropriate parts of the communications networks.

8. *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*

350. 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 good relationship with the community. The efficiency and completeness of registration is 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.

351. For a civil registration system to be successful and serve the needs of the general public, local civil registrars must have full-time employment, enjoy the status and benefits of the civil service and be adequately paid for their work.[82] In some countries where the civil registration system has not been adequately developed or where the number of vital events is small, local civil registrars may not have enough registration activities to fully occupy their time. In such a situation, the system should ensure that they should be available on a regular basis, as required.

352. To produce complete, accurate and timely registration,

[82] See *Handbook of Vital Statistics Systems and Methods*, vol. II, *Review of National Practices* (United Nations Publication, Sales No.E.84.XVII.11), paras. 94–118.

registrars must have recognition and standing in the communities they serve to enable them to carry out their responsibilities faithfully and to keep themselves informed of vital events as they occur through cooperative arrangements with knowledgeable persons, such as personnel in hospitals, clinics and health centres, including funeral directors, church officials and court clerks.

(*ii*) *Duties and responsibilities of the local civil registrar*

353. The duties and responsibilities of the registrar should be clearly stated in the civil registration law and typically include carrying out or overseeing the carrying out of the following:

(*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 inform the public 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 their transmission on 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.

354. Where there are problems of 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 the functions of their offices on an itinerant basis, preferably by making regular rounds of the households in their jurisdiction to register such events as may have occurred since the last such visit.

355. The local registrar's functions should also incorporate activities designed by the system's management to promote and evaluate the efficiency of the system, such as the implementation of mass publicity programmes in vernacular languages, securing support from local leaders to influence local opinion, encouragement of control of burial grounds to ensure that burial permits are required before burials occur, and the development of evaluation procedures designed to measure the degree of completeness of registration (see chap. V below). Support necessary for carrying out such activities may be, in many instances, provided by the statistical service and the health department.

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

357. On the registration side, the registrars are responsible for becoming aware 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. They must be familiar with the registration law and assume responsibility for its interpretation and for securing compliance with it. They must publicize their offices and the obligations of the public in order to obtain complete and prompt registration. The registrar is responsible for the completion of written records describing each event, seeing to the critical examination of these records and having them certified for accuracy by the informant. They must take steps to obtain missing or 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. They must issue complaints against those who fail to register vital events and perform any other registration functions that the law may require of the office of the registrar.

358. To meet official statistical needs, the 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., in electronic form) to the appropriate authorities charged with the compilation of vital statistics. This should be done in a timely, periodic fashion but scheduled to allow sufficient time to secure a maximum number of registrations and to check and verify the completeness and accuracy of 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.

(*iii*) *Improving the efficiency of local registrars*

359. 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 be given basic orientation and training in registration and statistical reporting before they are assigned to their duty stations. Routine inspection of their work is required. The visits not only serve an educational objective but also serve a motivational objective. Equally important is the provision to them of the ap-

propriate current manuals of procedures. From time to time, they must also be given in-service training in order to keep them up to date in their work.

360. 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 for the improvement of the system. It is the local registrars who are the cornerstone of the registration system and must carry out these responsibilities in a manner which maintains and improves the system.

361. The establishment of a nationwide professional association of civil registrars for the purpose of exchanging views on the administration of registration laws, outlining strategies for the improvement of registration and the like, is an important method for improving the morale and quality of the work of registrars. This approach is advantageous for both centralized and decentralized civil registration systems and is especially useful when the administration of civil registration in a country is decentralized. A single professional association is particularly useful in bringing the registrars of the country together, either physically or through written communication, to promote uniformity, good registration practices, problem-solving and professionalism.

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

362. 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 if the registrar:

(*a*) Fails to register a vital event or its characteristics 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 adequate protection of privacy and confidentiality to registrants;

(*d*) Has been found guilty of violating the provisions of the civil registration law or its rules and regulations.

363. While it is essential for the system to provide penalties for failures in compliance, it is equally important to encourage local registrars to do their best to support and improve the system through the provision of incentives. Such incentives as permanent civil service status, career development and training opportunities, merit-based promotions, and special awards and recognitions for outstanding work areconsidered important components in 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

364. A primary registration area (unit) is that part of the territory of a country which 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 required attention to produce complete and timely registration. It should be managed by one local registrar and easily accessible to the public it serves.

365. 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, as far as possible, 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.

366. Local registration offices should be established in adequate numbers and in such locations 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. If it is impossible to extend the office hours of registrars beyond the normal business day, arrangements might be made with employers to allow an excused absence for a reasonable amount of time for persons to absent themselves from their places of employment for purposes of registration.

367. Determination of the number of local offices, both primary and secondary (see para. 370), that a country may need should take into account the following factors: (*a*) population size in the area; (*b*) staff resources available to perform the registration work and the 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. Examples of the number, average area size and average population of civil registration units

of selected countries or areas are provided in the *Handbook on Vital Statistics* Systems.[83]

368. 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. In addition to the inconvenience of traveling, accessibility to the office is more difficult and registration completeness will suffer. On the other hand, 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.

369. A registration office must be easily accessible to every segment of the population as the first step in securing complete registration. If an individual must travel a long distance at personal inconvenience and expense in order to register an event, registration may be neglected entirely or delayed. If the registration office is open for only a few hours of the day or only on certain days of the week, its accessibility to the public is seriously limited and compliance with requirements may be difficult. For this reason, civil codes or administrative practice should maximize to the fullest extent possible the number of hours and days of the week that the civil register should be open for business with the public.

369. 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 universal and accurate registration. Such attention may involve keeping informed one way 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, it may mean being able to check on or examine periodically the work of subordinate registrars. For every registrar, it means being informed of the events which have occurred, recording these 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 vigorously avoided.

(*ii*) *Secondary (subsidiary) registration unit*

370. In order to improve the registration coverage of live births, deaths and foetal deaths, countries may set up additional civil registration offices in selected locations where the number of vital events is large enough to warrant an additional unit, such as in hospitals and other health facilities within the jurisdiction of a primary unit. These are called secondary or subsidiary registration units. When a secondary registration office is established, a responsible registrar should be appointed, and the boundaries for the registration area, which may sometimes cover localities outside the hospital, must be clearly defined.

(*iii*) *Mobile registration units for remote places*

371. For those areas of the country where the population density is too low to justify setting up a permanent registration unit or where the accessability to an existing registration unit is limited by terrain or distance, consideration should be given to establishing a mobile (via land, sea or air) registration unit. Such a unit should travel to predetermined places on 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 occurring since the last visit of the mobile unit.

9. Designation of legally responsible informant for each type of event

372. 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.

373. Where vital events occur in institutions (e.g., births in hospitals or maternity clinics, deaths in nursing homes or hospitals etc.), some countries have found it very effective 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 gathering 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 happen 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 change the responsibility of the medical certifier of causes of death, who must still provide cause of death information in the internationally prescribed format.

374. 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 not only to supply the accurate information necessary for registration, e.g., for legal purposes, but also the particulars required for statistical purposes.

375. The designation of an informant, for each type of vital event, should be made clearly and unequivocally in the civil registration law so that there will be one and only one person primarily responsible for providing the information needed for

[83] *Handbook of Vital Statistics Systems and Methods*, vol. II, Review of National Practices (United Nations publication, Sales No.E.84.XVII.11, table A.3.

the registration. Notwithstanding the above, the law may designate alternative informants and establish the order in which each of them must assume their responsibilities as such. Unless the informants are aware that they are required by law to report the vital event to the local registrar and no one else shares their responsibility, they cannot be expected to comply. Registration authorities should make provisions to permanently publicize issues related to where, how and when registration should be done.[84]

376. 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. This 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, but the certified cause of death or foetal death is not always a necessary part of the registration information although it is an essential statistical item in almost every country. Usually, the responsibility for reporting the occurrence of a death falls on a nearest relative of the deceased, who is a lay person, 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.[85]

377. 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. If institution-based informants are not permitted under the registration law, it may be feasible to appoint the institution as a secondary registration unit.

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

(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/partner; a brother, a sister, the father/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

E. THE CIVIL REGISTRATION PROCESS[86]

378. 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.

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

1. *Place of registration*

380. There are two criteria for determining where the registration of a vital event should take place: the place of occurrence or the place of usual residence. Whichever criterion is adopted, it is important that the civil registration law state clearly the place of registration for each type of event. The place of usual residence (see paras. 104-107) 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 have more than one residence (businessmen, students living away from their parental home or members of the armed forces), some have no usual place of residence (vagrants who live as permanent transients), while some are seeking residence (refugees). The treatment of all such cases should be clearly stated in the registration law. Most countries

[84] Guidance is provided in the Handbook on Civil Registration and Vital Statistics System: Developing Information, Education and Communication (United Nations publication Sales No. E.98.XVII.4).

[85] See *Handbook of Vital Statistics Systems and Method,.* vol. II, *Review of National Practices* (United Nations publication Sales No.E.84.XVII.11) chap. IV and table A.5.

[86] See ibid.

have adopted the place of occurrence (see paras. 94-95) as a norm for the registration of births, deaths and foetal deaths. Detailed information on national practices on place of registration are given in volume II of the *Handbook of Vital Statistics System and Methods*.[87]

381. Registration of vital events by place of occurrence facilitates and accelerates the registration process. However, registration by place of residence gives a better picture about the demographic changes in the resident population. Fortunately, the two criteria are not exclusive of each other. 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.

382. 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:

Vital event	*Place of residence of*
Live birth	The mother
Foetal death	The mother
Infant death	The mother or the infant
Death	The decedent

2. *Time allowed for registration*

383. 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.

384. 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 period allowed is too long. Such problems lead to misreporting or under-reporting 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.[88]

385. 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 should be as short as possible to facilitate current and accurate registration. A grace period of up to one year after the event has occurred may be allowed for extenuating circumstances.

3. *Cost of current registration*

386. To attain full registration coverage, it is recommended that when registration occurs within the time period prescribed by the registration law no fee should be charged for registering a birth, marriage, divorce, foetal death or death. Fees should be related to the purpose of issuance, such as, for certified copies of vital records or for delayed registration of vital events as provided in registration legislation. For individuals, fees may be related to the extent of delay or to the nature of information, e.g., name changes, legitimations, adoptions the establishment of filiation. Minor corrections due to clerical errors discovered at the time of registration, burial or cremation should be free of charge. For certificates requested by public agencies as part of their normal duties, copies may be free of charge.

4. *Proof required for the registration of vital events*

387. 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, the proof may be legal documents, medical certificates, witnesses, personal declaration or a combination of these.

388. Documentary evidence is in general more reliable than a witness. Therefore, the witness should always be accepted as 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 by a witness would be acceptable or when registration should be accepted solely on the basis of the information supplied by the informant.

389. In the registration of divorces, annulments of marriage and judicial separations, a transcript of the judicial pronouncement or 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 witness(es) or by the sole declaration of an informant. In the case of marriage registrations, a marriage license is generally required.

390. Documentary evidence presented to the civil registrar is generally prepared by different agencies for various purposes. Therefore, in the process of registration, the local

[87] United Nations Publication, Sales No. 84.XVII.11, see chap. V, paras. 169–182, and table A.8.
[88] See ibid, paras. 152–168.

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 form. In other cases, the legal document and medical certificate may contain useful information but may not fully satisfy the need 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 in order to improve their design to meet multiple needs. At the same time, the registration and statistical information should not become a burden to those who are responsible for preparing the document.

5. *Provision for late and delayed registration*

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

392. 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.

393. 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.

394. 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. On the part of 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. On the community side, delayed or late registration is likely to occur when the general public is not aware of the requirement for or is lacking interest in registration.

395. 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 from 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.[89]

6. *The vital event registration record*

396. 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 information concerning the persons related to the event. A vital event registration record has legal value and it is a dynamic record i.e., it is subject to corrections and amendments throughout the lifetime of the individuals concerned.

397. 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 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. The vital event registration record is discussed below (for the statistical report, see paras. 453-459 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 by which the vital event registration record is prepared, it is essential that the original and one copy be available to compile the central and local files of civil registration. It is also important that the forms be standardized throughout the country.

398. 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 parts. This is important because certified copies of the legal portion of the records are to be subsequently prepared from the combined forms; items which are only for statistical purposes must not be reproduced on certified copies of the records.

399. Specific provisions are needed in the civil registration regulations to indicate that a duplicate of the registration record has the same legal value as the original one.

400. The decision to adopt a specific type of registration document is a critical matter to which careful consideration

[89] See *Handbook on Civil Registration and Vital Statistics Systems: Developing Information, Education and Communication* (United Nations publication, Sales No. E.98.XVII.4).

should be given since there are both advantages and disadvantages for 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*

401. Countries or areas may wish to adopt one of the following ways of preparing registration records of vital events: the book register, the loose-leaf (single sheet) register, the card register or the electronically readable file. A brief description of each method of maintaining registration records follows, but more complete descriptions are found in the corresponding handbooks.[90, 91, 92]

(a) Book register. In a book register, pre-printed blank registration forms are bound together as a book and enclosed in a hard cover, enabling each vital record to be entered consecutively as it is reported. Thus, the vital event records 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 back-up purposes. This method increases the likelihood of introducing errors during the transcription process;

(b) Loose-leaf register or card register. The loose-leaf register and the card register 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, multi-copy form sets 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, as mentioned in paragraph 397 above. Loose-leaf registers and card registers can be filed according to different filing methods: numerical index, alphabetical index, chronological index (by date of occurrence).

(c) Electronic registration records.[93] - The registration and storage of vital records in electronic form is a more recent method which is gaining acceptance in many countries as a convenient and efficient method of civil registration that also facilitates record linkages within and outside the system. Electronic registration files (or computer-based vital event records) have many advantages over those which are paper-based, but there are also some special considerations which must receive particular attention if the system is computerized. 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 alphabetic and/or chronologic index; monthly frequency runs from the master files to review the completeness of coverage and the accuracy of data items on the files; and speedy derivation of vital statistics from the registration files (or statistical files for further processing by the vital statistical agency). However, planning for the use of an electronic system for civil registration introduces several issues which must be considered. Some of the more important of these are: the possible need for permissive legislation; the need for careful computer system analysis and design before other steps in the automation process are taken; 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 back-up and protection of the files; the need for appropriate training of staff and maintenance of equipment and electronic files.

(*b*) *Storing and preserving records of vital events*

(*i*) *Space and storage considerations*[94]

402. Each loose-leaf page or card is used to record a single vital event. The reverse side may be used to print information, such as the instructions for completing it, definitions of vital events etc., or is simply left blank. However, cards are usually half the size of a loose-leaf page. The page-size of a book register is either the same as the loose-leaf page or it may be larger. In a book register, two vital events are usually recorded per sheet, one event on each side. It is not advisable to record more than one event on each side of the sheet in a book register.

403. For loose-leaf forms, filing should be made by using a two- or three-ring binder. This method should be preferred to fastening the individual records together to facilitate their removal for photocopying and certification purposes.

404. Bookshelves are indispensable for storing book registers or loose-leaf records in binders. For storing card-type vital records, special storing cabinets with drawers are required.

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[90] *Handbook of Vital Statistics Systems and Methods,* vol.I, *Legal, Organizational and Technical Aspects,* (United Nations publication, Sales No.E.91.XVII.5).

[91] *Handbook on Civil Registration and Vital Statistics Systems: Management, Operation and Maintenance* (United Nations publication, Sales No.E.98.XVII.11).

[92] *Handbook on Civil Registration and Vital Statistics Systems: Computerization*. (United Nations publication, Sales No.E.98.XVII.10).

[93] See ibid.

[94] For guidance, see *Handbook on Civil Registration and Vital Statistics Systems: Management, Operation and Maintenance* (United Nations Publication Sales No.E.98.XVII.11), paras. 318 and 538–546.

Card file furniture usually requires more space than open shelves for book or binder storage.

405. Storage of electronic file media requires significantly less space than the other types of files. Depending on the exact kind of electronic media being employed, small, inexpensive containers, specifically designed for the purpose, are readily available. The files and the file boxes in which they are kept should be clearly labeled to facilitate retrieval of the records.

406. Space requirements must always take into consideration, regardless of which format of storage is employed, that back-up or duplicate copies of the files must be maintained in a different location (see paras. 407-414 below).

(*ii*) *Preservation methods and safety*

407. Safekeeping of records must be one of the highest priorities of the registration system owing to the importance of the records. All types of storage 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. Computer disks, if not internal within the computer, are easy to misplace if not always replaced after each use in a case designed for their storage.

408. The life of paper and card records is finite and closely related to the quality of the stock itself as well as 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. The life of electronic media has not yet been fully ascertained, but it is recommended that disks or tapes be recopied onto fresh media periodically, e.g., every two or three years. As magnetic fields destroy electronically stored data, it is recommended not to store disks near telephones, electric motors or electronic devices in order to prevent electronic data being wiped out.

409. 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.

410. Fires and natural disasters, such as floods and earthquakes, must also be considered in plans for safekeeping and preserving vital records. Paper-based records by type of vital event should be stored in books or binders by record number in an area protected from the elements and the threat from destruction from fire, climate and other hazards. Standards must be in place for use at the registration authority and at each local registration office.

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

412. In addition to precautionary steps 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., that in spite of procedures in place to protect records an adverse event occurs. The best line of defense is to have in place a procedure for making duplicate copies of files and storing them in a different location from the original files.

413. Duplicate or back-up files may be in the form of paper copies of original paper-based records, created at the time the originals are filed, or may be microfilmed copies filmed periodically, perhaps weekly or monthly, depending on volume. It is recommended to wait one or two years before committing paper-based records to microfilm process. This policy allows for time for the majority of the amendments and corrections to take place while the record is still in paper format. Vital records kept in microfilm also require special care and maintenance. Some registration offices use microfilm or microfiche images for their day-to-day operations, including the issuance of certified copies; an additional microfilm copy is used as back-up and original paper copies may be placed into an archive. Copies of electronic files are usually easily and rapidly made by computer. Optical disk storage can also be an option to consider. Availability of resources, down-time levels of the computer system and other local considerations will determine the best combination of back-up options.

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

(*iii*) *Cost*

415. In principle, the card register is more costly than the book register or the loose-leaf form because a special type of paper is needed. Besides, safekeeping of the cards requires costly furniture. On the other hand, the book registers may require periodic bookbinding because of the deterioration caused by daily use. Books also require additional papers for the opening and closing of the books and for indexing. Furthermore, because the book is usually closed at the end of each calendar year, many pages may be left unused. Cards may be easily arranged according to some method of filing. Book registers and loose-leaf records kept in binders require additional indexes, and considerable extra work and cost must be invested in such indexing. In the long run, the cost of the card system may actually be lower than that of the book or loose-leaf binder systems. However, the possibility of misplacement of cards often creates difficult problems not shared by the book or the loose-leaf binders. Electronic filing requires, in addition to the relatively inexpensive storage cases, computer and computer peripheral equipment, such as a printer and perhaps a scanner. Unless the volume of vital events is quite high, shared use with other applications can be

utilized to bring the registration costs down, but a dedicated computer system is to be preferred, if possible; the cost of computers and related equipment is rapidly falling and when all costs are taken into consideration, an electronic filing system may turn out to be the most cost-effective alternative.

(*iv*) *Flexibility of handling*

416. Cards, loose-leaf records and electronic records are stored and retrieved individually and can be handled more flexibly than book records. Examples of this flexibility are:

(*a*) There is no need for processes, such as opening and closing of books and the preparation of an index for each book;

(*b*) Card and loose-leaf records may be filled in using a typewriter or other mechanical means and electronic records are filled in using a keyboard similar to that of a typewriter. This method accelerates the registration process and reduces or eliminates the serious problem of illegibility always associated with handwriting in the book register;

(*c*) Cards and loose-leaf forms may be photocopied easily to accelerate the process of issuing certificates, while electronic files can be used to directly print certificates, as needed; books, on the other hand, do not permit photocopying individual records;

(*d*) Depending on the type of paper being used, multiple copies of registration records can be completed simultaneously when cards or loose-leaf records are employed, whereas such a possibility does not exist with the book register. Although multiple copies cannot be completed simultaneously with the creation of electronic records, the subsequent creation of copies of files is easily and rapidly accomplished.

(*v*) *The need for central storage and preservation of vital records*

417. Vital records are legal documents needed for a wide variety of purposes, both by individuals and by society over extended periods of time. They must be adequately stored and preserved to facilitate their retrieval. Often there is no way to reconstruct all of the information contained therein, long after the event, should original records and copies of them be lost or destroyed. Further, if copies of a record are needed but the local place of filing is not known by the applicant it may be a daunting task to locate the record. The risk of irreparable loss is minimized, coupled with the convenience of accessability, when all vital records for the country are kept in a well protected central file, with back-up copies safely stored in the local registration areas and in archives. If secondary or back-up files are maintained at their local point of origin, the local registration offices serve the function of off-site storage places 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*

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

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

419. It should be policy, established in law and regulation, that individual vital records information is not to be disclosed except to specifically authorized persons, such as the registrants themselves; their legal representatives; a close relative, such as spouse, parent or son/daughter; or other person having a direct and tangible right in the facts contained in the record.[95]

420. Procedures for sharing files with other authorized official agencies, including any restrictions on the 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.[96]

421. Similarly, requests for disclosure 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 criteria for such disclosures which should be clearly set out in regulations.[97]

(*e*) *Content of the vital record for legal purposes*

422. The content of vital registration documents must meet the requirements of the registration law. A minimal approach is to include only that information which is sufficient to legally provide 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 statistical purposes. If this is the case, both statistical and legal data must be included in the layout of the record (a detailed list of the recommended items and their definitions for statistical reporting purpose, see chap. II).

423. The topics recommended for inclusion in the vital records of births, deaths and marriages, either by themselves, comprising a minimal legal document, or in combination with the statistical items listed in chapter II, are set out below.

[95] For detailed guidance, see *Handbook on Civil Registration and Vital Statistics Systems: Policies and Protocols for the Release and Archiving of Individual Records*, (United Nations publication, Sales No. E.98.XVII.6).
[96] See ibid.
[97] See ibid.

Clearly, 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 inferred from 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 deduced from those appearing on the marriage record). The concepts and definitions of the topics should be the same as those for statistical purposes (see paras. 87-232 above).

(1) LIVE BIRTH RECORD

Characteristics of the registration record
- Name of the local civil registration office and its geographic 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

(3) DEATH RECORD

Characteristics of the registration record

- Name of the local civil registration office and its geographic 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

(3) MARRIAGE RECORD

Characteristics of the registration record

- Name of the local civil registration office and its geographic 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

(*f*) *Numbering vital records*

424. Registration records of each type should be numbered consecutively on an annual basis. A book register should be opened on 1 January and closed on 31 December, whereas a loose-leaf file can be compiled by a certain number of records (e.g., 200 records per register). A numbering system is essential for identifying each event registration record. This is one of the elements for record searching and to prepare an index.

425. 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, preferably at the time of their birth registration or at the time he/she enters to the registration files for the first time (e.g., resident aliens). This number may then be used in all subsequent vital event registration records of the person(s) concerned. If a country wishes to use this number as a unique personal identification number, then it may be used for a wide variety of other documentation the individual acquires during his lifetime (e.g., passport, driver license, social security 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 geographic place of occurrence, a numeric representation of the date of occurrence of the event and the sequential number given to the record in the register.[98, 99]

426. Such a numbering system has advantages even in countries where a personal identification number system is not in effect. When such a number appears on records originals 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 greatly facilitates 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 by others as a violation of confidentiality.[100]

427. 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 vital statistics system.

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

428. 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. This is the dynamic characteristic of the record mentioned earlier (see para. 396 above).

429. 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.

430. 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.

431. Similarly, registration of recognitions, legitimations, adoptions, change of name(s) and surname(s) call 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 to the adoptee.[101]

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

433. Additions or changes made to the registration records must be done in such a way that they do not alter any of the original entries. Therefore, it is of paramount importance that

[98] See *Handbook of Vital Statistics Systems*, vol. I, *Legal, Organizational and Technical Aspects* (United Nations publication, Sales No.E.91.XVII, 5), paras. 218–221; and Handbook on Civil Registration and Vital Statistics Systems: Management, Operation and Maintenance (United Nations publication, Sales No.E.98.XVII.11) paras. 315 and 316.

[99] *Handbook on Civil Registration and Vital Statistics Systems: Computerization* (United Nations publication, Sales No. E.98.XVII.10) paras. 121–136.

[100] See *Handbook on Civil Registration and Vital Statistics Systems: Policies and Protocols for the Release and Archiving of Individual Records* (United Nations publication, Sales No.E.98.XVII.6).

[101] See *Handbook on Civil Registration and Vital Statistics Systems: Management, Operation and Maintenance* (United Nations publication, Sales No. E.98.XVII.11), paras 504, 507 and 508, and 510.

the layout of the registration record allows ample space for entering those additions. Furthermore, it is important to make the changes 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 on-line mode in a section of the record designed for annotations. Annotations for microfilmed record files can be made by creating a separate roll of microfilm. A method must be developed next to send the searcher to the location of the annotated record in the new roll of microfilm.[102]

8. *Amendments (corrections) to vital records*[103]

434. 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 do so and under what circumstances the corrections may be made.

(*a*) *Authority for making amendments (corrections)*

435. There are three sources of authority through which corrections may be made:

(*a*) Authority to make amendments to records may be solely vested 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 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;

(*b*) 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. This arrangement provides a further opportunity for the central agency to supervise and monitor the work of the local registrars;

(*c*) Authority for making amendments may be given to a combination of the above two approaches, that is, an administrative procedure is used to correct apparent errors and a judicial process is adopted when there are legal implications or matters of dispute.

[102] See ibid, paras. 505–511.
[103] See ibid, paras. 496–503.

(*b*) *Methods of amendments (corrections)*

436. Correction of registration records (other than electronic ones) can be undertaken using either of two alternative methods:

(*a*) The first is to enter missing or corrected information in an ink colour other than that used for the other entries on the record;

(*b*) The second method requires the preparation of a new record containing the corrected or additional data, with a cross-reference to the original record.

437. A basic principle to follow when dealing with amendments (corrections) to vital records is that any "old" or superseded information (including the fact that an item originally had been left blank) should be preserved. The registration authority should always be able to go back to the original information, if the need arises.

438. Correction of electronic records can be undertaken in a manner similar to the second method of correcting paper records described above by providing a field in each electronic record to indicate whether the record is "active" (i.e., available for reference and copying) or is "void". A void record should contain an entry giving the sequential record number of its replacement, and the replacement electronic record should contain a reference to its original record number. If optical disk technology is used to store the vital event registration records, the technology allows for an amended record to be scanned next to the place where the original record is kept. The original is retained on the same disk. Space should be left on the disk to allow for amendments to be made of the records that have been carefully registered and preserved.[104]

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

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

440. 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 issuing them. For instance, it might be required that certificates be full and

[104] See ibid, para. 511.

complete copies of the record on file and issued as photocopies, as handwritten copies, as typed copies by microfilm reader/printer or as computer-based copies, using special safety paper to prevent forgery. Alternatively, the law might specify that only specific items be excerpted from the record and the certificate be prepared using one of the above methods. It has been found that, even when only certain items are to appear on a certificate, photocopying can be employed by using an overlay mask to cover unwanted items, provided that the original layout of the paper-based record has taken this into consideration.

441. Generally, the certificate may be either:

(*a*) A duplicate of the information contained in the vital event record that is copied in a special form, either handwritten or typed;

(*b*) An accurate reproduction of the original or of selected parts of it by means of some photocopying equipment;

(*c*) A print-out by mechanical or computerized equipment. When transcripts are made from the original records, care should be taken to avoid errors. This method is slower than making photocopies but may be the only one applicable when the necessary equipment is not available. Furthermore, transcription enables the improvement of the legibility of the original information when records are in such bad condition that photocopying becomes impossible. On the other hand, there is a possibility that this process may bring about a personal interpretation of illegible data.

442. As a deterrent to fraud and counterfeit, safety paper (paper which has been specially prepared to readily disclose erasures) should be used if possible for certificates, although this increases cost. There is available paper with intaglio printed borders (raised borders, such as are found on traveller's checks) from a limited number of companies that produce such documents. These forms should be sequentially numbered to monitor their use.[105] If photocopying is not utilized, preprinted blank forms should be used, but these should be prenumbered and carefully controlled and accounted for. In any case, every certificate should be authenticated by a certification statement and the signature of the civil registrar or other designated persons of 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 the authenticity of the certificate and to make it harder to prepare false documents.

443. 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.[106]

444. Access to vital records information for official administrative purposes may also be permitted under controlled circumstances. Official agencies could, upon request to the Registrar, be furnished copies of records or data provided that the information would be used solely in the conduct of their official duties and that any disclosures of information that might identify any person (or institution) would have to be specifically authorized by law, regulation or written agreement with the Registrar General.[107] Similarly, access for research purposes may be permitted provided that adequate safeguards to protect the confidentiality of the persons involved are written into the law and regulations.[108]

10. *Linkages of vital records within the registration system*

445. There are both statistical and administrative purposes for linking records within the registration system. This is best illustrated by 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. Matching and linking the two kinds of records yields information from the birth record, such as birth weight, gestational age and other characteristics of mother and infant at birth, which can 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 from such linking by identifying unregistered births and finding inconsistences in reporting of items which appear on both the live-birth and death records.

446. 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 who had died but who would now be at about the same age and of the same sex as the fraudulent applicant, had the infant lived. In this way, a copy of the birth record would be issued and used to establish a false identity. This false identity would have a lower risk of discovery than an identity taken from a living person. To protect against this deceit, many vital record offices link infant death records with the corresponding birth record and mark the birth record with the

[105] See *Handbook on Civil Registration and Vital Statistics System: Management, Operation and Maintenance* (United Nations publication, Sales No.E.98.XVII.11), para. 447.

[106] See *Handbook on Civil Registration and Vital Statistics Systems: Policies and Protocols for the Release and Archiving of Individual Records*. (United Nations publication, Sales No. E.98.XVII.6).

[107] *See* ibid.

[108] See ibid, para. *33*.

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.

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

448. The criteria for linking files[109] can be complex, involving the making of assumptions about the probability of 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 death occurring in the jurisdiction of the civil registry necessarily was born in that same jurisdiction. Furthermore, the files from more than one year may have to be searched for matches; infant deaths, for example, may have been born in the same year as their death or may have been born in the previous year.

449. Matching of records can be carried out by hand, especially if the number of records is not too large; however, in general, electronic matching methods are preferred. It should be borne in mind, however, that there is a manual component even when electronic procedures are employed. Linkages of vital records within the system are greatly facilitated if personal identification numbers are used and the matching is done by computer.

11. *Linkages of vital records with records of other systems*

450. 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 their records against the birth file for completeness checks. A cancer registry may wish to match its survivor records against the death record system. The voter registration unit, jury selection bureau or personal identification bureau may wish to purge their records of deceased persons by matching 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.

451. 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 looking at measures of under-coverage in the census and/or completeness of registration.

452. 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.

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

(*a*) *Types of statistical reporting forms and content*

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

454. In some countries, the statistical report form is part of the registration form, i.e., the form is 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.

455. In other countries, the registration form and the statistical report are two separate documents. In countries where legal provisions forbid the collection on civil registration documents of certain individual information, 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.

456. Details of the content of the statistical report in respect of each type of vital event are discussed in chapter II; the recommendations given in that chapter include many more topics than those specified in paragraph 432 above as the minimal topics required for registration. The reader may wish to compare both series of topics to see the differences in scope.

457. 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 than it is in connection with the legal register. Such standardization is also an important factor in achieving greater efficiency in statistical processing.

[109] See *Handbook on Civil Registration and Vital Statistics Systems: Management, Operation and Maintenance*, (United Nations publication, Sales No. E.98.XVII.11), paras. 337–348.

458. National uniformity of reports on each event will be of help in standardizing instructions to registrars, an aspect which should not be overlooked when establishing the design for statistical reports.

459. Separate statistical reports for each type of event promote efficiency in reporting for statistical purposes, and help to bring about 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*

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

461. Every geographic 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 which occur, irrespective of either the completeness of registration coverage or the extent of data available.

462. The principle of total inclusion of registered events in the statistical reporting flow relates 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 geographic area and population group should be collected is the 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 method 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 exclusion 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.

463. Another reason for unrestricted reporting is that even fragmentary data for certain areas is 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 geographic subdivisions may be useful.

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

465. It often is desirable to have data at subnational levels, and provision should be made either for channelling original statistical reports through local, state or provincial departments of government or for supplying these 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. Electronic transmission can significantly improve both availability and timeliness of data.

466. The channel through which the registrar transmits reports to the statistical service and the form in which these reports reach the national level are dependent on a variety of factors. First among these factors is the organizational or administrative pattern of the vital statistics system. In countries where statistical compilation is the responsibility of a subnational geographic area, such as a state or province, rather than of the national government, it is evident that the statistical reports on vital events will first pass from the local registrar to the state or provincial office. At this subnational office, they may be copied or compilations made from them before transmission to the national office. In any case, there is an intermediate step, between the registrar and the national statistical service, where compilation is the responsibility of a subnational area. There may or may not be such an intermediary step in countries where the peripheral registration offices depend directly upon the central government. If there is a computerized civil registration system, then the channels of transmission may change (see paras. 475-498 below).

467. Every possible administrative procedure should be employed for controlling the prompt receipt by the central vital statistical office of statistical reports from every reporting area in order to ensure the ability to prepare complete, detailed and timely tabulations of vital statistics.

468. Not only is it essential that reports be received promptly so that statistical processing can begin but also every delay in reporting decreases the potential effectiveness of the query programme for correcting and accounting for deficiencies. The more time allowed to elapse between registration and querying, the less chance there will be of either locating informants or obtaining from them the correct or necessary additional information.

469. 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 which 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 determining a realistic time, as will the number of intermediate receipts and dispatches of reports.

470. Once the time schedule is established, the receiving office must diligently control the receipt of reports. Control must be exercised for promptness, completeness and accuracy of reporting. Not only must reports be received on time but also care must be exercised to see that returns are received from every geographic reporting unit and that the frequencies reported are consistent with those reported during equivalent

reporting periods in the past.

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

471. As far as practicable, qualitative or quantitative indications of the degree of completeness and timeliness of registration should be given for each geographic reporting area (see chap. IV) and also, where pertinent, for various significant segments of the population (e.g., various ethnic groups).

472. 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.

473. 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 vague terms used in reporting causes of death). This serves both to clarify the facts concerning the event and to educate the informant and the recording agent regarding reporting requirements.

474. Continuous training and instruction of both registrars and medical personnel for the purpose of improving basic data is an important element of an effective vital statistics system.

F. COMPUTERIZATION OF THE CIVIL REGISTRATION SYSTEM[110]

475. Computer technology is a tool that countries can use to facilitate the management, operation and maintenance of the many functions in the civil registration system. Its use can greatly facilitate data storage, retrieval and back-up copies of records. It can also speed up the transfer of data from civil registration to the vital statistics agency for the production of vital statistics, thus providing the country with basic data on fertility, mortality and nuptiality on a timely and regular basis. As civil registration systems are designed to be permanent, continuous, compulsory and universal, it is recommended that policies to develop a computerized civil registration system be made jointly with all agencies concerned, including the agency responsible for the production of vital statistics. Any changes in the recording, processing, storing and transmission of events 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 electoral services. The main users should therefore be consulted and informed of any changes and development from the outset of establishing a computer-based system.

476. Introducing a computerized civil registration system is, for most countries, a task of considerable complexity. To overcome the hurdle without losing focus and enthusiasm while accomplishing the development in a timely fashion, it is recommended that changes in the system be introduced in phases. Each phase must be successfully completed, including analysis, design, construction, implementation, user training and production, before starting the next phase.

477. When planning a computerized civil registration system, several major decisions need to be taken. One can apply a check list of activities to a plan for an eventual computerization even when the implementation is limited to a portion of the system. This type of planning makes the addition of new actions and events transparent. This process is extensively discussed in the *Handbook on Civil Registration and Vital Statistics Systems: Computerization,*[111] 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 which events are 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 assigning an identification number to an 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.

478. Several important aspects of developing a computer-based civil registration system are set out below, dealing with: (*a*) computerizing a paper-based civil registration system, (*b*) computerizing a system based on electronic reporting, and (*c*) developing integrated databases for civil registration and vital statistics.

1. *Computerizing a paper-based civil registration system*

479. Computerizing a paper-based and manually operated civil registration system is a costly process and could take several years to complete. Therefore, it is advisable that a unified computerized system be developed to incorporate the needs of both registration and vital statistics so that, for example, sub-files can be extracted and forwarded to statistical agencies. In a computerized civil registration system, the individual is used as the key to information on vital events. Therefore, all registrations are linked to an individual by the use of a personal identification number issued at the time of

[110] Guidance on issues to consider leading to computerization of civil registration is provided in the *Handbook on Civil Registration and Vital Statistics Systems: Computerization* (United Nations publication, Sales No.E.98 XVII.10).

[111] Ibid.

birth registration or first time registration.

480. Although computerization alone does not ensure more complete and accurate registration, a computerized civil registration system contains built-in functions, validation rules and automatic checks of data that ensure the detection of erroneous registered information. Such errors may be corrected through a querying process. Computerized error detection procedures can reduce the error rate compared to a manual system.

481. A computerized system alone cannot improve reporting procedures. This can only be done as part of the establishment and enforcement of a legal and administrative framework that supports computerization. In addition, computerized civil registration can quickly indicate which areas of the country may have problems of completeness and timeliness in registering and reporting events so that improvement measures can be undertaken. Moreover, computerization makes the registered events quickly available electronically for use for vital statistics and other purposes. If legislation places responsibility for collection, continuous updating and storage of personal information with one central agency, computerization facilitates the coordination with the agency compiling vital statistics with respect to the transmission of registered events. Recommendations set out below provide guidance to the agency responsible for civil registration in converting the paper-based vital event registration records into a computerized civil registration system (for further information, see chap. II, sect. H).

(*a*) *Centralized compilation and processing of registration records*

482. In order to produce high levels of accuracy, uniformity and flexibility, it is recommended that individual vital event registration records be compiled and processed centrally by the authorities responsible for civil registration, except in cases where the numbers of vital events would be overwhelmingly large if processed at the central level. When compilation and processing are not carried out centrally but rather on a decentralized manner, detailed written guidelines dealing with such procedures as coding, editing, querying and data entry, must be issued by the central civil registration authority and closely monitored and evaluated.

(*b*) *Control and receipt of vital event registration records from local offices*

483. In a computerized event registration system, the central agency responsible for registration must ensure the timely and complete reporting of vital records, as discussed with regard to statistical reporting in paragraph 241 above.

(*c*) *Editing*

484. Before capturing the information from the registration document, manual editing should be carried out to ensure that the documents received by civil registration authorities are properly completed and accurate, with minimal errors. Automatic checks should be developed to ensure that the number of records processed matches with the records received and to detect missing, inconsistent, inappropriate or obscure items for subsequent querying to the registration units.

(*i*) *Querying*

485. The computerized system should also provide a list of items from registration documents with missing, inconsistent or inappropriate responses that should be questioned or "queried". The list is then provided to the reporting office for action. The querying process should be adopted as an integral part of the computerized civil registration system.

486. While querying is the first choice for correcting statistical items, it is not the only recourse, since imputing methods can also be employed (see paras. 246-247 above). This, however, is not the case for legal items on the registration record. Legal items that are missing, incorrect or inconsistent must not be imputed; they can be remedied only through the querying process.

487. It is important that the appropriate reporting office or the person responsible for recording or keying the item in question be queried. In such a case, it will be necessary to contact the local registrar and request that he or she contact the appropriate source, such as the informant, physician or midwife. Queries undertaken from the local level also serve as an educational process to alert local registrars to better check the documents for accurate recording. It is stressed that the vital record must be carefully screened before the informant leaves the office of the local registrar. On-line communications and use of electronic mail may be used for the querying process.

488. Once data have been queried the results must be saved for further transmission to the civil registration authority. The local registrar may send corrected vital records electronically, by telephone or by other means. When items are of legal concern (e.g., place of occurrence or date of death), it is essential that the corrections be made on the original legal records, either paper-based or electronic, and on all copies filed centrally, locally and in the archives. It is important to make corrections to statistical items as well.

(*ii*) *Coding of data*

489. The recommendations made for coding statistical items described in paragraphs 248 and 249 above also apply to the legal items. When a computerized system is developed, this function will need to be carried out by the civil registration authority. The cooperation of the agency responsible for vital statistics should be sought on a continuous and permanent basis for the development and maintenance of codes, the contents of files and electronic editing rules. Computer-assisted coding may be developed for more efficient coding.

2. *Computerizing a system based on electronic reporting*

490. Computer software for the electronic reporting of vital events can be used by hospitals and a local registration office,

which permits the use of a network that allows on-line communication with the central registration office. The hospital or local registration office first enters the data into its computerized birth or death software, which in turn creates an output report file on the computer. The data are then encrypted so that they cannot be read during transmission to the central registration office since they are considered to be highly confidential information.

491. In order to implement electronic registration, several important aspects of the system must also be developed, including developing computerized files of events that took place many years ago to enable all members of the population to obtain records of birth or death. Not only is it important to prepare electronic files from earlier paper records but also a process to issue copies of registered events for personal or administrative use is required. In countries where a comprehensive manual system of registration exists, conversion to a computer-based system is required. However, where part of the country has very limited or no registration of births or deaths, an integrated system is needed. Some areas require the computerization of manual operations. Other areas, where civil registration is very limited, require the development of an entire system, beginning with an electronic registration system.

492. Editing of data should be introduced on at least two levels of the process. First, as in the case of capturing data from paper-based registration, automatic checks of validity and consistency should be built into the data-entry software. Second, when all data have been entered, an editing program and should check the overall consistency of data in the record. Such programmes must be run whenever a record is entered or a correction to a record is made. Care should be taken in preparing the editing specifications of legal items. Strict guidelines need to be prepared for registration taking place electronically. Procedures for querying and coding of data need to be implemented in the same manner as those described in computerizing paper-based systems.

3. *Developing integrated databases for civil registration and vital statistics systems*[112]

493. When a computerized civil registration system is established, it is recommended that a single database be planned and developed, integrating all of the items of interest to both registration and vital statistics. To accomplish this, careful planning is required during the development stage, with the involvement of experts in both registration and vital statistics. A single database is more flexible and efficient for meeting the current and future needs than separate databases. This approach can be facilitated by the adoption of a single registration form which meets the information needs of both civil registration and vital statistics (see para. 253 above).

494. The common integrated database should be the source for extracting files for various purposes. For instance, files containing only those data items needed for vital statistics would be extracted and sent periodically to the responsible vital statistics authority or files could be made available to registration officials to produce listings and indices for registration purposes, to issue certificates, to register annotations and amendments in vital records, to conduct record linkages or to update and maintain the civil registration information. In this way, all files, regardless of how and by whom they are to be used, have a common source. Subsequent use of these files would be the responsibility of the recipients.

495. The availability of a common database allows registration officials to produce monthly frequencies for purposes of monitoring the reporting process and improving registration completeness. In addition, vital statisticians may occasionally wish to obtain access to legal items to carry out special records-matching studies. All access to the database must be limited to authorized staff, with appropriate passwords. When civil registration information is accessed by any public authority, protocols of confidentiality must be in place. Administrative procedures that govern the civil registration database may need to be amended from time to time. When amendments to the law are required, the central agency that is responsible for the computerized civil registration system must prepare and submit the proposed changes.

496. Databases created through computerized civil registration systems should include all data for the basic certificates issued in connection with vital events. They should have the ability to print out copies of these certificates, make amendments and notations, and conduct searches and inquiries. Once electronic records are correct they are stored permanently in the database. Further notations, amendments or corrections of vital records in the database must strictly follow the statutory rules, in consultation with the reporting local civil registration office.

497. Security of paper documents includes controlling the conditions of the storage for paper, microfilm copies and extra copies in remote locations (back-ups). Similarly, back-up copies of computerized records are essential. Records can be backed up on a daily basis so that only a portion of one day's work will be lost if equipment fails. The entire database should be backed up on a weekly or monthly basis. The agency responsible for managing the databases should always consider that changes in technology may render files unreadable by updated hardware or software. Choice of back-up media varies according to the type of replacement security strategy selected. One must consider the possibility of natural disasters, such as fire, flood or earthquake. In addition, contingency procedures must be in place for file copies in case of war. Remote storage is the appropriate response to such danger. Both the remote storage facility available and the size of the files involved will be considerations in determining the media selected.

[112] See *Handbook on Civil Registration and Vital Statistics Systems: Computerization* (United Nations publication, Sales No. E.98.XVII.10).

498. Along with the security of the civil registration system, one must also consider the confidentiality of the data. One possible threat to the computerized civil register is the risk of misuse by the administrative staff. Reasonable control measures should be established to enable management to carry out auditing procedures. These procedures involve a comprehensive logging utility, ensuring that all changes and inquiries to the civil register are recorded to provide information about the time and number of times each record is accessed and the identification of the operator. Based on such a log, management is able to carry out subsequent investigations, both randomly and for any reason of suspicion. The management should grant different levels of access to different categories of operator staff. It is normal to grant enquiry access to a larger part of the staff, while a more limited number of operators are able to update the database.

G. Civil registration and its linkages to the population register

499. This section explains the crucial role the civil event registration records play in continuously updating and maintaining a population register; and how vital statistics can be prepared if a country has a complete population register. The population register is defined and then briefly described, along with its main uses, operational functions, its relationships with the civil registration system, the vital statistics system and the services it can provide, on a continuous basis, to government administrative agencies.

500. The population register is a mechanism for the continuous recording of selected information pertaining to each member of the resident population of a country or area, making it possible to determine up-to-date information about the size and characteristics of the population at selected points in time. Because of the nature of a population register, its organization, as well as its operation, should have a legal basis.[113, 114] Population registers start with a base consisting of an inventory of the inhabitants of an area and their characteristics, such as date of birth, sex, marital status, place of birth, place of residence, citizenship and language. To assist in locating a record for a particular person, household or family in a population register, an identification number is provided for each entity.

501. The population register can contain other socio-economic data, such as occupation or education. The population register should be updated by births, deaths, marriages and divorces, which are part of the civil registration system of the country. The population register is also updated by migration. Thus, the population register is the result of a continuous process, in which notifications of certain events, which may have been recorded originally in different administrative systems, are automatically linked to a population register 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.

1. *Main uses of the population register*

502. The main administrative functions of population registers are to provide reliable information for the various purposes of government, particularly for programme planning, budgeting and taxation; for issuing unique personal identification numbers; for establishing the eligibility of individuals for voting, education, health, military service, social insurance and welfare and the pension system; and for police and judicial references.

503. Population registers are also useful for population estimation, census planning, census evaluation and for sampling frame of household surveys. Some countries use population registers to produce census-typed tables every five or 10 years in place of conducting regular census operations. 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.

504. Population registers represent one of the independent sources of data with which the population census results can be compared as part of the process of evaluating the accuracy of the latter. Comparison can be made between aggregates compiled from the two sources or by one-to-one matching of the corresponding records of the individuals so as to correct either the census or the population register.

2. *Coordination arrangements between the population register and the civil registration and vital statistics systems*

505. 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 base 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.

506. In some countries, the production of vital statistics is

[113] See *Methodology and Evaluation of Population Registers and Similar Systems* (United Nations publication, Sales No. E.69.XVII.15).

[114] See *Handbook on Civil Registration and Vital Statistics Systems: Computerization* (United Nations publication, Sales No. E.98.XVII.10), para. 124–134; see also "Danish experience with the computerization of the civil registration system, the role and status of civil registration (population registration) and vital statistics systems in Norway" and "Population registration in Sweden" papers presented at an African workshop for French-speaking countries on accelerating the improvement of civil registration and vital statistics systems, Rabat, 4 to 8 December 1995 (United Nations Statistics Division files).

the responsibility of the population registration agency. In this instance, this 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 Norwegian and Bulgarian population registers are examples of this type of arrangement and are under the administration of the respective statistical authorities of the countries. This is the preferred situation, where one agency is responsible for civil registration, the maintenance of the population register and the production of vital statistics.

507. If different agencies are responsible for different functions, the absence of good coordination between agencies might result in the production of different series of vital statistics which are inconsistent. Under this arrangement the coordination of the production of vital statistics is possible at two levels: the data-collection level and the data-processing level. At the data-collection level, one form, such as a multi-part form, is used to record the data and copies are sent to each organization for entry into its system. Thus, the same source documents serve as input into the respective systems.

508. The experience of some countries has shown that when a single record is used for both population register and vital statistics purposes, the most difficult task is handling confidential medical data on births, deaths and foetal deaths. A discussion of the problem of using the same form for registration and statistics can be found in the *Handbook on Vital Statistics Systems and Methods,* using the Norway population register as an example.[115]

509. 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 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.

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[115] See *Handbook of Vital Statistics Systems and Methods*, vol. 1, *Legal, Organizational and Technical Aspects*. (United Nations publication, Sales No. E.91.XVII.5).

IV. RECOMMENDED STRATEGIES FOR IMPROVING CIVIL REGISTRATION AND VITAL STATISTICS SYSTEMS

510. 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 which have proved useful in countries that have improved their systems; they do not by any means cover all the steps needed for improving them. Activities described in the present chapter include 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. TRAINING AND OTHER STRATEGIES FOR IMPROVING CIVIL REGISTRATION AND VITAL STATISTICS SYSTEMS[116]

1. *Training*

511. The civil registration and vital statistics systems should be established within the country's public administration to be effective. If the goal of producing vital statistics from civil registration is to be reached, a civil register must be permanent and continuous. This can be achieved by clearly establishing legal procedures for compulsory registration. The close involvement of civil society in supporting the establishment and maintenance of civil registration systems is essential.

512. Training of registration and vital statistics staff is an important activity leading to strengthening of the civil registration and vital statistics systems. Training programmes provide the knowledge and skills necessary to efficiently carry out the required functions. Through better understanding of what is expected, errors are reduced and staff morale is improved. Periodic training and retraining also provides opportunities for feedback from the staff about problems and possible alternative procedures and solutions.

513. Well designed training is a cost-effective way to focus on the needs of specific parts of the civil registration operation or particular geographic regions, such as urban or 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 of statistical items, their importance and their requirements for completeness and accuracy. The training plan should distinguish between internal training, which is directed towards civil registrars, vital statisticians and other technical and administrative personnel, and external training, which is directed towards policy makers, local officials, medical and health personnel and others associated with 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 improved understanding and cooperation. External training is a crucial mechanism for improvement and should not be neglected; it involves an essential aspect of the environment for cooperation and support. In some cases, such as with medical and health personnel who provide data to the system, the quality of the information is dependent on an 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 which must be shared between the civil registration and vital statistics systems and carried out on a regular basis rather than as an ad hoc activity.[117]

2. *Seminars and workshops*

514. Seminars and workshops for personnel from within the systems should be scheduled periodically to exchange views on problems encountered in civil registration and vital statistics operations. Participation at the meeting should be as wide as possible including personnel involved in data-processing, data retrieval and archiving and persons from outside the systems to help present fresh ideas and approaches.

3. *Feedback from users*

515. It is important to gain public support and to address the

[116] See also *Handbook of Vital Statistics Systems and Methods*, vol. 1, *Legal, Organizational and Technical Aspects* (United Nations publication, Sales No.E.91.XVII.5).

[117] For specification on training programmes, see *Handbook on Civil Registration and Vital Statistics Systems: Management, Operational and Maintenance* (United Nations publication, Sales No.E.98.XVII.11), paras. 259–271.

concerns and needs of users of the civil registration and vital statistics systems. This is a key to improvement since it promotes and develops a supportive constituency from outside the civil registration and vital statistics systems. One method of obtaining user feedback is through surveys (for further discussion related to obtaining user feedback, see paras. 519-524 below).

4. National and regional civil registration and vital statistics committees

516. National and regional civil registration and vital statistics committees provide an appropriate forum for leadership and authority for 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 interested technical, professional and governmental groups. Membership for such national and regional civil registration and vital statistics committees should provide a balance between the concerns and interests of users and the general public with the knowledge and expertise of specialists who can advise on technical issues.

5. *Development and implementation of action plans for improvement*

517. The steps necessary for the implementation of an action plan to improve registration and vital statistics should be based on factual knowledge about the current situation of the civil registration and vital statistics systems. There are a number of sub-activities that may be necessary under the plan; each of these should be specified, with an appropriate time reference indicated for them. The overall plan will probably span a number of years. Early stages or short-term activities may be implemented within the first year and might 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 that require more preparation and refinement, or that rely on pilot studies or evaluation methods and budget authorization. These activities may be implemented in one to three years following the implementation of the short-term activities. Even longer-term activities are of a more complex nature and require considerable technical changes either in the organization of the system or in its operations.

518. It is important that the action plan be carefully thought out and that the time-frames for each required step not be unduly optimistic. The plan should be reviewed and approved by all agencies and organizations which will be involved in its implementation. A guide to the content of such an action plan is presented in the *Handbook of Vital Statistics Systems and Methods*[118] and countries wishing to develop their own plan may wish to pattern it on the illustration provided in the *Handbook*.

B. PUBLIC EDUCATION, INFORMATION AND COMMUNICATION FOR EFFECTIVE CIVIL REGISTRATION AND VITAL STATISTICS SYSTEMS[119, 120]

519. The expense of public education campaigns in large countries with several languages and sociocultural differences can be great. This suggests the linkage of 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.

520. For the civil registration and vital statistics systems to function properly, it is essential to have the understanding and cooperation of several classes of persons who are involved in one way or another with the systems. These can be grouped as follows: the general public; representatives of institutions, professions or agencies; senior government officials; and personnel working directly in the registration or vital statistics systems.

1. *Government officials*

521. 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 public and to the government and its several programmes which rely on these systems. They should be informed of the dependency of vital statistics on the registration system (or other interim process for gathering data), and they need to be aware of the need for an acceptable level of data quality for statistical reliability. They 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. They should also be kept informed on a timely basis of results of evaluations of the systems in order to provide them with a good understanding of strengths, weaknesses and probable future requirements. Communications with high-level government officials should be designed specifically for these individuals and should be presented as concisely as possible.

2. *The general public*

522. The general public is the "target population" comprised of individuals whose vital events have been or will be registered, and they may from time to time serve as informants, providing information regarding a vital event. They will use

[118] See *Handbook of Vital Statistics Systems and Methods*, vol. I, *Legal, Organizational and Technical Aspects* (United Nations publication, Sales No.E.91.XVII.5), table 6.1.

[119] *See* ibid.

[120] Comprehensive guidelines are 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).

the registration system to obtain legal documents or to otherwise document the vital events occurring to themselves or others in their families. 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 the registration system. Without motivation on the part of the public to register events promptly and accurately, civil registration and vital statistics systems will not function properly. Every effort should be made to acquaint the public with the reasons for timely and accurate registration, their obligations to do so and the value of complying 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 have to do so. Communications carrying these messages, aimed at educating the general public, may be brief and carried by radio, television, posters, pamphlets or other communications media. The messages should include not only 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 or agencies*

523. 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. Included in this group are physicians; health workers; midwives; clinic and hospital personnel; educational officials such as directors of medical and public health schools; 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 their specific responsibilities and duties, including a step-by-step description of the required procedures. In addition, educational materials should describe the value of public education in order to help members of this group in their role of educating that part of the public which comprises their clientele.

524. Before launching a public education campaign, midwives and birth attendants, as well as leaders who may be responsible for birth registration in their villages, should be fully involved and receive training about the reasons for registering the birth of a child and when, where and how that may be accomplished, so as to enable them to convey that information to expectant and new mothers.

525. Appropriate international agencies should be encouraged to assist countries in exchanging civil registration practices and experiences. The dissemination of knowledge from one country to another, where successes and failures can be shared as a learning process, is an important source of techniques for improvement of the system.

C. EVALUATION STUDIES[121]

526. 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 civil registration and vital statistics systems, there should be a designation of an 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 chapter V below, as well as external evaluation, internal evaluation, pilot studies and demonstration area projects.

1. *External evaluation method*

527. 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, attitudes and perceptions, as well as more factual data on the operation of the systems, can be collected.

528. This method draws on techniques originally developed to carry out market research studies and is often carried out with informal "focus groups", i.e., 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 commonplace as an evaluation tool in other settings, such as in the industrial and trade sectors.

2. *Internal evaluation*

529. 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*

530. In performance measure evaluations, a set of evaluative criteria are needed to examine the performance of the systems in terms of staff, cost and operation. 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 as an illustration. In most countries, the raw data are simply by-products of the legal registration of vital events and the collection cost may not be

[121] See also *Handbook of Vital Statistics Systems and Methods*, vol.I, *Legal, Organizational and Technical Aspects* (United Nations publication, Sales No.E.91.XVII.5); and "Review and evaluation of United Nations Population Fund — supported projects on civil registration and vital statistics systems" P. Padmanabha, (New York, United Nations, 1996).

a major concern. However, the processing and dissemination costs of vital statistics require careful scrutiny. This is especially important when a decision is necessary for the choice of specific new equipment and new procedures.

531. 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 chap. V).

(*b*) *Attitudinal measure evaluation*

532. The measurement of attitudes and perceptions about 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 seen by users 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 for assisting in priority setting for future action.

3. *Pilot studies and demonstration area projects*

533. The evaluation of new practices or improvement strategies may be accomplished through the use of pilot studies and demonstration area projects as a test before full implementation takes place.

534. 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.

535. The demonstration area approach provides a mechanism to field 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 needed resources to extend these changes to a regional or national scale, or both.

536. 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 expanded 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 provide the resources to sustain the approach.

537. Countries intending to use this approach have to be both realistic in the goals they set as well as committed to sustaining or extending the experiences of the demonstrations to a national scale.

D. Use of information technology and automation

538. The level and sophistication of information technology and analysis contributes 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 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 an opportunity to become aware of new technologies and to assess them in terms of cost-effectiveness.

539. 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 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 civil registration and vital statistics officials to remain constantly aware of advances that offer improvement for the systems.[122]

540. In developed countries, the direction of civil registration over the last few decades has moved steadily towards computer-based recording, thus minimizing the use of paper.

541. In the production of statistical output from data, the trend is again away from paper-based systems and towards electronic media. The extraction of data from the master files of civil registration systems may facilitate the preparation of vital statistics and provide more timely availability directly to the user. The user can upload a data file immediately to software in his own personal computer to do analysis. The analysis itself will not be performed by a statistician working laboriously with pencil and paper to perform regressions but rather will be performed by a computer-knowledgeable statistician using a software package that will perform statistical analyses and tests at electronic speeds.

542. Computer technology and the availability of software programmes has also changed the ways in which data are handled. Data sets from the past have taken on new life in their ability to add new information from their records. The

[122] The *Handbook on Civil Registration and Vital Statistics Systems: Computerization* (United Nations publication, Sales No.E.98.XVII.10), gives examples of single area improvement techniques, as well as guidelines for a long-term plan to computerize the civil registration and vital statistics systems. The publication addresses modular improvements, such as the use of automated indexes, microfilm storage, optical disks and computer output to laser disk (COLD) technology. Also discussed in the publication are the computerized issuance of certified copies of vital records, the electronic reporting of births and deaths, and software for the automated coding of causes of death.

ability of the computer to match the records of one database with those of another has generated new life for such databases.

543. Many countries now have electronic birth and death records. Coding schemes can be automated, and certified copies of records can be issued electronically and not limited by current jurisdictional or technical boundaries. Systems can be developed to exchange the birth and death records directly from agency to agency so that the citizen need not carry a vital record from one agency to another.

544. It is essential, therefore, for the management of the civil registration and vital statistics systems to build into the systems a component for reviewing currently available information technology automation and communications systems. This will enable the systems to keep pace with fast changes in this field and to benefit from them.

V. EVALUATING THE QUALITY OF CIVIL REGISTRATION INFORMATION AND REGISTER-BASED VITAL STATISTICS

545. Although there are a number of non-statistical aspects of civil registration and vital statistics systems that should be addressed, the present chapter is confined to questions of evaluating the completeness and accuracy of information in the civil registration system and the vital statistics derived from this source (register-based vital statistics). The evaluation of vital statistics from other sources that comprise the vital statistics system is discussed in chapter VI.

546. The present chapter provides recommendations on some practices to enhance the quality of civil registration data and subsequently the quality of vital statistics based on these data, including field actions that closely monitor the records of vital events and query practices at the time of registration to ensure that omissions and errors are caught early enough so that the solutions can be incorporated in the original records. The evaluation of vital statistics from civil registration data is discussed from the perspective of reliance on other sources of information with direct and indirect demographic techniques, which are discussed in chapter VI. The present chapter also reviews the use of vital statistics from areas with incomplete registration. This may provide greater understanding of the dynamics of problems and help to design actions to counteract deficiencies, and may in the long run contribute to improve the completeness and accuracy of registration.

547. The quality of data may be measured according to completeness, correctness, availability and timeliness, as follows:

(*a*) Complete registration exists 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. Thus, 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, a vital statistical report is forwarded to the agency responsible for the compilation and production of vital statistics;

(*b*) Correctness or accuracy of registration means that data items for each vital event on the vital record have been accurately and completely filled in, i.e., there are no response errors and there are no missing items. The measurement of any deviation from correctness is called "content error". In registration-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 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 which has been collected, filed, processed and stored in each system (civil registration and vital statistics) is accessible in a user-friendly format to users, upon request;

(*d*) Timeliness in registration implies 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 of the vital statistics programme. It also implies that the production, publication and dissemination of the vital statistics is made prompt enough to serve users' needs.

548. The evaluation of quality of data should address, as a minimum, the level of completeness of civil registration as well as the accuracy and correctness of each item of data, both legal and statistical, which are required for each vital event.

549. Because of the importance of civil registration information and register-based vital statistics, both on an individual record basis as well as 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 considered as essential components of the management, operation and maintenance of the systems. Such critical evaluations are necessary for strengthening and improving systems which have deficiencies and for maintaining high standards of quality in those which are functioning satisfactorily.

550. The responsibility for the establishment and execution of methods of critical evaluation 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 is 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.

A. Evaluating completeness and accuracy of register-based vital statistics

1. *Assessing the completeness of statistical reporting*

551. Coverage errors in vital statistics arise from under- or over-reporting of registration information. As described in chapter III above, after the registration of a vital event an integral step in the production of vital statistics involves the transfer or statistical reporting of information from the civil register to the statistical service, which is accomplished by reproducing the registration form; by transcription onto a statistical report or into electronic format, utilizing microfilm, photocopy or electronic device; or by any other means. Problems arising in this step may result in inaccurate or incomplete statistical reporting. Errors introduced at this stage affect the completeness of national vital statistics in a way similar to under-registration or incomplete reporting of data items. It is also possible to have over-reporting of events resulting from duplicates of statistical reports inadvertently transferred to the statistical service. Duplication also occurs when delayed registrations are made upon request without thoroughly checking whether the birth (or death etc.) was registered earlier. However, the probability is that omissions will far exceed duplications, and in most developing countries not only are there failures in the transmittal of data but the registration of events is often grossly under-reported, thus affecting the completeness of vital statistics. Therefore, it is likely that, due to under-reporting of statistical forms, the level of completeness will be higher in registration than in vital statistics as the contributing factors add up.

(*a*) *Direct assessment*

552. A thorough system, with a clear delineation of responsibility for the receipt and control of received records within the vital statistics system, is essential to ensure the appropriate transmittal of statistical reports through the administrative channels. Careful monitoring of statistical returns from local registrars is necessary to detect problems in statistical reporting. The audit system must provide procedures to ensure that: (*a*) statistical reports from the registration areas are received on a timely basis; (*b*) every registration area has reported their data; (*c*) the frequencies of each type of vital event received 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 (week, 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.

553. Besides these regular querying and monitoring practices, which help to minimize such problems, indirect assessment may be utilized to measure the level of coverage error in statistical reporting and in the resulting vital statistics. Seasonal patterns in births and deaths can be compared with data from previous years to detect changes in the usual pattern. Similarly, the level of any vital statistics measure can be compared with historical trends for that measure; wide divergence from the established trend may indicate a relatively sudden deterioration in data quality.

(*b*) *Indirect assessment*

(*i*) *Comparison of trends*

554. The total number of vital events registered and reported to the statistical agency in any given period (e.g., month, quarter or year) can be compared with the number registered and reported in a previous time period of similar duration. In most cases, the total number will not vary greatly from the later time period to the corresponding previous period, unless some notable event, such as a war, major natural disaster or epidemic has taken place. This should be an important component of the routine audit system. Monthly frequencies of vital 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/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.

(*ii*) *Delayed registration*

555. Regular monitoring of the interval between the date of occurrence and the date of registration of events can provide useful information for assessing the completeness of statistical reporting. The proportion of total registrations that are delayed (or late) provides a rough but easily obtainable estimate of under-reporting 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 system is improving or deteriorating.

556. 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.

557. Information on late or delayed registrations or in delayed transmission of information can provide insight into

other aspects of the vital statistics 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 delay by type of place of birth or death (type of health facility/not in a health facility) may provide some information on the degree of cooperation of health personnel in the registration and reporting process.

(*iii*) *Comparison with census data*

558. If estimates of migration are available, the "balancing equation" can be used to compare inter-censal population growth (the difference between two successive censuses) with inter-censal births, deaths and net migration. If censuses as well as vital and migration records are considered reliable, inter-censal growth should equal the sum of inter-censal births and number of immigrants minus inter-censal deaths and number of emigrants. Assuming that census and migration data are accurate, differences between this sum and inter-censal growth will be due to the under-registration of vital events.[123]

559. In developing countries, these assumptions are often not met 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 only provide an approximate measure of error, one in which it will not be possible to separate the degree of under-registration of births and deaths.

560. 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 one year of age enumerated in the census is compared with the number of live births registered in the 12 months preceding the census, allowing for the number of deaths of these children during those months. The technique provides only a rough measure of under-registration, since the difference between the two data sources may be due in part to incomplete registration of births and infant deaths, errors in the statement of age of enumerated infants or in census under-enumeration of infants. The problems of infant under-enumeration and age misstatement, particularly important in developing countries, greatly limit the usefulness of this method.

(*iv*) *Comparisons of rates observed in similar populations or in previous periods*

561. Crude birth and death rates can be compared with rates from similar populations known to have good registration coverage. A significant difference between the two sources may indicate problems of under-registration, but other factors, such as differences between the age structures of the populations, may confound the comparison. Comparing data with only one other country, as well as actual annual fluctuations in rates of one or both 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 under-reporting. However, if large differences are found, this technique may be valuable as a warning that further examination of the data is warranted.

562. 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). But again, such comparisons can provide an early warning that something may be amiss in the data and that additional checking is called for.

(*v*) *Incomplete data methods: indirect techniques*

563. 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 of these methods can also be used to evaluate registration coverage in various ways: (*a*) birth or death rates estimated through incomplete data methods can be compared with vital rates obtained from civil registration data; (*b*) demographic relationships used in incomplete methods 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 under-registration of vital events. A detailed treatment of these techniques can be found in two United Nations publications.[124]

(*c*) *Advantages of indirect methods*

564. One important advantage of indirect methods is that the level of vital statistics completeness can be readily assessed as soon as data become available. Several methods can be applied at the local or regional levels, as well as the national level, providing a means of identifying the geographic location of any problems. Their ease of application makes these methods suitable for several purposes, such as the regular monitoring of completeness levels, and providing estimates of completeness for campaigns to promote improvements in civil registration.

(*d*) *Limitations of indirect methods*

565. The applicability of indirect methods is limited by a

[123] See Methods of Appraisal of Quality of Basic Data for Population Estimates: Manual II. (United Nations publication, Sales No. E.56.XIII.2), and Manual X: Indirect Techniques for Demographic Estimation (United Nations publication, Sales No.E.83.XIII.2).

[124] Manual X: Indirect Techniques for Demographic Estimation (United Nations publication, Sales No. E.83.XIII.2), and Manual XI: Estimating Adult Mortality (United Nations publication, forthcoming).

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.[125, 126] Owing to declines in both fertility and mortality, the number of countries where these techniques are suitable is small. The methods not requiring the assumption of stability require data from two censuses, [127] and as a result make the indirect methods unsuitable for countries that do not have reliable data from two censuses. 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 of deaths and of the population. In many countries, these conditions are not met. Furthermore, the estimates of complete death registration provided by these methods are always relative to the degree of completeness of census enumeration. This makes the determination of the absolute level of under-registration problematic in many cases.

566. Some of the limitations of indirect methods can be partially overcome. For example, since a much higher rate of under-reporting 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 ages 10 years and above. By restricting the analysis to such a selection of age groups, the assumption that there be no variation in completeness of registration by age may be acceptable. Such adjustments in the methodology reduce the vulnerability of the methods to violations of some assumptions, but no modifications have been devised to reduce the impact of violations of other basic assumptions.[128]

2. *Assessing the accuracy of vital statistics*

567. In addition to errors introduced through the transmission of statistical reports, several other potential sources of error can affect the accuracy of vital statistics data. Erroneous responses, whether due to faulty memory (recall error), refusal to respond, misunderstanding of a question or failure of the registrar to record the response accurately, can have a significant impact on data quality. The accuracy of vital statistics data is also affected by errors in editing and coding of responses, as well as by errors in data processing, including tabulation.

568. Both direct and indirect techniques are available to evaluate the accuracy of items of vital statistics data. In general, indirect methods indicate whether inaccuracies of this type exist, while direct methods not only assess the accuracy of data but also point to likely sources of the problems.

(*a*) *Direct assessment*[129]

569. The direct evaluation of response error in vital statistics data from civil registration can be 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.[130, 131]

570. Cause-of-death data can be evaluated by comparing a sample of death statistics reports with corresponding autopsy reports, hospital records, or by re-interviewing 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 and coordination for this kind of assessment may be obtained from one of the WHO collaborating centres for the classification of diseases listed in the current version of the International Classification of Diseases.[132]

571. Incorrect editing, coding and processing of vital statistics data is another important source of error. The detection of coding errors can be carried out 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 verification of the coding process. A very low level of discrepancy between the original coders and the verifiers can be tolerated in the statistical system, but otherwise discrepancies should be adjudicated.

572. Other assessments of qualitative accuracy information for vital statistics may be undertaken through the use of special sample surveys designed to interview informants and others involved in the provision of registration and vital sta-

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[125] See William Brass, *Methods for Estimating Fertility and Mortality from Limited and Defective Data* (Chapel Hill, University of North Carolina Laboratories for Population Studies, 1975).

[126] See S. Preston, and others, "Estimating the completeness of reporting of adult deaths in populations that are approximately stable", *Population Index*, vol. 46, No. 2 (1980).

[127] See J. Trussell and J. Menken, "Estimating the completeness of registration of deaths and the relative under-enumeration in two successive censuses", *Asian and Pacific Census Forum,* vol. 6, No. 2 (1979).

[128] See N, Bennett and S. Horiuchi, "Estimating the completeness of death registration in a closed population", *Population Index*, vol. 47, No. 2 (1981).

[129] See Handbook of Vital Statistics Systems and Methods, vol I, *Legal, Organizational and Technical Aspects* (United Nations publication, Sales No.E.98.XVII.5).

[130] See E. Kitegawa and P. Hauser, *Social and Economic Differences in Mortality, United States,* 1960 (Boston, Harvard University Press,).

[131] See United States, Center for Health Statistics, *Comparability of Marital Status, Race, Nativity and Country of Origin on the Death Certificate and Matching Census Records.* Vital and Health Statistics Series 2, No. 34, (Washington, D.C., Government Printing Office, 1969).

[132] See WHO, *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision*, (Geneva, 1992), vol. 1.

tistics data. For example, a sample of birth records could be selected and a questionnaire sent to the mother to obtain confirmation of the originally provided information; similarly, from a sample of death certificates a questionnaire might be designed for re-interviewing the informant and/or the medical certifier of the cause of death.

(*b*) *Indirect assessment*[133]

573. A variety of techniques are available for the evaluation of 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 indicate a misunderstanding of the definition of a live birth. Reported ages can be analysed for age heaping (preference for ages ending in 0 or 5 or even digits), using such techniques as the Myers blended method.[134] A large proportion of "unknowns" in any frequency distribution indicates that the distribution should not be considered reliable.

574. Special tabulations can also be used for the evaluation of data quality. For example, cross-classifying date of occurrence and date of registration will indicate the proportion of events reported long after occurrence and hence potentially subject to recall error. Tabulating deaths with medically certified causes of death separately from those with lay certifications of cause is always a good practice, but in addition insights into the relative quality and value of non-medical certifications may arise from comparing the two distributions.

B. Completeness and accuracy of civil registration

575. The level of registration completeness should be examined 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 the area has a record in the system, (*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 the geographic coverage is complete, there are other quantitative and qualitative issues of registration that should be evaluated.

576. The evaluation techniques used to assess both the quantitative and qualitative accuracy of civil registration fall into the same two general categories as the techniques for evaluating vital statistics from civil registration, namely, direct methods and indirect methods.

1. *Direct methods of evaluation*[135]

(*a*) *Types of direct methods*

577. The direct method for the evaluation of the completeness of civil registration involves the direct matching of 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 under-reporting, particularly if the test is carefully designed, and can also improve registration by identifying unregistered vital events.

(*i*) *Use of civil registration records*

578. 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. Although the check for birth records of infant deaths is limited to only a relatively small portion of all births, it is a useful measure since live-born infants who die shortly after birth are particularly susceptible to having their births unregistered. However, the list of infant deaths may also suffer some under-registration, and infants whose deaths are less likely to be registered (infants dying shortly after birth, infants dying in isolated areas) are also unlikely to have had their births registered.

579. The matching of infant death records with birth records can be carried out on a routine basis. When a match is found, the birth records can be routinely marked "Deceased" to prevent the use of the birth certificate of the decedent to obtain fraudulent identification documents.

(*ii*) *Use of administrative and social records*

580. Birth and death records can be matched against a variety of other lists, such as school enrolments, hospital records, baptism and burial records. Although none of these sources can be considered as complete lists of all births or deaths, each set of records can be useful in detecting under-reporting of certain types of vital events. Because of their selectivity,

[133] See Handbook of Vital Statistics Systems and Methods, vol. I; Legal, Organizational and Technical Aspects,(United Nations publication, Sales No.E.91.XVII.5).

[134] See Henry S. Shryock, Jacob S. Siegel and others, *The Methods and Materials of Demography* (United States Bureau of the Census, 1971).

[135] See Henry S. Shryock, Jacob S. Siegel and others, *The Methods and Materials of Demography* (United States Bureau of the Census, 1971).

however, matching based on any one of these lists should not be used to estimate the overall level of registration completeness.

581. 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.

582. Although the matching of records, especially those created under multiple auspices, presents a number of difficulties which must be addressed before the process can be successfully utilized, the linking of records is greatly facilitated by use of new technologies based on electronic processing and improved software matching algorithms.

(*iii*) *Use of lists obtained from population censuses and surveys*

583. 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 under-registration. The matching of census and survey records with those of civil registration may be carried out on a sample basis either at the national or the local level.

(*iv*) *The dual records system.*

584. An extension of the direct matching technique, known as the dual records system, uses two independent procedures to collect information on vital events: one procedure is the civil registration system and the other is a survey. 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,[136, 137] 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.[138]

[136] See C. Chandrasekaran and W.E. Deming, "On a method of estimating birth and death rates and the extent of registration", *Journal of the American Statistical Association,* vol. 44, No. 245 (1949).

[137] See E.S. Marks, William Seltzer and Karol J. Krotki, *Population Growth Estimation: A Handbook of Vital Statistics Measurement* (New York, The Population Council, 1974).

[138] For a summary of the process and specific country applications, see *Handbook of Vital Statistics Systems and Methods,* vol.I, *Legal, Organizational and Technical Aspects* (United Nations publication, Sales No.E.91.XVII.5).

(*b*) *Advantages of direct methods*

585. 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 those of another source, and they may also indicate the sources of under-registration or over-registration.

586. The direct method can be applied at either the national level or at the lowest level of local registration. The local registration offices, at 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.

(*c*) *Limitations of direct methods*

587. 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 independence between 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.

588. In direct comparisons, the matching procedures for records from two sources may present serious difficulties. The matching process can be slow and laborious if not automated, and the selection of appropriate matching criteria is not always straightforward.

589. The introduction of computer matching has greatly reduced the work previously done manually. However, the specification of the detailed rules for computer matching requires even more precision than for a manual process; every possible situation must be anticipated in advance and a decision rule designed for each one. To reduce the complexities of computer matching rules, a compromise approach is to have the computer flag equivocal or questionable matches and set those 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.

590. Other important limitations of direct methods are their expense and the amount of time necessary 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 by a manual review is highly advisable. The cost of obtaining an independent list of records must also be taken into consideration. In addition, there is also a timeliness 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 of evaluation*[139]

591. Indirect methods of evaluating civil registration are the same methods covered earlier in the present chapter for examining the quality of vital statistics. Since vital statistics are generated from the civil registration system any deficiencies found in the statistics can usually be related to the completeness and accuracy of the registration system. Therefore, the indirect methods described in paragraphs 551-574 above for the assessment of the completeness of statistical reporting and the quality of vital statistics are appropriate methods for the evaluation of the underlying civil registration system as well.

C. Choosing appropriate methods to assess completeness and qualitative accuracy of registration data

592. A variety of direct and indirect methods for the evaluation of completeness and accuracy of registration and vital statistics data 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. Chapter VI below reviews the potential and limitations of other demographic data-collection methods and of indirect techniques for the estimation of demographic measures.

593. The design of an evaluation study should address, at a minimum, the requirements set out below:

1. *Objectives*

594. The objectives of the study should be clearly stated, e.g., whether the results will be used to promote improvements in registration, to pinpoint specific problems or for other uses. The ends to which 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 to encourage 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. If the goal is to identify and eliminate specific coverage problems, direct methods are usually more appropriate.

2. *Degree of precision*

595. 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 partly be 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*

596. An important criterion for selecting the most suitable method is the time 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 but time-consuming direct method techniques may be considered.

4. *Type of event to be studied*

597. 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 most 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 vital statistics*

598. The study may be limited to an evaluation of completeness and/or to an assessment of vital statistics accuracy as well. 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 vital statistics accuracy, particularly for 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*

599. Other decisive factors are the amount of funding available for the evaluation study, the availability of skilled analysts, the type 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 view of expected funding levels, particularly if data collection in the field is required to construct a separate list of events. If the necessary questions can be added to an up-

[139] See ibid.

coming 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 dictate the choice of method to be applied, particularly if an indirect method is to be used.

VI. POPULATION CENSUSES AND SURVEYS AS COMPLEMENTARY SOURCES OF A VITAL STATISTICS SYSTEM

600. As stated above, 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. In countries where civil registration is lacking, deficient or insufficiently reliable, other methods of demographic data collection can be used to gather information on the incidence of vital events and to estimate or calculate vital rates; such methods are population censuses, household and demographic sample surveys, sample registration areas. Where civil registration is well established and maintained, these other sources of demographic data are useful for providing independent estimates of demographic parameters which can be used to evaluate the level of completeness of civil registration and vital statistics, and are also useful as complementary sources of demographic and health data. Moreover, population censuses are essential for providing the necessary denominators to calculate vital rates and ratios in combination with civil registration data (numerators). Civil registration data alone, therefore, does not provide the population-at-risk for the calculation of most vital statistics rates. In particular, the utilization of population census data as denominators is indispensable when the civil registration system is not accompanied by a population register.

601. It must be stressed that even though population censuses, sample surveys, sample registration may provide estimates of the current levels of fertility, mortality, foetal mortality, marriage and divorce, they 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. 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 vital events are merely collected as characteristics of 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.

602. The present chapter provides an overview of sources of data on vital events other than from the civil registration system. Realizing that more detailed discussions about these sources of vital statistics are available elsewhere, efforts are made, whenever possible, to provide appropriate references for more detailed reading. The chapter is divided into three sections. In section A, the various sources of demographic and related data are discussed. Section B contains brief notes on available topics, concepts and definitions. Section C provides descriptions of demographic parameters that can be estimated using specific topics from these sources, with summary reference to estimation techniques.

A. COMPLEMENTARY SOURCES OF A VITAL STATISTICS SYSTEM

603. Other than a civil registration system, there are three principal methods for collecting the incidence of vital events to estimate vital statistics rates: population censuses, household sample surveys and sample registration. Each of the three methods has its own advantages and limitations and users should keep them in mind when using these data on vital events from 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 and approximations of the demographic relationships between various characteristics of the population, especially those using indirect techniques, and caution needs to be exercised in their use, particularly when analysing trends and precise levels.

604. In addition to conventional methods of data collection, there are non-conventional sources of data, such as clinic and hospital records. Analysis of data from these sources may help in estimating more precise demographic rates or at least shed some light on the accuracy of the various data sources. Careful review and modifications are needed before one can use these non-standard sources of data for the estimation of vital events and rates.

1. *Population censuses*

605. 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.[140] The essential features of population censuses are individual enumeration, universality within a defined territory, simultaneity and defined periodicity. Data from population censuses can be used to estimate vital rates – mortality, fertility and migration – and to obtain other population characteristics, such as size and distribution. In addition, population censuses furnish data on numerators and denominators to the lowest geographical area, which allow for planning and follow-up on micro levels. And censuses provide the sample frame for demographic and health surveys and other

[140] See *Principles and Recommendations for Population and Housing Censuses, Revision 1* (United Nations publication, Sales No.E.98.XVII.8).

specialized studies. Finally, census data provide the denominators of population at risk for the calculation of vital statistics and rates based on the civil registration system.

606. Population censuses have their disadvantages, too. They are prone to non-sampling errors and they are poor mechanisms for gathering detailed data in specific fields, such as health, epidemiology, nutrition and income. Data from censuses should be complemented by sample surveys when detailed and more specialized studies are needed. Although basic information on individuals is collected through censuses, population censuses alone cannot serve the legal purposes of administrative records. The data collected in censuses are not normally organized to provide documentation for individuals or designed for the retrieval of individual information for legal and administrative objectives, and administrative purposes are therefore poorly served by these types of data. In addition, data collected from censuses are subject to memory lapse, mis-statements of age, and reference-period errors. Another limitation is the frequency of conducting the censuses, usually every 10 years, which is not frequent enough to provide regular feedback for the proper managing and monitoring of population and development programmes. Data from population censuses are usually supplemented by large sample and/or small tailor-designed surveys.

607. Since census data are necessary 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 and globally. For example, *Principles and Recommendations for Population and Housing Censuses: Revision 1*[141] and other United Nations handbooks give 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 from time to time to incorporate development 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*

608. 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 generating data on vital events to estimate demographic parameters. Questions and probes are generally more detailed than in population censuses. Moreover, because of smaller size, sample surveys tend to employ better qualified and trained field workers than in the population censuses.

609. Household sample surveys, depending on their design, provide a basis for updating census information at the national level or for broad geographical and administrative divisions. The relationship between population censuses and household/demographic sample surveys is essentially a complementary one, between an infrequent but geographically detailed cross-section represented by a census and a relatively more frequent time series. More detailed information is provided by sample surveys. Such 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. However, large household/demographic surveys, conducted on a regular basis, are relatively costly and the information they provide may be subject to many types of errors resulting from the interviewing process. Furthermore, data obtained through sample surveys are also subject to sampling errors.

(*a*) *Single-round retrospective household sample survey methods*

610. 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 two types of single-round retrospective surveys or include a specific set of questions in other multi-purpose national sample surveys. In the first case, one type of sample survey makes use of a short questionnaire, similar to questions incorporated in a census schedule. The other uses an individual extended questionnaire for a well defined sub-sample of the population, along with a household questionnaire applied to all households and household members in the sample. However, it is recommended that a single-round retrospective survey that employs a short questionnaire be adopted when the intention is to: (*a*) produce broad estimates of fertility, child and adult mortality; or (*b*) design the pattern of marital status, etc. In these sample surveys, a set of retrospective questions similar to those commonly used for population censuses are included in the survey questionnaire to obtain the vital events for estimating demographic parameters for a list of recommended topics for use in these types of enquiries as well as population censuses, see paras. 628-644 below.

611. It should be realized that the quality of data obtained from these types of sample surveys is usually better than those collected in a census, mainly because better qualified and trained field workers are employed since only a sample of the population is covered. Furthermore, quality and operational control procedures are usually done in more efficient ways. A retrospective survey of this type is also more suitable than a census for paraphrasing questions in the most desirable way and for using probing questions since there is more time available for each interview.

[141] United Nations publication, Sales No.E.98.XVII.8.

612. These types of sample surveys, however, have a number of limitations. The same type of errors referred to for population censuses (mis-statement of age, memory lapses, reference-period error etc.) can also affect data collected by this approach. Moreover, sample surveys allow for the estimation of demographic parameters for the country as a whole and, in some cases, depending on the sample size, for its major civil divisions (regions, provinces, states) as well as by type of residence (urban/rural). It should be borne in mind that, although data derived in this way are of higher quality than data from population censuses, they may not be useful for accurate monitoring and evaluation purposes because they are not undertaken on a regular basis. Furthermore, due to sample size constraints, they are not appropriate at the local area level or in areas where experimental projects are implemented.

613. Many countries include a module or set of questions on vital events and other demographic issues in household surveys planned to measure employment, revenues or standard of living to estimate the necessary demographic parameters. These questions allow for studying the relationship between the demographic and other socio-economic variables. Subsequently, the estimation of demographic variables by socio-economic subgroups can be made, such as by the poverty level of the household.

(*b*) *Individual in-depth single-round retrospective sample survey*

614. Since the 1970s, countries have been conducting specialized surveys concerned with very specific issues, such as fertility, infant and child mortality, reproductive health and morbidity. These types of surveys are known as individual in-depth single-round retrospective surveys that use extended individual questionnaires, including a birth history and/or pregnancy history (maternity history). A number of survey programmes, such as those of the World Fertility Survey programme (WFS), the Demographic and Health Surveys programme (DHS), the Pan Arab Project for Child Development (PAPCHILD), and most recently the Pan Arab Programme for Family Health Surveys (PAPFAM), were designed in a uniform manner with, however, more flexibility to accommodate specific national needs (the last two examples cover the Arab region only). Questionnaires have been designed in participating countries, using core documents as the starting point and modifying or adding modules to suit country needs. A household schedule, including the basic demographic questions, is usually used together with the individual module as the document for listing persons and for providing basic data for computation of demographic parameters.

615. In these surveys, a birth history or a pregnancy history is included and completed for each woman of reproductive age (or any other well defined sub-universe of women, e.g., ever-married women of 15 to 49 years of age). Because more detailed information is collected, a birth history offers a richer set of data for analysis. For instance, infant and child mortality rates and age-specific fertility rates can be calculated for a number of years prior to the survey. Because numerators and denominators are generally derived from the same source, they allow for direct estimation of levels, patterns and trends of fertility and infant/child mortality.

616. Experience drawn from analysing data obtained from these surveys has shown, however, that maternity histories are not free of several sources of error arising from dates of births and deaths, age mis-statements and under-reporting of children. Systematic errors can remain even when detailed questionnaires are used. The most important disadvantage of the birth-history approach is in the difficulty of obtaining accurate data on the timing of all births. Another potential drawback concerns the universe from which data are gathered. First of all, only those women surviving up to the survey date are interviewed, with the result that there is no record of the fertility of the women who did not survive, an important omission if mortality during reproductive ages is high and if the mortality of women is related to the level of fertility and child/infant mortality. Migration could also have an important effect on rates calculated. Therefore, in most recent surveys of this type only the information coming from the last five years is used for the calculation of rates.

617. Despite these limitations, birth histories are the most adequate way to collect information on fertility and child/infant mortality by in-depth retrospective sample surveys. When analysed in conjunction with other personal histories (marriage histories, work histories etc.), birth histories are a valuable research tool for finding the relationship between demographic behavior and socio-economic status.

618. In some in-depth retrospective surveys, particularly in the latest DHS and PAPCHILD surveys, a set of questions on survival of sisters have been included in order to broadly estimate maternal mortality through verbal autopsies (information on symptoms by a proxy, usually with non-medical training). In these surveys, a detailed list of sisters of the respondent, their current age if alive and their age at death if not alive are also included. This information allows for a direct estimation of maternal mortality. In some countries, estimates derived from these data have allowed the establishment of the magnitude of the incidence of maternal deaths. However, there is considerable doubt regarding the reliability and usefulness of estimates derived from these questions. Moreover, although they provide an estimate of maternal mortality some time in the past (i.e., retrospectively) they are not useful for assessing current levels. In recent years, efforts have been made to estimate current levels but the usefulness of such estimates is questionable. Causes of death collected through this approach for health interventions may not be accurate as they are reported by lay persons.

619. These types of surveys can be a very appropriate in-

strument for data collection of marriage patterns and family formation. Questions about marital status can be asked in a more detailed manner, allowing for a richer analysis of marriage in different cultural settings. For example, in the WFS programme many countries have included a full marriage history, including dates of the first and subsequent marriages, by type and dates of ending marriage by the reason for ending (death, divorce, separation). The detailed data on marriage allow for a richer analysis of patterns of family formation and dissolution and remarriage. It has been stated that data derived from changes in marital status are important to understand the dynamic changes to family formation and household establishment, which also helps to understand the family cycle.

(*c*) *Follow-up household sample survey method*

620. In order to collect relatively high-quality information countries should consider the use of other data-collection methods, such as follow-up sample surveys, in which a prospective approach is followed for the collection of current data on fertility, nuptiality and mortality. In this approach, cluster samples of households are interviewed repeatedly within certain periods of time (e.g., twice every six months). An inventory of all resident members of the household and certain basic particulars are recorded in the first round. At each subsequent round, changes in the household composition since the last interview are recorded, including information on births, marital status, deaths and in- and out-migration among members of the household. To improve the reports on infant deaths, a question on whether or not the interviewed woman in her child bearing period is pregnant at the time of each interview should be recorded. Thus, in the subsequent rounds the outcome of those pregnancies can be obtained and infant deaths, neonatal deaths and maternal deaths can be recorded.

621. The advantages of this type of data-collection method are evident. The follow-up survey method, which involves re-interviewing, permits correction of inconsistent data found in previous rounds. It also allows the inclusion of a retrospective survey, for example in the last used round of the follow-up survey, so that two different approaches can be made to measure fertility and mortality without significantly increasing the cost. Some countries have used this method to evaluate two approaches for measuring fertility and mortality.

622. Among the disadvantages is the need for a large sample in order to secure a sufficient number of births and deaths, which have a low frequency of occurrence in the population, especially when differentials are to be studied. Other drawbacks of this method are related to timing, cost and administration. The field work itself is never less than two years, to which the time required for advance planning and data processing must be added. The cost is larger compared to that of a single-round retrospective survey because of the need to maintain well trained staff during the whole period of the field work. On the administrative side, a number of surveys taken in various countries have proven the difficulty of maintaining high standards of quality since the commitment of the interviewers, enthusiasm and 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 are subject to omission, including death occurring to heads of households, for several reasons. Deaths occurring to heads of households often lead to the dissolution of households and present problems of locating individuals in the sample of households in subsequent rounds.[142]

(*d*) *Sample registration*

623. Many countries where civil registration systems are not fully developed, can adopt sample registration to register vital events and estimate the vital rates. They record vital events on a continuous basis as in a full civil registration system. If properly conducted and gradually expanded, sample registration can develop into a national civil registration system. In this case, a well prepared plan of expansion should be adopted from the beginning. The main drawback of this approach is that it does not provide vital rates estimates for the local level. Moreover, the denominators for calculating the demographic rates must come from population censuses.

(*e*) *Dual records system*

624. In some countries, the sample registration (or survey) can be complemented by a quarterly or semi-annually retrospective survey in the selected sample areas by independent field workers to collect information on births and deaths. This system is known as a dual records system.

625. It is an important method of collecting vital statistics data through household demographic sample surveys on a continuous basis. It is a special case of the follow-up survey method, which allows for the validation of information from two reporting sources, both based on survey techniques. In the dual record system, two independent records are collected on each vital event occurring in the selected sample areas. These two records are established through a continuous registration and through a periodical survey (e.g. undertaken every six months). An example of a successful dual record system is the Indian Sample Registration System.[143] The events reported in the two systems are then matched and the unmatched events are field-verified to insure that events belong to the sample area and have occurred during the refer-

[142] See *The Follow-up Method in Demographic Sample Surveys* (United Nations publication, Sales No.E.90.XVII).

[143] See Sunil K. Sinha, "Sample registration system in India", Office of the Registrar General of India", paper contributed by the Office of the Registrat-General of India to an East and South Asian workshop on strategies for accelerating the improvement of civil registration and vital statistics systems, Beijing, 29 November–3 December 1993, organized by the United Nations Statistics Division, in cooperation with the United Nations Population Fund, (document ESAWCRVS/93) updated August 1998.

ence period. Thus, for each calendar year there are three types of events: those matched (reported by both systems), and those missed by one but caught by the other and vice-versa. In some instances, a fourth category is added to reflect the event which might have been missed by the two systems of recording.

626. This procedure, in addition to eliminating errors due to duplicate recording or enumeration, also helps to identify possible sources of distortion. It also has several other advantages, such as: (*a*) minimization of recall biases and improvement of coverage of vital records through the retrospective survey; (*b*) provision of reliable estimates of fertility and mortality and other health indicators for policy formulation in the health sector;[144] (*c*) use of independent sources that provide both the numerator and denominator for estimating the vital rates; and (*d*) use of the function of checking the coverage of a national registration system by matching the registered vital events against the survey results.[145]

627. A major constraint in developing a dual records system is the cost and maintenance of the independence of the two collection sources. The establishment and maintenance of such a system is comparatively more expensive than a multi-round survey, for example. Moreover, the dual records system, as other household sample surveys, provides estimates of vital rates only at the subnational and national levels, which means that it is not suitable for local use and evaluation.

B. Available information on vital events and rates

628. In the preceding paragraphs a brief review of various sources of fertility, mortality and morbidity data were presented. The present section provides a brief review of how these data can be used to derive the number of births, deaths and marriages, along with fertility and mortality rates and ratios.

629. 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 which discuss these methods and their limitations in detail.[146] 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 situation, it is sometimes desirable to use indirect estimation techniques to arrive at 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 as such should be used with caution. Sometimes, due to changes in established relationships resulting from such factors as use of contraception, the underlying assumptions are found to have changed in most countries so that the estimated parameters are distorted.

1. *Live births*

(*a*) *Current fertility*

630. Information about live births in the recent past from censuses and sample surveys serves the purpose 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 to estimate 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 five-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.

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

631. The most straightforward means to enumerate live births is to ask, in the course of a census or retrospective 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.

(*ii*) *Date of birth of last child born alive*

632. As an alternative to direct questions, census and survey planners prefer to ask directly from or for each woman of childbearing age in the household, usually women aged between 15 and 50 years, the date of birth of her most recent live-born child. The woman is also asked to provide the survival status of the child at the time of the inquiry and the sex of the child in order to improve the estimation of infant mortality and of sex differentials in infant mortality (see para. 651 below).

633. The inclusion of these questions may be more suitable for use in sample surveys than in censuses insofar as they are time-consuming and complex. One option is to ask these questions of a sub-sample of women in a census. It is important that the sample be selected so that all data are collected from the same women or from a sub-sample of those women, in order to ensure that the data can, as appropriate, be cross-classified in tabulations and used collectively for analytical

[144] See Eli S. Marks, William Seltzer and Karol J. Krotki, *Population Growth Estimation: A Handbook of Vital Statistics Measurement* (New York, Population Council, 1974), chap. IV.

[145] See C. Chandrasekaran and W.E. Deming, "On a method of estimating birth and death rates and the extent of registration", *Journal Of American Statistical Association*, vol. 44, No. 245 (1949).

[146] See Henry S. Shryock, Jacob S. Siegel and others, *The Methods and Materials of Demography* (United States Bureau of the Census, 1971).

purposes.[147] This is particularly important if it is also intended to ask questions on lifetime fertility in order to derive indirect estimates of fertility and correct current fertility estimates (see paras. 635-639 below).[148]

634. National census practice lends support to the conclusion that it is prudent and cost-effective to utilize the opportunity provided to include these questions in censuses, not only where vital registration is weak but also where the costs of periodic surveys are high. Accordingly, current principles and recommendations regarding population and housing censuses support their inclusion.

(*b*) *Lifetime fertility: children ever born alive*

635. Even the most focused and best-worded questions 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 dates, in the age of women, of omission of births and generally of exact recall of events, in particular by older women, still occur.[149] In addition, some women may have had more than one live birth in 12 months and only the last is counted. It is, however, preferred to collect data on children ever born to the woman in her entire lifetime for correction of the current age-specific fertility rates (for a detailed discussion of such methodologies, see paras. 645-664 below).

636. Children ever born are all 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 (for details, see paras. 647-649 below).

637. 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, 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 or 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 or the census", (*f*) "the total number of daughters born alive who have died before the census date".[150]

638. 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 at least be asked 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 avoid any error of analysis due to misinterpretation of the women included.

639. In some countries, the information on children ever born and children surviving can be distorted by errors in the reported number of children or in the reported age of women, so that cross-classification can be erroneous. Such distributions will cause gross errors of estimation of fertility.[151]

2. *Deaths*

(*a*) *Child mortality*

640. Information on deaths can be obtained from information gathered through 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; children ever born to the women and number of surviving children according to the age of mother (see paras. 630-639 above) and duration of conjugal union; and 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. From questions on pregnancy history, information can be obtained 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*

641. Adult mortality may also be estimated on the basis of census information although results tend to be less satisfactory than for the estimation of fertility and infant and child mortality. The following items of information are useful for deriving estimates of adult mortality: parity-specific death rates; distribution of deaths by sex and age from the respective questions in the inquiry; distribution of population by

[147] See *Principles and Recommendations for Population and Housing Censuses, Revision 1*, (United Nations publication, Sales No. E.98.XVII.8), paras, 2.119, 2.136; and *Handbook of Population and Housing Censuses*, part II, *Demographic and Social Characteristics*, (United Nations publication, Sales No. E.91.XVII.9), para. 17.

[148] Questions on lifetime fertility have sometimes been found to be more easily entered into surveys than censuses; see *Manual X: Indirect Techniques for Demographic Estimation* (United Nations publication, Sales No. E.83.XIII.2), and *Handbook of Vital Statistics Systems and Methods*, vol. 1, *Legal, Organizational and Technical Aspects*, (United Nations publication, Sales No. E. 91.XVII.5), para. 531.

[149] See *Manual X: Indirect Techniques for Demographic Estimation*, (United Nations publication, Sales No. E.83.XIII.2), paras.31–41.

[150] See *Principles and Recommendations for Population and Housing Censuses, Revision 1*, (United Nations publication, Sales No. E.98.XVII.8), paras. 2.126 to 2.132; and the guidelines regarding specific census questions, in *Handbook of Population and Housing Censuses*, part II, *Demographic and Social Characteristics*, (United Nations publication, Sales No. E.91.XVII.9).

[151] See *Manual X: Indirect Techniques for Demographic Estimation*, No. 81 (United Nations publication, Sales No. E.83.XIII.2), chap. II.

sex and age in the inquiry. If certain assumptions are met, survival probabilities can be derived from two censuses during the interim period (for more details, see paras. 650-657 below).

3. *Nuptiality: characterization of marital status of a population*

642. Nuptiality is a primary subject of vital statistics, and information on marital status can be usefully estimated from censuses where civil registration is absent or deficient. Moreover, the cross-sectional data approach of a census may be a better source to study the civil status of a population, because the legal acts of marriage and divorce that are recorded in civil registration reflect only part of the dynamics of couple formation, dissolution, and co-residence.[152] For example, unions and separations that are consensual and not legally sanctioned—de facto unions and de facto separations—are rarely registered. Nevertheless, such non-statutory states can be captured and documented on the basis of censuses and other field enquiries. Censuses and other field enquiries can also include information on the status of the population with respect to the share of customary marriages (binding under customary law) and consensual unions (that are extralegal) among de facto unions. Similarly, some aspects of marital status, such as age at marriage, are more easily derived from censuses and other large-scale enquiries than from the processing of registration data. Accordingly, it is advisable that a census enquiry, wherever is possible to obtain detailed data from individuals and households, includes for every individual the current marital status (married, widowed, legally separated or divorced), adapted to the prevailing conditions of the country. In each case, these characteristics should be presented according to age[153] and sex. Although censuses and sample surveys are good methods to obtain nuptiality data, in many countries of the world the range of marital status categories provided in these enquiries do not adequately describe the prevalence of statutory marriage combined with relatively stable de facto unions outside marriage due to the reluctance of individuals and households to provide such data.

643. In addition, censuses and surveys provide information on date at first marriage, or alternatively, on age at first marriage and marriage duration. Information on duration of first marriage in the case of marital dissolution is important for estimating fertility by duration of marriage in countries where enquiry on marriage duration yields better data than does age reporting for women.[154]

644. Data on nuptiality from censuses and surveys can be used to derive estimates of mean age at marriage, proportion of married, widowed, divorced and married but separated, mean duration of fertile union etc. They could also be used to derive nuptiality tables. However, they cannot be utilized to estimate marriage and divorce rates.

C. TECHNIQUES FOR ESTIMATION OF VITAL RATES AND RATIOS

645. 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 attempt to develop techniques that might help to evaluate data and produce plausible estimates. As a result, there has been an important development of indirect techniques of demographic estimation, mainly during the 1970s and early 1980s. 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 fertility and mortality (child, infant, adult, maternal) estimates. In the absence of accurate and timely data, indirect estimates have provided the most important information available in many developing countries.

646. In order to assist countries the United Nations published *Manual X: Indirect Techniques for Demographic Estimation*[155] for utilization in estimating fertility and mortality in the absence of direct and reliable estimates. Manual is the most complete compilation to date of methods suitable for application to incomplete or defective demographic data and estimation of demographic measures. It includes the basic hypotheses underlying the various indirect methods, and presents examples of how to apply the methods, including some guidance on the interpretation of the results. A broad description of some these techniques is set out below.

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[152] *Handbook of Vital Statistics Systems and Methods*, vol. 1, *Legal, Organizational and Technical Aspects*, (United Nations publication, Sales No. E. 91.XVII.5), para. 520.

[153] See *Principles and Recommendations for Population and Housing Censuses, Revision 1*, (United Nations publication, Sales No. E.98.XVII.8), paras. 2.96-2.103 and 2.118; and recommendations for questions, in *Handbook of Population and Housing Censuses*, part II, *Demographic and Social Characteristics*, (United Nations publication, Sales No. E.91.XVII.9), paras. 8-15.

[154] See *Handbook of Vital Statistics Systems and Methods*, vol. I; *Legal, Organizational and Technical Aspects*, (United Nations publication, Sales No. E. 91.XVII.5), paras. 545-546 and 548; *Principles and Recommendations for Population and Housing Censuses, Revision 1*, (United Nations publication, Sales No. E.98.XVII.8), paras. 2.119 and 1.142; and *Manual X: Indirect Techniques for Demographic Estimation*, (United Nations publication, Sales No. E.83.XIII.2), chap. II.

[155] United Nations publication, Sales No. E.83 XIII.2.

1. *Estimates of fertility*

(*a*) *Children ever born*

647. 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*

648. 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 and net reproduction rates. In order to improve the quality of data on current fertility, all women of reproductive age are asked about the date of their last child born alive instead of the traditional question on births in the past year. Since data contain errors as previously discussed, a number of methods for adjusting the data have been proposed, such as adjusting the level upwards to correspond with the level of the experience of fertility of all women in their younger ages, that is, under 35 years of age. This group is regarded as providing the most accurate information. Moreover, a number of improvements were introduced to the original method.[156] Methods of adjusting data and calculation of these rates are clearly explained in chapter II of Manual X.

(*c*) *Own children method*

649. 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 is made and age-reporting of both mothers and children is good, the "own-child" 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.[157] 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 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. The own-child method can also help in mortality estimation.

2. *Estimates of mortality*

650. Mortality estimates for different age and sex groups can be made by the indirect method, using retrospective data on children ever born alive and surviving, survival of mother and father, and survival of first spouse. The number of children ever born alive and the number of surviving children (or the number of children who have died up to the census or survey date) may be transformed into estimates of mortality in infancy and childhood. For estimates of adult mortality, data collected from retrospective surveys on orphanhood and widowhood may be used. The combination of those estimates then can lead to the estimation of a complete pattern of mortality by age and sex.

(*a*) *Childhood mortality*

651. 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 probability of dying before attaining certain age of childhood so as to estimate infant and child mortality. The method is considered one of the most powerful tools to estimate child mortality in the absence of reliable civil registration data, and has been elaborated by researchers into a number of variants: to provide estimates when based on duration of marriage (where age data are poor); under conditions of declining mortality and fertility; and to employ 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.[158]

652. An assumption of this method, that the children of women in the different age groups experience the same level of mortality, affects mainly the results coming from women under 25 years old. This method allows for the estimation of the time period before the census or survey in which death occurred.

653. The "own-child" (see para. 649) measurement of fertility is a method that may also be applied to the measure-

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[156] See ibid.; and E. Arriaga "Estimating fertility from data on children ever born, by age of the mother", research document , No.11 (Washington, D.C., United States Bureau of the Census, 1983).

[157] 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 *Manual X: Indirect Techniques for Demographic Estimation*, (United Nations publication, Sales No. E.83.XIII.2), chapter VIII.

[158] See William Brass, *Methods for Estimating Fertility and Mortality from Limited and Defective Data* (Chapel Hill, University of North Carolina Laboratories for Population Studies, 1975); the methodology is elaborated in *Manual X: Indirect Techniques for Demographic Estimation*, (United Nations publication, Sales No. E.83.XIII.2), chap. III; the census recommendations may be found in *Principles and Recommendations for Population and Housing Censuses, Revision 1*, (United Nations publication, Sales No. E.98.XVII.8), paras. 2.126 to 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*, (United Nations publication, Sales No. E.91.XVII.9).

ment of mortality of infants and children.[159]

(*b*) *Adult mortality (general)*

654. Answers to questions on the survival status of mother and father, or on the first spouse, form the basis of estimation of adult mortality rates. Information on the survival of parents or spouses is usually obtained from single-round retrospective surveys, although a number of countries have included that in their censuses too.

655. The orphanhood and widowhood data may be converted into the probability of dying before the attainment of certain adult ages, starting in adulthood. These estimates, derived from respondents of different age-groups, represent averages of mortality over the period of time that the relatives were exposed to the risk of dying. As with the estimation of child and infant mortality, the reference period can also be estimated. If the same data are available from two consecutive surveys, 5 or 10 years apart, it would be possible to produce estimates for the inter-censal period.

(*c*) *Maternal mortality*

656. As mentioned above, in some surveys, questions regarding the survival of sisters have been included. Using an indirect technique developed by Graham, Brass and Snow[160] it is possible to obtain an estimation of level of maternal mortality for a period around 10-12 years before the surveys. In some DHS surveys, the information collected on survival of sisters is more complete, allowing the calculation of a "direct" measure of maternal mortality[161] for the two quinquennial periods before a survey. The time of reference of this type of "direct" estimation is then closer to the survey. The evaluation[162] of these procedures has shown that the quality of estimates is not assured, even when asking a detailed history of sister's survival. In both cases, maternal deaths are probably under-reported (mainly those related to abortions). These could be partially compensated for by an over-report of maternal deaths, which occur when respondents declare a non-maternal death as a maternal death.

3. *Advantages and limitations of indirect techniques*

657. 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. However, as noted above, the same data from single-round retrospective sample surveys will usually not permit estimates below the national level. In addition, the underlying conditions of the models used should be considered, as well as the inaccuracies in the demographic information used as a basis for the mortality estimates.

658. Although these techniques have been tested on data obtained from statistically developed countries,[163] they may not work in all cases because of violation of underlying assumptions. In addition, quality of data vary from one enquiry to the other, depending on numerous factors, including planning and implementation of these surveys and censuses. They also provide estimates at the country and major divisions levels only, and they may be of a limited value for monitoring and evaluation of population and health programmes because they do not produce annual estimations of rates.

(*a*) *Fertility estimates*

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

660. Regarding the lifetime fertility, in addition to the reporting problems, there will be children that 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, so that unless fertility has been constant these estimates overstate the fertility level during the period of its decline and understate the situation in the period of increasing fertility.

(*b*) *Mortality estimates*

661. Data by age of mother on children born alive and still living are available from a number of population censuses and single-round retrospective surveys, which provide mortality estimates for the childhood period. The advantage of using census data for this purpose is that data are available for the country as a whole as well as for the major political

[159] See Samuel H. Preston and Alberto Palloni "Fine-tuning Brass-type mortality estimates with data on ages of surviving children", *Population Bulletin of the United Nations*, No. 10 (United Nations publication, Sales No. E. 78.XIII.6).

[160] See W. Graham, W. Brass, and R. Snow "Estimating maternal mortality: the sisterhood method". *Studies in Family Planning*, vol.20, No.3.

[161] See ibid.; see also N. Rutemberg, T. Boerma, J. Sullivan and T. Croft "Direct and indirect estimates of maternal mortality, with data on the survivorship of sisters: results from Bolivia DHS" paper presented at the annual meeting of the Population Association of America, Toronto, 3 - 5 May 1990.

[162] See WHO/UNICEF/UNFPA "Inter-country consultation on maternal mortality estimates, Washington, D.C., 20-22 April 1998"; WHO and UNICEF. The sistehood and method for estimating maternal mortality: guidance notes for potenial users" (document WHO/RHT/98.27); and C. Stanton, N. Abderrahim and K. Hill *DHS Maternal Mortality Indicators: an Assessment of Data Quality and Implications for Data Use*, DHS Analytical Report, No.4 (Calverton, Maryland, Macro International, 1997).

[163] John Blacker "Experiences in the use of special mortality questions in multi-purpose surveys: the single round approach", in *Data Bases for the Measurement of Mortality* (United Nations, publication, Sales No. E.83.XIII.3).

subdivisions to satisfy some of the public health programme needs.

662. Because data used for the estimation of mortality in adulthood data on survivorship of parents or of spouses are generally obtained from sample surveys, the estimates will be feasible for the country as a whole but generally not for the geographical subdivisions. However, the most important issue is that the estimation of adult mortality derived from these sources seems to be less satisfactory than those obtained for infant mortality.[164] However, some authors consider that, with the introduction of some additional questions about whether parents died before or after respondent married, one can overcome many of the limitations of the method.

663. Such questions such as "Is your mother (or father) still alive?" are questions of fact which the respondent should be able to answer accurately for the orphanhood method. There are exceptions, however, such as 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 may respond in terms of the adopted parents rather than the natural parents. Deaths of childless couples will be missed as well as those of persons who were never married. Over-counts may occur in the case of parents with more than one child among the respondents. In addition, there is a real problem in putting the events in the proper time-frame.

664. The questions of surviving spouses in the widowhood method applies only to the ever-married population. Therefore, implicit in the method is the assumption that the mortality risk of the never-married population is similar to that of the ever-married. The model also assumes that there has not been a change in the levels of mortality and nuptiality, and that the survival of the respondent is independent of that of the spouse. These assumptions do not generally hold in the real situation. There are other problems, such as obtaining information on spouses from the first marriage in case of remarriage and eliciting accurate age information. In the latter case, it may be possible to use duration of marriage for the inference of the length of exposure to the risk of dying if it is determined that the information on the duration of marriage can be obtained more accurately than the age of spouse.

[164] See K. Hill, "An evaluation of indirect methods for estimating mortality", in *Methodologies for Collection and Analysis of Adult Mortality Data*, J. Vallin , J. H. Pollard and L. Helligman, eds. (Liège, Belgium, Ordina Editions, 1984).

4. *Conclusion*

665. To conclude, there is no single source or approach that adequately serves the needs for vital statistics for a variety of uses. Estimates of fertility, mortality and nuptiality from data collected in population censuses and household and demographic surveys are valuable and complementary to 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 socio-economic planning; they are not substitutes for a well established system, which provides data that is free of coverage and sampling errors.

666. In population censuses or sample surveys, data on live-born children should, preferably, be collected for each woman of childbearing age and 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 born in a place other than the place of usual residence.

667. If in a population census or sample survey it is not feasible to obtain information for never-married women, information on total live births should at least be collected 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 avoid ambiguity in 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.

668. A country's selection of topics to be investigated will depend on its needs for information and on the resources available, with particular attention to be given to the number and types of questions that would be practicable for inclusion in the survey or population census questionnaire. The inclusion of too many items usually has an adverse effect on the quality of the data to be collected. Therefore, it is desirable to limit the number of questions and the length of time necessary to complete each questionnaire in order to improve the quality and usefulness of the information collected.

Annex 1

Annual Tabulation Programme of Vital Statistics compiled from Civil Registration Data
Outlines of Essential Tables

Contents

∗ Page numbers of individual tables are indicated in the minimal list of tabulations contained in Section B.

A. Elements of an annual tabulation programme

1. Introduction

1. For national and subnational purposes, an annual programme of tabulation of vital statistics should provide data classified in accordance with needs for the study of the incidence, patterns, time trends and geographic 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 agencies and, wherever possible, conform with recommendations for achieving international comparability.

2. The design of the tabulation programme should maximize the utilization of available information. In formulating the tabulation programme, consideration should focus 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 chap. II, para. 264, and chap. V). 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 a way that 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 minimal list of tabulations set out in Section B below is limited to tabulations appropriate to data collected by the civil registration method. The tabulation plan is only intended to serve as a guide to the preparation of vital statistics. The list is structured by type of vital event and is followed in Section C below by a set of outlines of most of the tables listed that 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 occurrence and by place of residence, for the country as a whole and for its civil divisions.

2. Scope and objectives of tabulations

6. The purposes of the tabulations described below are twofold. They are designed mainly to acquaint users with types of tables that the vital statistics office would be able to prepare both for the purposes of presenting data and for evaluating the quality of vital statistics, that is:

- First, to provide examples of basic tabulations that may be produced annually from the topics recommended in chapter II, and that meet minimum national data needs and enhance international comparability**.** Most of them are graphically illustrated;
- Second, to present tabulations for administrative purposes that are 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 a suggested minimum basic annual programme. It does not include all the topics shown in the list provided in chapter II, paragraph 86, but focuses on those topics which are considered as a minimal list to meet specific users and country needs. It is offered as a guide to countries which may need to modify and expand it 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 which are identifiable within that country. Regional and other geographic 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 comprised of counts of population groups from which the events counted in the numerators arose (population-at- risk). For most rates, the

denominators are usually obtained from separate data sources, such as population censuses, population registers, if available, or population estimates. Therefore, it is essential that careful attention be given to the harmonization of definitions and classifications used in sources from which numerators and denominators are obtained.

3. Tabulation principles

9. Tabulation principles have been provided in chapter II, paragraphs 263 to 279, 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 geographic area and include events for all population groups within the area occurring during the specified time period (see paras. 58, 264 and 265).

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 where these relate to persons included in the population denominator for potential national rates, such as deaths to tourists or 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. 273).

12. In the event that the registration area is limited to one part of the country, the tabulation programme and geographic detail shown needs 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. 266-272).

14. *Tabulations by place of occurrence and place of residence.* Final annual tabulations should be made 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 geographic areas less than the total national territory, major civil divisions, minor civil divisions and cities should for analytic purposes be made according to place of usual residence. However, as discussed in paragraphs 273 to 277, place of occurrence tabulations required for administrative purposes or evaluation of registration coverage need to be prepared (chap. II, see para. 277, for designation of the place of residence of the reference person for each type of event).

4. Minimal 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, appropriate rates and ratios (see chap. II, paras. 279-283); text to indicate the qualifications of the data necessary for the users to interpret and understand the data, 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. Where a comprehensive system does not exist, some modification of the principles set forth in chap. II, paragraphs 263 to 279 will be necessary and a more limited tabulation programme 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 that regularly process vital statistics may serve as a tool for promoting coordination within the system, between the ministry responsible for civil registration and the one with authority to prepare vital statistics.

17. In order to facilitate a summary appraisal of the scope of the tabulation programme, the minimal list set out in Section B 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 C below. 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 UNESCO on the classification of education and the ILO on education.

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, for example, tables to assist in the evaluation of completeness in registration, timeliness and accuracy of content.

[a] Geneva, WHO, 1992.

19. Vital statistics compiled from registration data are basic tools for designing, evaluating and monitoring health and administrative programmes for 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, that is 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 geographic 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 amount of available variables in order to undertake more in-depth studies. To that end, countries may wish to design special tabulations.

B. Minimal list of tabulations *

LIVE BIRTHS (LB)

Deaths (DE)

* Tabulations are sequentially numbered within each type of vital event in the list. Tabulation formats are illustrated in Section C below, on the pages indicated. 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 format illustration.

Infant Mortality (IM)

Foetal Deaths (FD)

Live Births and Foetal Deaths (LB-FD)

Marriages (MA)

Divorces (DI)

Summary Tables (ST)

LB-l. Live births by place of occurrence and sex of child

Place of occurrence	*Sex of child*			
	Both sexes	*Male*	*Female*	*Not stated*
TOTAL				
Urban				
Rural				
Major civil division A[a]				
Urban				
Rural				
Minor civil division A[a]				
Urban				
Rural				
City or town A[a]				
City or town B[a]				
(etc.)				
Major civil division B[a]				
Urban				
Rural				
Minor civil division B1[a]				
Urban				
Rural				
City or town A[a]				
City or town B[a]				
(etc.)				
Minor civil division B2[a]				
(etc.)				
Major civil division Z[a]				
Urban				
Rural				
Minor civil division Z1[a]				
Urban				
Rural				
City or town A[a]				
City or town B[a]				
(etc.)				
Minor civil division Z2[a]				
(etc.)				

Classifications:

(a) Place of occurrence (paras. 94 and 95): (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. If birth registration coverage is less than 90 per cent complete, then use only major and minor civil divisions which register births;

(b) Sex (para. 131): male; female; not stated.

NOTE: 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.

[a]Name of major civil division, minor civil division, city, town.

LB-2. Live births by place of occurrence and place of usual residence of mother

Place of occurrence	*Place of usual residence of mother*			
	Total	*Same as place of occurrence*	*Other*	*Not stated*
TOTAL				
Urban				
Rural				
Major civil division A[a]				
Urban				
Rural				
Minor civil division A[a]				
Urban				
Rural				
City or town A[a]				
City or town B[a]				
(etc.)				
Major civil division B[a]				
Urban				
Rural				
Minor civil division B1[a]				
Urban				
Rural				
City or town A[a]				
City or town B[a]				
(etc.)				
Minor civil division B2[a]				
(etc.)				
Major civil division Z[a]				
Urban				
Rural				
Minor civil division Z1[a]				
Urban				
Rural				
City or town A[a]				
City or town B[a]				
(etc.)				
Minor civil division Z2[a]				
(etc.)				

Classifications:

(a) Place of occurrence (paras. 94 and 95): (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;

(b) Place of usual residence of mother (paras. 104-107): same as place of occurrence, other, not stated

NOTE: 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 is their residence or in other geographic locations. 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, 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.

[a]Name of major civil division, minor civil division, city, town.

LB-3. Live births by place of registration, month of occurrence and month of registration

Place of registration and month of occurrence	*Month of registration*						
	Total	*January*	*February*	....	*November*	*December*	*Not stated*
TOTAL							
January							
February							
March							
April							
May							
June							
July							
August							
September							
October							
November							
December							
Not stated							
Major civil division A (same as for TOTAL)							
(etc.)							

Classifications:

(a) Place of registration (paras. 94 and 95: (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;

(b) Month: January, February, March, April, May, June, July, August, September, October, November, December, not stated.

NOTE: Time lags between date of birth and date of registration are useful information 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 geographic areas of the country or delays with a seasonal pattern.

LB-4. Live births by month, place of occurrence and place of usual residence of mother

Place and month of occurrence	*Total*	*Place of usual residence of mother*		
		Same as place of occurrence	*Other*	*Not stated*
TOTAL				
January				
February				
March				
April				
May				
June				
July				
August				
September				
October				
November				
December				
Not stated				
Major civil division A (as for TOTAL)				
Major civil division B (as for TOTAL)				
(etc.)				

Classifications:

(a) Place of occurrence (paras. 94 and 95): (i) total country; (ii) each major civil division. Distinguish urban and rural for (i),(ii) and as may be required for national use;

(b) Month of occurrence: January, February, March, April, May, June, July, August, September, October, November, December, not stated;

(c)Place of usual residence of mother (paras. 104-107): same as place of occurrence, other, not stated.

NOTE: The knowledge about the month of occurrence of live births provides information required to establish time series and seasonal patterns important for short-term forecasting, for vaccination and immunization programmes and to monitor the reporting flows of vital records from registration units to the compiling office. The tabulations of live births by month also allows for the calculation of crude birth rates by both, place of occurrence and place of usual residence at national and subnational levels. The denominator to calculate such crude rates is usually the mid-year total population, developed from population censuses and adjusted for the time lapsed since the last census.

LB-5. Live births by age, place of usual residence and marital status of mother

Age and place of usual residence of mother	*Total*	*Marital status of mother*						
		Single	*Lawfully married*	*Other unions*	*Widowed*	*Divorced*	*Separated*	*Not stated*
TOTAL								
Under 15 years								
15-19								
20-24								
25-29								
30-34								
35-39								
40-44								
45-49								
50 and over								
Not stated								
Urban								
15-19								
20-24								
25-29								
30-34								
35-39								
40-44								
45-49								
50 and over								
Not stated								
Rural								
15-19								
20-24								
25-29								
30-34								
35-39								
40-44								
45-49								
50 and over								
Not stated								
Major civil division A								
(as for TOTAL)								
Minor civil division A								
(as for total)								
(etc.)								
Major civil division B								
(as for TOTAL)								
(etc.)								

Classifications:

(a) Place of usual residence (paras. 104-107): (i) total country; (ii) each major civil division; (iii) each minor civil division. Distinguish urban and rural for (i), (ii), (iii) and as may be required for national use;

(b) Marital status (paras. 168-174): (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. Some countries may wish to tabulate this table for the father, and should therefore decide on the age grouping for the father.

NOTE: The tabulation of live births by age of mother, both alone and in conjunction with such other items as birth order, marital status and occupation, is essential to the study of fertility and fertility differentials and is useful for the formulation of welfare and social policy, such as family planning.

LB-7. Live births by place of usual residence, age and educational attainment of mother

Place of usual residence and age of mother	*Total*	*Educational attainment of mother*							
			Primary education		*Secondary education*		*Higher education*		
		No schooling	*Completed*	*Not completed*	*Completed*	*Not completed*	*Completed*	*Not completed*	*Not stated*
TOTAL									
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 A (as for TOTAL)									
Major civil division B (as for TOTAL)									
(etc.)									

Classifications:

(a) Place of usual residence of mother (paras. 104-107): (i) total country; (ii) each major civil division. Distinguish urban and rural for (i),(ii) and as may be required for national use;

(b) Age of mother (paras. 121-124): (i) under 15 years; (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;

(c) Educational attainment of mother (paras. 180-181): (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 not stated.

NOTE: 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 to calculate such detailed fertility schedules is usually provided by population censuses, adjusted for the time lapsed since the last census, e.g., the mid-year total population by same age groups and levels of education.

LB-8. Live births by educational attainment and age of mother and live-birth order

Educational attainment and age of mother	*Total*	*Live-birth order*						
		First	*Second*	*Third*	*Fourth*	...	*Tenth and over*	*Not stated*
TOTAL								
Under 15 years								
15-19								
20-24								
25-29								
30-34								
35-39								
40-44								
45-49								
50 and over								
Not stated								
No schooling								
(As for TOTAL)								
Primary education not completed								
(As for TOTAL)								
Primary education completed								
(As for TOTAL)								
Secondary education not completed								
(As for TOTAL)								
Secondary education completed								
(As for TOTAL)								
Higher education not completed								
(As for TOTAL)								
Higher education completed								
(As for TOTAL)								
Education not stated								
(As for TOTAL)								

Classifications:

(a) Age of mother (paras. 121-124): (i) under 15 years; (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;

(b) Educational attainment of mother (paras. 180 and 181): (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 not stated;

(c) Live-birth order (para. 150): (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.

NOTE: 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 socio-economic variables, such as the educational attainment of the mother.

LB-9. Live births by place of usual residence and age of mother, sex of child and live-birth order

Sex of child and age and place of residence of mother	*Total*	*Live-birth order*						
		First	*Second*	*Third*	*Fourth*	...	*Tenth and over*	*Not stated*
TOTAL								
Both sexes								
Under 15 years								
15-19								
20-24								
25-29								
30-34								
35-39								
40-44								
45-49								
50 and over								
Not stated								
Male (same as both sexes)								
Female (same as both sexes)								
Major civil division (as for TOTAL)								

Classifications:

(a) Place of usual residence of mother (paras. 104-107): (i) total country; (ii) each major civil division. Distinguish urban and rural for (i),(ii) and as may be required for national use;

(b) Sex (para.131): male; female;

(c) Age of mother (paras. 121-124): (i) under 15 years; (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;

(d) Live-birth order (para. 150): (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.

NOTE: This table provides relevant information for the calculation of 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 to calculate such rates is the female population by age, usually provided by population censuses, adjusted for the time lapsed since the last census, e.g., the mid-year total population.

LB-10. Live births by live-birth order and interval between last and previous live births to mother

Live-birth order of last live-birth	*Total*	*Interval between last and previous live births*									
		Under 12 months	*12-17 months*	*18-23 months*	*24-29 months*	*30-35 months*	*3 years*	*4 years*	*5-9 years*	*10 years and over*	*Not stated*
TOTAL											
First											
Second											
Third											
Fourth											
Fifth											
Sixth											
Seventh											
Eighth											
Ninth											
Tenth and over											
Not stated											

Classifications:

(a) Live-birth order (para. 150): (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;

(b) Interval between last and previous live births (paras. 156-158): (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.

NOTE: This table 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.

LB-11. Live births by ethnic and/or national group and place of usual residence and age of mother

Place of usual residence, ethnic and/or national group of mother	*Total*	*Age of mother (years)*									
		Under 15	*15-19*	*20-24*	*25-29*	*30-34*	*35-39*	*40-44*	*45-49*	*50 and over*	*Not stated*
TOTAL											
Each national and / or ethnic group for which separate information is required, and ethnic group not stated											
All others											
Not stated											
Major civil division A (As for TOTAL)											
...											
Major civil division Z (As for TOTAL)											

Classifications:

(a) Place of usual residence of mother (paras. 104-107), as may be required for national use, should be related to (i) total country; (ii) each major civil division. Distinguish urban and rural for (i),(ii) and as may be required for national use;

(b) Ethnic and/or national group of mother (paras. 186 and 187): each national and / or ethnic group for which separate information is required, all others and ethnic group not stated;

(c) Age of mother (paras. 121-124): (i) under 15 years; (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.

NOTE: This table provides data necessary to assess the ethnic pattern of live births and to study fertility differentials by ethnic group. Data should be presented for each ethnic or national subgroup, where data are available and numbers are sufficient to allow the calculation of reliable estimates (e.g., for largest ethnical groups only). Information on ethnicity is important from a social policy perspective, in terms of educational attainment and entry into the labour force.

LB-12. Live births by place of usual residence and age of mother and legitimacy status

Place of usual residence and age of mother	*Total*	*Legitimacy status*		
		Born within wedlock	*Born out of wedlock*	*Not stated*
TOTAL				
TOTAL country				
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 A (as TOTAL Country)				
Major civil division Z (as TOTAL Country)				

Classifications:

(a) Place of usual residence of mother (paras. 104-107), as may be required for national use, should refer to: (i) total country, (ii) major civil division;

(b) Age of mother (paras. 121-124): (i) under 15 years; (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;

(c) Legitimacy status (paras. 132-136): (i) born within wedlock (legitimate); (ii) born out of wedlock (illegitimate).

NOTE: 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 analytic measures useful in describing patterns of out-of-wedlock births.

LB-13. Live births by place of occurrence, site of delivery and attendant at birth

Place of occurrence and site of delivery	*Total*	*Attendant at birth*						
		Physician	*Nurse*	*Nurse-midwife*	*Midwife*	*Other paramedical personnel*	*Lay person*	*Not stated*
TOTAL								
Hospital								
Other institutions								
Private home								
Other								
Major civil division A (as for TOTAL)								
...								
Major civil division Z (as for TOTAL)								

Classifications:

(a) Place of occurrence (paras. 94 and 95): (i) total country; (ii) each major civil division;

(b) Site of delivery (para. 228): (i) hospital; (ii) other institutions; (iii) private home; (iv) other;

(c) Attendant at birth: (para. 212): (i) physician; (ii) nurse; (iii) nurse-midwife; (iv) midwife; (v) other paramedical personnel; (vi) lay person;(vii) not stated.

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.

LB-14. Live births by site of delivery, attendant at birth and birth weight

Site of delivery and attendant at birth	*Total*	*Birth weight (grams)*					
		Under 500	*500-999*	*1,000-1,499*	*...*	*4,500-4,999*	*5,000- and over*	*Not stated*
TOTAL								
Physician								
Nurse								
Nurse-midwife								
Midwife								
Other paramedical personnel								
Traditional birth attendant								
Lay person								
Not stated								
Hospital (as for TOTAL)								
Other institutions (as for TOTAL)								
Private home (as for TOTAL)								
Other (as for TOTAL)								

Classifications:

(a) Site of delivery (para. 228): (i) hospital; (ii) other institutions; (iii) private home; (iv) other

(b) Attendant at birth (para. 212): (i) physician; (ii) nurse; (iii) nurse-midwife; (iv) midwife; (v) other paramedical personnel; (vi) lay person (grams);(vii) not stated;

(c) Birth weight (paras. 137 and 138:) (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.

NOTE: 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 getting adequate care during the perinatal period. These counts may be used as denominators in detailed analyses of perinatal, neonatal and infant mortality.

LB-15. Live births by birth weight and place of usual residence and educational attainment of mother

Place of usual residence of mother and birth weight	*Educational attainment of mother*								
			Primary education		*Secondary education*		*Higher education*		
	Total	*No schooling*	*Completed*	*Not completed*	*Completed*	*Not completed*	*Completed*	*Not completed*	*Not stated*
TOTAL									
Under 500 grams									
500 - 999									
1,000- 1,499									
1,500- 1,999									
2,000- 2,499									
2,500- 2,999									
3,000- 3,499									
3,500- 3,999									
4,000- 4,499									
4,500- 4,999									
5,000 or more									
Not stated									
Major civil division A (as for TOTAL)									
...									
Major civil division Z (as for TOTAL)									

Classifications:

(a) Place of usual residence of mother (paras. 104-107): (i) total country; (ii) major civil division. Distinguish urban and rural for (i),(ii) and as may be required for national use;

(b) Birth weight (grams) (paras. 137 and 138): (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;

(c) Educational attainment of mother (paras. 180 and 181): (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 not stated.

NOTE: 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 development problems during infancy and is highly correlated with infant mortality. Statistics on birth weight cross-classified by socio-economic statistics of the family, as measured by the level of education of the mother, for example, are particularly important for targeting subpopulation groups in need of prenatal care and medical services after birth. This information indicates the relationship between family socio-economic status and infants' health (measured by the rate of low birth weight and infant mortality).

LB-16. Live births by gestational age and birth weight

Place of usual residence of mother and gestational age	*Total*	*Birth weight (grams)*						
		Under 500	*500-999*	*1,000-1,499*	*...*	*4,500-4,999*	*5,000- and over*	*Not stated*
TOTAL								
Under 20 weeks								
20-21 weeks								
22-27 weeks								
28-31 weeks								
32-35 weeks								
36 weeks								
37-41 weeks								
42 weeks and over								
Not stated								
Major civil division A								
(As for TOTAL)								
...								
Major civil division Z								
(As for TOTAL)								

Classifications:

(a) Place of usual residence of mother (paras. 104-107): (i) total country; (ii) each major civil division;

(b) Gestational age (paras. 142 and 143): (i) under 20 weeks; (ii) 20-21; (iii) 22-27; (iv) 28-31; (v) 32-35; (vi) 36; (vii) 37-41; (viii) 42 and over; (ix) not stated

(c) Birth weight (grams) (paras. 137 and 138): (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.

NOTE: This tabulation provides important information 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.

LB-17. Live births by birth weight, place of usual residence of mother and month in which prenatal care began

Birth weight and place of usual residence	*Month in which prenatal care began*													
	First trimester				*Second trimester*				*Third trimester*				*No prenatal care*	*Not stated*
	Total	*Month 1*	*M 2*	*M 3*	*Total*	*M4*	*M5*	*M6*	*Total*	*M7*	*M8*	*M9*		
TOTAL														
Under 500 grams														
500 - 999														
1,000- 1,499														
1,500- 1,999														
2,000- 2,499														
2,500- 2,999														
3,000- 3,499														
3,500- 3,999														
4,000- 4,499														
4,500- 4,999														
5,000 or more														
Not stated														
Major civil division A (As for TOTAL)														
...														
Major civil division Z (As for TOTAL)														

Classifications:

(a) Birth weight (grams) (paras. 137 and 138): (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;

(b) Place of usual residence of mother (paras. 104-107): (i) total country; (ii) each major civil division. Countries may wish to extend the breakdown to (iii) minor civil division and major cities and towns;

(c) Month in which prenatal care began (paras. 144 and 145): (i) single month, each trimester totals;(ii) no prenatal care;(iii); (iv) not stated.

NOTE: 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.

LB-18. Live births by age and place of usual residence of mother and by month in which prenatal care began

Age and place of usual residence of mother	*Month in which prenatal care began*													
		First trimester			*Second trimester*				*Third trimester*				*No prenatal care*	*Not stated*
	Total	*Month 1*	*M 2*	*M 3*	*Total*	*M4*	*M5*	*M6*	*Total*	*M7*	*M8*	*M9*		
TOTAL														
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 A (As for TOTAL)														
...														
Major civil division Z (As for TOTAL)														

Classifications:

(a) Age of mother (paras. 121-124): (i) under 15 years; (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;

(b) Place of usual residence of mother (paras. 104-107): (i) total country; (ii) each major civil division. Countries may wish to extend the breakdown to (iii) minor civil division and major cities and towns;

(c) Month in which prenatal care began (paras. 144 and 145): (i) single month, each trimester totals; (ii) no prenatal care; (iii) not stated.

NOTE: There is a strong relationship between adequate prenatal care and pregnancy outcome. This table 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 the age of the mother allows a deeper analysis and more effective action in areas that start later with prenatal attention.

LB-19. Live births by live-birth order, place of usual residence of mother and month in which prenatal care began

Live-birth order and place of usual residence of mother	*Month in which prenatal care began*													
	First trimester				*Second trimester*				*Third trimester*				*No prenatal care*	*Not stated*
	Total	*Month 1*	*M 2*	*M 3*	*Total*	*M4*	*M5*	*M6*	*Total*	*M7*	*M8*	*M9*		
TOTAL														
First														
Second														
Third														
Fourth														
Fifth														
Sixth														
Seventh														
Eighth														
Ninth														
Tenth and over														
Not stated														
Major civil division A (As for TOTAL)														
...														
Major civil division Z (As for TOTAL)														

Classifications:

(a) Live birth order (para. 150): (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;

(b) Place of usual residence of mother (paras. 104-107): (i) total country; (ii) each major civil division. Countries may wish to extend the breakdown to (iii) minor civil division and major cities and towns;

(c) Month in which prenatal care began (paras. 144 and 145): (i) single month, each trimester totals;(ii) no prenatal care; (iii) not stated.

NOTE: There is a strong relationship between adequate prenatal care and pregnancy outcome. This table 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 deeper analysis and more effective action by studying the differences related to experience in pregnancy.

DE-1. Deaths by place of usual residence and sex of decedent

Place of residence and urban/rural distribution	*Sex*			
	Both sexes	*Male*	*Female*	*Not stated*
TOTAL				
Urban				
Rural				
Major civil division A[a]				
Urban				
Rural				
Minor civil division A[a]				
Urban				
Rural				
...				
Major civil division B[a]				
Urban				
Rural				
Minor civil division B1[a]				
Urban				
Rural				
...				
...				
Major civil division Z[a]				
Urban				
Rural				
Minor civil division Z1[a]				
Urban				
Rural				

Classifications:

(a) Place of usual residence (paras. 104-107): (i) total country; (ii) each major civil division; (iii) each minor civil division. Distinguish urban and rural for (i), (ii) and (iii);

(b) Sex (para. 131): male; female; not stated.

NOTE: This tabulation provides data needed for studying the geographic distribution of deaths. These data are used to calculate crude death rates at national and subnational levels. The denominator is usually obtained from population census figures, adjusted for the time elapsed since the last census.

[a]Name of major civil division, minor civil division, city, town.

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												
Urban												
Rural												
Major civil division A[a]												
Urban												
Rural												
Minor civil division A[a]												
Urban												
Rural												
(etc.)												
Major civil division B[a]												
Urban												
Rural												
Minor civil division B1[a]												
Urban												
Rural												
(etc.)												
(etc.)												
Major civil division Z[a]												
Urban												
Rural												
Minor civil division Z1[a]												
Urban												
Rural												
(etc.)												

Classifications:

(a) Place of occurrence (paras. 94 and 95): (i) total country; (ii) each major civil division; (iii) each minor civil division. Distinguish urban and rural for (i), (ii) and (iii);

(b) Place of usual residence (paras. 104-107): same as place of occurrence, other, not stated;

(c) Sex (para. 131): male; female

NOTE: 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.

[a]Name of major civil division, minor civil division, city or town.

DE-3. Deaths by month and place of occurrence and place of usual residence of decedent

Place and month of occurrence	*Total*	*Place of usual residence of decedent*		
		Same as place of occurrence	*Other*	*Not stated*
TOTAL				
January				
February				
March				
April				
May				
June				
July				
August				
September				
October				
November				
December				
Not stated				
Major civil division A (same as for TOTAL)				
(etc.)				

Classifications:

(a) Place of occurrence (paras. 94 and 95): (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;

(b) Month of occurrence: January, February, March, April, May, June, July, August, September, October, November, December, not stated;

(c) Place of usual residence of decedent (paras. 104-107): (i) same as place of occurrence; (ii) other; (iii) not stated.

NOTE: The comparison of deaths by place of occurrence and place of residence by month is useful for administrative purposes and for interpreting geographic and temporal (seasonal) patterns of mortality and the distribution of medical facilities in relation to place of residence and place of death. Frequencies of deaths down to the smaller civil division by month of occurrence can assist in monitoring the performance of the civil registration system.

DE-4. Deaths by place of registration, month of occurrence and month of registration

Place of registration and month of occurrence	*Total*	*Month of registration*					
		January	*February*	....	*November*	*December*	*Not stated*
TOTAL							
January							
February							
March							
April							
May							
June							
July							
August							
September							
October							
November							
December							
Not stated							
Major civil division A (same as for TOTAL)							
(etc.)							

Classifications:

(a) Place of registration (paras. 94 and 95): (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;

(b) Month: January, February, March, April, May, June, July, August, September, October, November, December, not stated.

NOTE: 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 geographic areas of the country or delays with a seasonal pattern.

DE-5. Deaths by place of occurrence and site of occurrence

Place of occurrence	*Total*	*Site of occurrence (type of place of occurrence)*				
		Hospital	*Other institutions*	*Private home*	*Other*	*Not stated*
TOTAL						
Urban						
Rural						
Major civil division A						
Urban						
Rural						
Minor civil division A1						
Urban						
Rural						
(etc.)						
Major civil division Z						
Urban						
Rural						
Minor civil division Z1						
Urban						
Rural						
(etc.)						

Classifications:

(a) Place of occurrence (paras. 94 and 95): (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;

(b) Site of occurrence (para. 228): (i) hospital; (ii) other institutions; (iii) private home; (iv)other; (v) not stated.

NOTE: This table is useful for the analysis of the numbers of deaths occurring in hospitals, other institutions, in public places and at home for each geographic subdivision of the country. Such data are helpful in planning for medical facilities and health manpower.

DE-6. Deaths by place of usual residence, age and sex of decedent

Age (in years) and place of usual residence and urban/rural distribution	*Sex*			
	Both sexes	*Male*	*Female*	*Not stated*
TOTAL				
Under 1 year				
1				
2				
3				
4				
1 - 4				
5				
6				
7				
8				
9				
5 - 9				
10-14				
15 - 19				
20 - 24				
...				
95 - 99				
100 and over				
Not stated				
Urban (Same as for TOTAL)				
Rural (Same as for TOTAL)				
Major civil division A				
Urban (Same as for TOTAL)				
Rural (Same as for TOTAL)				
(etc.)				
Major civil division Z				
Urban (Same as for TOTAL)				
Rural (Same as for TOTAL)				
(etc.)				

Classifications:

(a) Place of residence (paras. 104-107): (i) total country; (ii) each major civil division. Countries may wish to extend the breakdown to (iii) minor civil division and major cities and towns. Distinguish urban and rural for (i), (ii) and (iii).

(b) Sex (para. 131): male; female; not stated;

(c) Age (paras. 121-126): under one 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.

NOTE: 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.

DE-7. Deaths by age, sex, place of usual residence and marital status of decedent

Age, sex, and place of usual residence of decedent	*Total*	*Marital status of decedent*						
		Single	*Lawfully married*	*Other unions*	*Widowed*	*Divorced*	*Separated*	*Not stated*
TOTAL								
Both sexes								
Under 15 years								
15-19								
20-24								
25-29								
30-34								
...								
80-84								
85 and over								
Not stated								
Male								
Female (same as for both sexes)								
Major civil division A (same as for TOTAL)								
(etc.)								

Classifications:

(a) Place of usual residence (paras. 104-107): (i) total country; (ii) each major civil division. Countries may wish to extend the breakdown to (iii) minor civil division and major cities and towns;

(b) Sex (para.131): male; female;

(c) Age (paras. 121-126): under 15 years, 5-year age groups to 84 years, 85 and over, not stated;

(d) Marital status (paras. 168-174): (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.

NOTE: Age and sex are important determinants of mortality. 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 epidemiologic analyses, including studies of the levels and trends in widowhood.

DE-8. Deaths by place of usual residence, age, sex and educational attainment of decedent

Place of usual residence, age and sex of decedent	*Educational attainment of decedent*								
			Primary education		*Secondary education*		*Higher education*		
	Total	*No schooling*	*Completed*	*Not completed*	*Completed*	*Not completed*	*Completed*	*Not completed*	*Not stated*
TOTAL									
Both sexes									
Under 15 year									
15-19									
20-24									
25-29									
30-34									
...									
80-84									
85 and over									
Not stated									
Male									
(same as for both sexes)									
Female									
(same as for both sexes)									
Major civil division A									
(same as for TOTAL)									

Classifications:

(a) Place of usual residence (paras. 104-107): (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;

(b) Sex (para. 131): male; female;

(c) Age (paras. 121-126): under 15 years, 5-year age groups to 84 years, 85 and over, not stated;

(d) Educational attainment of the decedent (paras. 179-181): (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.

NOTE: The education 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.

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)*													
	All ages	*Under 1*	*1*	*2*	*3*	*4*	*5-9*	*10-14*	*15-19*	*20-24*	*25-29 ...*	*80 - 84*	*85 and over*	*Not stated*
TOTAL														
Both sexes														
Causes of death should be in accordance with the International Classification of Diseases: a. Mortality list 1 b. Mortality list 2														
Male														
(As for both sexes)														
Female														
(as for both sexes)														
Major civil division (optional) (same as for TOTAL)														

Classifications:

(a) Cause of death (paras. 216-223): classification of cause of death should be based on the latest revision of the International Statistical Classification of Diseases and Related Health Problems.[a] *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 category, with or without four-character category. For publication of data and international comparison, tabulations should be made in accordance to mortality list 1 or mortality list 2.* 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.

(b) Sex (para. 131): male; female;

(c) Age (paras. 121-126): 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;

(d) Place of usual residence (paras. 104-107): (i) country; (ii) each major civil division (optional). Countries may wish to distinguish urban and rural/urban and rural for (i) and (ii) for national use.

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 for health promotion, planning and evaluation, as well as important components of other social programmes and for population analyses. The most important application of such data is to provide information for the determination of public health policy.

[a]Currently the *Tenth Revision* (Geneva, World Health Organization, 1992); see vol. I.

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								
Major civil division A								
(etc.)								
Major civil division Z								

Classifications:

(a) Place occurrence (paras. 94 and 95): (i) country; (ii) each major civil division. Countries may wish to distinguish urban and rural for (i) and (ii) for national use;

(b) Sex (para.131): male; female;

(c) Type of certification (para. 215): (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.

DE-12. Maternal deaths by cause of death and age of woman

Cause of death and place of usual residence	*Age of woman (years)*										
	Total	*Under 15*	*15-19*	*20-24*	*25-29*	*30-34*	*35-39*	*40-44*	*45-49*	*50 and 0ver*	*Not stated*
TOTAL											
Causes of death in accordance with the International Classification of Diseases related to pregnancy or aggravated by the pregnancy or its management except for accidental or incidental causes											
Major civil division (optional) (same as for TOTAL)											

Classifications:

(a) Cause of death (paras. 216-223): classification of cause of death should be based on the latest revision of the International Statistical Classification of Diseases and Related Health Problems.[a] *For the purpose of international reporting of maternal mortality, only those maternal deaths that occurred while pregnant or before the end of the 42nd day after the termination of pregnancy should be included in the tabulation, 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. In countries where medical certification of cause of death is incomplete or limited to certain areas, figures for death not medically certified should be published separately;*

(b) Age of the woman (paras. 121-124): (i) under 15 years; (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;

(c) Place of usual residence (paras. 104-107): (i) country; (ii) each major civil division (optional). Countries may wish to distinguish urban and rural for (i) and (ii) for national use.

NOTE: The numbers of maternal deaths for each civil division of residence and for the country as a whole by cause form the numerators of the calculations of age- and cause-specific maternal mortality rates and ratios. For the ratios, the denominators are usually the live births that have occurred within same period of time, and for the rates they are usually the appropriate denominator of estimated mid-year female population or are derived from censuses.

[a]Currently the *Tenth Revision* (Geneva, World Health Organization, 1992); see vol.1.

ID-1. Infant deaths by place of occurrence and place of usual residence of mother

Place of occurrence	*Place of usual residence of mother*			
	Total	*Same as place of occurrence*	*Other*	*Not stated*
Total				
Major civil division A				
Major civil division B				
(etc.)				

Classifications:

(a) Place of occurrence (paras. 94 and 95): (i) total country; (ii) each major civil division. Countries may wish to extend the breakdown to (iii) minor civil division and major cities and towns;

(b) Place of usual residence of the mother (paras. 104-107): same as place of occurrence, other, not stated.

NOTE: This table gives data used to estimate the level and patterns of infant deaths by sex, that is, deaths occurring before one 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, socio-economic 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.

ID-2. Infant deaths by month of occurrence and sex and age of child

Month of occurrence	*Age of child*				
	Total	*Under 7 days*	*7 to 27 days*	*28 days to under 1 year*	*Not stated*
TOTAL					
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					
Not stated					
Male					
(same as TOTAL)					
Female					
(same as TOTAL)					

Classifications:

(a) Month of occurrence: January, February, March, April, May, June, July, August, September, October, November, December, not stated;

(b) Sex (para. 131): male; female; not stated;

(c) Age of the child (paras. 121-125:) (i) under 7 days; (ii) 7 to 27 days; (iii) 28 days to under 1 year; (iv) not stated.

NOTE: The tabulation of infant deaths by month of occurrence is useful for analytic purposes, such as finding seasonal patterns in the distribution of infant deaths, as well as for monitoring purposes.

ID-3. Infant deaths by place of usual residence of mother and age and sex of child

Place of usual residence of mother and age of child	*Sex*			
	Both sexes	*Male*	*Female*	*Not stated*
TOTAL				
Under 1 day				
1 day				
2 days				
3 days				
4 days				
5 days				
6 days				
7-13 days				
14-20 days				
21-27 days				
28 days and up and not including 2 months				
2 months				
3 months				
4 months				
...				
11 months				
Not stated				
Major civil division A (same as for TOTAL)				
(etc.)				
Major civil division Z (same as for TOTAL)				

Classifications:

(a) Place of usual residence (paras. 104-107): (i) total country; (ii) each major civil division. Countries may wish to extend the breakdown to principal cities or towns;

(b) Age of the infant (paras. 121-125): classification of the age of the infant should be based on the latest revision of the International Statistical Classification of Diseases and Related Health Problems.[a]

(c) Sex (paras. 131):(i) male;(ii) female;(iii) not stated.

NOTE: The tabulation of infant deaths by specific age is in accordance with the World Health Organization's recommendations for special statistics for infant mortality. Age is an important variable in the study of infant mortality. The impact of biological versus environmental factors can be seen in the proportion of infants who die shortly after birth (e.g., under 1 day, less than one week or less than one month) compared with those who survive the first month of life but die before attaining one year of age. These data are essential for the calculation of such key public health measures as the perinatal mortality rate, the neonatal mortality rate and the infant mortality rate.

[a]Currently the *Tenth Revision* (Geneva, World Health Organization, 1992); see vol. 2.

ID-4. Infant deaths by cause of death, place of residence of mother and sex and age of child

Place of 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 and up*	*2 months*	*...*	*11 months*	*Not stated*
TOTAL														
Both sexes														
Causes of death of infant mortality should be in accordance with the International Classification of Diseases for infant and child mortality: a. Tabulation list 3 b. Tabulation list 4														
Male (same as for both sexes)														
Female (same as for both sexes)														
Major civil division A (same as for TOTAL)														
(etc.)														
Major civil division Z (same as for TOTAL)														

Classifications:

(a) Place of residence of mother (paras. 104-107): (i) total country; (ii) each major civil division. Countries may wish to extend the breakdown of the place of residence up to principal cities or towns;

(b) Sex (para. 131): (i) male, (ii) female;

(c) Age of the infant (paras. 121-125): classification of the age of the infant should be based on the latest revision of the International Statistical Classification of Diseases and Related Problems.[a]

(d) Cause of death (paras. 216-223): classification of cause of death should be based on the International Statistical Classification of Diseases and Related Health Problems.[b] *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 category, with or without four-character category. For publication of data and international comparison, tabulations should be made in accordance to mortality tabulation list 3 or list 4 for infant and child mortality.*

NOTE: This is a key tabulation for the investigation of infant mortality and the public health programmes aimed at its reduction. Epidemiologic analyses by geographic areas of the country looking for patterns of preventable causes are essential for the elimination or reduction of deaths to infants from controllable causes.

[a]Currently the T*enth Revision* (Geneva, World Health Organization, 1992); see vol. 2.
[b]Ibid.; see vol.1.

ID-5. Infant deaths by place of usual residence of mother and incidence of birth registration

Place of usual residence of mother	*Total*	*Birth registration*		
		Birth registered	*Birth not registered*	*Not stated*
TOTAL				
Major civil division A[a]				
Minor civil division A[a]				
(etc.)				
Major civil division B[a]				
Minor civil division B1[a]				
(etc.)				
(etc.)				
Major civil division Z[a]				
Minor civil division Z1[a]				
(etc.)				

Classifications:

(a) Place of occurrence (paras. 94 and 95): (i) total country; (ii) each major civil division; (iii) each minor civil division. Countries may distinguish urban and rural for (i), (ii) and (iii);

(b) Birth registration (para. 146): (i) birth registered; (ii) birth not registered; (iii) not stated.

NOTE: This is a useful tabulation for monitoring the 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 the birth registration. It is also useful information for record linkages of infant and live birth records for purposes of research on infant mortality.

[a]Name of major civil division or minor civil division.

FD-1. Foetal deaths by age and place of usual residence of mother and sex of foetus

Age and place of usual residence of mother	*Total*	*Sex of foetus*			
		Male	*Female*	*Unknown*	*Not stated*
TOTAL					
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 A [optional] (As for TOTAL)					
...					
Major civil division Z [optional] (As for TOTAL)					

Classifications:

(a) Place of usual residence of mother (paras. 104-107), as may be required for national use, should be related to (i) total country,(ii) each major civil division (optional);

(b) Age of mother (paras. 121-124): (i) under 15 years; (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;

(c) Sex of the foetus (para. 131): (i) male, (ii) female,(iii) unknown, (iv) not stated.

NOTE: This is useful in medical research into women's histories of foetal death, particularly as a proxy measurement of pregnancy wastage. Public health programmes aimed at improved maternal health and the reduction of perinatal mortality use these data for planning and evaluation.

FD-4. Foetal deaths by place of usual residence of mother, sex and birth weight

Place of residence of mother and sex	*Total*	*Birth weight (grams)*					
		Under 500	*500-999*	*1,000-1,499*	*. . . 4,500 4,999*	*5,000 and over*	*Not stated*
TOTAL							
Both sexes							
Male							
Female							
Major civil division A (as for TOTAL)							
Minor civil division A (optional) (as for TOTAL)							
Major civil division B (as for TOTAL)							
Minor civil division B (optional) (as for TOTAL)							
(etc.)							

Classifications:

(a) Place of residence (paras. 104-107): (i) total country; (ii) each major civil division; (iii) minor civil division (optional). Countries may wish to extend the breakdown up to principal cities or towns;

(b) Sex (para. 131): male, female;

(c) Birth weight (grams) (paras. 137 and 138): (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.

NOTE: Reportable foetal deaths are 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.

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	*Total*	*Birth weight (grams)*						
		Under 500	*500-999*	*1,000-1,499*	*...*	*4,500-4,999*	*5,000 and over*	*Not stated*
TOTAL								
Under 20 weeks								
20-21 weeks								
22-27 weeks								
28-31 weeks								
32-35 weeks								
36 weeks								
37-41 weeks								
42 weeks and over								
Not stated								
Major civil division A (optional)								
(As for TOTAL)								
...								
Major civil division Z (optional)								
(As for TOTAL)								

Classifications:

(a) Place of usual residence of mother (paras. 104-107): (i) total country;(ii) each major civil division (optional);

(b) Gestational age (para. 142): (i) under 20 weeks; (ii) 20-21; (iii) 22-27; (iv) 28-31; (v) 32-35; (vi) 36; (vii) 37-41; (viii) 42 and over; (ix) not stated

(c) Birth weight (grams) (paras. 137 and 138): (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.

NOTE: Data from this table are useful for medical research into 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.

FD-6. Foetal deaths by age and place of usual residence of mother and birth weight

Age and place of usual residence of *mother*	*Total*	*Birth weight (grams)*						
		Under 500	*500-999*	*1,000-1,499*	*...*	*4,500-4,999*	*5,000 and over*	*Not stated*
TOTAL								
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 A (As for TOTAL)								
...								
Major civil division Z (As for TOTAL)								

Classifications:

(a) Place of usual residence of mother (paras. 104-107): (i) total country; (ii) each major civil division;

(b) Age of mother (paras. 121-124): (i) under 15 years; (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;

(c) Birth weight (grams) (paras. 137 and 138): (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.

FD-8. Foetal deaths by age of mother and total birth order (live births plus foetal deaths)

Age of mother (in completed years)	*Total*	*Total birth order (live births plus foetal deaths)*						
		First	*Second*	*Third*	*...*	*Ninth*	*Tenth and over*	*Not stated*
TOTAL								
Under 15 years								
15-19								
20-24								
25-29								
30-34								
35-39								
40-44								
45-49								
50 and over								
Not stated								

Classifications:

(a) Age of mother (paras. 121-124): (i) under 15 years; (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;

(b) Total birth order (live births plus foetal deaths) (paras. 153 and 154): (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

NOTE: This tabulation is useful for medical research into women's histories of foetal death, particularly as to the possibility of a "proneness" to foetal death.

FD-9. Foetal deaths by month of pregnancy in which prenatal care began and number of visits and place of usual residence of mother

Number of visits and usual residence of mother	*Month of pregnancy in which prenatal care began*													
	First trimester				*Second trimester*				*Third trimester*				*No prenatal care*	*Not stated*
	Total	*Month 1*	*M 2*	*M 3*	*Total*	*M4*	*M5*	*M6*	*Total*	*M7*	*M8*	*M9*		
TOTAL														
1 - 3 visits														
4 - 6														
7 - 9														
10 and over														
Not stated														
Major civil division A														
(As for TOTAL)														
...														
Major civil division Z														
(As for TOTAL)														

Classifications:

(a) Age of mother (paras. 121-124): (i) under 15 years; (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;

(b) Place of usual residence of mother (paras. 104-107): (i) total country; (ii) each major civil division. Countries may wish to extend the breakdown to (iii) minor civil division and major cities and towns;

(c) Month of pregnancy in which prenatal care began (paras. 144 and 145): single month, each trimester, total, no prenatal care and not stated;

(d) Number of visits (para. 143): 1-3, 4-6, 7-9, 10 and over, not stated.

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 table 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.

FD-10. Foetal deaths by place of occurrence and type of certification

Place of occurrence	*Total*	*Type of certification*		
		Medical	*Other*	*Not stated*
TOTAL				
Major civil division A				
...				
Major civil division Z				

Classifications:
(a) Place of occurrence (paras. 94 and 95): (i) total country; (ii) each major civil division;

(b) Type of certification (para. 215): (i) medical; (ii) other; (iii) not stated.

NOTE: The type of certification of foetal death is useful for 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.

MA-1. Marriages by place of residence of groom and month of occurrence

Place of residence of groom	*Total*	*Month of occurrence*					
		January	*February*	....	*November*	*December*	*Not stated*
TOTAL							
Major civil division A (as for TOTAL)							
Minor civil division A (optional) (as for TOTAL)							
Major civil division B (as for TOTAL)							
Minor civil division B (optional) (as for TOTAL)							
(etc.)							

Classifications:

(a) Place of residence of groom (paras. 104-107): (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;

(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 socio cultural studies, and also for the analysis and projections of consumption patterns, such as in marketing research. It also serves as an administrative tool for checking on seasonal swings in workloads for registration offices in the civil divisions of the country.

MA-2. Marriages by place of residence of groom and age of bride and of groom

Place of residence and age of groom (years)	*Age of bride (years)*								
	All ages	*under 15*	*15-19*	*20-24*	*. . .*	*65-69*	*70-74*	*75 and over*	*Not stated*
TOTAL									
All ages									
Under 15									
15-19									
20-24									
25-29									
.									
.									
.									
70-74									
75 and over									
Not stated									
Major civil division A (as for TOTAL)									
Minor civil division A (optional) (as for TOTAL)									
Major civil division B (as for TOTAL)									
Minor civil division B (optional) (as for TOTAL)									
(etc.)									

Classifications:

(a) Place of residence of groom (paras. 104-107): (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;

(b) Age (paras. 121-127): under 15 years, 5-year groups from 15 to 74, 75 and over, not stated.

NOTE: 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 to study geographical differentials in patterns of family formation.

MA-3. Marriages by age and previous marital status of bride and of groom

Age and place of usual residence of groom	*Previous marital status*					
	Total	Single	Other unions	Widowed	Divorced	Not stated
			Bride			
All ages						
Under 15 years						
15-19						
20-24						
25-29						
30-34						
35-39						
40-44						
45-49						
50-54						
55-59						
60-64						
65-69						
70-74						
75 and over						
Not stated						
			Groom			
All ages						
Under 15						
15-19						
20-24						
25-29						
30-34						
35-39						
40-44						
45-49						
50-54						
55-59						
60-64						
65-69						
70-74						
75 and over						
Not stated						

Classifications:

(a) Age (paras. 121-127): under 15 years, 5-year groups from 15 to 74, 75 and over, not stated;

(b) Previous marital status (paras. 168-175): (i) single (never married), (ii) other unions (religious marriages, consensual and customary unions), (iii) widowed and not remarried; (iv) divorced and not remarried, (v) not stated.

NOTE: 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 marriage patterns and also for the analysis of fertility.

MA-4. Marriages by educational attainment of bride and of groom

Educational attainment of groom	*Educational attainment of bride*							
			Primary education		*Secondary education*		*Higher education*	
	Total	*No schooling*	*Completed*	*Not completed*	*Completed*	*Not completed*	*Completed*	*Not completed*	*Not stated*
TOTAL									
No schooling									
Primary education not completed									
Primary education completed									
Secondary education not completed									
Secondary education completed									
Higher education not completed									
Higher education completed									
Education not stated									

Classifications:

(a) Educational attainment (paras. 179-181): (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; (viii) not stated.

NOTE: The relation between the educational attainment of bride and of groom gives important information for sociological and cultural studies, especially in family formation-related studies.

DI-2. Divorces by age of husband and of wife

Age of husband (years)	*Age of wife (years)*										
	All ages	*under 15*	*15-19*	*20-24*	*25-29*	*30-34*	*. . .*	*65-69*	*70-74*	*75 and over*	*Not stated*
All ages											
Under 15											
15-19											
20-24											
25-29											
30-34											
35-39											
40-44											
45-49											
50-54											
55-59											
60-64											
65-69											
70-74											
75 and over											

Classifications:
(a) Age (paras. 121-127): under 15 years, 5-year groups from 15 to 74, 75 and over, not stated.

NOTE: This tabulation is used to establish age patterns of divorced couples; and in the sociological study of age and age differences between husbands and wives as factors in the stability or instability of marriages.

DI-3. Divorces by duration of marriage and age of husband and of wife

Duration of marriage (years)	*Age (years)*										
	All ages	*under 15*	*15-19*	*20-24*	*25-29*	*30-34*	*. . .*	*65-69*	*70-74*	*75 and over*	*Not stated*
						Wife					
Total											
Under 1											
1											
2											
3											
4											
5											
6											
7											
8											
9											
10-14											
15-19											
20-24											
25-29											
30 and over											
Not stated											
						Husband					
Total											
Under 1											
1											
2											
3											
4											
5											
6											
7											
8											
9											
10-14											
15-19											
20-24											
25-29											
30 and over											
Not stated											

Classifications:

(a) Age (paras. 121-127): under 15 years, 5-year groups from 15 to 74, 75 and over, not stated;

(b) Duration of marriage (paras. 163-166): under 1 year, single years to 9 years, 5 year groups to 29 years, 30 and over, not stated.

NOTE: This table 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 for the study of the duration of marriages in cases of divorce involving women of childbearing age, an important element for understanding the effect of marital instability on the potential fertility of the population.

DI-4. Divorces by duration of marriage and number of dependent children

Duration of marriage (years)	*Total*	*Number of dependent children*						
		No children	*1*	*2*	*3*	*. . .*	*7 children and over*	*Not stated*
Total								
Under 1								
1								
2								
3								
4								
5								
6								
7								
8								
9								
10-14								
15-19								
20-24								
25-29								
30 and over								
Not stated								

Classifications:

(a) Duration of marriage (paras. 163-166): under 1 year, single years to 9 years, 5 year groups to 29 years, 30 and over, not stated;

(b) Number of dependent children (paras. 161 and 162): (i) no children; (ii) 1 child; (iii) 2 children; (iv) 3 children; (v) 4 children; (vi) 5 children; (vii) 6 children; (viii) 7 children and over; (ix) not stated.

NOTE: Duration of marriage for divorcing couples is a measure of marriage stability, while the numbers of dependent children give insight into the social, psychological and economic impact of divorce on society. Data from this table are important in the administration of social policy in so far as the policy must cope with providing assistance to children from broken marriages.

DI-5. Divorces by educational attainment of husband and of wife

Educational attainment of husband	*Educational attainment of wife*							
			Primary education		*Secondary education*		*Higher education*	
	Total	*No schooling*	*Completed*	*Not completed*	*Completed*	*Not completed*	*Completed*	*Not completed*	*Not stated*
TOTAL									
No schooling									
Primary education not completed									
Primary education completed									
Secondary education not completed									
Secondary education completed									
Higher education not completed									
Higher education completed									
Education not stated									

Classifications:

(a) Educational attainment (paras. 179-181): (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.

NOTE: The educational attainment of divorced couples gives information for sociological and cultural studies. Comparison of this data with the educational attainment of the bride and groom in marriages is useful for studies about family instability.

ST-1. Live births, deaths, infant deaths, foetal deaths, marriages and divorces by place of usual residence

Place of usual residence	*Live births*			*Deaths*		*Infant deaths*			*Foetal deaths*	*Marriages*	*Divorces*
	Total	*Male*	*Female*	*Total*	*Male*	*Female*	*Total*	*Male*	*Female*			
TOTAL												
Urban												
Rural												
Major civil division A[a]												
Urban												
Rural												
Minor civil division A[a]												
Urban												
Rural												
City or town A[a]												
City or town B[a]												
(etc.)												
Major civil division B[a]												
Urban												
Rural												
Minor civil division B1[a]												
Urban												
Rural												
City or town A[a]												
City or town B[a]												
(etc.)												
Minor civil division B2[a]												
(etc.)												
Major civil division Z[a]												
Urban												
Rural												
Minor civil division Z1[a]												
Urban												
Rural												
City or town A[a]												
City or town B[a]												
(etc.)												
Minor civil division Z2[a]												
(etc.)												

Classifications:

(a) Place of usual residence (paras. 104-107): (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) (iii) and as may be required for national use. Place of usual residence is defined as follows:

. 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 (para. 131): (i) male; (ii) female.

NOTE: It is very useful for the administration of health and population programmes to have, at a glance, the total number of each type of vital events that have occurred in a particular year and to see their distribution by civil divisions. Information from this tabulation form the numerators to calculate infant and foetal mortality rates for the country and its civil divisions when related to appropriate denominators: total number of live births, and the total number of live births plus the total number of foetal deaths, respectively. It also provides the numerators for the calculation of birth, death, marriage and divorce crude rates by place of residence when related to the appropriate denominator, usually provided by population censuses, adjusted for the time lapsed since the last census, e.g., the mid-year total population.

[a]Name of major civil division, minor civil division, city, town.

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								
Major civil division A								
...								
Major civil division B								
(etc.)								

Classifications:

(a) Place of usual residence (paras. 104-107*): (i) total country; (ii) each major civil division. Place of usual residence is defined as follows:*

. 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 (para. 131): (i) male;(ii) female.

NOTE: This table provides a wealth of information for 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, marriages and divorces crude 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.

ST-3. Time series of live births by place of usual residence of mother (past 10 years)

Place of usual residence of mother	*Year of occurrence*									
	y-9	y-8	y-7	y-6	y-5	y-4	y-3	y-2	y-1	y
TOTAL										
Urban										
Rural										
Major civil division A[a]										
Urban										
Rural										
Minor civil division A[a]										
Urban										
Rural										
City or town A[a]										
City or town B[a]										
(etc.)										
Major civil division B[a]										
Urban										
Rural										
Minor civil division B1[a]										
Urban										
Rural										
City or town A[a]										
City or town B[a]										
(etc.)										
Minor civil division B2[a]										
(etc.)										
Major civil division Z[a]										
Urban										
Rural										
Minor civil division Z1[a]										
Urban										
Rural										
City or town A[a]										
City or town B[a]										
(etc.)										
Minor civil division Z2[a]										
(etc.)										

Classifications:

(a) Place of usual residence of mother (paras. 104-107): (i) total country; (ii) each major civil division; (iii) each minor civil division (optional); (iv) each principal locality. Distinguish urban and rural for (i), (ii) (iii) and as may be required for national use;

(b) Year of occurrence: past 10 years.

NOTE: The total number of live born children in current and recent years facilitates in a single tabulation the comparison between years for the country as a whole and for its civil divisions. It is useful to observe the changes in time of the absolute numbers of live births for the provision of public health and educational and social services throughout the country. The total number of live births in each year, each civil division of residence, and for the country as a whole, form the numerators of the calculations of time series of crude birth rates when related to the appropriate denominators of mid-year estimated population. Care should be taken in the interpretation of crude birth rates when either the numerator is incomplete or the mid-year population is inaccurate, or both.

[a]Name of major civil division, minor civil division, city, town.

[b]y = year.

ST-4. Time series of deaths by place of usual residence of decedent (past 10 years)

Place of usual residence of decedent	*Year of occurrence*									
	y-9	y-8	y-7	y-6	y-5	y-4	y-3	y-2	y-1	y
TOTAL										
Urban										
Rural										
Major civil division A[a]										
Urban										
Rural										
Minor civil division A[a]										
Urban										
Rural										
City or town A[a]										
City or town B[a]										
(etc.)										
Major civil division B[a]										
Urban										
Rural										
Minor civil division B1[a]										
Urban										
Rural										
City or town A[a]										
City or town B[a]										
(etc.)										
Major civil division Z[a]										
Urban										
Rural										
Minor civil division Z1[a]										
Urban										
Rural										
City or town A[a]										
City or town B[a]										
(etc.)										
Minor civil division Z2[a]										
(etc.)										

Classifications:

(a) Place of usual residence of decedent (paras. 104-107): (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) (iii) and as may be required for national use;

(b) Year of occurrence: past 10 years.

NOTE: 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 in time of the absolute numbers of deaths to provide for health-care services throughout the country. The total number of deaths for each year, each civil division of residence and for the country as a whole form the numerators of the calculations of crude death rates when related to the appropriate denominators of mid-year estimated population. Care should be taken in the interpretation of crude death rates when either the numerator is incomplete or the mid-year population is inaccurate, or both.

[a]Name of major civil division, minor civil division, city, town.
[b]y = year

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-9	y-8	y-7	y-6	y-5	y-4	y-3	y-2	y-1	y
TOTAL										
Urban										
Rural										
Major civil division A[a]										
Urban										
Rural										
Minor civil division A[a]										
Urban										
Rural										
City or town A[a]										
City or town B[a]										
(etc.)										
Major civil division B[a]										
Urban										
Rural										
Minor civil division B1[a]										
Urban										
Rural										
City or town A[a]										
City or town B[a]										
(etc.)										
Major civil division Z[a]										
Urban										
Rural										
Minor civil division Z1[a]										
Urban										
Rural										
City or town A[a]										
City or town B[a]										
(etc.)										
Minor civil division Z2[a]										
(etc.)										

Classifications:

(a) Place of usual residence of mother (paras. 104-107): (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) (iii) and as may be required for national use;

(b) Year of occurrence: past 10 years.

NOTE: The information on infant deaths in the current and recent years in a single tabulation allows for the comparison of the incidence of infant deaths in between years for the country and its major and minor civil divisions. It is useful to observe the changes in time of the absolute numbers of infant deaths to provide public health-care services throughout the country. The total number of infant deaths for each year, each civil division of residence and for the country as a whole form the numerators of calculations of infant mortality rates when related to the appropriate denominators of live births that have occurred in the same years that can be obtained from table ST-3.

[a]Name of major civil division, minor civil division, city, town.

[b]y = year

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-9	y-8	y-7	y-6	y-5	y-4	y-3	y-2	y-1	y
TOTAL										
Urban										
Rural										
Major civil division A[a]										
Urban										
Rural										
Minor civil division A[a]										
Urban										
Rural										
City or town A[a]										
City or town B[a]										
(etc.)										
Major civil division B[a]										
Urban										
Rural										
Minor civil division B1[a]										
Urban										
Rural										
City or town A[a]										
City or town B[a]										
(etc.)										
Major civil division Z[a]										
Urban										
Rural										
Minor civil division Z1[a]										
Urban										
Rural										
City or town A[a]										
City or town B[a]										
(etc.)										
Minor civil division Z2[a]										
(etc.)										

Classifications:

(a) Place of usual residence of mother (paras. 104-107): (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) (iii) and as may be required for national use;

(b) Year of occurrence: past 10 years.

NOTE: 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 in time of the absolute numbers of foetal deaths to provide education and prenatal health-care services throughout the country. The total number of foetal deaths for each year, each civil division of residence and for the country as a whole form the numerators of the calculations of foetal rates when related to the appropriate denominators of live births plus foetal deaths in the same years that can be obtained from table ST-3 and the present table ST-6.

[a]Name of major civil division, minor civil division, city, town.
[b]y = year

ST-7. Time series of marriages by place of usual residence of groom (past 10 years)

Place of usual residence of groom	*Year of occurrence*									
	y-9	y-8	y-7	y-6	y-5	y-4	y-3	y-2	y-1	y
TOTAL										
Urban										
Rural										
Major civil division A[a]										
Urban										
Rural										
Minor civil division A[a]										
Urban										
Rural										
City or town A[a]										
City or town B[a]										
(etc.)										
Major civil division B[a]										
Urban										
Rural										
Minor civil division B1[a]										
Urban										
Rural										
City or town A[a]										
City or town B[a]										
(etc.)										
Minor civil division B2[a]										
(etc.)										
Major civil division Z[a]										
Urban										
Rural										
Minor civil division Z1[a]										
Urban										
Rural										
City or town A[a]										
City or town B[a]										
(etc.)										
Minor civil division Z2[a]										
(etc.)										

Classifications:

(a) Place of usual residence of groom (paras. 104-107): (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) (iii) and as may be required for national use;

(b) Year of occurrence: past 10 years.

NOTE: Information about the current and recent years of total numbers of contractual marriages in a single tabulation allows for a comparison between years for the country and its civil divisions. It is useful to observe the changes in time of the absolute numbers of marriages. The numbers of marriages for each year, of civil division of residence and for the country as a whole form the numerators of the calculations of crude marriage rates when related to the appropriate denominators of estimated mid-year population. Care should be taken in the interpretation of crude marriage rates when either the numerator is incomplete or the mid-year population is inaccurate, or both.

[a]Name of major civil division, minor civil division, city, town.
[b]y = year

ST-8. Time series of divorces by place of residence of husband (past 10 years)

Place of residence of husband	*Year of occurrence*									
	y-9	y-8	y-7	y-6	y-5	y-4	y-3	y-2	y-1	y
TOTAL										
Urban										
Rural										
Major civil division A[a]										
Urban										
Rural										
Minor civil division A[a]										
Urban										
Rural										
City or town A[a]										
City or town B[a]										
(etc.)										
Major civil division B[a]										
Urban										
Rural										
Minor civil division B1[a]										
Urban										
Rural										
City or town A[a]										
City or town B[a]										
(etc.)										
Minor civil division B2[a]										
(etc.)										
Major civil division Z[a]										
Urban										
Rural										
Minor civil division Z1[a]										
Urban										
Rural										
City or town A[a]										
City or town B[a]										
(etc.)										
Minor civil division Z2[a]										
(etc.)										

Classifications:

(a) Place of residence of husband (at the time of petition of divorce) (paras. 104-107): (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) (iii) and as may be required for national use;

(b) Year of occurrence: past 10 years.

NOTE: Information about the current and recent years of total numbers of dissolution of marriages by divorce in a single tabulation allows comparison between years and for the country and its civil divisions. It is useful to observe the changes in time of the absolute numbers of divorces. The numbers of divorces for each year, civil divisions of residence and for the country as a whole form the numerators of the calculations of crude divorces rates when related to the appropriate denominators of estimated mid-year population. Care should be taken in the interpretation of crude divorce rates when either the numerator is incomplete or the mid-year population is inaccurate, or both.

[a]Name of major civil division, minor civil division, city, town.
[b]y = year

ST-9. Time series of vital events in the country (past 10 years)

Year of occurrence	*Live births*			*Deaths*			*Infant deaths*			*Foetal deaths*	*Marriages*	*Divorces*
	Total	*Male*	*Female*	*Total*	*Male*	*Female*	*Total*	*Male*	*Female*			
y												
y-1												
y-2												
y-3												
y-4												
y-5												
y-6												
y-7												
y-8												
y-9												

Classifications:

(a) Year of occurrence: past 10 (or 15) years;

(b) Sex (para. 131): (i) male; (ii) female.

GLOSSARY

ACCURACY OF REGISTRATION: When data items for each vital event on the vital record have been correctly and completely filled out, i.e. there are neither response errors nor missing items. The measurement of any deviation from correctness is called "content error".

ACCURACY OF REGISTER-BASED VITAL STATISTICS: Means that data items on the statistical report have been correctly and completely filled out and that no errors have been introduced during transcription of data from vital records on to the statistical report (if this is the case) or during the processing stages (coding, editing, input, tabulation).

ADOPTION: Legal and voluntary taking and treating of the child of other parents as one's own in so far as provided by the laws of the country. By means of a judicial process, whether related or not to the adopter, the adopted child acquires the rights and status of a biological child born to the adopting parents.

AGE: Interval of time between birth and the present time, expressed in *completed* units of solar time. For adults and children, age is usually measured in completed years, while for infants or very young children, in completed months, weeks, days, hours or minutes of life, as appropriate.

ANNULMENT: Invalidation or voiding of a legal marriage by a competent authority, according to the laws of the country, thus conferring on the parties the status of never having been married to each other.

AVAILABILITY OF DATA: Data that have been collected, filed, processed and stored in each system, thus civil registration and vital statistics, are accessible in a user friendly format to users upon request.

APPGAR SCORE: System of scoring 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 0, 1 or 2. The maximum total score for a normal baby is 10. Those with low scores require immediate attention if they are to survive.

ATTENDANT AT BIRTH: The person who assisted the mother in giving birth, e.g., a physician, midwife, nurse, other paramedical person or lay person.

BORN IN WEDLOCK: A characteristic of a live-born infant or dead fetus whose mother and father were legally married (any recognized union according to the laws or customs of the country) at the time of delivery (see WEDLOCK STATUS).

BORN OUT OF WEDLOCK: A characteristic of a live-born infant or dead foetus whose mother and father were not legally married at the time of delivery.

BURIAL PERMIT: Official document, usually issued only for a legally registered death, authorizing the removal of the dead body (corpse) to the cemetery or 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. Symptoms or modes of dying, such as heart failure or asthenia, are not considered to be causes of death for vital statistics purposes (see UNDERLYING CAUSES OF DEATH and CONTRIBUTORY CAUSES OF DEATH).

CERTIFIER (OF CAUSE OF DEATH): 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/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 due to violence or injury, the medical-legal officer (e.g., coroner or medical examiner).

CITIZENSHIP: Legal nationality of a person.

CIVIL REGISTRATION: Is the continuous, permanent, compulsory and universal recording of the occurrence and characteristics of vital events (live births, deaths, foetal deaths, marriages and divorces) and other civil status events pertaining to the population as provided by decree, law or regulation, in accordance with the legal requirements in each country. It establishes and provides legal documentation of such events. These records are also the best source of vital statistics.

CIVIL REGISTRATION SYSTEM: the institutional, legal and technical settings established by government to conduct civil registration in a technical, sound, coordinated and standardized manner throughout the country, taking into account cultural and social circumstances particular to the country (see CIVIL REGISTRATION and VITAL STATISTICS SYSTEM).

CIVIL REGISTER: Loose-leaf file, ledger book, electronic file or any other official file set up for the permanent recording, in accordance with established procedures, of each type of vital event and its associated data occurring to the population of a well defined area (a county, district, municipality, parish etc.).

CIVIL REGISTRAR: Official charged with the responsibility for

civil registration of vital events in a well defined area (an entire country, a county, district, municipality, parish etc.) and for recording and reporting information on those vital events for legal and statistical purposes.

COMPILATION OF VITAL STATISTICS DATA: The process of condensing and summarizing information on vital events by classifying and tabulating data into categories or groups to produce vital statistics according to a predetermined tabulation programme.

COMPLETE CIVIL REGISTRATION: When every vital event that has occurred to the members of the population of a particular country (or area), within a specified period, has been registered in the civil registration system, i.e., has a vital registration record. Thus the system has attained 100 per cent coverage. Any deviation from complete coverage is measured by "coverage error".

COMPLETE VITAL STATISTICS: Vital statistics from civil registration data are complete when, in addition to the requirement of registration of each vital event (see COMPLETE CIVIL REGISTRATION), a vital statistics report is forwarded to the agency responsible for the compilation and production of vital statistics.

CONTRIBUTORY CAUSE OF DEATH: A significant medical condition that contributes to death but is not related to the disease or condition directly causing death.

CORONER: 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, injury or suspicious circumstances to determine if the death was due to non-natural causes, such as accident, suicide or homicide.

CRUDE BIRTH RATE: A 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 the given geographical area during the same year.

CRUDE DEATH RATE: A 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 the given geographical area during the same year.

CRUDE DIVORCE RATE: A 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 the given geographical area during the same year.

CRUDE MARRIAGE RATE: A 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 the given geographical area during the same year.

DATE OF BIRTH: The day, month and year of birth, including hours and minutes, if required, to determine age in completed units of time (see AGE).

DATE OF OCCURRENCE: The day, month and year of occurrence of a vital event, including hours and minutes in the case of births and infants dying in the first week of life.

DATE OF REGISTRATION: The day, month and year when an entry of registration of a vital event is made in the civil register.

DEATH: Death is the permanent disappearance of all evidence of life at any time after live birth has taken place (post-natal cessation of vital functions without capability of resuscitation). This definition excludes foetal deaths (see FOETAL DEATH).

DELAYED REGISTRATION: The registration of a vital event after the prescribed period denoted in existing laws, rules or regulations (including any grace period, if one is specified). A 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 the registration of a vital event one year or more after the vital event has occurred (see LATE REGISTRATION).

DESCRIPTIVE EPIDEMIOLOGY is the study of the occurrence of disease or other health-related characteristics in human populations usually concerned with the relationships of disease to basic variables, such as age, sex race, ethnicity, geographic location, occupation and socioeconomic measures.

DIVORCE: Final legal dissolution of a marriage; a separation of husband and wife that confers on the parties the right to remarriage under civil, religious and/or other provisions in accordance with the laws of the country.

DUAL RECORDS SYSTEM: A method of collecting vital statistics data, mainly births and deaths, through household demographic sample surveys on a continuous basis. It is a special case of the follow-up survey method, which allows for the validation of information from two independent reporting sources, both based on survey techniques. Two independent records are collected on each vital event occurring in the selected sample areas. These two records are established by a 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 study of the distribution and determinants of health-related states and events in populations.

EVALUATION OF A CIVIL REGISTRATION SYSTEM (OR A VITAL STATISTICS SYSTEM): An apppraisal of the value, worth and importance of elements to the operation of the system

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; 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 muscles.

FOETAL DEATH RATE: A 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 a given geographical area during a given year per 1,000 total births (live births plus foetal deaths).

FOETAL DEATH RATIO: A 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 a given geographical area during a given year per 1,000 live births.

GESTATIONAL PERIOD: 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 born with no evidence of life (foetal death).

ILLEGITIMATE BIRTH: The birth of a child to a mother who, according to national law or customs, was not married at the time of the birth. This term should not be used to explicitly describe the child on the birth certificate unless specifically required by national law, but rather may be considered as a statistical term for counting such births to describe the number of out-of-wedlock births which have occurred (see BORN OUT OF WEDLOCK).

INFANT DEATHS: Deaths of live-born children under one year of age.

INFANT MORTALITY RATE: A vital statistics summary rate based on the number of infant occurring during the same period of time, usually a calendar year, i.e., the number of deaths under one year of age occurring in a given geographical area during a given year, per 1,000 live births occurring among the population of the given geographical area during the same year.

INFORMANT: The individual 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 and characteristics related to the event. On the basis of such a report, the event may be legally registered by the local registrar.

JUDICIAL (LEGAL) SEPARATION: Disunion of married persons, without conferring on the parties the right to remarriage, according to the laws of each country.

LATE CIVIL REGISTRATION: A late civil registration is 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: Formal vesting of a person with the same status and rights of a person born in wedlock, according to the laws of the country.

LEGITIMATE BIRTH: The birth of a child to a mother who, according to national law or customs, was married at the time of the birth. This term should not be used to explicitly describe the child on the birth certificate unless specifically required by national law, but rather may be considered as a statistical term for counting such births to describe the number of in-wedlock and out-of-wedlock births which have occurred (see BORN IN WEDLOCK).

LIVE BIRTH: A live birth is 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.

MATERNAL DEATH: A maternal death is 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 accidental or incidental causes.

MATERNAL MORTALITY RATE:[*] A 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 and the puerperium, (*b*) from interventions, omissions or incorrect treatments or their results, or (*c*) from indirect obstetric causes resulting from previously existing disease or disease arising during pregnancy and which was not due to direct obstetric causes but which 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)

[*] The use of the term "rate", although inexact in this context, is retained for the sake of continuity; see World Health Organization, *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision*, (Geneva, 1992), vol.2.

live births occurring in the given geographical area during the same year.

MONITORING OF A CIVIL REGISTRATION SYSTEM (OR A VITAL STATISTICS SYSTEM: A check on civil registration system and vital statistics system operations designed to control efficiency, accuracy, timeliness and coverage on an ongoing basis.

NEO-NATAL PERIOD: The neonatal period commences at birth and ends 28 completed days after birth.

NEO-NATAL DEATHS: Deaths among live births during the first 28 completed days of life.

NEO-NATAL MORTALITY RATE: A 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.

NOTIFIER: An individual appointed by the local registrar to act as intermediary between the local registrar and the informant in providing all information and characteristics of an event that is to be legally registered by the local registrar.

PERINATAL PERIOD: the perinatal period commences at 22 weeks (154 days) of gestation (the time when birth weight is normally 500 grams) and ends seven completed days after birth.

OUT-OF-WEDLOCK BIRTH: A birth occurring to a mother who is not legally married at the time of delivery.

POPULATION: (1) All the inhabitants of a given country or area (province, city, metropolitan area etc.) considered together; the number of inhabitants of a country or area. (2) In sampling, the whole collection of units (persons, households, institutions, events etc.) from which a sample may be drawn.

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 (denominator) by which the number of vital events (numerator) is divided.

PROBABILITY SAMPLE: Sample selected from a population by a method based on the theory of probability (random process), that is, by a method involving knowledge of the likelihood of any unit being selected.

QUALITATIVE ERRORS: Errors arising from ignorance or forgetfulness of the facts, refusal to reply to a question, failure to understand a question or failure of an interviewer to put the question clearly or to record its answers properly.

QUALITY OF A VITAL EVENT RECORD (REPORT): This element of a vital event report refers to its effectiveness as the preferred legal proof of the fact that the event occurred, and to the accuracy and timeliness of its subsequent compilation for statistical purposes.

QUALITY OF DATA: In the civil registration system or in the vital statistics system, quality of data is measured according to their degree of completeness, correctness (accuracy), timeliness and availability (See ACCURACY, AVAILABILITY, COMPLETENESS AND TIMELINESS).

RECORD LINKAGE: A process, usually computer-based, that brings together information from two or more data files into a new combined file containing selected information about individuals or events that were not available in the separate records.

REFERENCE PERIOD ERROR: A type of false or mistaken result obtained in a survey or census which is due to the failure of the respondent to place past events in the proper time period, e.g., the reporting of a death which actually occurred two years ago when asked to report deaths for the past year.

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 which is due to chance (random error) when the result from the sample differs from the result that would have been obtained if the entire population were studied.

SAMPLING FRAME: A collection of units (persons, households, institutions, events etc.) from which a sample may be drawn (See POPULATION).

STATISTICAL REPORTING OF VITAL EVENT DATA: Transmission of statistical reports on vital events legally recorded to the agency responsible for compilation of statistics on these events.

TIMELINESS IN REGISTRATION: This element of a vital event report is determined by the difference between the date of the event and the date of its registration when compared to the interval specified by legislation.

TIMELINESS IN REGISTER-BASED VITAL STATISTICS: Means 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 the vital statistics is prompt enough to serve the users' needs.

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 which produced the fatal injury. The underlying cause of death is used as the

basis for tabulation of mortality statistics (see CONTRIBUTORY CAUSE OF DEATH).

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 in the civil register which 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 for vital statistics compilation.

VITAL STATISTICS SYSTEM: A vital statistics system is the total process of (1) collecting information by civil registration or enumeration on the frequency of occurrence of specified and defined vital events as well as relevant characteristics of the events themselves and of the person or persons concerned, and (2) of compiling, processing, analysing, evaluating, presenting and disseminating these data in statistical form (see VITAL EVENT).

WEDLOCK STATUS OF THE MOTHER AT THE TIME OF THE CHILD'S BIRTH: This topic is derived from the marital status of the mother and 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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