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DEMOGRAPHIC AND HOUSING STATISTICS

RECOMMENDATIONS FOR THE IMPROVEMENT AND STANDARDIZATION OF  
VITAL STATISTICS : DRAFT PROPOSALS

Report of the Secretary-General

## PREFACE

Origin of the present proposals

At its seventh session in 1953 the Statistical Commission approved the Principles for a Vital Statistics System<sup>1/</sup> which had been prepared for its consideration in response to resolutions of the Commission itself and of the Population Commission; those Principles were further approved in 1953 by the Economic and Social Council of the United Nations as serving an immediate and constructive purpose in both the developed and developing countries. Published shortly afterwards, the Handbook of Vital Statistics Methods<sup>2/</sup> gave further guidance on statistical standards and on concepts, definitions and procedures for the development of national systems of vital statistics and, in addition, provided detailed appraisals of national vital statistical practices around 1950.

The intrinsic value of the Principles and the Handbook has not changed — on the contrary they have been, and still are, in wide and constant use — but changing circumstances call for a re-appraisal. Most important of these circumstances has been the increasing emphasis on planning for economic and social development, an emphasis symbolized by the formulation of the idea of the United Nations Development Decade, with the object of promoting national economic growth and social advancement, primarily in terms of rising national

<sup>1/</sup> Principles for a Vital Statistics System : Recommendations for the Improvement and Standardization of Vital Statistics (United Nations publication, Sales No.: 53.XVII.8).

<sup>2/</sup> Handbook of Vital Statistics Methods (United Nations publication, Sales No.: 55.XVII.1).

income.<sup>3/</sup> There are few countries in the world with statistics of the full range and quality required for national planning, and in many instances the basic demographic data, including vital statistics, are inadequate to describe relevant aspects of their populations. Even the most fundamental index -- the rate of population increase -- is imperfectly measured in the statistics of some of the developing countries, while, in the developed world, the components of the rate of growth require more intensive study than is possible with existing data.

Such considerations as these, re-inforced by the growing recognition of the importance of civil registration in guaranteeing the status and rights of individuals in society, as well as its importance as a source of vital statistics, led to a series of recommendations of the Statistical Commission, endorsed by the Population Commission, on the need for further action to improve the effectiveness of existing vital statistics systems.

At its twelfth session in 1962, the following resolution was adopted by the Statistical Commission<sup>4/</sup>:

That study be intensified on methods of obtaining and improving vital statistics in territories where conventional registration methods are not yet able to supply reliable data on population growth rates, required for planning purposes.

At its thirteenth session in 1965, the Statistical Commission adopted resolution 14 (XIII) with the intention of stimulating regional and international action:<sup>5/</sup>

The Statistical Commission,

Being aware that deficiencies in the coverage and quality of

<sup>3/</sup> The United Nations Development Decade : Proposals for Action (United Nations publication, Sales No.: 62.II.B-2), page 7.

<sup>4/</sup> Official Records of the Economic and Social Council: Thirty-fourth session, Supplement No.13, resolution 8 (XII), operative paragraph 4.

<sup>5/</sup> Official Records of the Economic and Social Council, Thirty-ninth session Supplement No.13, resolution 14 (XIII).

national vital statistics represent a serious gap in world demographic knowledge,

Recognizing that vigorous efforts should be exerted by the United Nations, the specialized agencies, the regional commissions and the Member States to push forward with the development of reliable vital records and statistics,

1. Requests the Secretary-General to support the conclusions of the Second Inter-American Seminar on Civil Registration and the recommendations of the African Seminar on Vital Statistics, including:

- (a) Intensifying efforts and co-ordinating activities of the specialized agencies to promote the establishment and maintenance of adequate national systems of vital records and statistics;
- (b) Making use of bilateral aid as available, providing regional advisers in vital registration, and training of national personnel in this field under the United Nations technical assistance programme;
- (c) Sponsoring a programme of studies and research in sample household survey methods for obtaining demographic data, particularly in providing information on vital rates;

2. Recommends

- (a) That States Members of the United Nations which do not yet have a reliable vital statistics system consider organizing sample survey and/or sample registration areas as interim measures while taking recommended long-range steps toward improving the entire vital records and statistical system;
- (b) That States Members of the United Nations whose vital records and statistics systems are highly developed be requested to make available experts to advise in this important area under United Nations or bilateral programmes of technical assistance.

The present Recommendations for the Improvement and Standardization of Vital Statistics : Draft Proposals have been prepared in response to these resolutions. The Draft Proposals attempt to reflect the needs and resources of countries at different stages of development and to outline an integrated system of vital statistics conceptually centered on, though not restricted to, a comprehensive system of civil registration.

The Draft Proposals will provide a basis for the revision of the Principles for a Vital Statistics System and of the Handbook of Vital Statistics Methods,

in accordance with the resolutions of the Statistical Commission cited above.

It is hoped that the Draft Proposals will assist individual countries in the production of a wider range of vital statistics than has existed up to now and that these statistics will provide a foundation for the areas of study which have been demarcated by the Population Commission in response to resolution 2211 (XXI) of the General Assembly and resolution 1084 (XXXIX) of the Economic and Social Council.

The Ad Hoc Committee of Experts on<sup>the</sup> Long-range Programme of Work in the Field of Population, which met in New York in 1964, drew up a list of five priority areas for the United Nations expanded programme of work in the field of population: fertility, mortality and morbidity, internal migration and urbanization, demographic aspects of economic development and demographic aspects of social development. The five priority areas within the long-range programme of work were subsequently confirmed by the Population Commission at its thirteenth session<sup>6/</sup> and by the Economic and Social Council in resolution 1084 (XXXIX).

Initiating a series of ad hoc meetings of experts to deal with these five priority areas, the Secretary-General invited a group of experts in the field of fertility to convene in 1966 (the Ad Hoc Committee of Experts on Programmes in Fertility).<sup>7/</sup> In 1967, a group of experts in demographic research related to population distribution, settlement, internal migration and urbanization was convened (the Ad Hoc Committee of Experts on Programmes in Demographic Aspects of Urbanization).<sup>8/</sup> The proposals contained in the present paper have taken into account the data requirements suggested by these Ad Hoc Committees.

<sup>6/</sup> Official Records of the Economic and Social Council, Thirty-ninth session, Supplement No.9, para. 107.

<sup>7/</sup> Demographic Statistics Relevant to Fertility Studies: Current Status and Plans for Development (United Nations document, E/CN.9/AC.6/R.12).

<sup>8/</sup> Report of the Ad Hoc Committee of Experts on Programmes in Demographic Aspects of Urbanization (United Nations document, E/CN.9/218).

In preparing the Draft Proposals account has also been taken of a wide variety of background materials and activities at international and regional levels. Among these was the survey undertaken by the Statistical Office <sup>of the United Nations</sup> in 1964 which provided systematic and up-to-date information on vital statistics practices in 51 countries. In addition, for the less developed areas there were regional reviews of various aspects of vital statistics systems in Africa<sup>9/</sup> and in the Americas<sup>10/</sup>, while for Asia and the Far East information was available in a number of papers presented to the Economic Commission for Asia and the Far East, each of which pointed to the deficiencies of civil registration systems.

The views of the specialized agencies and of numbers of individual demographers and specialists in related fields have been noted, as well as the recommendations of a large number of international meetings on the types of data required for new developments in demographic and related studies, and on techniques of improving existing systems of data collection or instituting new methods.

<sup>9/</sup> Methods and Problems of Civil Registration and Vital Statistics Collection in Africa, Economic Commission for Africa (United Nations document, E/CN.14/CAS.3/8).

<sup>10/</sup> Inventario de las Estadísticas Nacionales: Estadísticas Vitales, Washington, D.C., Pan American Union, 1960 (Inter American Statistical Institute, document 4156 Esp. 11/2/60-250).

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## INTRODUCTION

1. In preparing the Draft Proposals as a basis for a revision of the Principles for a Vital Statistics<sup>1/</sup> the intention is the same as that stated in the Introduction to the Principles, namely to assist national statistical services in the development and improvement of national vital statistics and of their comparability, in order that their scope and reliability will be adequate to the role they play in a general system of statistics, viewed primarily as a basis for informed national economic and social planning.

2. In the fifteen years that have elapsed since the Principles were adopted by the Statistical Commission, endorsed by the Population Commission and approved by the Economic and Social Council, the emergence of a large number of former colonial dependencies as independent nations has created a situation which calls for ad hoc measures if they are to acquire with the requisite speed statistical data which will adequately describe the levels and trends of mortality and fertility and the interrelationships of demographic, economic and social factors. The developing countries can afford no delay in attempting to reach, by informed planning, a situation where economic growth runs at a higher rate than population growth; they are unable either to formulate their plans on a sound basis nor to assess their progress in implementing their plans, until the components of population growth are more adequately described in the statistics.

3. Therefore the Draft Proposals follow the spirit of resolution 8 (XII) of the Statistical Commission in outlining a system which includes the adoption of sample surveys and/or other techniques as substitutes for and/or complement to a comprehensive system of civil registration, on the grounds that such methods can provide estimates of the main vital rates with minimum delay. The techniques have already been adopted by a number of countries in Asia, Africa

<sup>1/</sup> Principles for a Vital Statistics System, op.cit.



and Latin America and it is now possible to assess both their utility and the limitations to which they are subject.

4. It must be emphasized that the international organizations and the individual countries, whether in the developed or the less developed areas of the world, recognize the need for civil registration in the long run, but it is also recognized that in the developing countries there are serious obstacles to the achievement of comprehensive civil registration systems in the short run. Certain of the techniques outlined in Chap.VI of these Draft Proposals for use in the developing countries may therefore be regarded as interim measures to meet urgent data requirements, pending the achievement of comprehensive registration; since they can serve to diagnose difficulties and to assess completeness of registration they should also be viewed as preparing the ground for implementing or improving civil registration systems.

5. By contrast, in most developed countries civil registration already functions with reasonable effectiveness as a source of vital statistics despite a number of organizational and definitional problems. Yet here too additional methods are relevant because there are deficiencies in the quality and scope of the registration data, examples of which are: insufficient socio-economic data on both fertility and mortality; insufficient data for compilation of fertility histories of women; imperfect diagnosis and/or recording of cause of death; and no data relating to cause of death in related family members in one generation or in successive generations.

6. While it would not be reasonable to demand of a registration system, which is essentially legal in its nature, that it cover all such topics, it is reasonable that a vital statistics system should envisage means by which such data requirements may be met, since studies based on data of this kind have a durable interest in the potentiality of their findings to influence future policies, and to raise the health component of living standards. The practicability of some of these studies depends to a large extent on the development of computer techniques which open up new

possibilities of combining data by record-linkage, which may perhaps in the future make the present outlook on data collection seem outmoded.<sup>2/</sup>

7. The major changes from the Principles for a Vital Statistics System consist (a) in a broadening of the definition of a vital statistics system to include both the civil registration method and other techniques of obtaining data on the vital events; (b) greater emphasis on the uses of the vital records and vital statistics; and (c) greater emphasis on the need for integration of a vital statistics system with other fields of statistics and (d) greater emphasis on the need for evaluation of the completeness and accuracy of the results.

8. The first chapter outlines the uses of vital statistics while Chapters II to IV describe respectively the characteristics of a vital statistics system (including the events to be investigated and their definition), the topics to be investigated in respect of the vital events, together with their definition and specification, and the general principles for a tabulation programme. (The precise contents of the tabulation programme will be incorporated in the next draft of the Proposals). The remaining three chapters V-VII describe respectively the civil registration method as a source of vital statistics data, the role of sampling in collecting and processing vital statistics and methods of evaluation of a vital statistics system.

9. It is recognized that a vital statistics system depends upon administrative and legal arrangements, many of which are matters of purely national concern. Therefore, the proposals for civil registration systems do not cover all registration practice. They deal only with those registration aspects which have a bearing on the statistical report in terms of its content or its collection (and hence with the comparability of resulting statistics) and not with the

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<sup>2/</sup> See for example, "Demographic Attacks on Genetic Problems" by L.L. Cavalli-Sforza in The Use of Vital and Health Statistics for Genetic and Radiation Studies : Proceedings of the Seminar sponsored by the United Nations and the World Health Organization, Geneva, 1960 (United Nations publication, Sales No.: 61.XVII.8), pages 223-224.

legal connotations.

10. The proposals for the incorporation of additional elements in a vital statistics system are for similar reasons limited to the considerations which most directly affect the collection of the data rather than to the precise administrative structure required.

## CHAPTER I

### Uses of Vital Records and Vital Statistics

11. The development of a system of vital statistics or the adoption of recommendations for improvement depends for its implementation on the recognition of the uses of the statistics and the civil registration records. The most important uses of the records and of the vital statistics, as demonstrated by the experience of many countries, are set forth below.

#### A. Vital Records

12. The civil registration records of birth provide for the individual legal proof of his or her identity (including name, parentage, ancestry or lineage), age, nationality (citizenship)<sup>3/</sup>, marital status, legitimacy status, etcetera, on which depend a wide variety of rights particularly in regard to the exercise of civil functions, entitlement to family allowances, property ownership and inheritance, care of children, etcetera. The death records provide legal evidence relevant to claims to inheritance of property, to rights of surviving spouse to re-marry, to claims for family allowances where the death creates financial need, etcetera. Marriage and divorce records are the basis for claims for dependency allowances, tax deductions, provision and allocation of

<sup>3/</sup> It should be noted that while the birth register will give documentation of place of birth of the child and perhaps also of his or her parents, legal provisions governing nationality differ from country to country and in certain circumstances may require option by the child on reaching a particular age. Also, aliens may acquire nationality by residence or other qualifications. Therefore, while the civil registers may attest nationality of parents at the time of the birth of the child, they cannot give universal evidence of nationality itself, but grounds on which nationality may be established.

specific types of housing and numerous other facilities which relate to a married man and his wife, including claims to a change of nationality on the basis of marriage.

13. The protective value of live birth records has been officially endorsed by the United Nations in a number of legal instruments. The Universal Declaration of Human Rights<sup>4/</sup>, adopted in 1948, proclaimed in Article 15, that (a) "Everyone has the right to a nationality"; (b) "No one shall be arbitrarily deprived of his nationality nor denied the right to change it". The basic right to a nationality provided by the Declaration of Human Rights, which depends on having ones birth legally recorded, was reinforced by the adoption in November 1959 of the Declaration of the Rights of the Child<sup>5/</sup>, which affirmed that "The child shall be entitled from his birth to a name and a nationality". The establishing of "a civil or other register in which all marriages and divorces will be recorded" was urged in General Assembly resolution 853 (IX) of 17 December 1954. Article 3 of the Convention on Consent to Marriage, minimum Age for Marriage and Registration of Marriage (General Assembly Resolution 1763/AA (XVII) adopted 7 November 1962) lays down that "All marriages shall be registered in an appropriate official register by the competent authority". Divorce registration was most recently endorsed by the Economic and Social Council in its resolution 1068 F (XXXIX) adopted 16 July 1965.

14. For administrative agencies, the birth records are the basis for public health programme for post-natal care of mother and child and may be used when

<sup>4/</sup> Official Records of the General Assembly, Third session, Part I, Resolutions (A/810), Annex to Resolution 217 A (III).

<sup>5/</sup> Official Records of the General Assembly, Fourteenth session, Supplement No.16 (A/4354). Resolution 1386 (XIV).

<sup>6/</sup> Note suppressed.

needed for programmes of vaccination and immunization. The death records are used to indicate needs for prevention and control of infectious diseases, public safety measures, accident prevention and crime/<sup>prevention and</sup>eradication; they are also of administrative use in the clearing of files, such as social-security and military-service files and tax registers.

15. Recent developments in the study of fertility and mortality emphasize the value of the birth, death and marriage records as the starting point in certain types of longitudinal genetic and radiation studies<sup>7/</sup> (paragraph 285) as well as for purely demographic inquiries.

B. Vital Statistics

16. One of the most important uses of the vital statistics, as distinct from the registration records, is their role in demographic analysis as a prerequisite for planning for economic and social development. The vital statistics yield information on the rate and trend of population growth and on the behavior of its components, and, by aggregation over time, on population size, structure and (migration excluded) geographic distribution. Projections of population<sup>8/</sup> can be built up on the basis of the probable future trends of natality, nuptiality and mortality as derived from study of these factors and the interaction of the demographic, economic and social factors.

17. The aggregation of population and the vital events to which it has been subject in an intercensal period may be compared with the census enumeration at the end of the period and the differences in total size and in numbers in each sex/age group may be taken as an estimate of the net gain or loss by

<sup>7/</sup> The Use of Vital and Health Statistics for Genetic and Radiation Studies, op.cit., Sessions II, IV and V.

<sup>8/</sup> Methods for Population Projections by Sex and Age (United Nations publication, Sales No.: 56.XIII.3).

international migration. Manipulations of appropriate data (where available) may be devised to yield comparable regional estimates and also to measure internal transfers. These possibilities, particularly the measure of internal migration, are of special interest in view of the importance of such data and their relative scarcity.<sup>9/</sup> The rural-urban drift is the outstanding instance in which data on internal transfers are urgently required.

18. The interaction of demographic, economic and social factors is so important and complex an aspect of the development process that increasing differentiation is required in the study of the factors which influence birth, death and marriage: urbanization, education, occupation, housing, religion, the family structure, income and patterns of expenditure amongst households or families are all relevant to the question. They not only enhance the understanding of the demographic process as such, but they provide, where applicable, data required for the national accounting in which the state of development of the economy is reflected and summarized. At the same time, socio-economic differentials in fertility have implications for the question of whether human resources of the future will be adequate in background, education and attitudes to function effectively in an increasingly technological society. And the patterns of savings and investment of households of different size have immense economic ramifications.

19. Amongst the demographic factors, the influence of marriage, and the consequent importance attaching to statistics of marriage, is sometimes overlooked or taken for granted by reason of the concentration on natality and mortality as the direct determinants of natural growth of population and its composition by sex and age.

<sup>9/</sup> A United Nations manual to be completed in the first half of 1968 in collaboration with the International Union for the Scientific Study of Population will examine various methods of using census data on population distribution and internal migration, in order to help fill this gap in demographic statistics. See Report of the Ad Hoc Committee of Experts on Programmes in Demographic Aspects of Urbanization, op.cit., para.20.

Increasing attention, however, is being directed to statistics of marriage as a measure of the formation of new family and/or household units, to marital fertility, to the relation between marital status and mortality, and to economic activity status of women and to the dissolution of marriage by divorce, separation or death. In an extended form such data could be used to examine the "life-cycle" of the family with a view to predicting changes in family (and/or household) size<sup>10/</sup> through the joint operation of these factors. Alternatively, the onset of changes in the trend of population growth may be diagnosed by longitudinal studies of fertility of women by duration of marriage and age at marriage, and the conclusions reached may be amplified by the study of the differentials referred to above arising from education, occupation, income, the effects of urbanization on the traditional social structure, and/or other factors influencing size of family.

20. The social and economic implications of such changes are very far-reaching indeed, involving as they do changes in the pattern of demand for the staples of life: food, nutrition and shelter; and for the ameliorations of bare subsistence: health, education and welfare.

21. In more practical terms, the example of housing may be adduced as a field where size of family, and the pattern of saving and investment of families referred to above, jointly influence effective demand and must be taken into account in estimating housing needs<sup>11/</sup> and the capacity to satisfy them.

22. Again, the dissolution of marriage by divorce or separation creates social problems of the possible dissolution of family units and economic problems of support and care for children.

<sup>10/</sup> The concept is examined and illustrated in American Families, by Paul C. Glick, New York, 1957.

<sup>11/</sup> Methods of Estimating Housing Needs (United Nations publication, Sales No.: 67.XVII.15), pages 56-57.



23. Data on illegitimacy are required in order to assess the extent, scope and trend of the problem in order to develop programmes for services on behalf of unmarried mothers and their children. In the United States, the National Council on Illegitimacy offers the considered opinion that the welfare of mother and child are best safeguarded through the documentation of legitimacy status in a confidential medical-health section of the birth certificate.<sup>12/</sup>

24. For these and for many other purposes too numerous to list exhaustively, improvements and extension of the statistics of marriage, of marital fertility (and also of illegitimate births), divorce and separation are urgently needed. In the less-developed countries, where most marriages may be unrecorded because of the prevalence of customary rather of civil sanctions, efforts must be made to encourage the registration of marriage and to obtain statistics of marital status and of its inter-relations with the vital events of births and deaths, and their trends.

25. In the framework of demographic trends, development plans can be formulated in terms of over-all economic targets and in terms of planning for health, welfare, education, housing, etcetera. These plans in turn depend on vital data incorporated in projections of needs for food and nutrition, health services, education facilities, technological and scientific skills in manpower, housing, and so on.

26. Continuity in the supply and analysis of vital statistics is essential to the evaluation of the operation of social and economic plans. Also certain aspects of plans may be measured by trends in demographic indicators of the level of living, such as the expectation of life at birth and the infant mortality rate.<sup>13/</sup>

<sup>12/</sup> U.S. Department of Health, Education and Welfare, National Center for Health Statistics: The Registrar and Statistician, Vol.32, No.9, September 1967.

<sup>13/</sup> Report on International Definition and Measurement of Standard and Levels of Living: An Interim Guide (United Nations publication, Sales No.: 54.IV.5).

27. The intrinsic interest and the utility of the conclusions derived from demographic analysis are paralleled by the interest and utility of vital statistics in medical research, for example, in the study of morbidity and of the trends in mortality by age and sex and cause. The changing pattern of cause of death is itself largely a result of the application of results of medical research, which have been a powerful influence in the reduction of mortality from specific causes and in the extension of the average life expectancy. Further advances can be anticipated here also in view of new technical possibilities of amassing personal and family histories which will increase the power of morbidity analysis and open the way for further improvements in the health status of the population.

28. Vital statistics are also employed for determining administrative action in connexion with the programmes of governmental agencies other than those concerned with public health, and also in relation to numerous professional, private and commercial activities. Planning and production of public and private housing and educational facilities; planning and operating social security programmes and private insurance enterprises; production of consumer goods such as medicines, food, clothing, furniture, and equipment for infants and mothers, as well as household equipment in general; provision of medical care facilities for deliveries, services for interment, and so forth, are all dependent on information produced by the vital statistics system.

29. At the international level, vital statistics are of the utmost interest in providing bases for comparison and for evaluation of the differentials which they reveal as between countries, sub-regions and regions, and for tracing the movements over time by which the world and its many geographic, social, political and economic divisions progresses from stage to stage of its demographic development in response to and/or as a determining influence in the process of social and economic development.

30. These needs, as well as new needs which will arise or be recognized in the course of time, must all be met by a vital statistics system. To meet them

adequately in all their ramifications, the system must operate according to certain well-defined principles which are applicable at every step of the way.

31. At the same time, the system must be flexible enough to incorporate new methods or to adapt old ones to the purpose in hand, particularly in view of contemporary issues such as the effects of radiation, genetic factors in morbidity and mortality, and the formulation of population policies, for the understanding of which vital statistics are essential.

32. These issues require a broader approach to vital statistics, an approach in which man may be viewed both as an individual and as a member of his family (descent) group.<sup>14/</sup> Technically, difficulties persist but the basis for a solution appears to exist in the power of electronic machines. Substantively, some modifications of the traditional scope of a vital statistics system are required.

<sup>14/</sup> "Use of Vital Statistics" by Harold B. Newcombe in Proceedings of the World Population Conference, Belgrade, 30 August-20 September 1965, Volume II, paragraph 2.

## CHAPTER II

### The Characteristics of a Vital Statistics System

#### A. Definition of a Vital Statistics System

33. For the purpose of these proposals, a vital statistics system is defined as the total process of (a) collecting information on the frequency of occurrence of certain vital events, as well as relevant characteristics of the events themselves and of the person(s) concerned, and (b) compiling, analyzing, evaluating, presenting and disseminating these data in statistical form.

34. The vital events on which data should be collected in a vital statistics system are live births, deaths, foetal deaths, marriages, divorces, annulments, judicial separations, adoptions, legitimations and recognitions defined for statistical purposes in paragraph 41.

<sup>15/</sup>  
35. Other events of recognized demographic importance, such as migratory movements and naturalizations, are not included because information on them is not usually available from a regular system of civil registration. Particular attention is drawn to the desirability of exploring methods of obtaining information on non-registered marital unions ("common-law" or "consensual" marriages) with recognition of the fact that, by their very characteristics, they are not obtained by the registration method.

#### (1) Priorities

36. In establishing or improving a vital statistics system, first priority should be given to setting up procedures for the registration and reporting of live births, deaths, marriages and divorces.

37. Provision for collecting information on the frequency and characteristics of foetal deaths should have secondary priority and, although the registration of all foetal deaths irrespective of gestational age is a desirable goal to be

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<sup>15/</sup> Vital statistics, together with population and migration statistics, constitute the field of demographic statistics.

attained as soon as possible, as a minimum all countries should seek to register all foetal deaths occurring after the 28th completed week of gestation.

38. Arrangements for registration of annulments, judicial separations, adoptions, legitimations and recognitions, should have a lower priority than foetal deaths but represent an ultimate registration goal.

39. The **exclusion** from a vital statistics system of events which are not usually subject to registration arises from the fundamental importance of civil registration to the efficient operation of a vital statistics system: the great value and utility of the legal records in the economic and social development process tends to produce a conceptual and practical framework for the continuous provision of statistical data on the vital events. Nevertheless, the civil registration records are not the only source of vital statistics, either in the developed countries, where civil registration is already operating **fairly** efficiently, or in the developing countries, where registration is in the majority of cases still seriously inadequate.

B. Definition of each Vital Event for Statistical Purposes

40. The definition of each event on which data are to be collected for vital statistics purposes should conform, in so far as possible, with the definitions for statistical purposes given in paragraph 41 below. If the legal concept or definition in any country cannot be harmonized with these, provision should be made to report the events for statistical purposes, as defined below, or in **accordance** with definitions which do not differ in principle from those below. If this is impossible, full description of divergencies should be given wherever statistics of these events appear.

41. The recommended statistical definitions are as follows:

- (1) LIVE BIRTH<sup>16/</sup> is the complete **expu**sion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which,

<sup>16/</sup> The definition of live birth was adopted, as one of the Recommendations under Article 23 of the Constitution and 17 of the "Regulations No.1" of the World Health Organization, by the Third World Health Assembly, 19 May 1950 (WHA 3.6). (World Health Organization, Official Records, No.28, pages 16-17).

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 time of registration, and if they die at any time following birth they should also be registered and counted as deaths.

(2) 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 therefore excludes foetal deaths.

(3) FOETAL DEATH 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.<sup>17/ 18/</sup>

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<sup>17/</sup> The definition of foetal death was adopted by the Third World Health Assembly under the Articles referred to in regard to the definition of live birth.

<sup>18/</sup> The term "Stillbirth" has been omitted from the Draft Proposals as being strictly a particular species of "foetal death". If, for any reason, the term must be used in national vital statistics, it should be equated to "late foetal deaths", that is, to foetal deaths of 28 or more completed weeks of gestation, as provided by the World Health Organization.

- (4) MARRIAGE is the act, ceremony or process by which the legal relationship of husband and wife is constituted.<sup>19/</sup> The legality of the union may be established by civil, religious, or other means as recognized by the laws of each country.
- (5) DIVORCE is a final legal dissolution of a marriage, that is, the separation of husband and wife by a judicial decree which confers on the parties the right to remarriage under civil, religious and/or other provisions, according to the laws of each country.
- (6) 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.
- (7) SEPARATION, JUDICIAL is the disunion of married persons, according to the laws of each country, which does not confer on the parties the right to remarry.
- (8) 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.
- (9) LEGITIMATION is the formal investing of a person with the status and rights of legitimacy, according to the laws of each country.
- (10) RECOGNITION is the legal acknowledgment, either voluntarily or compulsorily, of the paternity of an illegitimate child.

C. Principles for Collection and Compilation of Vital Statistics

(1) Designation of responsibilities

42. From the organizational viewpoint, the responsibility for the maintenance of standards for the design and conduct of the various operations by which vital statistics are collected and compiled, should be allocated to a central

<sup>19/</sup> See Encyclopaedia Britannica, 1957, Vol.14, p. 950.

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 co-ordination amongst the civil registration service, general statistical service, population and migration statistical services, health statistical service, etcetera, and with research projects which involve consideration of demographic factors, for example in the economic, social or medical field.<sup>20/</sup> This last provision is of increasing interest to-day because of the emphasis being placed on genetic and radiation studies and on record-linkage as the appropriate technique of investigation,<sup>21/</sup> and the potentialities of similar methods in a vital statistics system.

(2) Integration and co-ordination

43. The contemporary emphasis on social and economic planning imposes the necessity for a high degree of statistical integration, since the assessment of needs in particular fields and the setting of targets depends upon the availability of a large number of statistical series, and the data must be logically consistent. The close relationship between planning and statistics implies the necessity for an over-all view of the series required<sup>22/</sup> and of the statistical organization for obtaining them.

<sup>20/</sup> In some countries it has been found that co-ordination has been facilitated through the establishment of "National Committees on Vital and Health Statistics" (of which the Statistical Commission took note at its fifth session) or committees or councils of a similar character. The establishment of National Committees was recommended by the World Health Organization at its First World Health Assembly in 1948 and is endorsed by the Inter American Statistical Institute. See Report of the Vital Statistics Sub-Committee to the Committee on Improvement of National Statistics, Washington, D.C., March 1961 (Inter American Statistical Institute document, 4358a-2/12/62-125).

<sup>21/</sup> Use of Vital and Health Statistics for Genetic and Radiations Studies, op.cit.

<sup>22/</sup> The basic series required in the developing countries are listed in Statistical Series for the Use of Less Developed Countries in Programmes of Economic and Social Development (United Nations publication, Sales No.: 59.XVII.10). This document is shortly to be revised.



44. While the arrangements within a given country will naturally depend on the administrative structure existing in that country, centralized co-ordination 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 and which are embodied in tabulations which meet the needs of the consumers without over-lapping or omissions. This is important not only in regard to data which are specifically collected by statistical agencies but also for statistical data which are by-products of administrative activities, such as the civil registration system itself, social security services, hospital records, labour bureaux, education departments, alien registers, etcetera.

45. The definitions of vital events adopted in the statistical and administrative systems should be consistent with those employed for the same events in the vital statistics system. In the case of demographic statistics in general, it is particularly important to co-ordinate the concepts, definitions, classifications and tabulations with those employed in population censuses, in intercensal field surveys, and in migration statistics. This applies not only to vital events, such as births, deaths and marriages, but also to characteristics of these events such as economic activity, and to geographic classifications such as the locally-operative urban/rural division. The base population, de facto or de jure, must also be considered in order to ensure consistency between the numerator and denominator of the vital rates at a point of time and over time.

46. Where international standards have been agreed upon, as in the field of population censuses,<sup>23/</sup> and in a number of fields of interest of the Specialized Agencies (such as the definition of live births and foetal deaths,<sup>24/</sup> the

<sup>23/</sup> Principles and Recommendations for the 1970 Population Censuses (United Nations publication, Sales No.: 67.XVII.3).

<sup>24/</sup> The accepted definitions, agreed upon by the World Health Organization and endorsed by the Statistical Commission, as cited in para. 41.

classification of cause of death,<sup>25/</sup> the investigation of economic characteristics<sup>26/</sup> and of education<sup>27/</sup>), it is recommended that these standards be applied in the vital statistics system, wherever applicable. 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 form convertible to the international standards.

47. At the technical level, integration of a system of demographic statistics may in the future be achieved through developments in the use of electronic computers. The full scale operation and smooth running of such a system would be facilitated by the allocation of an identifying number to each birth recorded, the same number to be used throughout the vital records of the individual concerned.<sup>28/</sup>

<sup>25/</sup> Manual of the International Statistical Classification of Disease, Injuries, and Causes of Death, Eighth Revision, adopted by the nineteenth World Health Assembly, Geneva, 1966 (In press).

<sup>26/</sup> International Standard Industrial Classification of All Economic Activities (United Nations publications, Sales No.: 67.XVII.11) and International Standard Classification of Occupations (International Labour Organization publication, Geneva 1958) both in process of revision and due for publication 1967/68.

<sup>27/</sup> Manual of Educational Statistics, first edition, UNESCO, Paris, 1961.

<sup>28/</sup> By extension, the system could be made to perform the function of a population register, with greater ease in the derivation of statistical data than heretofore. This in turn would imply satisfactory recording of migratory movements, at present beyond the resources of many countries. Because of this, and because a population register does not differ in principle from a civil registration system in respect of obtaining information on and legally documenting the vital events, a population register system is not treated in detail in the Draft Proposals. See Methodology and Evaluation of Continuous Population Registers (United Nations document, E/CN.3/293). (In process of revision).

(3) Coverage

48. A vital statistics system should include all vital events occurring in all geographic areas and in all population groups in the **national area**.

49. If sampling techniques are employed, the sample should be so designed as to be representative of all geographic areas and all population groups in the national area, or in such sub-national areas as may be under consideration.

(4) Continuity

50. The principle of continuity in collection and compilation of vital statistics should be observed in order that the data may reflect short-term fluctuations, including seasonal movements, in the vital rates, 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 measures such as sample surveys are adopted to obtain estimates of the vital rates, efforts should be made to ensure that data become available as frequently and as regularly as is possible in the circumstances.

(5) Confidentiality

51. Confidentiality of personal information in the records should be safeguarded in so far as consistent with its use for administrative and statistical purposes. The statistical reports should be opened to the widest possible legitimate use consistent with the needs for confidentiality in each country.

(6) Goal of the compilation programme

52. The compilation of vital statistics should have as its ultimate minimum goal (1) the provision of total monthly or quarterly summary counts of live births, deaths, marriages and divorces (and of foetal deaths if these are included in the collection programme) on a time schedule prompt enough to provide information for administrative or other needs; and (2) the production of detailed annual tabulations of such type and on such time schedule as will make possible their effective use for the scientific analysis of the inter-relationship between

demographic, economic and social factors, for planning, operating, and evaluating public health programmes, and for other purposes as required, particularly in regard to the formulation and evaluation of economic and social plans. In so far as possible, such statistics should be comparable on an international basis and lend themselves to international analysis.

### CHAPTER III

#### Topics to be Investigated in a Vital Statistics System, their Definition and Specification

##### A. The Topics to be Investigated

53. To satisfy national and international needs for vital statistics, provision should be made in all countries for the investigation of a group of basic topics and such additional topics as may be desirable and practicable in each country, in relation to each of the vital events listed and defined in paragraph 41. above.

54. A list of topics to be investigated in respect of live births, deaths, foetal deaths, marriages, and divorces is given below. The events are listed in the order shown in paragraph 41, and for each event the topics to be investigated are arranged in alphabetical order. The exact manner in which the specified topics will be investigated and recorded will be determined by each country but in order to preserve comparability the resulting data should be such as will conform to the definitions given in paragraphs 62-139.

55. The suggested list is an extended one designed to meet the data requirements implied in the examination of the uses of a vital statistics system in Chapter I. Because it will not be possible for all countries to operate at a uniform pace in achieving coverage of the suggested topics, the list distinguishes first-priority (\*) topics. These may be regarded as immediate goals on which every country should concentrate; the remaining topics constitute second priority goals which should be achieved as resources permit.

56. The following is the List of topics to be investigated:

(1) LIVE-BIRTH

(i) Characteristics of the event (child)

- \* Attendant at birth
- \* Date of occurrence (of delivery)
- \* Date of registration
  - Gestational age
  - Hospitalization
- \* Legitimacy status
- \* Place of occurrence (geographic)
- \* Sex
- \* Type of birth (that is, single or multiple issue)
  - Weight at birth

(ii) Characteristics of mother and father (except where otherwise specified)

- Age (see Date of birth)
- \* Children born alive to mother during her lifetime
- \* Children born alive to mother during her lifetime and still living
- \* Children born dead to mother during her lifetime
- \* Children born alive to mother during the preceding 12 months
- \* Children born alive to mother during the preceding 12 months and still living
- Citizenship (nationality)
- \* Date of birth; if not available, age
  - Date of marriage or duration of marriage (for legitimate births)
  - Duration of residence in usual (present) place
  - Educational attainment
  - Ethnic (or national) group
  - Industry
  - Interval since last previous live birth to mother

(ii) Characteristics of mother and father (except where otherwise specified) (continued)

Literacy status

\* Occupation

Place of birth (geographic)

Place of previous residence

\* Place of residence at a specified time in the past

\* Place of usual residence

Status (as employer, employee, etcetera)

(2) DEATH

(i) Characteristics of event

\* Cause of death

\* Certifier or attendant

\* Date of occurrence (of death)

\* Date of registration

\* Place of occurrence (geographic)

(ii) Characteristics of decedent

Age of decedent (see Date of birth)

Age of surviving spouse (for married)

\* Children born alive during lifetime (for females of child-bearing age and over)

\* Children born alive during lifetime and still living (for females of childbearing age and over)

Citizenship (nationality)

\* Date of birth; if not available, age

Date of marriage or duration of marriage

Duration of residence in usual (present) place

(ii) Characteristics of decedent (continued)

Educational attainment

Ethnic (or national) group

Hospitalization

Industry

Legitimacy status (for decedent under one year of age)

Literacy status

\* Marital status

\* Occupation

Place of birth (geographic)

Place of previous residence

\* Place of residence at a specified time in the past

\* Place of usual residence

\* Sex

Status (as employer, employee, etcetera)

(iii) \*Deaths in each household in the preceding 12 months, number of <sup>29/</sup>

(3) ~~FOETAL-DEATH~~ <sup>30/</sup>

(i) Characteristics of event (product of conception without evidence of life)

Cause of foetal death

Certifier or attendant

\* Date of occurrence (of foetal delivery)

\* Date of registration

\* Gestational age

Hospitalization

<sup>29/</sup> This information can be obtained only by a direct question on the deaths which occurred (in households) in the specified period.

<sup>30/</sup> The Draft Proposals do not recommend the inclusion of inquiries on foetal deaths in field surveys, because of the difficulty of collecting the data, especially in developing countries.



(i) Characteristics of event (product of **conception**)(continued)

- \* Legitimacy status
- \* Place of occurrence (geographic)
- \* Sex
- \* Type of birth (that is, single or multiple issue)  
Weight at delivery

(ii) Characteristics of mother and father (except where otherwise specified)

- Age (see Date of birth)
- \* Children born alive to mother during her lifetime
- \* Children born alive to mother during her lifetime and still living
- \* Children born dead to mother during her lifetime  
Citizenship (nationality)
- \* Date of birth; if not available, age
- \* Date of marriage or duration of marriage (for legitimate deliveries)  
Educational attainment  
Ethnic (or national) group  
Industry  
Literacy status
- \* Occupation  
Place of birth (geographic)
- \* Place of usual residence (of mother)  
Status (as employer, employee, etc.)

(4) MARRIAGE

(i) Characteristics of event

- \* Date of occurrence (of marriage)
- \* Date of registration
- \* Place of occurrence (geographic)
- \* Type of marriage

(ii) Characteristics of bride and groom

- Age (see Date of birth)
- Citizenship (nationality)
- \* Date of birth; if not available, age
- Educational attainment
- Ethnic (or national) group
- Duration of residence in usual (present) place
- Industry
- Literacy status
- \* Marital status (previous)
- Marriages, previous number of
- \* Occupation
- Place of birth (geographic)
- Place of previous residence
- \* Place of residence at a specified time in the past
- \* Place of usual residence
- Status (as employer, employee etcetera)

(iii) \*Married in the preceding 12 months, number of persons<sup>31/</sup>

31 This has been included as a topic for investigation in field surveys but the same information may be obtained indirectly from data on date or duration of marriage, in which case "number of marriages" should be regarded rather as a tabulation concept.

(5) DIVORCE<sup>32/</sup>

- (i) Characteristics of event
  - \* Date of occurrence (of divorce)
  - \* Date of registration
  - \* Place of occurrence (geographic)
- (ii) Characteristics of divorcees (husband and wife separately)
  - Age (see Date of birth)
  - \* Children dependent on divorcees
  - Citizenship (nationality)
  - \* Date of birth; if not available, age
  - \* Date or duration of marriage being dissolved
  - Duration of residence in usual (present) place
  - Educational attainment
  - Ethnic (national) group
  - Industry
  - Literacy status
  - Marriages, previous number of
  - Mode of dissolution of previous marriages
  - \* Occupation
  - Place of birth (geographic)
  - Place of occurrence of marriage (geographic)
  - Place of previous residence
  - \* Place of usual residence
  - Status (as employer, employee, etcetera)
  - Type of marriage being dissolved

32/ The Draft Proposals do not recommend the inclusion of inquiries on divorce as a separate topic in field surveys because the low incidence would require a large sample.

B. Topics Relating to the Base Population and their Relevance to a Vital Statistics System

57. Even in those developed countries where civil registration is already operating effectively the obtaining of data on population size and characteristics presents a problem, since civil registration does not in itself produce the required population statistics. However, the problem in such countries is not serious because the adjustment of census figures and data on the vital events can usually be relied upon to provide annual intercensal estimates of population.

58. Where population statistics are inadequate for such a purpose, the acquisition of the required data must be explicitly considered in order that a vital statistics system can function. For example, in setting up sample registration area schemes and in inquiring into the occurrence of vital events in a sample field survey, the data on the events can be computed as rates only when corresponding up-to-date population figures are available. The normal procedure is to collect the population data by means of a sample field survey by enumerating not only the vital events and related characteristics, but also all the persons who are usual residents of households in the sample.

59. The topics to be investigated in respect of the household and its members are listed in paragraphs 253-256 which also cite the sources of definitions and specifications of the topics.

C. Definition and Specification of Topics to be Investigated

60. Each topic to be investigated in a vital statistics system should be clearly and explicitly defined and accompanied by precise specifications; the definitions and specifications should operate towards the achievement of international comparability and should be consistent with current practice in the demographic statistics in each country.

61. Accordingly, the definitions and specifications given below for the topics recommended in paragraph 56 to be investigated in a vital statistics system

conform with those recommended in the Principles and Recommendations for the 1970 Population Censuses<sup>33/</sup> and also with those given in the Handbook of Household Surveys.<sup>34/</sup> Except where otherwise indicated, the characteristics should be reported as of the date of occurrence of the event.

62. (1) AGE (duration of life at death, at birth of child, at delivery of dead foetus, at marriage, at divorce) is the exact interval between the date of birth and the date of occurrence of the event, expressed in the largest completed unit of solar time, such as years, months, weeks, days, hours or minutes of life, as appropriate.

63. Information on age may be secured either by obtaining the year, month and day of birth or by asking directly for age at the last birthday. The first method usually yields more precise information but it is extremely difficult to use in enumerating illiterate persons and, in any case, it involves additional processing in converting the answers into completed years. 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. It is, however, the appropriate question to use when a considerable proportion of the population cannot give a precise birth date. Where exact age is unknown estimated age may be recorded. Among less literate persons, it may be useful to employ history calendars, that is lists 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 may help arrive at reasonable estimates of age. Climatic and farming cycles, and religious events may also be used.<sup>35/</sup> Approximation of the age

<sup>33/</sup> Op.cit.

<sup>34/</sup> United Nations publication, Sales No.: 64.XVII.13.

<sup>35/</sup> For examples of such calendars, see Blanc, Robert, Manuel de recherche démographique en pays sous-développé, France, Ministère de la Coopération, Institut National de la Statistique et des Etudes Economiques, 1962, pp.77-84.

of an individual by simple criteria of physiological age or from a study of the ages of other members of the same household whose relationship to the persons of unknown age is given, may be of assistance.

64. The obtaining of relatively reliable information on age calls for special efforts on the part of the interviewer. Special care must be exercised, for example, in certain population groups among whom age is reckoned from the New Year. In such communities, an infant is considered to be already one year old at birth and, at the succeeding New Year (it may be Chinese or Moslem) he automatically becomes 2 years of age, and he continues to advance one year at each New Year regardless of his actual birth date. Thus, unless special care is taken to ask for date of birth in terms of the solar calendar, these reports are likely to result in an upward bias of one year and a half on the average.

65. (2) ATTENDANT AT BIRTH is the physician, midwife, nurse or other person who delivered the mother.

66. (3) BIRTH ORDER is the numerical order (of the child whose birth is now being recorded) in relation to all previous issue of the mother, that is, those born alive plus those born dead, legitimate and illegitimate. The computation is based on "total issue" born to this mother, total issue being the sum of the children recorded in topic 6 "Children born alive to mother during her lifetime" and topic 8 "Children born dead to mother during her lifetime". If the computation is made on the basis of legitimate births only, the term "marriage-birth order" is preferable. If it is made on the basis of live-births only, the term "live-birth order" should be used (see topic 28, "Live-birth order").

67. (4) CAUSE OF DEATH is the morbid condition or disease process, abnormality, injury or poisoning leading directly, or indirectly, to death. Symptoms or modes

of dying such as heart failure, asthenia, etcetera are not considered to be causes of death for statistical purposes. The underlying cause of death, which, rather than the direct or intermediate antecedent cause, is the one to be adopted as the main cause for tabulation of mortality statistics may be defined as (a) the disease or injury which initiated the train of morbid events leading directly to death, or (b) the circumstances of the accident or violence which produced the fatal injury.

68. For purposes of international comparability it is recommended that countries compile their data in accordance with the International Statistical Classification of Diseases.....<sup>36/</sup>

69. (5) CERTIFIER is the person who certified the cause of death, that is, the physician or surgeon who attended the decedent in his terminal illness, the medical practitioner who examined the body after death, or the coroner, midwife, nurse, or layman who reported a cause.

70. (6) CHILDREN BORN ALIVE TO MOTHER DURING HER LIFETIME is defined to include all children born alive to the woman concerned whether legitimate or illegitimate, or whether born of the present or of previous marriages, and regardless of whether they are living or dead at the time of the event being registered or the inquiry, or where they may be living. In the case of multiple issues, each child should be counted separately.

71. Data on the total number of live-born children should preferably be collected for all women of childbearing age and over, regardless of marital status. If it is not feasible to obtain the information for single women, it should be collected at least for all women of childbearing age and over who are married (including consensually married), widowed, separated or divorced. In

either case, the group of women for whom the data have been collected should be clearly specified so as to avoid ambiguity in the analysis of the results. For legitimate births, provision may be made to distinguish issue of current and previous marriages (if any).

72. The collection of accurate data on the number of children born alive can be difficult because of the possibility that some of the replies will actually include foetal deaths, on the one hand, while, on the other, they may exclude children who died early in their infancy. It is therefore recommended that, in obtaining information on total fertility, a series of probing questions on fertility be asked covering, in addition to the number of children born alive, (a) total number of issue (including foetal deaths), (b) the number born dead and (c) the number still living. Any lack of consistency among the answers to these questions will indicate some error in the response, which can then be further probed.

73. (7) CHILDREN BORN ALIVE TO MOTHER DURING HER LIFETIME AND STILL LIVING is defined to include all the children born alive to the woman concerned (whether they are legitimate or illegitimate, or whether born of the present or of previous marriages), who are still living at the time of the event being registered or the inquiry, regardless of their age. The number recorded should comprise those children living with her and those living elsewhere, no matter where the latter may reside.

74. Data on the total number of living children should be collected for the same group of women for whom data on total number of live-born children/<sup>(topic 6)</sup>are secured. The group should, therefore, preferably consist of all women of childbearing age and over, regardless of marital status. If it is not feasible to obtain the information for single women, it should be collected at least for all women of childbearing age and over who are married (including consensually married), widowed, separated or divorced.



75. (8) CHILDREN BORN DEAD TO MOTHER DURING HER LIFETIME is defined to include all foetal deaths that is, all products of conception born without evidence of life to the woman concerned, whether such conception was legitimate or illegitimate, or whether it related to the present or previous marriages. The data should be collected for the same women for whom data on children born alive and children still living (topics 6 and 7) are collected.
76. (9) CHILDREN BORN ALIVE TO MOTHER DURING THE 12 MONTHS PRECEDING THE INQUIRY is defined to include such of the issue referred to under topic 6 above as were born in the 12 months preceding the date of the inquiry.
77. (10) CHILDREN BORN ALIVE TO MOTHER DURING THE 12 MONTHS PRECEDING THE INQUIRY AND STILL LIVING is defined to include such of the issue referred to under topics 6 and 7 as were born in the 12 months preceding the date of the inquiry and were still living at the date of the inquiry.
78. (11) CHILDREN DEPENDENT ON DIVORCEES is the total number of living children under 18 years of age dependent on either of the divorcees at the time the petition is filed.
- 79 (12) CITIZENSHIP (of parents, brides, grooms and divorcees) is defined as the legal nationality of the person concerned.
80. Data on citizenship should be collected so as to permit the characterization of the persons concerned as (a) citizens, including all citizens by birth or naturalization whether by declaration, option, marriage, or other means, and (b) aliens. Information on the country of citizenship of aliens should also be collected.
81. Indications should be given of the classification of stateless persons, persons with dual nationality, persons in process of naturalization and any other ambiguous citizenship groups.
82. (13) DATE OF BIRTH (of parents, of decedent, of bride and groom, of divorcees) should be expressed as year, month, and day of birth, that is, in detail equivalent to that given for "date of occurrence of event" in order that exact

interval between the two dates 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, give "age" as defined in (1) above.

83. (14) DATE OF MARRIAGE (of parents, of divorcees). In connexion with legitimate births, it is the day, month, and year of the marriage of the parents of the child or foetus. For marriages being dissolved by divorce, it is the day, month, and year of the marriage being dissolved. See also topic (18) "Duration of marriage".

84. (15) DATE OF OCCURRENCE (of live birth, death, delivery of dead foetus, marriage or divorce) is the exact date when the event occurred, and should be expressed in terms of day, month, and year; and hour and minute if appropriate.

85. (16) DATE OF REGISTRATION (of live birth, death, foetal death, marriage or divorce) should be expressed as day, month, and year when the entry in the civil register was made.

86. (17) DEATHS IN EACH HOUSEHOLD IN THE PRECEDING 12 MONTHS refers to the number of deaths which took place in the twelve months preceding the inquiry among persons who at the time of their death were members of the household.

87. (18) DURATION OF MARRIAGE is the interval between the date of marriage and the date of the event (birth, foetal death, divorce) or of the inquiry. It may be a topic to be directly investigated but, if the information is derived from information on "date of marriage" (topic 14 above) it should be regarded as a tabulation concept.

88. (19) DURATION OF RESIDENCE (of parents, decedents, brides, grooms and divorcees) in (usual) present place is the interval of time up to the date of the event or inquiry, expressed in completed years, during which each person has lived in (a) the locality which is his usual residence (see topic 40) at the time of the event or inquiry and (b) the major civil division in which that locality is located.

89. Information on duration of residence is only meaningful if it is cross-classified with usual residence at the time of the event or inquiry. If, however, in the compilation of the population of geographic units, persons are allocated to the place where they were found at the time of the event or inquiry rather than to their usual place of residence, information on duration of residence is irrelevant for those persons who were only visiting at, or transient in, the place at which they were recorded. Such persons must, therefore, be identified as non-residents, so that they will not erroneously be counted as recent migrants.

90. 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 but not in the particular household.

91. (20) 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. Information on educational attainment should be recorded for persons at or beyond the usual age for entrance into school but if for any reason it is confined to the population above a stated minimum age, the minimum should not be higher than twenty-five years. (See also topic 27, "literacy status").

92. (21) ETHNIC AND/OR NATIONAL GROUP (of parents, decedents, brides, grooms and divorcees). The ethnic and/or national groups of the population about which information is needed in different countries are dependent upon national circumstances. Some of the basis on which ethnic groups are identified are: ethnic nationality (that is, 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 by the groups which it desires to identify. By the nature of the subject, these groups will vary widely from country to country, so that no internationally-accepted criteria can be recommended.

93. Because of the interpretative difficulties which may occur, it is important that, where such an investigation is undertaken, 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 principal classification should be a few broad categories, leaving open the possibility of a more detailed breakdown for important tribal or other groups where these are relevant.

94. (22) GESTATIONAL AGE (of child or dead foetus) is the interval in completed weeks which has elapsed between the first day of the last menstrual period<sup>of the mother</sup> and the date of <sup>her</sup> delivery, irrespective of whether the product of conception was live-born or without evidence of life.

95. (23) HOSPITALIZATION (for births, foetal deaths and decedents) refers to the type of place where the event occurred, as for example in a hospital, institution, private home or other place.

96. (24) INDUSTRY (of parents, decedents, brides, grooms and divorcees) refers to the activity of the establishment in which an economically-active person worked during the time-reference period established for data on economic characteristics<sup>37/</sup> or last worked, if unemployed. For purposes of international comparability, it is recommended that countries compile their data in accordance with the International Standard Industrial Classification of all Economic Activities (ISIC) most recently approved by the United Nations. If this is not possible,

<sup>37/</sup> See International Labour Office, The International Standardization of Labour Statistics, Geneva, 1959, pp.44-45.

provision should be made for the categories of the classification employed to be convertible to the ISIC or at least to the major (two digit) groups of this classification. If the national data are not classified in accordance with the ISIC, an explanation of the differences should be given. See also topics 35 "Occupation" and 41 "Status".

97. 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 births, marriages and divorces should be no longer than one week.<sup>38/</sup> Industry of decedents should preferably refer to "usual" industry in order to relate industry to mortality.<sup>39/</sup>

98. (25) INTERVAL SINCE LAST PREVIOUS LIVE BIRTH is the time elapsed, in completed months, between the exact date of the last previous delivery of a live-born child and the date of the delivery of the live birth now being reported. (See also topic 6, "children born alive to mother").

99. This item is related to live-birth order by duration of marriage (topics 18 and 28) and the birth interval data indicate the time elapsed since a woman achieved a given parity (birth order) status. This type of information not only permits identification of passage of time between parities for the compilation of reproductive histories of women but it also represents an important

<sup>38/</sup> Ibid.

<sup>39/</sup> The problem of establishing comparability between the numerator and the denominator in industrial mortality studies is recognized.

40/

variable in personal family planning.

100. (26) LEGITIMACY STATUS is the status of the child or dead foetus with respect to being legitimate, that is, considered to be the lawful issue of a couple.

101. (27) LITERACY STATUS. Literacy is defined as the ability both to read and 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 who can, with understanding, both read and write a short, simple statement on his everyday life. A person is illiterate who cannot, with understanding, both read and write a short, simple statement on his everyday life.<sup>41/</sup> Hence, a person capable of reading and writing only figures and his own 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.

102. The language or languages in which a person can read and write is not a factor in determining literacy and need not ordinarily be considered on the questionnaire.

103. [Suppressed]

104. Because of the possible reluctance of at least some illiterate persons to admit to this fact and the difficulties of applying a test of literacy, the data

40/ Ad Hoc Committee of Experts in Programmes of Fertility : Demographic Statistics Relevant to Fertility Studies, op.cit., paragraph 30.

41/ UNESCO, Recommendation Concerning the International Standardization of Educational Statistics, Adopted by the General Conference at its Tenth Session, Paris, 3 December 1958.

collected may not be highly accurate.

105. (28) LIVE-BIRTH ORDER is the numerical order of the child (the report of whose birth is being tabulated) in relation to all previous live-born issue of the mother, irrespective of whether pregnancies were legitimate or illegitimate. The computation is based on topic 6, "Children born alive to mother during her lifetime". Should it be desirable to compute live-birth order solely on legitimate issue, it is suggested that the term "marriage live-birth order" be adopted for this modified index. (See topic 3, "Birth order").

106. (29) MARITAL STATUS is the personal status of each individual in relation to the marriage laws or customs of the country. The categories of marital status to be identified are at least: (a) single, that is never-married, (b) married, (c) widowed and not remarried, (d) divorced and not remarried, and (e) married but **judicially separated**.

107. In some countries it will be necessary to take into account/customary unions (which are legal and binding under customary law) and extra-legal unions, the latter often known as de facto (consensual) unions. Some countries will also wish to distinguish between married persons living with their spouses and those living apart from their spouses.

108. The treatment of persons whose only or latest 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.

109. Some countries have experienced difficulties with distinguishing (a) between formal marriages and de facto unions, (b) between persons **judicially separated** and those formally married but de facto separated, and even (c) between persons legally separated and those legally divorced. If any of these circumstances necessitate a departure from the recommended classification of marital status, the composition of each category should be clearly stated.

110. 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, also, there are likely to be persons who have been permitted to marry below the legal minimum age because of special circumstances.

111. [Suppressed]

112. The marital status categories described 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 union outside of the 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 different circumstances prevailing among countries. It is suggested, however, that countries which wish to investigate these relationships should consider the possibility of collecting separate data for each person on formal marital unions, on de facto unions and on the duration of each type of union.



113. (30) MARRIAGE LIVE-BIRTH ORDER is a tabulation concept based on total legitimate issue. The definition is given under topic 3, "Birth order".

114. (31) MARRIAGE ORDER is a tabulation concept based on topic 32 "Marriages, previous number of" and refers to the numerical sequence of the current marriage, as first, second, third, etcetera.

115. (32) MARRIAGES, PREVIOUS NUMBER OF (of persons marrying or of divorcees) is the number of marriages entered into before the one contracted at this marriage, or before the one being dissolved by this divorce, irrespective of whether the last previous marriage was dissolved by death or divorce.

116. (33) MARRIED IN THE PRECEDING 12 MONTHS refers to the number of persons in regard to whom the act, ceremony or process constituting their legal relationship took effect in the twelve months preceding the inquiry.

117. (34) MODE OF DISSOLUTION OF PREVIOUS MARRIAGES (of divorcees) will indicate for each marriage entered into before the one being dissolved by divorce whether it was terminated by death or by divorce.

118. (35) OCCUPATION (of parents, decedents, brides, grooms and divorcees) refers to the kind of work done during the time-reference period established for data on economic characteristics by the person employed (or performed previously by the unemployed), irrespective of the industry or the status (as employer, employee, etcetera) in which the person should be classified. For purposes of international comparisons, it is recommended that countries compile their data in accordance with the latest edition of the International Standard Classification of Occupations (ISCO) issued by the International Labour Office. If this is not possible, provision should be made for the categories of the classification employed to be convertible to the ISCO or at least to the minor (two digit) groups of this classification. If national data are not classified in conformity with the ISCO, an explanation of the differences should be given. (See topic 24, "Industry" and 41, "Status").

The time-reference should be as specified for topics 24, "Industry" and 41, "Status".

119. (36) PLACE OF BIRTH (of parents, decedents, brides, grooms and divorcees) is defined as the country, or specified type of geographic unit of the country in which the person was actually born. In some countries, place of birth is reported as the area in which the mother of the individual resided at the time of the person's birth. Each country should specify which definition it has used.

120. The collection of information distinguishing between persons born in the particular country (natives), and those born elsewhere (foreign born), is necessary where any inquiry on place of birth is made. Even countries where the proportion of foreign-born population is insignificant and which, therefore, desire to compile information only on the place of birth of the native population must first separate the native from the foreign-born population. It is therefore recommended that place of birth be asked of all persons. For respondents who cannot name their country of birth, at least the continent should be ascertained.

121. 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 event or inquiry. To ensure such comparability, however, it may be necessary to obtain information not only on country of birth but also on major territorial division or even specific locality, so that reported place of birth can be correctly allocated to countries according to present boundaries. The necessity 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.

122-125 [Suppressed]

126. (37) PLACE OF OCCURRENCE is the geographic locality where the 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 such smaller administrative subdivisions as may be required for national use, and also to

enable a rural/urban distribution to be included in tabulations where required. (See topic 47, "Urban and Rural").

127. (38) PLACE OF PREVIOUS RESIDENCE (of parents, decedents, brides, grooms and divorcees) is the major or other civil division in which the individual resided immediately prior to migrating into his present civil division of usual residence. Where reliable data can be collected, some countries will find it useful to ask for residence at a specified time in the past (topic 39).

128. Suppressed

129. (39) PLACE OF RESIDENCE AT SPECIFIED DATE IN THE PAST (of parents, decedents, brides, grooms and divorcees) is merely an extension of topic 38, "Place of Previous Residence". The date to be specified refers to the date of a census or other inquiry, which information would permit the data on place of previous residence of parents, decedents, brides, grooms and divorcees to be related to the population enumerated at the date specified.

130. (40) PLACE OF USUAL RESIDENCE (of parents, decedents, brides, grooms and divorcees) is the geographic place where the specified person usually resides. This may be the same as, or different from, the place where he was found at the time of the event or inquiry or his legal residence.

131. (41) STATUS (as employer, employee, etcetera) (of parents, decedents, brides, grooms and divorcees) refers to the status of an economically active individual with respect to his employment, that is, whether he is (or was, if unemployed) an

The time-reference should be as specified for topics 24, "Industry" and 35, "Occupation".

employer, own-account worker, employee, unpaid family worker, or a member of a producers' co-operative, as defined below.

(a) Employer: a person who operates his or her own economic enterprise or engages independently in a profession or trade, and hires one or more employees. Some countries may wish to distinguish among employers according to the number of persons they employ.

(b) Own-account worker: a person who operates his or her own economic enterprise or engages independently in a profession or trade, and hires no employees.

(c) Employee: a person who works for a public or private employer and receives remuneration in wages, salary, commission, tips, piece-rates or pay in kind.

(d) Unpaid family worker: a person who works a specified minimum amount of time (at least one third of normal working hours), without pay, in an economic enterprise operated by a related person living in the same household. If there are a significant number of unpaid family workers in enterprises of which the operators are members of a producers' co-operative who are classified in category (e), these unpaid family workers should be classified in a separate sub-group.

(e) Member of producers' co-operative: a person who is an active member of a producers' co-operative, regardless of the industry in which it is established. Where this group is not numerically important, it may be excluded from the classification and members of producers' co-operatives should be classified to other headings, as appropriate.

(f) Persons not classifiable by status: experienced workers with status unknown or inadequately described and unemployed persons not previously employed.

132. (42) TOTAL BIRTH ORDER is a tabulation concept based on "total issue"; see topic 3, "Birth order" for definition of "total issue" and cf "birth order".
133. (43) TYPE OF BIRTH refers to the single or multiple nature of the issue of the pregnancy to which the statistical report relates. Each live-born infant or dead foetus should be characterized as single, twin, triplet, and so forth, and, for each member of a multiple birth, provision should be made to indicate the condition of the other member(s) (mates) with respect to being born alive or dead (foetal death), and sex.
134. (44) TYPE OF CERTIFICATION (of death, foetal death) is a tabulation concept based on the identity of the certifier, topic 5 above.
135. (45) TYPE OF MARRIAGE (of brides, grooms, divorcees) being recorded or being dissolved is the type of act, ceremony or process by which the legal relationship of husband and wife is or was constituted and may be classified as civil, religious and/or customary.
136. (46) UNDERLYING CAUSE OF DEATH - see topic 4, "Cause of death".
137. (47) URBAN AND RURAL is a tabulation concept of high priority in a vital statistics system. However, because of national differences in the characteristics which distinguish urban from rural areas, the distinction between urban and rural population is not yet amenable to a single definition which would be applicable to all countries. For this reason, each country should decide for itself which areas are urban and which are rural.
138. For national purposes as well as for international comparability, the most appropriate unit of classification is the locality,<sup>42/</sup> or, if this is not possible,

<sup>42/</sup> A locality is defined for statistical purposes as a distinct population cluster (also designated as inhabited place, population centre, settlement, etcetera) the inhabitants of which live in neighbouring buildings and which has a name or a locally recognized status. (Principles and Recommendations for the 1970 Population Censuses, op.cit., paragraph 232).

the smallest administrative division of the country. If regional recommendations on the definition of urban and rural are available at the time of the event or inquiry, their specifications should be followed.

139. (48) WEIGHT of a live-born child at birth or of a dead-born foetus at delivery should be the weight determined immediately after delivery, and should be expressed in grammes to a degree of significance which will allow a classification of 500-gramme intervals to be made.

CHAPTER IV

The Tabulation Programme

A. Standards for Compiling Vital Statistics

140. The standards proposed below are a fundamental element in a vital statistics system and it is important that the relation between tabulations from a comprehensive civil registration system and tabulations from other sources of data should be recognized with a view to obtaining the greatest possible conformity between. For this reason, the standards are presented first in the form suitable to compilations from a comprehensive civil registration system, after which reference is made to certain differences imposed by the nature of the data collected in sample registration schemes and by field surveys

(1) WHERE A COMPREHENSIVE CIVIL REGISTRATION SYSTEM EXISTS

Tabulation coverage

141. Statistics should be compiled where possible and as applicable for the total geographic area of the country, for each major and minor civil division and for each principal town, and should also distinguish urban and rural for the first two of these.

142. Every effort should be made to ensure that national vital statistics refer to the total population of the country.

143. Where registration of vital events among important population groups is very incomplete and/or the quantity or quality of original data is very deficient, separate tabulations may have to be made for the various segments of the population and an explanation of the limitations in coverage given wherever the statistics appear.

144. In countries where the social and economic characteristics of large segments of the population vary greatly, for example, amongst ethnic (or national) groups or nomads, it is recommended that, in so far as possible, the identity of each important population group be maintained in the tabulations.

National centralized compilation from individual statistical reports

145. National vital statistics should be compiled in such a way as to obtain uniformity of classification and tabulation and to permit flexibility and adaptability in tabulation to meet national and international requirements.

146. Experience has shown that the procedure best adapted to produce the highest degree of accuracy, uniformity, and flexibility is centralized compilation from individual reports which contain full information necessary for statistical purposes.

Tabulation by calendar periods

147. Final tabulations should refer to a Gregorian calendar period, that is, solar month, quarter, or year, as appropriate. If for reasons of climate or other considerations national vital statistics are more meaningful on a different time base, provision should be made for supplying solar calendar-period tabulations in addition.

Tabulation by date of occurrence or date of registration

148. Final tabulations for any calendar period should be based on events which occurred during that period and not on those registered. 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 tabulations by date of registration approximate those by date of occurrence, and it is desirable that the analyses of this relationship be published.

149. 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 also it should be demonstrated that analyses based on events which are registered during a period can be interpreted in terms of those which occurred.

Tabulation by place of occurrence and place of residence

150. Final tabulations for geographic areas less than the total national territory and 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. The definition of "residence" upon which the allocation of vital events to place of residence is made should not be a legalistic one but one which will allow vital statistics to be related to corresponding population data.

151. Determination of "place of residence" for purposes of tabulation should be made as follows:

Live births	)	
Foetal deaths	)	..... Place of residence of mother
Infant deaths	)	
Deaths		..... Place of residence of decedent
Marriages		..... Place of residence of groom
Divorces		..... Place of residence of husband

152. Tabulation of data for the national territory should relate in general to data on events occurring within the national boundaries, although under certain circumstances, as for example during war years, provision may need to be made for including in the national tabulations data for deaths among the armed forces stationed outside the national boundaries.

(2) WHERE CIVIL REGISTRATION IS LACKING OR DEFICIENT

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153. Modifications to the standards set forth above will be imposed where registration exists but is based on a scheme of sample areas and where data for vital statistics are collected in field surveys. The principal modifications are noted under headings identical with those specified in relation to a comprehensive civil registration system.

Tabulation coverage

154. Wherever sampling has been employed, compilations can be made only for the areas selected in the sample. Statistics should of course be compiled for these areas distinguishing minor civil divisions where appropriate, and retaining the urban/rural differentiation. Important ethnic (or national groups) should also be distinguished as specified in the standard.

National centralized compilation from individual statistical reports

155. The standard applies to sample civil registration schemes but in the case of data collected in field surveys, the application is imprecise because the system of individual reports of vital events is not employed. However, the general aim of uniformity, flexibility and adaptability in classifications and tabulations should be preserved.

Tabulation by calendar periods

156. In the case of data collected in field surveys, tabulations refer to for a specified period (preferably twelve months) before the date of the inquiry. This process does not necessarily yield data for a calendar year; moreover, while it would be theoretically possible to derive monthly or quarterly compilations of vital events and related characteristics, the size of the sample usually precludes this. A similar limitation exists in regard to monthly and quarterly compilations from sample registration schemes.

Tabulation by date of occurrence or date of registration

157. Theoretically in the case of field surveys and actually in the case of sample civil registration schemes, the standard relating to date of occurrence rather than date of registration may be met. In field surveys, however, "date of registration" is frequently omitted, and where a large proportion of events is unregistered, there is little point in including it. Therefore evaluation studies of differences between the two series, date of occurrence and date of registration, are not possible.

Tabulation by place of occurrence and place of residence

158. In a sample of registration areas, tabulations by place-of-occurrence are relevant (as is recommended in the standard for compilation), because on the one hand place-of-registration and place-of-occurrence are in theory identical while on the other hand it is impossible to transfer events by place-of-residence from areas falling outside the sample to the areas which do fall into the sample (and vice versa). In a sample field survey, likewise transfers are impossible

because only a proportion of the total number of areas will fall into the sample; however, in this case, by reason of the nature of the inquiries on vital events recommended for field surveys, the resultant data will represent place-of-residence statistics (events occurring to persons usually resident in households in the sample areas).

B. Recommended Tabulations

159. ///The present Draft Proposals do not contain recommendations for the exact tabulations to be compiled from a vital statistics system. It is preferable at this stage to give the outline of an extended system of vital statistics, and, when agreement has been reached on the priorities of topics to be investigated, to proceed with the formulation of a tabulation programme. It is expected that the next draft will include a list of tabulations, with specifications, and an outline of the uses of each tabulation./// <sup>43/</sup>

160. Meanwhile, reference may be made to the Handbook of Vital Statistics Methods<sup>44/</sup>, the Handbook of Household Surveys<sup>45/</sup>, Principles and Recommendations for the 1970 Population Censuses,<sup>46/</sup> and National Programmes of Analysis of Population Census Data as an Aid for Planning and Policy-Making.<sup>47/</sup>

<sup>43/</sup> Brackets ///.../// indicate matter which is not part of the recommendations as such.

<sup>44/</sup> Op.cit.

<sup>45/</sup> United Nations publication, Sales No.: 64.XVII.13.

<sup>46/</sup> Op.cit.

<sup>47/</sup> United Nations publication, Sales No.: 64.XIII.4.

## CHAPTER V

### The Civil Registration Method as a Source of Data for Vital Statistics

#### A. The Fundamental Role of a Civil Registration System

161. The following considerations justify the fundamental role accorded to the civil registration method in a vital statistics system, despite the fact that there are difficulties in establishing and perfecting civil registration and despite the availability of other methods (described in Chapter VI below) of obtaining data on the vital events and related characteristics.

#### Legal and protective advantages to individuals

162. As indicated in Chapter I, the safeguarding of human rights and questions of social status and benefits particularly amongst children and youth, require registration for every individual. It is obvious that the other techniques described in the following chapters cannot meet this requirement because (i) in the case of sample registration schemes the registration coverage relates only to a proportion of the population and (ii) in the case of the remaining measures the operations are in principle purely statistical and do not effect registration of even a portion of the population.

#### Administrative advantages

163. Requirements of data for small civil or geographic divisions throughout a country cannot be met by these ad hoc techniques either because (i) the estimates are derived from sample inquiries or (ii) the estimates are derived from analytic techniques which by virtue of the assumptions on which they are based are unsuitable for application down to small civil divisions, even if the raw data used in the estimation were obtained in a complete enumeration. Moreover, for some administrative purposes, records are required on an individual basis, for example, all deaths from a particular cause, all cases requiring maternal and child care, etcetera.

Statistical advantages

164. In comparison with other methods of obtaining vital statistics, a comprehensive civil registration system generates records which are relatively free from certain types of response error and which are not subject to sampling error; it provides statistical data for planning, administration and research at whatever geographic or administrative level is required; it is continuous by its nature; it is inexpensive because the statistics are a by-product of an administrative process; it permits of qualified medical certification of all causes of death including rare instances, which though statistically unimportant, may be crucial for public health programmes; it can record data which might not be obtainable in a field inquiry (as on legitimacy status); 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 intensive studies of fertility, morbidity and mortality.

B. The Characteristics of the Civil Registration Method

165. The characteristics of a general system of vital statistics as set forth in Chapter II naturally apply to the civil registration method; however, some points are repeated here in order to give a comprehensive review of the requirements of the civil registration method in its statistical aspects.<sup>48/</sup>

Definition

166. The civil registration method is defined as the continuous and permanent, compulsory recording of the occurrence and the characteristics of vital events as defined in paragraph 41, primarily for their value as legal documents as provided by law, and secondarily for their usefulness as a source of statistics, as provided through decree or regulation, in accordance with

<sup>48/</sup> The characteristics specified below are essentially the same as those presented in the Principles for a Vital Statistics System and they are presented here in the same abbreviated form. They are given in the Handbook of Vital Statistics Methods, in the expanded form analagous to the presentation of the content of other Chapters of these Draft Proposals.

legal requirements in each country.

Confidentiality of the registration records

167. Legal safeguards of confidentiality should be provided. However, these provisions should not be so rigid as to exclude the use of the records, under proper control for studies of the kind referred to in paragraphs 284-287 below. Such control may be effected by co-ordination between the agencies holding relevant records //as in the United States mortality differentials study where each of the agencies involved co-operated by extracting the data from the records held by them, without breach of confidentiality. <sup>49/</sup> //

Designation of responsibilities

168. Responsibility for the establishment or development of a civil registration system should be the function of a national government agency or agencies, whether separate from or identical with that with over-all responsibility for the vital statistics system.

169. The assignment of functions should be accompanied by clear designation of duties and responsibilities with respect to registration, recording, statistical reporting, collecting, compilation, analysis, presentation and dissemination of the data and the critical evaluation of the system.

Co-ordination

170. Clear delineation of duties should be supplemented by arrangements for co-ordination of needs and services between official agencies concerned with the registration of events for legal purposes, those responsible for compiling facts for statistical purposes, and those who use these data for administrative or analytic purposes in connexion with economic and social matters, or for planning, operating and evaluating public health programmes either on a national or an international scale.

49/ "Methods Used in a Current Study of Social and Economic Differentials in Mortality" by Evelyn M. Kitagawa and Philip M. Hauser in Emerging Techniques, in Population Research: Proceedings of a Round Table at the Thirty-Ninth Annual Conference of the Milbank Memorial Fund September 18-19, 1962, Milbank Memorial Fund, 1963.

171. Co-ordination, especially 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 or other types of population statistics, with those in charge of migration statistics, with the agencies responsible for planning, national accounts, public health statistics, and other related social and economic statistics.

172. The co-ordinating mechanism established to achieve these objectives should have a direct relationship with the agency responsible for the general co-ordination of the national system of statistics.

Compulsory nature of registration

173. In accordance with priorities established under paragraphs 36-38. registration of every vital event occurring within the boundaries of the country should be made legally compulsory for every group of the population and parallel provision for enforcement should be established.

174. Supplementary arrangements on a non-compulsory basis for registration of events among national residents who are temporarily abroad may be provided at the national level.

175. The efficiency with which these provisions operate or may be presumed to operate should not be a factor in their establishment.

Incentives to registration

176. Incentives should be established to stimulate and encourage compliance with the compulsory registration law.

Organization for registration at local and national level

177. When the administrative and geographic organization of the country permits, responsibility for effecting the legal registration of vital events should be placed on official local agencies which are directly dependent, in so far as registration matters are concerned, on a national office which can co-ordinate, unify, supervise, and promote registration efficiency to the end that it satisfies both legal and statistical needs.

178. In case direct dependence from the national level is not possible, the appropriate national office should have the functions of co-ordination.

Number and size of primary registration units

179. Local registration offices should be established in adequate numbers and in such locations as will ensure that they are easily accessible to the public, and they should be kept open for business during convenient hours, so that the informant may comply with the registration requirements within the time allowed for current registration.

180. The size of the primary registration unit should be such that the registrar in charge can give to that unit the attention required to produce good registration.

The registrar--his duties and responsibilities with respect to registration

181. The position of "registrar" should be one of local prestige and responsibility with remuneration sufficient to attract competent personnel. The duties and responsibilities of the registrar (or his equivalent) at the local, intermediate, and national levels should be codified.

182. The responsibilities of the registrar should include, as appropriate, the legal recording of the specified information regarding vital events; the responsibility for ensuring compliance with the registration law; the responsibility for the accuracy and completeness of each record; the obligation to adopt such measures as are required to inform the public of the necessity, procedures, and requirements for effecting registration, and the value of vital statistics; the custody of records; and the recording and reporting of data for statistical purposes.

183. Where there are difficulties which prevent informants from visiting the registration office to register vital events, provision should be made for the registrar to carry out his functions on an itinerant basis, preferably by making regular rounds of the households in his registration unit.

184. In areas where registration is seriously deficient, these provisions should be interpreted as including all of the activities of promotion, supervision



and evaluation needed to raise the efficiency of the system; for example, activities designed to raise the professional status of the registrars themselves<sup>50/</sup> and to ensure that the provisions regarding adequate numbers of registration offices are observed, training of registration officers and the preparation of manuals of instruction for their use, mass publicity programmes in the vernacular, securing of support from local leaders in influencing local opinion, encouragement of control of burial grounds to ensure that burial permits are issued, regular supervision of the registration records and the statistical reports compiled in registration offices, evaluation procedures designed to measure the degree of completeness<sup>51/</sup>, etcetera. The range of these activities requires considerable support which may be provided by the statistical service and the health department.

Improving the efficiency of registrars

185. The national registration authority or its equivalent should take such steps as are necessary to provide guidance and instruction for registrars in the carrying out of their responsibilities.

Designation of legally-responsible informant

186. Responsibilities with respect to informing the registration authorities of the occurrence of an event should be clearly and unequivocally designated by law or regulation, and publicized in such a way that familiarity with the legal obligations is established.

187. Provision should be made for delegation of authority in certain circumstances as required by questions of literacy, topography, place where event occurs, and so forth.

<sup>50/</sup> The lack of status of registrars has been cited as a major cause of difficulty. See Fourth Inter-American Statistical Conference, Washington, D.C., November 5-16, 1962, Final Report (OAS Official Records, OAS/Ser.C/VI.6.4), p.48.

<sup>51/</sup> See Chapter VII: Evaluating a Vital Statistics System.

188. As far as possible, medical certification of cause of death should be the responsibility of the attending physician.

Place where registration is to be made

189. Each vital event should be registered in the primary registration unit in which it occurred.

190. The place of residence should always be reported (see paragraph 130) and if the registered event concerns a resident of a locality other than that where the event occurred, it may be desirable also to make such arrangements as are required to inform the place of residence of the event.

Cost of current registration

191. The registration of vital events, as prescribed by law, should be free of charge to the person making the registration if provisions of the law with respect to time and so forth are complied with.

192. As an incentive to registration, it may be desirable in some countries to furnish an initial proof of registration to the informant, without charge.

Time allowed for current registration

193. The maximum period to be allowed between the occurrence and the obligatory registration of a vital event should be determined with respect to all the contributory factors operating in the country and should be as short as is consistent with the facilitating of the current and accurate registration of all necessary facts.

194. Every civil registration system should recognize the inevitability of delayed or late registration, that is, those registrations which can be effected through regular registration procedures but which are made after the expiration of the standard registration period.

195. Provision should be made for registering these events in a way which will discourage repetition, but not discourage registration.

Form and content of the registration record

196. Separate registers should be maintained for each type of event on which data are to be collected by the registration method.

197. In order to ensure uniformity throughout the country, the form and content of the registration record should conform in basic content to a national standard established by the national agency which controls or co-ordinates registration. Such standardization should not, of course, prejudice the right of sub-national authorities to add important items of local interest or administrative value, but it should act as a deterrent to omission of topics considered basic at the national level.

198. When the registration record is the original and only source of information for statistical purposes, provision should be made for obtaining information at least on the priority topics listed in paragraph 56.

Definition of each topic on the registration record

199. Each topic on the registration record should be defined, clearly and unambiguously, in accordance with **the relevant definitions given in paragraphs 62-139.**

200. The designated definitions should be printed either on the registration record itself or in the form of separate instructions, in order that they may be available at all times to the registrar responsible for interpreting them.

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

Statistical reporting-coverage

201. A statistical report should be made on every event which is legally registered whether registration takes place within the period prescribed for current registration or is delayed, and irrespective of the procedure by which the legal record is established.

Statistical-reporting area: geographic and ethnic aspects

202. Every geographic area or ethnic group for which registration records are available should be included in the statistical-reporting area, and emphasis

should be placed on statistical recording and reporting of all events which occur, irrespective of the completeness of registration coverage or the extent of data available.

203. As far as practicable, qualitative or quantitative indications of the degree of completeness of registration should be given for each geographic reporting area. (See Chapter VII, Evaluating a Vital Statistics System).

Organization for collection of statistical reports

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

205. If it is desirable for sub-national purposes, provision should be made for channelling original statistical reports through, or supplying copies thereof, to local, state or provincial departments of government which may require information on individual reports for statistical or other purposes.

Control of receipt of statistical reports

206. 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, with the object of making possible current tabulations which will be adequate in terms of completeness of geographic and ethnic coverage, timeliness and detail.

207. A strict time schedule should be established, taking into account the characteristics of the country in terms of topography, communications, and so forth, as well as the provisions for channelling original reports or copies thereof to intermediate offices.

The duties and responsibilities of the registrar with respect to recording and reporting statistical information

208. The legal definition of the responsibilities of the registrar should specify that he has duties with respect to recording and reporting information for statistical purposes in addition to his responsibilities for filing legal records of events.

209. Whether the specified procedure provides that he transmit to the statistical authorities a duplicate of the original legal record or an independent statistical form, this report should be as complete and accurate as he can make it and the coverage in terms of events occurred should also be complete and timely.

Improvement of completeness and accuracy of data reported for statistical purposes

210. An appropriate continuous querying procedure should be established and maintained with respect to all data which are collected for statistical purposes-- and in particular with respect to terms of doubtful significance used in reporting causes of death--with the purpose of clarifying the facts concerning the event and of educating the informant and the recording agent regarding reporting requirements, in order that the resulting statistics may be improved.

211. Methods to improve basic data by means of continuous training and instruction of registrars and of medical personnel should be an essential part of an effective vital statistics system.

Form and content of the statistical report on a vital event

212. The form of the statistical report on a vital event should be uniform throughout a country.

213. For purposes of flexibility and efficiency, the report should preferably be an individual document which provides adequate space for the response to each item of information required.

214. With respect to medical certification of cause of death, it is suggested that the form adopted should conform as far as possible to the "International Form of Medical Certificate of Cause of Death." <sup>52/</sup>

214(a) The content of the statistical report should be in accord with the recommendations made in paragraph 56.

(c) Definition of each topic on the statistical report

214(b) Each topic on the statistical report should be defined in accordance with relevant definitions set forth in paragraphs 62-139.

<sup>52/</sup> Published in "Medical Certification of Cause of Death. Instructions for Physicians on Use of International Form of Medical Certificate of Cause of Death" (Bulletin of the World Health Organization: Supplement 3, Geneva, Switzerland, 1952, p.7).

## CHAPTER VI

### The Role of Sampling in Collecting and Processing of Data for Vital Statistics

215. Because of the many applications of sampling in the collecting and processing of data for vital statistics, the present chapter reviews the role of sampling in these aspects of a vital statistics system. The utility of sampling in evaluating vital statistics data is not included here but is presented in Chapter VII together with other aspects of evaluation.

216. This Chapter does not deal with the principles and methodology of sampling nor do they consider whether the advantages of sampling (for example, reduced cost, improvement in timeliness of statistics, achievement of higher quality) will result from the applications cited. For the theoretical considerations, the standard texts should be consulted.

217. Theoretically, sampling can be applied for the collection of data on all types of vital events, although to be effective in practice, those events for which the incidence is small might require a sample of extraordinary size. On the other hand, applications concerned with processing (including tabulation) may be appropriate in connexion with statistics of all of the events mentioned.

#### A. Collection of Data for Vital Statistics

##### (1) INVESTIGATION OF SPECIAL TOPICS IN THE STATISTICAL REPORTS OF REGISTERED VITAL EVENTS

218. The recommendations for topics to be investigated in a vital statistics system as set forth in Chapter III constitute an extended list which it may not be convenient or advisable to cover completely in the legal register. Moreover, the legal provisions may be such as to preclude the addition of topics not specifically listed therein. In such instances, sampling may prove of great utility in the investigation of topics not included in the legal records; such topics could be investigated in a sample of registration units or in a sample of each relevant event.

registered in each registration unit. The informant could be asked to supply information on the specified topics which would then be entered on the statistical report (but not, of course, in the legal register). Since in most countries the statistical report is not an exact replica of the legal record, no difficulty should arise in implementing the above suggestions.

219. Topics which lend themselves to such a means of investigation are the topics relating to minority groups (ethnic (or national) groups) to migration (place of previous residence, duration of residence), industry, status as employer, employee, interval since last previous live birth to mothers.

(2) WHERE A CIVIL REGISTRATION SYSTEM IS LACKING OR DEFICIENT

220. Because every vital event which occurs among the population should be registered for legal purposes, civil registration must be universal and it is therefore evident that sampling is not applicable to legal registration.

(a) SAMPLE OF REGISTRATION UNITS

221. However, where civil registers do not yet exist, or where they are insufficiently reliable, and where efforts to improve this situation are being made but where resources are limited, sampling can be applied to establish a "registration area" of a size commensurate with the resources available for their development. Such a miniature system would form the nucleus upon which a national vital statistics system could be developed. By its limited size it would provide an administratively-feasible means of using limited resources more effectively than could be done if they were spread thinly over the whole country. It could also provide a proving ground for procedures.

222. Representative versus purposive sampling. Where a system of sample registration areas is contemplated as a means both of obtaining interim estimates of the vital rates and of promoting development of a comprehensive civil registration system in the long run, it is recommended that the selected areas should constitute a representative sample. This is in accordance with the objective of obtaining estimates of the rate of population growth, with minimum delay

as an aid to development planning, while at the same time promoting registration for the legal and administrative advantages which it confers.

223. Purposive sampling may, however, be preferred where there are administrative or other obstacles to the selection of a representative sample: for example registration may be established first in capital cities, or in certain regions or districts, where it is believed that success may be achieved with relative ease and speed:

224.      The procedures by which the United States developed its civil registration system may be regarded as purposive sampling somewhat along the above lines; similarly in the Kenya <sup>53/</sup> sample vital registration scheme and in the many instances such as Ghana where a system has been instituted for administrative reasons in special areas, particularly in urban areas and/or in pilot zones.     

225.      On the other hand, the Population Growth Estimation (PGE) experiment in Pakistan <sup>54/</sup> was organized on a representative basis although the registration units (20 with 5 000 inhabitants each) were outside and apart from the regular registration system.     

226.      In the recently-instituted scheme for improvement of vital statistics in India, representative sample registration areas have been selected ( . . . Model Registration Areas where special attention is paid to registration of births and to certification of cause of death. <sup>55/</sup> ) The schemes in Southern Peru <sup>56/</sup>

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53/ Experiments in Vital Registration and Sample Surveys of Births and Deaths in Kenya (United Nations document E/CN.14/CAS.4/VS/8).

54/ "Vital Rates in East and West Pakistan: Tentative Results from the PGE Experiment" in The Pakistan Development Review Vol. IV, Winter, 1964, Number 4, pages 734-759.

55/ Recent Developments in Vital Statistics in India, by R.B. Lal (paper presented to the Conference of the International Union for the Scientific Study of Population held in Sydney, Australia, 21-25 August 1967.)

56/ Sample Vital Registration Experiments, by Joseph A. Cavanaugh (paper presented to the International Population Union Conference, New York, 1961)



Thailand,<sup>57/</sup> Turkey,<sup>58/</sup> Ghana,<sup>59/</sup> and the United Arab Republic<sup>60/</sup> also incorporate the idea of a representative sample of registration areas.<sup>//</sup>

227. Sampling units. The sample ideally should be a probability sample of areas in which the primary registration unit is the sampling unit.

228. The use of the registration unit is meant to ensure that the efforts put into establishing registration contribute directly to the establishment of a comprehensive net-work of such registration units. The sample should be expanded as soon as resources are sufficient for the expansion of full registration procedures to new areas.

229. The registration units should be selected in sufficient number to constitute a total sample size large enough to provide estimates of the vital rates at an acceptable level of error, at the national level and for urban and rural areas separately. A possible alternative version, requiring greater resources but with certain administrative advantages, would be to institute civil registration in a 100 per cent sample of the urban areas but in a smaller sample in the rural areas.

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57/ Technique to Measure Population Growth: Survey of Population Change in Thailand (paper presented to the World Population Conference, Belgrade 1965)

58/ The Turkish Demographic Survey: An Outline of Its Goals, Contents, Control Methods and Implementation, by Nusret H. Fisek, Yasar Heperkan, Zeki Avaralioglu, and John Rumford. 1st edition, October 1964. School of Public Health, Ankara, Turkey.

59/ A Scheme for Vital Registration in a Rapidly Developing Country by Benjamin Gil (paper presented to the International Population Conference, New York, 1961).

60/ The United Arab Republic Project for Measuring Vital Rates in Rural Areas by G. Vukovich (paper presented to the World Population Conference, Belgrade, 1965).

230. Organization of a sample registration area scheme. In all essential respects, the principles of organization are identical with those proposed in Chapter V for a comprehensive civil registration system. However, some variation in detail is required by the fact that sampling is involved and by the widespread difficulties in promoting individual interest in registration.

231. It would first be desirable to enact legislation giving the broad structure required for a comprehensive civil registration system, setting out the duties of the registrar and the provisions for legal documentation, etcetera; actual implementation of the legislation could then be effected through regulations under the act. This arrangement would make it possible for all persons who wish to register an event to do so under uniform provisions, but active promotion would be restricted to a probability sample of areas; flexibility in the legal arrangements would also make it possible to introduce modifications as suggested by later experience. In the areas selected in the sample, ~~full-scale~~ registration procedures should be implemented and the registrar should have power to effect legal registration of the events reported.

232. The duties of the registrar should include all of those required in a comprehensive civil registration system, but in addition he must make the most intensive efforts to promote registration by every possible form of publicity and by personal contacts with traditional leaders in the community and with other persons of status who may by example and influence help others to see the advantages of registration. The registrar should himself be "itinerant" or should send an agent to visit each household as often as is possible, on a continuous basis, to inquire into recent vital events and to arrange for registration. Schools may play an important part in the development of the system by instructing pupils in the advantages of registration and establishing some means of liaison which would channel information given by children on vital events in their homes through the teacher to the registrar. By simplification, the teacher could be appointed as registrar if it is believed that part-time activities are sufficient for the registration work.

233. Continuity. In order to provide continuity in the supply of data from the system, statistical compilations should be undertaken regularly as in a comprehensive system of registration, and on the standards proposed in Chapter IV. However, the validity of the estimates of vital rates from the data so compiled may be affected by the size of the sample: the smaller the sample size the longer the interval required to give validity to the rates.

234. A limitation of sample registration schemes is that in the course of time population changes especially migrations may alter the representative character of the sample, in which case it might be necessary to drop from the tabulation programme sample areas which had lost the characteristics which had justified their original selection. However, if a gradual extension of the size of the sample is envisaged, the loss of areas from the tabulation programme may not be of great importance in the long run.

235. The events to be registered and their definition. Theoretically, all of the vital events may be registered in a sample registration scheme but priority is given as in a comprehensive system to the registration of live births, deaths, marriages and divorces. The definition of these events should be identical with the definitions given in Chapter II above.

236. The topics to be investigated in respect of each vital event. Each country will decide, on the basis of its resources, the range of topics to be included. Efforts should be made, within the limits of these resources, to investigate at least as many of the first-priority topics listed in Chapter III as are relevant to local needs and conditions, and such additional topics as are of special local interest keeping in mind the limitations of sampling for geographic detail.

(b) SAMPLE FIELD SURVEYS

237. Not all countries which need to develop vital statistics systems can afford to install a scientifically-designed sample registration system as a forerunner to a comprehensive system, even though registration is acknowledged to be the ultimate goal. Moreover, very often the need for a measure of the population growth rate, or at least for an estimate of the crude birth and

death rates, issso urgent that a short-cut, interim method of collecting the information must be resorted to. In such cases, information on births and deaths (and on other vital events) can be obtained by interviewing a member (or members) of a household in a sample of households.

238. The objective is to interrogate a member or members of the household regarding events which occurred in that household and this maybbedone by a single-round, wholly retrospective method, by a multi-round, comparative or follow-up method, or by "continuous" (repeated) observations.<sup>61/</sup> Sample registration schemes may be associated with sample surveys which, in addition to providing estimates of the vital rates, provide a check of completeness of registration in the sample areas. (by matching of events on a one-to-one basis)(see Chapter VII on evaluation)

239. //The scheme for improving registration in a sample of areas in Pakistan, Thailand, India, Turkey, Peru, Kenya, Ghana and United Arab Republic, (mentioned above) all have in addition provision for a parallel household survey in these areas. Estimates of the birth and death rates (and population growth rate) obtained from sample field surveys are available for at least thirty-four countries throughout the world, twenty-six of which are in Africa, where civil registration is notably deficient. The countries are listed in Annex I of the Progress Report on Improvement of Demographic Statistics.<sup>62/</sup> In addition to these large-scale surveys, there are examples too numerous to record here of surveys of sub-national areas.//

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<sup>61/</sup> "Continuous" or repeated observations differ in principle from follow-up surveys only in that more frequent rounds or observations are implied in the former.

<sup>62/</sup> Progress Report on Improvement of Demographic Statistics (United Nations document, E/CN.3/377)

240. Despite its apparent simplicity, the survey method of generating an independent list of births or deaths for estimating corresponding rates is subject to many sources of error. The overriding disadvantages are those of any interview survey, namely, dependence (1) on the willingness of the informant to give information; (2) on his knowledge of the events, and (3) on his ability to remember well enough to place the event correctly in time and space. Experience has shown the value of combining the various techniques, such as the fully-retrospective method with a follow-up round or rounds and perhaps also with "continuous"(repeated) observations. <sup>63/</sup>

241. <sup>Organization for surveying</sup>  
Organization for surveying. It seems likely that where surveys are required for the direct estimation of the vital rates, for evaluation of a sample registration scheme and/or for providing the base population for estimation of vital rates from a sample registration scheme, the need for such surveys will be more or less continuous. In view of these considerations and of the needs for surveys of manpower, health, etcetera, it is recommended that a permanent survey organization be set up whenever and wherever resources permit.

242. Co-ordination. The survey organization may be most effectively located in the central statistical service but, irrespective of administrative arrangements, it should operate in close co-ordination with the agency or agencies responsible for general statistical integration and for integration of the concepts, definitions, classifications and tabulations employed in the vital statistics system. One of its principal functions should be the application of rigorous sampling standards and interview techniques to the acquisition of data required by interested agencies.

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<sup>63/</sup> An example of methodological interest is the pilot scheme in Senegal described in Repeated Demographic Observation in a Rural Area in Senegal. Method and First Results, by Pierre Cantrelle (paper presented to the World Population Conference, Belgrade, 1965).

243. Where co-ordination is sufficiently effective, sample surveys designed to provide statistics of the vital events and their characteristics may be incorporated into multi-subject surveys and this broadening of the field of reference may permit wider studies of the vital events and the inter-relations of the economic, social and/or psychological factors which influence them. However, because of the difficulty in obtaining reliable data, it is not desirable that vital events surveys should be greatly extended in scope.

244. Sample design. Considerations of flexibility suggest that an area sample is the most efficient all-purpose design in the present context. In the case of a sample registration scheme, an area sample is required by virtue of the fact that the unit must be a registration unit. In the case of the demographic survey in which vital events are investigated different considerations apply.

A two-stage design with households as the second stage may be efficient in a single-round survey but the area sample is preferred: for estimating the rate of population growth in the interval since a previous survey; for evaluation of completeness of coverage in a census or in a comprehensive or sample registration scheme; and for the operation of a multi-round comparative or follow-up survey. The reason is the same in each case: new households entering the areas can be recorded and households which have become extinct between the two operations can, at least in principle, be taken into account. Moreover, the process yields fringe benefits because the data on households arriving and departing may be compiled as migration in and out of the sample areas.

245. Whenever estimation of vital rates is involved, the minimum sample size should be such as to permit of estimation of rates at acceptable levels of error at least for the national area and for urban and rural areas separately.

246. If detailed cross-classifications are contemplated, an increase in the sample size would be required.

(i) Single-round, fully-retrospective surveys

247. In surveys of this type, information may be recorded on vital events which occurred in households in the sample in a fixed reference-period (preferably the

12 months preceding the inquiry); the information on the vital events should be recorded in terms of events which occurred to persons who are members of the household at the time of the inquiry.

248. This method of recording is appropriate in the investigation of events other than deaths, for which a compromise is required by the fact that deaths occurring to persons who died in the reference period while still household members should be recorded in order to preclude their complete omission from the survey.

249. This does not impair the general consistency of the approach with the definition of the household recommended for census purposes<sup>64/</sup>, that is, the question is to be asked of persons who are members of the household at the time of the survey. If the definition of the household for any reason were modified to include also other persons who were members at some particular time during the past year but are not members at the moment of the inquiry, then, for example, the question on births during the past twelve months should relate also to women who have since died, or been divorced. However, the formulation in terms of the household as constituted at the time of the inquiry is the preferred one.

250. In respect of households, rather than individual members of households, the assumption is that households who may have departed from the sample area in the reference period are compensated by households newly-arrived in the sample area in the reference period.

251. Events to be investigated in retrospective sample surveys. The events which are suggested as suitable for investigation in retrospective sample field surveys are births, deaths and marriages. (or more precisely, number of persons married). Divorce and other vital events might equally be investigated but are omitted because, in the case of divorce, the sample would need to be expanded considerably because of the low incidence of the event and, in the case of other

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<sup>64/</sup> Principles and Recommendations for the 1970 Population Censuses, op.cit., paragraphs 146-147.

events, such as foetal deaths, the problems of collection are likely to produce seriously inaccurate data.

252. The definitions of the vital events investigated in the surveys must be identical or at least consistent with those given in Chapter II.

253. Topics to be investigated in relation to the vital events and to the base population. In order to secure the range of data appropriate to the means of collection and to the most urgent data requirements implied in the outline of the uses of vital statistics in Chapter I, the following topics are proposed as desirable and practicable ones for investigation in sample field surveys. The topics regarded as of first priority are marked with an asterisk (\*). The topics are sub-divided to show those which relate to the household as a unit, to each household member, and to each woman in the household, because these distinctions correspond with the way in which it is most appropriate to collect the data:

254. For the household as a unit

- \* Children born alive in the household in the 12 months preceding the inquiry, and sex of each.
- \* Children born alive in the household in the 12 months preceding the inquiry and still living, at the time of the inquiry, and sex of each.
- \* Deaths in the preceding 12 months, sex and age of each decedent
- \* Location (street address and name of locality)
- \* Married in the preceding 12 months, sex and age of each person and type of marriage
- \* Members present
- \* Members temporarily absent
- Visitors

For each household member

- \* Age or date of birth
- Educational attainment
- Ethnic (or national) group



For each household member (cont.)

Industry

Literacy

\* Marital status

\* Name

\* Occupation

\* Place of residence at a specified time in the past

\* Relationship to head of household

\* Sex

Status (as employer, employee, etcetera)

For each woman of childbearing age and over in the household

\* Children born alive during lifetime, and sex of each

\* Children born alive during lifetime and still living, and sex of each

\* Children born alive in the 12 months preceding the inquiry, and sex of each.

\* Children born alive in the 12 months preceding the inquiry and still living, and sex of each.

255. The definitions of the topics should coincide with or be consistent with the definitions given in Chapter III. However, that chapter does not include definitions of topics which relate to household members (present and temporarily absent) and to visitors, and to name, relationship to household head and location. For definition of these topics, reference should be made to the Handbook of Household Surveys<sup>65/</sup> and/or the Principles and Recommendations for the 1970 Population Censuses.<sup>66/</sup> It may be noted that the topics on the household membership and the sex and age characteristics of the household members provide the basic population data to which the data on the vital events may be related.

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<sup>65/</sup> Op.cit

<sup>66/</sup> Op.cit

256. Reference should also be made to the Handbook of Household Surveys<sup>67/</sup> and to the Handbook of Vital Statistics Methods<sup>68/</sup> for various aspects of the problem not treated here, and for information on the calculation of vital rates.

257. Investigating births. It should be noted that the data on births are investigated from three different aspects. The responses to the questions on children born alive in the reference period in the household and those born to women of child-bearing age in the household in the same period should agree exactly if all replies are correct; and this checking is an essential element in the proposals for the conduct of retrospective inquiries on the vital events. The answers should include all the children born alive to women members of the household wherever they may have been at the time of the birth, including those who may have returned temporarily to their parents' household for their confinement. Special care will need to be taken to ensure that children born away from the place of residence and who subsequently died, are included. Children born to women who are temporary visitors in the household should not be included.

258. The inquiry on lifetime fertility is intended to eliminate the omission of children through errors in placing the event correctly in a specified time - reference period. The inclusion of information on children still living not only checks the reliability of the replies but provides data on general mortality which may be analyzed by appropriate techniques.

259. To maximize their utility in the analytical process of deriving estimates of fertility from defective data, which is particularly relevant in the developing countries, the questions should be asked of all women, irrespective of marital

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<sup>67/</sup> Op.cit.

<sup>68/</sup> Op.cit.

status. If for some reason, never-married women must be excluded, the question should be asked of all married women, not merely mothers.<sup>69/</sup>

260. Investigating deaths. The investigation of deaths in retrospective surveys is notably subject to errors of omission, especially in respect of deaths in single-person households which dissolve upon the death of the person involved and deaths of infants. It is the intention in asking both the direct question on deaths and the question on children born alive in the reference-period to provide the range of data required for the analytic techniques for estimating demographic measures from incomplete data<sup>70/</sup> as well as for the estimation of various mortality rates from the raw data.

261. Investigating marriage. Information on persons married in the reference-period may provide a useful indication of the general marriage-rate, as well as marriage rates by sex and age; it should also be of value in obtaining useful data on births, if any, to women in their first year of marriage and on the types of marriage, such as customary marriage, about which little is known in a statistical sense. Though there may be difficulties in obtaining correct responses,<sup>71/</sup> it is important that efforts be made to study the incidence of marriage and, wherever possible, the different types of marriage.

(ii) Multi-round, comparative (or follow-up) surveys.

262. The distinctive feature of follow-up surveys is that information on the vital rates, and incidentally on migration, may be obtained from the process

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<sup>69/</sup> Methods of Estimating Basic Demographic Measures from Incomplete Data, op.cit., chapter V.

<sup>70/</sup> Ibid.

<sup>71/</sup> See, for example, "The Relation of Marriage to Fertility in African Demographic Inquiries" by Etienne van de Walle in Demography, Vol. II, 1965.

of matching persons enumerated at an initial survey in households in the sample areas with the persons enumerated in the same households at a later round.<sup>72/</sup>

263. Survey method, events and topics to be investigated. The fully-retrospective method and the follow-up technique may be combined with advantage, each acting as a check on the accuracy of the other. The first round of the follow-up survey could then be identical in principle in content, and in definitions, with a single-round, fully-retrospective survey, and could provide a first estimate of the crude rates of birth, death and marriage, and data on lifetime fertility of women, as well as providing the initial enumeration of household members in the sample areas.

264. At the second round, which should take place exactly twelve months later to facilitate calculation of the vital rates, each household member should be checked off for presence or absence. Then, in the case of absentees, the record should show whether the absentee (a) is temporarily absent; (b) is permanently living elsewhere (has emigrated); or (c) is now dead. In the case of a death, the event should be included as relevant for the subsequent statistical compilations only if the decedent was still a member of the household at the time of his death; if not, the presumption is that his death should be recorded elsewhere. In the case of persons not recorded at the initial enumeration, the record should show whether the newly-enumerated person (a) is a temporary visitor; (b) has become a resident of the household (has immigrated); or (c) is a child born in the 12 months interval between the survey rounds. Events occurring in the interval to temporary visitors should not be included.

265. If, as is recommended, the initial enumeration recorded the marital status of household members, the second round of the survey may be designed to check this also, and changes of marital status may then yield data on the number of persons married in the 12 months interval between visits.

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<sup>72/</sup> Obviously, the advantages will be neutralized if mobility of households is substantial.

266. In each instance where a birth is recorded, the date (and place or place) of birth should be recorded; for each death, date (and place of death) should be recorded. The information on place of death would provide circumstantial evidence that the enumerator had attempted to ascertain whether persons no longer present were dead or had migrated, and would also be useful if a check of death registers were contemplated as an evaluation procedure. The place of birth would provide checks of response. For immigrants and emigrants, place of previous residence and place of present residence, respectively, should be recorded in order (i) to show as definitely as possible that these were genuine instances of migratory movement and (ii) to permit a tabulation by direction of movement, if that is desired.

267. For operational simplicity, these "places" of residence" might be reduced to four categories: (i) elsewhere in the same sample area, (ii) elsewhere in the same district, (iii) in another district in the same country, (iv) abroad //

268. The inventory of births to and deaths of household members in the interval since the preceding visit omits births and deaths of children born to household members when such children died before the second visit. Detection of such cases requires a retrospective question which should be addressed to all women members of the household. Where any adult woman in the household is reported as having died in the interval between visits, it is necessary to check whether she too may have had a live-born child in the interval, while still a member of the household, and whether the child is dead. Failure to record both births and deaths of such children would lead to understatement of the rates.

269. It is recommended that at each round of a follow-up survey, a summary statement should be included showing total live births and total deaths in each household in the last twelve months. This summary will be a reconciliation of (a) replies to retrospective questions and (b) the checking-off process by which household members are accounted for. Its utility is indicated by the need to investigate every possible avenue of obtaining correct replies.

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270. Provision should be made for enumerating households newly-resident in the area and vital events occurring thereto in the past twelve months<sup>73/</sup> on the grounds that the vital events would otherwise be totally omitted from the survey. Also, special efforts will be required to trace extinct and dispersed households in order to include deaths which may have led to dissolution of households; deaths in one-person households are likely to be the most troublesome source of omission. These too would otherwise be completely omitted and the efforts required to question neighbours and local officials and so on, are an essential element in the follow-up nature of the survey. This is in contrast with a single-round survey where the assumption made in paragraph 250 above that departures and events thereto are compensated by arrivals and events thereto, permits a simpler approach.<sup>74/</sup>

271. If the survey is to continue further, the procedures will be comparable at each later round with those adopted for the second round.

272. In designing surveys of the follow-up type, the interval between visits may be more or less than 12 months without any change in the principle outlined above; however, the sample size may need to be changed to take account of the different number of observations.

273. The inclusion of extra topics in a follow-up survey -- topics such as the social and economic characteristics listed in paragraph 254 . . . is possible, but their inclusion is to be avoided unless there are really compelling reasons which impose special needs for such data. The advantages

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<sup>73/</sup> This information may be entered in the household summary statement referred to in the preceding paragraph.

<sup>74/</sup> At the tabulation stage, and for the calculation of vital rates, a distinction may be made with advantage between households present at each round, households which have immigrated and households which have emigrated.

of the follow-up survey derive from a more intense effort directed to a restricted field of observation with the object of reducing response errors, and an extension of the coverage involves the risk of lowered standards, as well as producing a rather unwieldy and cumbersome questionnaire design.

(iii) Continuous (repeated) observation

274. This is a device for providing control of accuracy by the installation of a system of "continuous" (repeated) observation in which the enumerator or the registrar visits each household in his area at frequent intervals (every month, if practicable) to record events as closely as possible to the time of their occurrence. The method may be used in connexion with sample surveys or in connexion with a (sample) civil registration scheme. In the latter case the operations of the enumerator or of the itinerant registrar are similar to those of a "continuous" observation of household members. If this system is independent of the household interviews, the accuracy check gains much in validity.

275. The data to be recorded or to be registered would in principle be the same as the data on births and deaths collected in the sample survey or entered in the registration record.

(3) Problems of Estimating the Vital Rates

276. Because of the errors of omission or of duplication which may be embodied in vital data collected either in a sample of registration units or in sample field surveys, the vital rates estimated from either set of data are likely to require adjustment. The method which is recommended as the most objective is the matching one-to-one of events as reported in a sample of registration areas with the events reported in a sample field survey.<sup>75/</sup>

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<sup>75/</sup> "On a Method of Estimating Birth and Death Rates and the Extent of Registration" by C. Chandra Sekar and W.E. Deming in Journal of the American Statistical Association, Vol.44, No.245, March 1949.

277. The process of matching produces four classes of "matches" (1) those recorded in both the register and the survey; (2) those recorded in the register but omitted from the survey; (3) those recorded in the survey but not in the register; (4) hypothetical group omitted in both sets of records. This process would eliminate any errors of duplication, which would theoretically be detected in the matching process or as a consequence of it.

278. One advantage of the procedure is that a qualitative understanding may be reached of the sources of distortion in the various sets of records and this may lead to an improvement in techniques in the future. However, the advantage of immediate importance in the present context is that the application of the Chandra-Deming formula to the three classes of events (a), (b) and (c) above permits an estimation of the size of the fourth class (d), thus generating the possibility of adjusting the recorded number of events, and consequently providing an adjusted estimate of the relevant vital event.<sup>76/</sup> The adjustment so provided also provides a measure of the degree of completeness of the registration and of the field survey reports of events.

279. Despite the problems of matching events, recent experiments have led to increased emphasis on the statistical utility of carrying out the two independent operations of registration and of field surveys in order that greater accuracy may be achieved in the results.

280. Examples of particular interest are the Population Growth Estimation Study (PGE) in Pakistan, the Survey of Population Change (SPC) in Thailand and the Demographic Survey in Turkey (TDS), each of which aims particularly at providing

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<sup>76/</sup> Ibid.



reliable estimates of population growth rates for areas within each of the countries, using both the registration method (on a sample basis in Pakistan and Turkey) and the follow-up survey method.<sup>77/77</sup>

(c) WHERE A CIVIL REGISTRATION SYSTEM FUNCTIONS EFFICIENTLY

(1) Sample of registration units.

281. The establishment of a sample of registration units need not be considered solely in connexion with countries where the civil registration system is deficient. Even where good basic vital statistics are derived from information recorded in civil registers, a sample registration area scheme could provide a means of getting special tabulations more quickly and cheaply. It could also provide a means of testing new procedures before they were incorporated into the national system and of experimenting with procedures for improving registration. It might also be used to produce current population statistics.

(2) Sample record-linkage surveys.

282. Sample surveys can also provide a means of enriching and enhancing the vital statistics obtained from efficient conventional civil registers. The vital statistics registers of birth, death, marriage, etcetera, normally can contain only a limited amount of peripheral or background data and hence demographic research is fragmented in the sense that it is limited to analysis of data contained in the separate source documents. In such cases, recourse can be had to interviews in a sample of the population to supplement the statistics derived from the registers.

283. The sampling frame for such an inquiry will be the civil registers themselves, from which a systematic sample of records can be drawn to be followed back or followed forward to the informant from whom additional or supplementary

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<sup>77/</sup> "Field Experience in Estimating Population Growth Rates", by Patience Lauriat, in Demography, 1967, (Vol. 4, No. 1).

information on the event concerned can be obtained. Alternatively, the procedure may involve the collation of the sample records with other records in order to merge the two sources of information on the one event. Such merging is known as "record-linkage" or the process of bringing together information from two or more separate documents concerning an individual with the object of consolidating facts concerning that individual not available on any of the records separately. Since these operations are, as at present envisaged, most suited to inquiries on a fairly modest scale, sampling from the records is required to keep down the size of the operation; and the sample may be representative or it may be purposively chosen. One major limitation of this method of data collection is, of course, the limitation on geographic detail it can produce.

284. 78/ Representative sample surveys anchored or linked to the death register, have been carried out in the United States since the national mortality sample survey was instituted in 1961, 78/ mainly by mail. In the first year, hospital utilization was investigated; in 1962, household composition and socio-economic variables were added; others contemplated are morbidity and disability during last year of life, cost of medical care, etcetera. The national natality survey was set up in 1963 and supplementary data obtained included radiological examination history of mothers, pregnancy histories, congenital malformations, etcetera. 77

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78/ Design of Surveys Linked to Death Records: A Description of Methods Used in Conducting Surveys Linked to the Death Record, by Monroe G. Sirken, James W. Pifer, Morton L. Brown, U.S. Department of Health, Education and Welfare, Public Health Service, National Center for Health Statistics, National Vital Statistics Division, September 1962.

285.    A record-linked pilot study of relatively modest size and objectives has been carried out in a purposive sample in Canada (Province of British Columbia) where family groups have been identified by linking individual birth records to records of marriages of the parents using such common information as names of husband and wife, their birthplace and their ages. Linkage was effected automatically by electronic computer.<sup>79/</sup> These linkages were established primarily to implement studies on population genetics but it is obvious that the technique is equally useful in providing the statistics required for furthering demographic research. Studies of child-spacing following stillbirth and infant death, for example, can be carried out by linking births, marriages and deaths into family groups. Family reproductive histories can be developed in this way including such information as relationship of birth order to duration of marriage, etcetera.  <sup>80/</sup>

286.    An example of considerable interest is the record-linked investigation of economic and social differentials in mortality in the United States conducted by the University of Chicago in co-operation with the National Vital Statistics Division and with the U.S. Bureau of the Census. By individual matching of a national sample of death registrations with persons enumerated in the 1960 census, it becomes possible to collate the information on each death record

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<sup>79/</sup> See The Use of Vital and Health Statistics for Genetic and Radiation Studies; op. cit., Sessions V, VI, VII.

<sup>80/</sup> Precedents for this type of study are documented in "Methods of Using Old Documents to Study Population Trends in the Past" by T.H. Hollingworth, in Proceedings of the World Population Conference, Belgrade 1965, op. cit., important amongst which is the work of Louis Henry and other French demographers using parish registers as their source.

with all the relevant variables enumerated on the census schedules and by this means to study differentials associated with geographic area, place of birth and ethnic group, income, occupation, education, family status and housing type, social and economic factors for selected cause of death, and interrelationship among the social and economic factors.<sup>81/</sup> Similarly, the proposed companion study on fertility illustrates the current interest in medical and health aspects of fertility and in a range of variables (such as residence, place of birth and ethnic group, type of housing, marital and socio-economic status) comparable to those included in the mortality study. The approach also envisages the study of cohort fertility, birth orders and birth intervals, in order to highlight the spacing of children over marriage, by age of mother and duration of marriage.<sup>82/</sup>

287. //Also relevant in this area is the inter-American mortality study of 1962-64 in which a sample of registered deaths was followed back to the households of the decedents and to the hospital records and autopsy findings to amplify the information on cause of death.<sup>83/</sup>

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<sup>81/</sup> "Methods Used in a Current Study of Social and Economic Differentials in Mortality" by Evelyn M. Kitagawa and Philip M. Hauser in Emerging Techniques op.cit. Public Health Reports of the World Health Organization, Vol. 72, No. 1, 1967, pp. 1-10.

<sup>82/</sup> "Plans for the APHA (American Public Health Association) Monograph on Fertility in the 1960 Census Period" by Clyde V. Kiser, Wilson H. Grabbill and Joseph Schacter in Emerging Techniques, op. cit.

<sup>83/</sup> Patterns of Urban Mortality: Report of the Inter-American Investigation of Mortality by Ruth Rice Puffer and G. Wynne Griffiths (Pan-American Health Organization publication), Washington, 1967.

(3) Sample field surveys.

288. A sample field survey like that described in section (a) above could also be used to collect data which could enrich traditional vital statistics. The reasons for such a supplementary source are those set forth in connexion with the record-based surveys described above but in the field survey, a wide range of topics would be investigated among a sample of households drawn from an area sample. Since all topics of interest are investigated at the same time, the field survey can provide the means of making a number of complex cross-tabulations not otherwise feasible.

B. a Processing of vital statistics

289. 1) Quality control (sample verification)

289. Wherever mass clerical operations are involved, quality control techniques based on sampling are applicable. Hence, quality control or sample verification could be used in connexion with (1) transcription of statistical reports from civil registers when this is done manually; (2) editing for consistency and completeness of items on reports from registers or interview surveys; (3) coding of items on reports from registers or interview surveys; (4) transcribing manually or mechanically to compilation record, for example, to tally sheets or to punch cards; (5) verification by hand, or machine-checking of correctness of distributions; (6) computations of rates, ratios and other indices.

2) Tabulation

(a) Advance tabulations

290. Systematic sampling of records from registers may be used to compile advance tabulations of vital statistics to meet current needs. This procedure is similar to that set forth in paragraph 283 except that a smaller sample may suffice since usually only national data can be obtained quickly and these provisional results will be superseded by final tabulations. // This is a procedure used in the United States where a 10 per cent sample of deaths is

systematically selected each month by each State, transcribed and forwarded to the national office in advance of the regular reports of death for the month in question. Immediately upon receipt at the national level, this sample of deaths is coded, tabulated and analyzed especially with respect to selected cause of death. Provisional national mortality data are thus supplied far in advance of the regular tabulations and published as the Current Mortality Sample (CMS). //

(b) Final tabulations

291. Where the civil registration system is efficient and the registers moderately complete, vital statistics, at least at the national level, could be produced from a sample of registration records instead of processing the whole file. Reference is made above to advance tabulations being made on a sample of records, but the proposal here is the processing of only a sample of records to produce final results. Such a system should reduce the cost of processing and make data available more promptly. However, it is questionable whether the sample could be so much smaller than the universe as to make the reduction effective, taking into account the geographic detail required and the low incidence of events, such as certain causes of death, foetal deaths, divorce, et cetera. It is likely that the application of sampling would be useful only in countries where the number of cases of birth and death were very large. // In the United States, and Puerto Rico, for example, a 50 per cent sample of birth records has been used to produce natality statistics since 1951, the sample consisting of even-numbered birth records. Mortality statistics continue to be based on 100 per cent of the records except for the provisional monthly data described in paragraph 290 above. //

(c) Tabulations for special purposes.

292. The use of a sample of records for special tabulations needed for research or special programmes (for example, in public health) is related to the record-based surveys mentioned above. Special studies often require more

detailed coding of cause of death, of socio-economic characteristics, or of fertility data, than the routine tabulation programme can produce economically or reliably. Processing of a small sample of records could produce the needed cross-tabulations at a minimum cost and presumably with better quality.

293. If a sample registration or sample field survey system exists it also could be utilized to obtain special and complex tabulations not appropriate for inclusion in the national tabulation programme.

## CHAPTER VII

### Evaluating a Vital Statistics System

#### A. Types of Evaluation Technique

294. Though there are aspects of the system other than the purely statistical aspects - such as questions of organization, recruitment and training, adequacy of instructions for recording data - which should be periodically evaluated, the present chapter is confined to questions of evaluating the reliability of statistical data derived from the system.
295. Techniques of evaluation of the completeness and accuracy of vital statistics should constitute a standard part of a vital statistics system, and should be applied to the data irrespective of whether they are obtained from civil registration records or collected in (sample) field inquiry.
296. Responsibility for the establishment and execution of methods for critical evaluation of the vital statistics system should be vested in a designated authority.
297. Evaluation of the reliability of vital statistics involves measuring (1) the quantitative completeness with which vital events are either (a) registered or (b) reported in a survey and (2) the qualitative accuracy with which the characteristics of the events are reported by the informant and inscribed or recorded by the registrar or interviewer as the case may be.
298. Errors in the quantitative accuracy or completeness of coverage of vital statistics may arise from under- or over- reporting, both in the registration method and in the field survey method of obtaining the data. In the case of the registration method, the probability is that omissions will be much more numerous than duplications, and in fact in the developing countries registration is frequently grossly deficient, if not altogether lacking. However, duplications do actually occur where delayed registrations are made upon request without checking whether the birth was registered earlier. In the case of field surveys,



over-reporting of vital events may arise from errors in placing the event correctly in regard to the cut-off point of the time-reference period and from double-reporting of individual events due to mobility of households or other factors. There is an over-all tendency towards omissions rather than the reverse arising from total failure to recall events which occurred some time before the date of the survey.<sup>84/</sup>

299. Detection of errors and assessment of their extent, may be accomplished in two ways which for convenience may be designated as the direct and the indirect methods.

300. The direct method is the more fundamental and refined one which consists of checking the individual entries of the register or other type of record against corresponding records from an independent source to discover omissions. This is analogous to a postcensal field check of the population census whereby a set of independent records is produced in such a way as to be considered more accurate than the originals and which, therefore, can be used to produce adjustments to them.

301. The indirect method of detecting and possibly assessing the extent of errors is the analytical procedure which consists in (1) scrutinizing for plausibility and consistency the statistical results derived from the records and comparing these for compatibility with corresponding numerical data from another time period or from a similar geographical area and (2) comparing results with corresponding aggregates and rates obtained from an independent source.

302. In principle, consideration of the applicability of these two general methods could be based on the view that refined measurement techniques become less and less important where under-registration is obviously great, because precision is necessary only in those areas where registration is relatively complete but where there is appreciable variation on a geographic or ethnic basis. In

<sup>84/</sup> Technical Paper on Non-Sampling Errors and Biases in Retrospective Demographic Inquiries (United Nations document, E/CN.14/CAS.4/VS/3).

practice, however, efforts should always be made to bring to bear both the direct and indirect methods for evaluating the reliability of vital statistics. Indirect or analytic evaluation will normally be part of almost any analysis of vital statistics since it gives the first rough approximations of accuracy which may be useful in focussing the direct evaluation procedures. Tests based on direct matching are required to determine the reasons for under- or over-reporting and its geographic or ethnic variation, with enough precision to enable remedial measures to be effectively employed.

(1) The role of sampling in evaluating vital statistics

303. Sampling plays a major role in the evaluation of vital statistics data, especially in respect of the direct method. Since this method involves the matching of individual records, the advantages of economy through sampling are important in reducing the burden of work. For this matching it is obviously necessary to have two independent sets of records, one of which may be established for a sample of the universe under study: for example, the reports of births and/or deaths in a sample field survey may be matched one-to-one to the records of these same events in the civil registers. The registration system also might be on a sampling basis (a sample of registration units) but the registration of births and deaths must be comprehensive within the selected units; otherwise the matching process becomes inoperative.

304. Alternatively, a sample drawn from the registers might be matched to records such as baptismal records or records of burial permits for the register might be used as a frame for the selection of sample households which could be followed back and interviewed in regard to births and deaths, which could then be checked again in the registers. Other examples of the applications of sampling are included in the sections on evaluating quantitative and qualitative aspects of coverage of vital statistics.

305. In the application of the indirect method of checking the reliability of vital statistics, sampling, as such, is not employed since the method depends

on the comparison of aggregates and rates. However, the data assembled in these aggregates and rates may, of course, have been collected for a sample of the universe and in that sense the indirect method of checking may be dependent on sampling, and especially since the sampling error must be taken into account in judging the acceptability of estimates of the vital rates derived from the sample data.

(2) Applications of evaluation techniques

306. Since applicability of the evaluation measures can be documented most effectively in terms of live-births and deaths, the methods described below will be set forth mainly in terms of those two events. The evaluation of the completeness of the marriage records is complicated by the fact that only legal marriages are recorded officially in the civil registers. In the developing countries, it will frequently be evident from census results on marital status, that many more persons report themselves as "married", than could have resulted from the legally-recorded number of marriages. The excess consists in part of persons living in consensual or common law unions of the permanent or transient type; and it is interesting to note that women often exceed men in the numbers of persons recorded as "married" and "consensually married", perhaps because of a tendency amongst women who are in fact divorced, widowed or separated to report themselves as "married", while amongst males similarly situated, the reports may show their marital status as "single". Low marriage rates are consistent with low proportions of population reported as "married" (conversely high percentages single). Under these circumstances, "completeness" in the sense used here is not applicable to marriage records and all that can be done is to verify that the calculated marriage rates are consistent with low proportions of population reported as "married" at the census, and with the corollary, high levels of illegitimacy in the birth rates. The application of the methods to evaluation of reports of foetal deaths, divorces, adoptions, legitimations, recognitions, annulments and legal separations is not examined here but the methods could be extended to cover these events also.

307. The techniques of evaluation are described in terms of quantitative (coverage) errors and qualitative (content) errors separately.<sup>85/</sup> However, certain tests of coverage may also act as tests of content errors; for example, in the testing of completeness of birth registration, errors may be detected in the statements of date of birth (age) of young children reported in censuses or surveys.

B. Quantitative (Coverage) Errors

(1) Completeness of registration and of reporting of vital events in a survey

308. The recommended evaluation technique is the direct matching of individual events in two or more independent sets of records. This method has already been referred to in paras. 276-279 where the question of adjusting estimates of vital rates was discussed. The adjustment technique depends on the availability of the four categories of matched events: (1) events recorded in both register and survey; (2) events recorded in register but omitted from survey; (3) events reported in survey but omitted from register; (4) a hypothetical group which has escaped being listed on both the register and the survey, and the application thereto of the Chandra-Deming formula (paragraph 278 ). The experience of Pakistan, Thailand and Turkey, mentioned in paragraph 280VI , in matching events reported in a survey to registered events, demonstrates the utility of the matching process as an evaluation of the completeness of reports of births and deaths as well as a technique for correcting the estimated rates.

309. A variation of considerable interest is the use of the population census to generate a set of "infant cards", one for each child born in a specified period before the census. The cards may then be checked back to the birth register to establish the sets of "matched" events required for the evaluation of completeness of the registers of births. Similar procedures might be used in respect of deaths.

<sup>85/</sup> See United Nations Demographic Yearbook, 1961, for the application of evaluation techniques to the quantitative and qualitative accuracy of mortality statistics.

86 // The census has been used in a number of countries to obtain one of the required lists of events to be matched, including the United States, Yugoslavia, Ceylon and India. 86 //

310. A further variation is the matching of events as registered or reported in a survey to records such as hospital records, school enrollment lists, baptismal and cemetery records. Even where such lists are partial only, they may reveal omissions or duplications of births and deaths.

311. Where interview surveys of a sample of households have been utilized for collecting vital statistics, it is a matter of special importance to develop adequate methods for direct evaluation of the completeness or accuracy of the data obtained.

312. Where a registration system is in operation, even if it covers only part of the country or functions imperfectly, experience indicates that direct checks by matching registration lists with household survey returns, along the general methodological lines indicated above, are useful in evaluating the survey data and are essential for a reliable estimate of birth and death rate.

313. Where registration records are lacking or completely inadequate for the purpose, a sample field check of the main survey would have to be undertaken. The re-survey of a sub-sample of the original units could be a replication of the original survey. The use of interpenetrating networks of sub-samples might be explored.

314. Despite the emphasis on the direct method of evaluation of the completeness of reporting of the vital data, the indirect methods should also be employed both in regard to registration data and in regard to events reported in field surveys: in fact, the evaluation checks frequently amount to a check of mutual consistency in these two types of data. Some of the applications of the indirect checks are:

- (i) Comparison of the number of births and deaths registered in a given

period with the number registered in another period: marked fluctuations would suggest the need for investigating sources of error in the data.

(ii) Comparisons of the total number of persons enumerated at two successive censuses: if the two censuses were reliable, and if the vital and migration records were complete, the total intercensal increase of population should equal the balance of intercensal births and immigrants as against intercensal deaths and emigrants (the "balancing equation").<sup>87/</sup> In the developing countries, these conditions are usually not fulfilled, but, where defects in migration statistics are unimportant because migration itself is not a factor of importance in population change, the total intercensal increase may be sufficiently accurate as to suggest the order of the total increase, and may thus be compared with the balance of births and deaths (a) from registered events and (b) as estimated by the application of a rate of natural growth derived from sample surveys. Though the comparison may not be expected to yield any precise measure of error, it may be very useful in promoting efforts to increase completeness of coverage of vital events.

(iii) The comparison of the annual number of births registered or reported in a survey in a particular area with the number of children of corresponding age enumerated in a census or survey in a given year, may reveal incompleteness of registration (or errors of content, in this instance, mis-statements of age).

(iv) This last comparison is of course more precise if deaths by age have been taken into account before comparing the numbers of the events registered with the numbers enumerated. In this case, lack of consistency between the two sets of data may reflect errors in the numbers of births and/or deaths, as well as in statement of age.

<sup>87/</sup> See Methods of Appraisal of Quality of Basic Data for Population Estimates (United Nations publication, Sales No.: 56.XIII.2) for illustrations of the use of the balancing equation.

(v) In evaluating the completeness of reporting of births and deaths in field survey, indications of omissions, or the reverse, might be obtained from a cross-classification of the reported events by date of occurrence and date of inquiry. This classification may reveal a tendency for the number of events to decrease as the time interval extends (which is more typical on present evidence than the reverse tendency). The evaluation process could be expanded to include an adjustment to the rates as estimated from the raw data on the assumption that the "true" rate should approximate the rate at the time nearest to the date of the inquiry, when the recall error would be minimal.<sup>88/</sup>

(vi) The comparison of the crude rates of birth and death and/or the rate of natural increase for different periods and with rates observed in other similar populations, may suggest that the data are unreliable. If there are wide fluctuations from year to year, the data are suspect, and equally so if the comparison suggests inconsistency with the known characteristics of such populations.

(vii) Examination of the sex ratio in the total population will plainly reveal gross departures from the generally-prevalent balance between the sexes at birth, whereby males outnumber females at birth.

(viii) The comparison of age-specific fertility and mortality rates with rates observed in populations of similar type, and with rates in previous periods in the same country, may suggest the presence of errors of statement embodied in both the enumerators and the denominators.

(ix) Estimates of mortality derived from survivorship ratios from age-group to age-group at two succeeding censuses may also be used to evaluate the accuracy of registration data on total deaths and deaths by age.

(x) Comparison of the reports of current fertility (cumulated by successive age-groups) in a census or survey may be compared with reports of lifetime

<sup>88/</sup> Technical Paper on Non-Sampling Errors and Biases in Restrospective Demographic Inquiries, op.cit.

fertility of women, and after the evaluation of sources of errors in the base population data and in fertility reports, may be manipulated to yield a more reliable estimate of the birth rate than could be obtained from either set of data alone, - a process wherein evaluation and estimation are inextricably interwoven,<sup>89/</sup> and where the estimated birth rate may naturally act as a check of completeness of registration data.

315. Similarly, estimates of mortality derived from statements of numbers of children born alive and still surviving may be used to check the registration data on deaths.

C. Qualitative (Content) Errors

316. Non-sampling errors (such as errors arising from ignorance or forgetfulness of the facts, refusal to reply to a question, failure to understand the question or failure of the interviewer or registrar to put the question clearly and/or to record it properly) may distort or make unreliable the distribution of vital statistics according to characteristics involved. This poses one of the most important problems in using the resultant vital statistics in demographic analysis.

317. Some of the characteristics of vital events requiring evaluation for quality of reporting are those connected with the fact of the event or the person involved, such as sex, age, marital status, cause of death, place of residence, place of birth, place of death, occupation, industry and so forth.

(1) Sample of records

318. Matching of a sample of vital records to those in an independently - generated set could be used to evaluate the correctness of response on topics investigated in both. //An example of the utilization of this technique may be

<sup>89/</sup> See Methods of Estimating Basic Demographic Measures from Incomplete Data, op.cit.



found in the United Kingdom's analysis of the accuracy of statements of age in the 1951 census of population, the methodology and results of which are published in the General Report.<sup>90/</sup> In that study an attempt was made to match selected information, of which one topic was age, for each of 9 864 deaths registered between 1 and 7 May 1951 to that on schedules from the 1 April 1951 census. The results showed that age statements at death registration had a high order of reliability. //

319. //A United States study designed primarily to evaluate the comparability of reports on occupation from a sample of vital records and the 1950 census.<sup>91/</sup> also compared information on age and found that despite the difficulty of identifying all the persons involved in the sample, the method appeared to yield useful results. The same studies showed high rates of identity for marital status. The degree of consistency between statements of occupation obtained at the census and on death records was also investigated. //

320. Direct evaluation of the accuracy of cause-of-death statements may be made by comparison of a sample of death certificates with autopsy records; official records of accidents, suicide and homicide may serve as checks on corresponding cause-of-death statements.

(2) Sample surveys may be evaluated in respect of:

321. (i) Response errors. A sample of death records can be followed-back to obtain supplementary information and at the same time, it can provide a means of checking on the accuracy of basic information already collected, such as age, marital status, etcetera, through (1) record matches; (2) re-survey of original informants or (3) survey of substitute informants.<sup>92/</sup>

<sup>90/</sup> Census 1951, England and Wales; General Report, General Register Office, London; Her Majesty's Stationery Office, 1958, pages 41-43.

<sup>91/</sup> The Comparability of Reports on Occupation from Vital Records and the 1950 Census. Vital Statistics - Special Reports, Vol.53, No.1, June 1961. U.S. Department of Health, Education and Welfare, Washington 25, D.C., pages 22-24.

<sup>92/</sup> Design of Surveys Linked to Death Records, op.cit., pages 20-23.

322. Direct evaluation of cause-of-death statements by this technique were made under the auspices of the Pan American Health Organization in ten cities of the Americas.<sup>93/</sup>

323. (ii) Coding. The amount of divergence in coding practices in respect of cause of death can be evaluated by a test which involves having different groups of coders code the same set of death reports. One of the first such tests on an international basis took place in 1934 when a sample of 1 073 certificates of death which occurred in the United States during 1927 from "causes associated with pregnancy", were sent to 24 other countries with a request that the cause shown be assigned to puerperal or non-puerperal causes as appropriate.<sup>94/</sup> Sixteen countries replied to the request, revealing substantial disagreement in the assignments.

324. A similar investigation on a broader scale was carried out in preparation for the 1929 revision of the International List of Causes of Death when the U.S. Bureau of Census in June 1935 at the request of the Commission for the Revision, submitted a set of 1 032 causes of death, each containing from two to five separate causes, to a number of countries for coding of the primary cause of death. The returns show that there was considerable difference in the Classification rules of principles followed by the various countries in 1935.<sup>95/</sup>

325. An inquiry of the same type, carried out in 1961, under the auspices of the World Health Organization Centre for Classification of Disease, London,

<sup>93/</sup> Patterns of Urban Mortality, op.cit.

<sup>94/</sup> Comparability of Maternal Mortality Rates in the United States and Certain Foreign Countries; a study of the effects of variations in assignment procedures, definitions of live births and completeness of birth registration by Elizabeth C. Tandy. Department of Labour. Children's Bureau. Publication No. 229. Gov. Print. Off., Washington, 1935.

<sup>95/</sup> "Classification of Joint Causes of Death". Vital Statistics - Special Reports. Vol. 5., No.47.

England, is of special interest.<sup>96/</sup> This was a test of local interpretation of coding rules by arranging for the Canadian Dominion Bureau of Statistics, the United Kingdom General Register Office and the United States National Office of Vital Statistics, to code the cause of death on three random samples of 2 000 death certificates. Out of the 6 000 coding units, there were 390 where the coding was not unanimous. About one-half of these cases were the result of uncertainty as to which condition the certifier regarded as the underlying cause.<sup>97/</sup> The same technique can be applied on a national basis to detect and evaluate this source of error at the sub-national level.

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<sup>96/</sup> Factors Influencing the Comparability of Mortality Statistics by H.G. Corbett, European Technical Conference on Mortality Statistics, Asnières-sur-Oise, 23-28 October 1961, (Working Paper EURO-200/8).