

Handbook on Civil Registration and Vital Statistics Systems: Management, Operation and Maintenance, Revision 1

Third draft

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experts



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Introduction

The present *Handbook on Civil Registration and Vital Statistics Systems: Management, Operation and Maintenance, Rev. 1* provides guidance and assistance to countries. It is the first revision of the original publication issued in 1998; and reflects a restructuring in the contents that is conceptually consistent with the *Principles and Recommendations for a Vital Statistics System, Rev.3*, which were adopted by the United Nations Statistical Commission at its forty-fifth session in 2014.

This *Handbook* offers background, specifications and practical examples for the improvement and/or establishment of civil registration, vital statistics and identity management systems. It presents **model** organizational and legal arrangements, as well as **ideal** descriptions, processes and protocols that are considered the **gold standard**. Although some national examples are offered, this text is not a technical report describing country practices, but a model to strive to. It aims to encourage countries to undertake long-term self-sustaining programmes of strengthening the management and interoperability of their civil registration, vital statistics and identity systems.

The scope of the *Handbook* includes the entire range of vital events – live births, deaths, foetal deaths (including causes), marriages, divorces, annulments, judicial separations, adoptions, legitimations and recognitions – although an emphasis is placed on live births, deaths and foetal deaths, given that they are given first priority as per the *Principles and Recommendations for a Vital Statistics System, Rev.3*. There is a clear distinction between vital statistics as a set of data crucial for policy making and its source, the civil registration system as a critical element for establishing rights of individuals. In the context of heightened importance of assigning each individual with a unique identity document, this *Handbook* addresses the ideal information flow and institutional arrangements for ensuring effective civil registration, quality vital statistics and warranted rights and services for the population, notwithstanding security issues.

Applications of registration and statistical data and records at all levels of government, as well as in the public, private and academic domains are highlighted throughout the *Handbook*. Specific functions are described both within centralized and decentralized structures. In addition, the need and value of continuous monitoring and evaluation are presented as essential for good management, efficient operations and effective maintenance. In fact, a chapter on methods for assessing completeness and coverage of civil registration was newly introduced to the contents of this revision of the *Handbook*. Coupled with this, a chapter on digitizing civil registration and vital statistics is also a novelty in this revision, in response to the will of governments to modernize their approaches and operations, the wide availability of information technology and the consequent need for guidance.

The *Handbook* consists of seven chapters. Chapter I provides an overview of civil registration and vital statistics systems, including centralized or decentralized structures, the necessary legal framework, and the interaction with population registers and identity management systems. Chapter II details how to carry out activities of the civil registration system and deals with essential functional components and relations with the vital statistics system. Chapter III describes the operational requirements for sound civil registration and vital statistics systems. Chapter IV builds on the content presented in the *Principles and Recommendations for a Vital Statistics System, Rev. 3*

and thoroughly examines the issue of quality in the context of civil registration and vital statistics systems. Chapter V inspects the issues emanating from the proliferation of population registers, identity management systems and their interlinkages with civil registration and vital statistics systems. Chapter VI describes a wide range of applications and utilization of data and information from civil registration and vital statistics systems. Chapter VII focuses on technical details of the implementation of the enterprise information system paradigm and its features adapted for civil registration, vital statistics, population registers and identity management. For a full understanding of CRVS management, operation, and maintenance we recommend a full review of the text although the chapters have been developed to function independently if a targeted review is necessary.

This *Handbook* has drawn, not only from the from *Principles and Recommendations for a Vital Statistics System, Rev.3*, but also from the e-learning course¹ developed in partnership with the Global CRVS Group² and the CRVS Digitization Handbook³, developed for the purpose of supporting the Africa Programme for Accelerating Improvement of Civil Registration and Vital Statistics⁴. All these resources are consistent with each other and it is possible to use them jointly.

The process of revising the *Handbook on Civil Registration and Vital Statistics Systems: Management, Operation and Maintenance* included several stages. In the first stage, a first draft was prepared by the United Nations Statistics Division. Secondly, this text was presented at the United Nations Expert Group Meeting on Management and Evaluation of Civil Registration and Vital Statistics Systems, held in New York from 20 to 24 February 2017⁵. **Thirdly, based on the proceedings of this meeting, the second draft of the revision was prepared by the United Nations Statistics Division and circulated to the members of the Expert Group and the Global CRVS Group for further comments and suggestions, which were incorporated in the third draft. This text, too, was circulated to all members of the Expert Group, whose final input was solicited. The final draft was submitted to the Statistical Commission at its forty-ninth session, held in March 2018; whereas the complete edited version was submitted to the Statistical Commission for adoption at its fiftieth session in 2019.**

¹ Work in progress, to be hosted by the Open Learning Campus of the World Bank (<https://olc.worldbank.org/>)

² Learn more about the Global CRVS Group at <https://unstats.un.org/unsd/demographic/crvs/globalcrvs.html>

³ Available at <http://www.crvs-dgb.org/en/>

⁴ Learn more about APAI-CRVS at <http://www.apai-crvs.org/>

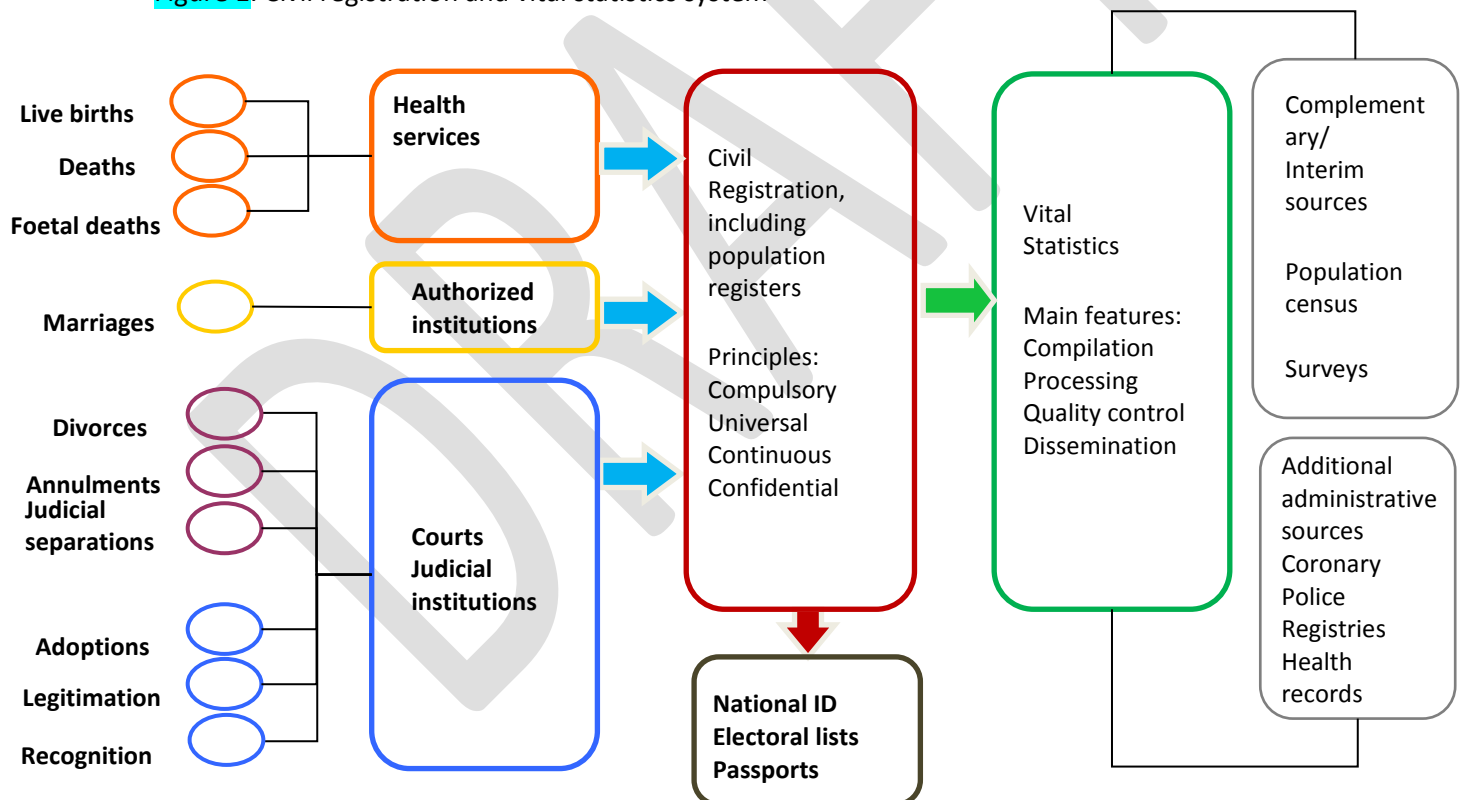
⁵ All the papers and presentations are available at <https://unstats.un.org/unsd/demographic-social/meetings/2017/new-york--egm-on-management-and-evaluation-of-crvs-systems/>.

I. Institutional arrangements for civil registration and the interface with the vital statistics system

A. Introduction

1. The essential objective of the current revision of the principles and recommendations for a vital statistics system, effective as of 2014, is to present vital statistics and civil registration as separate entities, with the ultimate goal being to establish, maintain and exploit these two entities as components of a coordinated and coherent system for registering and producing vital statistics. The procedures for recording births and deaths are equally important for civil registration in legal terms and for vital statistics in the context of source of statistics; hence, the work of civil registrars and that of statisticians are interdependent.⁶ In addition, the emergence of the interconnectedness between civil registration and contemporary identity management systems adds yet one more dimension to the structure of the civil registration and vital statistics system. These relationships and functioning is presented below, in [Figure 1](#).

Figure 1. Civil registration and vital statistics system



Source: Principles and Recommendations for a Vital Statistics System, Revision 3, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 26.

⁶ Principles and Recommendations for a Vital Statistics System, Revision 3, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 274.

2. Civil registration is defined as the **continuous/permanent, compulsory, universal** recording of the occurrence and characteristics of vital events pertaining to the population, as provided through decree or regulation in accordance with the legal requirements in each country, with full respect of rules regulating the protection and privacy of individual information. It is important to highlight the quality of universal in relation to the people's right towards the registration of vital facts. Established in the 1948 Declaration of Human Rights and supported through other global accords, every person has the right to an identity as bestowed through civil registration. In this regard, laws, policies, rules and regulations must not be a hindrance to the realisation of this right. In particular, the registration of events must be performed even if the time frame given by law has elapsed, and regardless of migratory status, and any other request that may act as an obstacle to registering the vital facts occurred in the territory. Civil registration is carried out primarily for the purpose of establishing the documents provided for by law. The usefulness of these records as the best source of vital statistics is well established.

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

4. Responsibility for the establishment or development of a civil registration system should lie with an agency or agencies of a national Government⁷. A civil registration system refers to the entire administration, legal, institutional framework, including the personnel, registration network, procedures, recordkeeping and retrieval, certificate issuing, outputs, data transfer, services to other agencies, and all other activities pertaining to civil registration in a country (or state/province). The civil registration system, therefore, encompasses both the registration method and all institutional, technical and legal settings associated with it.

5. The juridical function of civil registration is to register the occurrence of acts and events that constitute the source of civil status, and issue certificates. Such events are called vital events. The vital events that most countries register, as internationally recommended, refer to live births, deaths, foetal deaths, marriages, judicial separations, divorces, annulments, adoptions, legitimations and recognitions⁸. In addition to the legal role of maintaining public records and performing the certifying activity, the fundamental role for the production of vital statistics is a key function that must be recognized as a matter of paramount importance in the design of national development policies.

6. Civil registration is also the source that maintains population registers and identity lists updated in countries where these exist. If population registers and identity management systems

⁷ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 301.

⁸ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 2.

are not fed from the civil registration system with information on births and deaths, they will quickly become outdated and therefore will lose their usefulness.

7. According to international standards, a list of vital events for which data are to be collected for vital statistics purposes and its recommended definition is provided directly below:⁹

- **Live birth:** the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached; each product of such a birth is considered live born (all live-born infants should be registered and counted as such, irrespective of gestational age or whether alive or dead at the time of registration, and if they die at any time following birth, they should also be registered and counted as deaths).
- **Death:** the permanent disappearance of all evidence of life at any time after live birth has taken place (postnatal cessation of vital functions without capability of resuscitation). (This definition excludes foetal deaths, which are defined separately below.)
- **Foetal death:**¹⁰ 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 (note that this definition broadly includes all terminations of pregnancy other than live births, as defined above).¹¹
- **Marriage:** the act, ceremony or process by which the legal relationship of spouses is constituted. The legality of the union may be established by civil, religious or other means as recognized by the laws of each country. Countries may wish to expand this definition to cover civil unions if they are registered; in that case, registered partnership usually refers to a legal construct, registered with the public authorities according to the laws of each country, that leads to legal conjugal obligations between two persons.
- **Divorce:** the final legal dissolution of a marriage, that is, that separation of spouses which confers on the parties the right to remarriage under civil, religious and/or other provisions, according to the laws of each country. In case a country recognizes registered partnerships, a legal dissolution of a registered partnership refers to the

⁹ Idem

¹⁰ Also referred to as “dead-born foetus” and “stillbirth”.

¹¹ The legal requirements for the registration of foetal deaths vary from country to country. It is recommended that dead fetuses weighing 500 grams or more at birth (or those of 22 completed weeks of gestation or crown-heel body length of 25 centimetres or more if weight is not known) be registered. In addition, for statistical purposes, it is recommended that such terminology as “abortion”, “early foetal death” and “late foetal death” be replaced through the use of weight-specific measures, e.g., the foetal death rate for fetuses of 1,000 or more grams or the foetal death rate for fetuses weighing between 500 and 1,000 grams, etc.). See World Health Organization, International Statistical Classification of Diseases and Related Health Problems. Details available from <http://apps.who.int/bookorders/anglais/detart1.jsp?codlan=1&codcol=15&codcch=835>

legal final dissolution of such a partnership, according to national laws, conferring on the parties the right to re-enter into another partnership or marriage.

- **Annulment:** the invalidation or voiding of a marriage by a competent authority, according to the laws of each country, which confers on the parties the status of never having been married to each other.
- **Separation, judicial:** the disunion of married persons, according to the laws of each country, without conferring on the parties the right to remarry.
- **Adoption:** the legal and voluntary taking and treating of the child of other parents as one's own, insofar as provided by the laws of each country.
- **Legitimation:** the formal investing of a person with the status and rights of a person born in wedlock, according to the laws of each country.
- **Recognition:** is the legal acknowledgement, either voluntarily or compulsorily, of the paternity of a child born out of wedlock

8. It has to be emphasized that the relationship between vital statistics and health statistics is of considerable importance in modern systems. A number of variables collected by the vital statistics component represent a direct entry into the health statistics collection, such as age of mother, number of previous life births and so forth. Health statistics, in turn, are indispensable for developing policies and measures for improving overall health of the population. The source of health statistics is usually the health institution (public or private) which also acts as an informant of the occurrence of vital events such as births and deaths. Harmonization of definitions, classifications and data formats, therefore, between civil registration, vital and health statistics, has to be tackled in very early stages of designing a holistic system of civil registration, vital statistics and population registers.

9. **Continuous, permanent** recording of vital events can best be ensured by means of proper legislation and the establishment of mechanisms to enforce it nationwide. The civil registration law should promote close integration of people into the community, and should give them clear guidelines on the type of organization adopted for the civil registration system in the country or area. It should also spell out the types of vital events that must be registered, their definitions, the designation of informants for each type of event, the time allowances for registering each type of vital event, procedures for late registration, the registrar's duties, the rights and obligations related to registration, the penalties for noncompliance and so forth.

10. In the context of defining a system as a set of interacting or independent components forming an integrated whole and for the purposes for which these principles and recommendations are to be applied, the components of a vital statistics system are: (a) legal registration, (b) statistical reporting of, and (c) collection, compilation and dissemination of statistics pertaining to vital events¹², as illustrated in figure 1 above.

11. Taking into consideration that the institutional organization of civil registration and vital statistics impacts significantly the interlinkages, as well as the setup and functioning of the system,

¹² *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 26.

it is necessary to elaborate on different arrangements that are implemented in different countries and circumstances. Both civil registration and official (vital) statistics are in most countries a function of the government; yet, the organizational settings for one or the other differ. In general, the organizational structure or structures for the efficient management, operation and maintenance of the system might be centralized or decentralized. In terms of its overall structure, a centralized system relies on being managed at the national level, with subnational offices at appropriate local levels. Decentralized systems are those where the primary responsibility for civil registration and local vital statistics rests with subnational authorities, such as governments of states or provinces.

B. Centralized administration for the civil registration

11. A centralized administration of civil registration usually has an agency for directing, coordinating and monitoring the nationwide civil registration work. An office with such duties can promote national standards and uniform registration of all vital events occurring within the country and among various groups of the population.

12. Under this type of central arrangement, the national registration agency plays not only an administrative and legal role but also a technical one over the network of subnational and local civil registration offices. It establishes all local registration offices, provides written materials and Standard Operating Procedures (SOPs) to local registrars to guide their daily work, coordinates the registration procedures throughout the system, and supervises and evaluates the registration work of the local offices.

13. The central office is responsible for coordinating with other governmental agencies that support the civil registration system, including the health services that inform of the occurrence of vital events and certify causes of death, the courts that deal with marriages and divorces, and the national statistical service that compiles the registration data and publishes vital statistics.

14. The advantages of having a central registration office to administer the system may be listed as follows:

1. It makes possible the preparation and approval of a standard legal framework for the civil registration system, which will promote uniformity of procedures throughout the country, and will, in turn, facilitate further changes in legislation, whenever needed;
2. It facilitates the interpretation and enforcement of norms and regulations;
3. It permits the adoption of uniform procedures for recording and reporting vital events nationwide, including ways and means of certifying registered vital events, and for releasing certificates to the public;
4. In terms of establishing direct links with identity management authorities, it allows for more secure and uniform protocols for channelling the necessary inputs;

5. It promotes the maintenance of direct and effective control over the entire system. It facilitates the carrying out of research based on vital records kept under uniform archival techniques;
6. It facilitates the development and channelling of advisory services and other forms of technical assistance to local civil registrars, such as periodical training courses to keep them abreast of any changes in the system and the provision of focal technical advice for solving a particular problem.

15. In a centralized administration paradigm, there are two main options for the administration of the vital statistics system:

1. In one, the responsibility for both civil registration and vital statistics is within a single government institution¹³. The organization might be the national statistical office, ministry of health, the interior, home affairs or justice, or an independent agency.
2. In the other, the civil registration and vital statistics are separated. Civil registration might be under the responsibility of the national civil registrar, the ministry of interior or justice and the vital statistics system under the responsibility of another agency, most often the national statistical office¹⁴. In turn, the vital statistics system itself can be administered in a centralized or decentralized manner. In both cases, the critical importance is given to the coordination of the two components in order to avoid dissemination of differing vital statistics, one sourced in civil registration and the other in official statistics.

16. A more detailed elaboration of the two models is provided below.

1. **Separate administrative agencies for civil registration and vital statistics**

17. As presented above, in a number of cases the civil registration and vital statistics functions are assigned to separate administrative agencies. In this arrangement, these agencies have complementary functions: the civil registration agency is in charge of collecting the information that the statistics agency later analyses and uses to produce tabulations, rates and ratios. Interaction and cooperation between these agencies becomes a key factor in having effective civil registration and vital statistics systems. Offices of civil registrars, ministries of the interior, home affairs, justice or health or an independent agency have responsibility for the civil registration system. Another agency, most often the national statistics office, would have the responsibility for the vital statistics system. This kind of structure requires a more complex organizational and

¹³ While there are not many examples in the world, the one in the Philippines stands out, where the Philippine Statistical Authority is at the same time responsible for both civil registration and issuing certificates as well as for generating vital statistics

. In India, the functions of the Office of the Registrar General and Census Commissioner also cover both the civil registration and compiling vital statistics, albeit the coverage of civil registration on terms of vital events occurring varies significantly between various states in India.

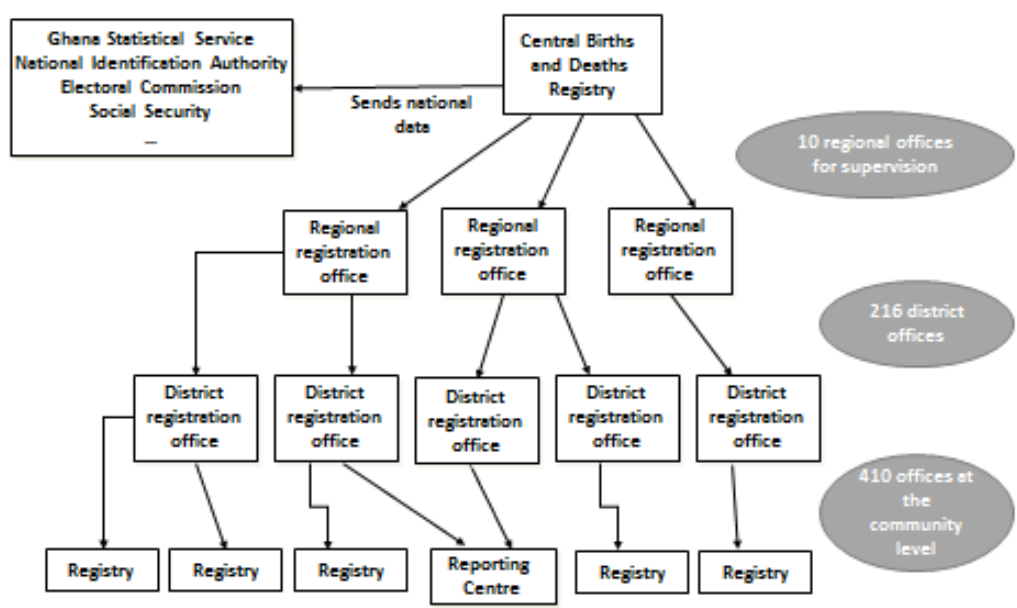
¹⁴ There are a number of examples that would fall into this category, such as Costa Rica, Guatemala, Ethiopia, Mongolia, Norway, Uzbekistan to name a few.

operational arrangement than when a single agency is responsible for both systems. The vital statistics system may be centralized or decentralized.

18. The first concern is how to create an interactive and collaborative relationship between the two agencies. The vital statistics function derives its data from the daily operation of the civil registration system. The statistical agency should take the lead in establishing a working relationship with the registration programme. The best option is to have an inter-agency committee established by the civil registration law or regulation (or in the vital statistics law). Another option is to prepare a memorandum of agreement that designates a committee with representatives from both programmes, as well as other relevant stakeholders, such as the ministry of health. Committee membership should represent the relevant factors affecting the civil registration and vital statistics systems. Factors should include the operational parts of both systems, such as the forms for legal registration and documentation and for the preparation of vital statistics. Another concern of the committee is the set of rules and regulations needed to provide complete and accurate data for both programmes. Factors for the committee will also include processing methods to assure effective registration services and timely and relevant vital and health statistical information. The committee should meet bimonthly or quarterly to address completeness, accuracy, timeliness and reliability of the data for each function. Discussion should also include coding and data-entry activities, as well as problems that the processing routines of each programme identify.

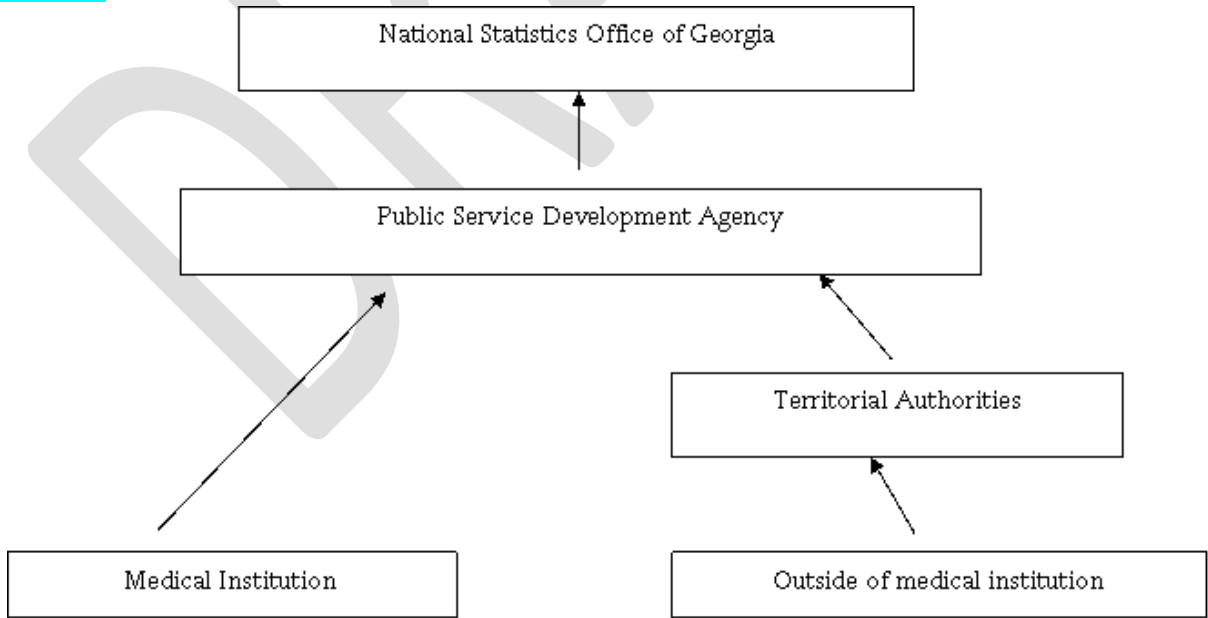
19. Further, the importance of routinely collected data from civil registration for use in the production of birth and death statistics (fertility and mortality), including cause of death, should be reflected in the National Statistics Strategy (or equivalent national strategy document). The flow of the data in the separate agency structure is consistent with that in the single agency structure described in section below. The data (micro level) flow from the local registration units through district and/or regional offices to the national level, and then to the statistical component, taking into account data confidentiality restrictions. See [Figure 2](#) and [Figure 3](#) for examples of the centralised model with separate agencies for civil registration and vital statistics, Ghana and Georgia, respectively. The committee should coordinate the interaction with those local offices.

[Figure 2](#). Organisational structure of civil registration in Ghana



Source: Workshop on the Principles and Recommendations for a Vital Statistics System, Revision 3, for African English-speaking countries, held in Addis Ababa, Ethiopia, 2-5 December 2014¹⁵

Figure 3. Civil registration and vital statistics systems in Georgia



Source: Sub-regional Asian workshop on applying Principles and Recommendations for

¹⁵ All documentation available at: https://unstats.un.org/unsd/demographic/meetings/wshops/Ethiopia/2014/list_of_docs.htm

implementing the Regional Action Framework for strengthening CRVS, held in Istanbul, Turkey, 15-18 September 2015¹⁶

20. The vital statistics system derives its data from the civil registration system and the combined or separate statistical and civil registration forms (on paper or in electronic format) that are completed at the time of registration. The civil registration system brings in all the necessary information, both for registration and statistical purposes. Hence, contact and interaction with local units (village, district and region) should originate from the registration office. The registration system unit responsible for field activities should consult with the committee and then initiate these contacts. In the separate agency structure, the national level maintains the legal and statistical functions. Registration offices at the local level conduct registration activities, including issuing of certificates, corrections, amendments and so on.

21. In most cases, the national level of the system conducts the vital statistics function, such as cleaning, coding, data processing, preparation of tables and charts, statistical and trend analyses, publishing reports and doing related research. The national level then distributes that information to local government units. This approach ensures the consistency of the data and information for the country as a whole. Local agencies can then use such data for local programmes, planning and population-related activities. However, a number of countries also conduct cleaning, coding and data processing at regional or subnational levels – which, depending on the size and particularities of the country, may be much more efficient in terms of timeliness and the proximity to the original source of information; this approach necessitates uniform data cleaning and processing procedures and protocols in order to ensure standard format and content of resulting vital statistics.

22. One advantage of separate agencies for civil registration and vital statistics is that each agency can focus completely on the discharge of its own specific function. In addition, collaborative and constructive competition between the two agencies can result in more attention and interest in managing each system in an effective and efficient manner. The joint committee **maintains coordination** of those separate system activities.

23. Another positive element of the separate agency structure concerns obtaining support for changes, modifications and improvements. Requests for resources are more often given greater consideration by government budget offices when support is requested by separate agencies for the same activity than when a single agency seeks support on its own. The one negative aspect is getting the two agencies to agree on the specific needs to be addressed and the resulting distribution of available resources. This is particularly the case when the civil registration agency views the statistical function as just another by-product and not a critical component.

24. Reaching agreement between the two agencies may be a problem on any number of issues. For example, when civil registration and vital statistics systems are both automated, there could be duplication of data entry and other processing activities, not to mention incompatibility of the

¹⁶ All documentation available at:
https://unstats.un.org/unsd/demographic/meetings/wshops/Turkey/2015/list_of_docs.htm

technologies applied and the need for harmonisation. There could also be a problem in reaching agreement on the data-collection process, forms and data item content, definitions, and procedures for assessing the completeness, validity and accuracy of information. Those issues are best resolved at the time of writing up the memorandum of agreement and through the established committee responsible for addressing such issues and concerns.

25. Within a centralized system, the major difference between a single agency responsible for both civil registration and vital statistics and one where two agencies are responsible is the need for a legal mandate for cooperation and coordination or official agreement and a coordinating committee. The combination of committee and agreement assures each system an operational structure that can produce high-quality results.

2. Single agency for civil registration and vital statistics

26. Another type of arrangement for the civil registration and vital statistics systems is for both responsibilities to be placed in a single government organization under the rationale of close links between the two systems. Vital statistics come from data on combined civil registration and vital statistics forms, or from the pairing of civil registration forms with statistical forms filled out at the time of registration. Their completeness and accuracy depend on the data collection and data processing methods used in registration. It is more efficient to maintain control of the forms and processes within a single organization. For example, in countries in which a single agency is responsible for both systems it is easier to implement a single form that combines data for legal and statistical purposes for data collection.

27. The advantage here is that the agency responsible for both systems controls any modifications that affect either system, which eliminates the need to resolve differences about the systems between the agencies. It allows closer intra-agency collaboration and improves timing for making effective changes.

28. A committee with representatives from civil registration and vital statistics units within the agency can be very effective in providing guidance for monitoring and operating each functional area. When a single agency is responsible, civil registration and vital statistics daily activities undertake the achievement of the goals of the two systems. A single agency unifies the attainment of specific goals and objectives

29. An advantage of the single administrative agency role is the management of the total system of registration and vital statistics. A single agency in a centralized structure can initiate, develop and achieve each functional and operational task. Single administrative control allows for the appropriate distribution of staff and other resources. In those cases where the local staff are not employees of the central agency, the agency must provide regulations and standards for the operational aspects of the system. This assures that local sites are consistent with central office protocols. The assignment of local sites and local registrars to carry out registration activities at the various local geographic locations is essential for an effective system.

30. Direct control over each component of the system enhances the ability to operate the system efficiently and cost-effectively. A single administrative agency with oversight on both civil registration and vital statistics is in a good position to accomplish such efficiencies. The design (of forms), the selection of data items, the development of coding structures, the establishment of processing methods and the choice of statistical measures and indicators are more efficiently executed within a single agency. The development and use of contemporary IT technologies is also more focused, coordinated and uniform. A single administrative body can more effectively provide services to the public, the research community and other governmental programmes.

31. In a centralized system, the primary resources for operating and maintaining the system are at the national level in a central office. It is important to note that under a single, centralized system, the agency is responsible for each operational and functional activity that the national, regional and local levels conduct. This makes the registration activities at the regional or local levels more consistent. The centralized national structure minimises any local bias or difference in process.

32. The central agency needs to establish an organizational structure with specific operational roles clearly defined at each level. The agency also needs to establish, at each level, ongoing monitoring and evaluation protocols to assure the quality and completeness of data collection and the timely reporting of vital events. A centralized programme presents a systematic structure with all parts of the programme within a single administrative unit. This creates a unified programme, with all functioning units interrelating under one mode of operation. It provides the necessary registration services to the public, and produces the vital statistics for national, regional and local use.

33. The centralized registration authority directs civil registration throughout the country. The central agency also produces vital statistics data from the civil registration forms for births, deaths, foetal deaths, marriages and divorces. The data derived from those records and used for both registration services and vital statistics are reviewed and validated, coded and processed at the central site. This allows for standards and criteria to be used for both registration and vital statistics needs in a consistent fashion: a very important system attribute.

34. The national system may use district and regional sites to direct record flow from the local registration offices. Each level may retain copies of the records completed for each vital event to provide services to the population. The national office, however, prepares the vital statistics derived from those forms: It then provides the information to the various levels of users.

35. Thus, within the single agency structure, the registration functions of record retention and copy preparation for public access may occur at each level of government - local, district and regional. The vital statistics component is primarily a national office activity. As district and regional offices develop the ability to prepare vital statistics data locally, some efficiency may be gained if the units abstract data from the registration records as they pass through their offices on their way to the national office; this would become even a more efficient and routine operation if

the system is digitized¹⁷. This flow of the registration records provides an incentive for the local units to establish a capability to use the data in an proactive manner as well as to have an active role in civil registration.

36. Since the centralized system has both the civil registration and vital statistics functions, it becomes the single source for information from either system. Thus, other agencies, both public and private, and related programmes may seek direct access to the centralized data source. As the exploitation of anonymized microdata becomes one of the major sources of detailed analysis of population dynamics and related economic and social research, the consolidation of all the records under one roof enables more stringent development of protocols related to the use of microdata and protection of their confidentiality and privacy. Also, this makes all the processes more effective, and eliminates the difficulties in resolving differences concerning various aspects of the system which could occur if the components were divided among a number of agencies.

37. The centralized structure may give rise to concerns whether there is adequate representation and access for other programmes or governmental agencies that can use both registration and statistical information. The health sector, in particular, other statistical and research organisations, and government agencies in the social and health service areas all rely to some degree on information from the registration and vital statistics systems. Input from those disciplines is essential so that the single administrative agency would need to formulate a comprehensive programme to meet their needs.

38. The establishment of an inter-agency committee, with representation from appropriate programmes and organizations, can address the above concern from a more general perspective. The committee may include such programmes as maternal and child health, family planning, social services, population registers, identity management agencies, electoral rolls, immigration and naturalization, demography and population dynamics, and police. In this way, the needs and issues of other programmes can be included as part of the administration and operation of the registration system.

39. In a centralized system, the fact that all direction comes from above may result in the lack of incentives at the local level in terms of restricting relevant input regarding innovations and more comprehensive understanding of local circumstances reaching the central agency. This can result in a failure by local officials to put forth innovative approaches that could enhance the system. To avoid that type of occurrence, it is essential that strong lines of communication are in place in both directions - from the central office to the local units and vice versa. This assures that knowledge from both levels is used to effectively manage and operate the system.

40. Another possible disadvantage of the single-agency approach is related to the attempt to reconcile two different methodological concepts in discharging the official responsibilities; the civil registration method is oriented to a case-by-case approach, which refers to applying rules and regulations according to the facts and characteristics of each particular situation. Statistical approach is all about quantification of individual cases into aggregates, and each entry is treated

¹⁷ Please see chapter VII of this *Handbook*.

equally. Translated in operational arrangement, this difference is reflected the necessity for much closer and much more frequent interaction of registrars with public – which is not really necessary in the production of statistics. Hence, the agency has to make additional efforts and establish structures to accommodate efficient delivery of both functions.

C. Decentralised administration of civil registration

41. Decentralized civil registration has more than one model – in fact, the distinction is made based not only on the manner and institution(s) administering the registration of vital events, but primarily on the uniformity of procedures, protocols, content of records and harmonization of processes. For example, in a number of European countries the actual registration of vital events, as well as issuance of relevant certificates, is the sole authority of local governments, such as municipalities and in most cases even the funding for these services comes from local government budget; however, at the national level, the civil registration law and accompanying regulations ensure that the registration process, in terms of procedures, content and all other aspects is identical. Therefore, while the actual administering of civil registration is decentralized, that is, without a national agency and accompanying hierarchical structure, the registration process is uniform in terms of protocols, deadlines, forms, and certificates and so forth.

42. In another model of a decentralized administration for civil registration, civil registration is administered at the level of the major civil divisions, such as the state, province or department. In the capital city of each major division, an authority for civil registration is established to direct and monitor the civil registration work of the major division. Many countries with a federated political system, a large territory or a large population may adopt this mode of decentralized administration for civil registration. See **Box 1** for an example of this model, Canada.

Box 1

Canada. A decentralised system of civil registration and vital statistics

Canada's national vital statistics system is based on the cooperation and collaboration between the thirteen provincial and territorial registrars and the federal government represented by Statistics Canada. Together, they form the Vital Statistics Council for Canada, the advisory group governing civil registration and vital statistics in Canada".

Civil registration of births, deaths, stillbirths and marriages are the responsibility of the provinces and territories. Each operates under its own provincial or territorial Vital Statistics Act. The collection and dissemination of national vital statistics are the responsibility of Canada's central statistical agency, Statistics Canada, which is legislated under the federal Statistics Act.

The provincial and territorial vital statistics registrars collect data on births, deaths, and stillbirths and send an agreed upon subset of these data to Statistics Canada using the National Routing System (NRS). The NRS was developed as a joint partnership between three federal departments, Statistics Canada, the Canada Revenue Agency and Service Canada to enable the vital statistics registrars to provide information to the three federal departments by using common technical and data standards. The NRS allows for the transmission of near real-time data.

43. Although recommended, not all countries with decentralized administration for civil registration have adopted uniform legal provisions and procedures for civil registration. A number of such countries have made provisions to develop a model law and its regulations so that each major civil division may promulgate its own laws and regulations on the basis of that model. Indeed, it is recommended that a model law be developed, and that each sub-national jurisdiction be encouraged to follow it. Such model law should cover data access issues, in order to facilitate national compilation of vital statistics. Please see [Section D in Chapter I](#) for more detailed guidance on the legal framework.

44. It has to be outlined that the production and dissemination of vital statistics, as well as standardization of identity management at the national level, in the case of fully decentralized administration of civil registration, usually requires at least one agency at the national level to enforce and standardize the work of civil registration and vital statistics, and another one in the case of identity management and issuing resulting legal tenders (passports, for example).

45. Within a decentralized administrative structure for civil registration, the organizational options for the vital statistics system may be centralized or decentralized. Centralized system refers to a model whereby there is a national statistical office at the central level of government in charge of consolidating all inputs from various institutions at the sub-national level. This approach requires strict compliance with harmonized definitions, classification and data formats.

46. Another configuration is represented in some other models in place today. In this decentralized structure, the state or provincial government has responsibility for both civil registration and vital statistics within its jurisdiction, independent of the national Government. The individual states or provinces make arrangements with the national Government to provide data, which are then aggregated at the national level. Those data are used to prepare national vital statistics and civil status information, and to address national issues related to legal, health and population programmes. A national government agency is designed for conducting the vital statistics system. In any case, there must be only one entity entitled by law to publish official statistics and figures.

47. As mentioned above (see [paragraph 42](#)) in decentralized systems it is essential to establish relationships between the states or provinces and the national government organization responsible for the use of the national data for vital statistics purposes and national civil information. In any the decentralised modality, collaboration at all levels is key to avoid fragmentation. There is a need at the state or provincial level for consistency in the interactions of civil registration with national programmes. Such programmes as immigration and naturalization, identity management, passport control, national health and social benefits, population registers, education, conscription, identification services and electoral rolls may have requirements with which civil registration must be consistent.

D. Legal framework for civil registration and vital statistics¹⁸

48. Establishing the legal basis for civil registration and vital statistics systems requires incorporating definitions of each element and component into the statutes, rules and regulations of the country. This must include all the administrative and technical aspects of establishing, operating and maintaining the systems. The civil registration and vital statistics statutes may be contained in sections of the law related to the specific ministries that are responsible for notification, registration and statistics. When more than one agency is involved, each should have specific functions defined within the laws for its agency.

49. It must be noted that the legal aspects of civil registration and vital statistics are very different in nature and purpose. Commonly, they obey to different laws, often conflicting. The most practical avenue to address this conflict is via lower level legal instruments, such as rules and regulations, memoranda of understanding among agencies and so forth. Legal reforms can also address conflicting laws; however legislative processes may take long.

50. The specific definitions for birth, death, foetal death, marriage, divorce, adoptions, legitimations and other vital events, and reporting time periods are essential for an effective programme. The United Nations specifies that the definitions should be consistent with international standards¹⁹. The time period requirements for the registering of events must be such that the information is complete, accurate and consistent with other related functions of the system. The law should also specify some type of punitive action should the responsible reporting sources and registration units fail to comply with requirements.

1. Organizational infrastructure and related legal status

51. When there is a centralized structure and the national registration office administers the registration system, the legal requirements of the national office can directly address all registration activities. If, however, the registration programme is under the auspices of another agency, such as the ministry of health, interior or home affairs, then the legal issues may be included in the sections of the national laws for that agency. Conversely, the national civil registration law may indicate the roles and responsibilities of the various ministries. The differences resulting from this diversity of administration are described below.

52. For the decentralized structure, the legal framework is in the laws of the state or province. In cases where the national Government establishes some specific requirements for registration, then the state or province must incorporate these into their laws as well. When the national Government is not involved in the registration systems, then the state or province forms the laws

¹⁸ The issue of legal framework is thoroughly examined in the *Handbook on Civil Registration and Vital Statistics: Preparation of a Legal Framework*, United Nations publication, Sales no. E.98.XVII.7, New York, 1998 and its first revision (*Guidelines on the Legislative Framework for Civil Registration, Vital Statistics and Identity Management Systems, upcoming in 2018*).

¹⁹ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 2.

stating specifications for the programme. In instances where city or regional offices control the registration process, the state or province establishes requirements for the local programme.

53. Laws are, almost without exception, adopted by the representative body and usually require considerable time for adoption. Hence, rules and regulations – enacted by the executive branch of the government -are often used to address specific issues identified during the operation of the registration programme. The registration units generally develop such rules and regulations. They address legal issues, such as delayed registration, adoption, paternity or other record changes that occur after the original recording of the event. The use of rules and regulations allows for more timely operation and adaption to real-life circumstances.

54. There are specific areas that should be part of the laws at every level, including issues surrounding adoption, filiation, procedures for corrections and amendments, paternity, delayed registration specifications, legitimation and civil status. The law, rules and regulations should also cover such issues as access to the records, confidentiality of selected information, fees for record searches, copy preparation and changes, and the security, storage and retention of records. For all these issues, the law should also specify details and considerations for different formats that the registration records might exist (paper and different electronic formats).

55. The legal framework should define the required legal documents, court decisions, and other information sources acceptable for adoption and filiation. The laws should address access to the registration records for vital statistics purposes and research activities (for more on confidentiality, please see Chapter VI, paragraphs 377 onwards). It should define permissible use of the records by health programmes and other governmental agencies for administrative needs. The law should define specific fees for specific activities, such as late registration, certified copies, legal changes to the record and the preparation of data for research, as well as for legal or administrative uses.

56. Many countries include the above components in the laws of the existing legal and administrative structure. The first step to streamline the civil registration and vital statistics systems is to obtain information concerning the current legal structure. Then an analysis should be made to determine that the necessary components are present for sound civil registration and statistics systems. If the analysis indicates deficiencies in the legal framework, then it is important to proceed to a thorough revision and seek government support to enhance the law and regulations. This may take time but is a fundamental step.

57. When working to improve the civil registration law and regulations, vulnerable groups such as refugees, internally displaced and stateless persons should not be forgotten: civil registration should cover the whole population of a country, including those who might not be citizens or recognised permanent residents, but this is often not the case. Some countries have discriminatory laws and practices which do not allow certain groups to register their vital events. It can also be the case that displaced persons are not aware of the importance of registering vital events or are unable to access the national systems due to financial, social, or physical barriers to civil registration. There could also be a reluctance to register because of fear of being expelled or suffering other negative consequences. Addressing refugees, internally displaced and stateless persons in the legal framework of civil registration and vital statistics will help to ensure protection

and integration in the country of refuge and in repatriation. It also contributes to reducing human trafficking.

2. Purpose, function and utility of a legal framework

58. The inclusion of the components of a civil registration system in the laws of the country or a particular state or province serves a number of very important purposes. It makes specific agencies responsible for registration activities and for establishing and maintaining reporting systems. It specifies standards and quality control conditions for the use of the records and information collected through the system. The legal framework also offers a consistent and structured basis for performing all of the tasks associated with the legal uses of the records of events. The legal foundation gives the programme an essential ingredient to be able to operate successfully throughout the country.

59. Another important purpose of the legal framework is to ensure that the registration system is a high quality data-collection medium for the development of vital statistics. The legal framework for the civil registration system establishes a **continuous** source of information to serve a broad range of activities and programmes. Thus, the legal framework should also specify the conditions for data sharing with other government agencies. Without a legal basis for the system, the **continuity**, quality and consistency of reporting can over time be affected by changes that have an impact on resources and staff. The fact that the law requires registration sustains operations.

60. The contents of the sections covering registration in the laws, rules and regulations serve to provide information to the population. Individuals and families can determine what steps must be taken to resolve problems in response to the registration system. The law provides the public with a description of required legal documents, information sources or court actions to address a particular issue. Without the laws covering those specific areas, it would be difficult to determine actions or strategies.

61. A legal framework for the processes and procedures of civil registration ensures comparable results throughout the country. This is the purpose of having the law identify detailed descriptions of the registration functions, thus preserving the integrity of the system and guaranteeing that legal issues, wherever they occur, will be handled in a consistent manner. Whether issues being addressed occur in different geographic locations, under different administrative conditions or for social or economic reasons, the use of the legal specifications (contained for example in rules and regulations) applicable to the issue remains constant. This makes it important to carefully review items in the laws that address registration issues.

62. Establishing the civil registration programme within the laws of the country, state or province serves multiple purposes, and ensures an effective, consistent and productive system. The benefits are clear. But difficulties can be significant if only portions of the system are incorporated into the laws, rules and regulations.

E. Civil registration, population registers and vital statistics²⁰

63. The term *population register* is defined²¹ as “an individualized data system, that is, a mechanism of **continuous** recording, and/or of coordinated linkage, of selected information pertaining to each member of the resident population of a country in such a way to provide the possibility of determining up-to-date information concerning the size and characteristics of that population at selected time intervals”. Thus, the population register is the product of a **continuous** process, in which notifications of certain events, which may have been recorded originally in different administrative systems, are automatically linked on a current basis. The method and sources of updating should cover all changes so that the characteristics of individuals in the register remain current. Because of the nature of a population register, its organization, as well as its operation, must have a legal basis.

64. Population registers have been effectively used as a statistical data source for decades and they may be considered the logical product of the evolution of a vital statistics system. The interest in population registers dates back to the nineteenth century, when the International Statistical Congress recommended their introduction²². Some forms of population registers already existed in various societies at that time, and several countries subsequently established such a system, in the nineteenth and twentieth centuries. However, full exploitation of the population register as a statistical source has become more feasible with the introduction of computerization.

65. The essential premise of the contemporary mechanisms related to population registers and their functioning is that the civil registration system is uniquely positioned to provide reliable input into the population registers. In that context, population registers are built up from an inventory of information on the inhabitants of a certain area and a **continuous** update on the facts of births, deaths, adoptions, legitimations, recognitions, marriage, divorce, annulments and judicial separations, change of name or sex, change of residence.

66. Information about address of residence is an important part of a population register. It is recommended that the definition of usual place of residence as per the UN Principles and Recommendations for Population and Housing Censuses²³ be used, in order to comply with international standards. Address of residence is used at sub-national level for administrative and statistical processes. Address changes are usually reported to the population register by the residents themselves, and it is typically required by law (or rules and regulations). This is the case

²⁰ Substantive portions of Chapter III of the *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014 are incorporated in this subsection; therefore, readers are encouraged to refer to original text, as specific quotations are purposefully omitted to ensure a smoother presentation.

²¹ *Methodology and Evaluation of Population Registers and Similar Systems*, United Nations publication, Sales No. E.69.XVII.15, United Nations, 1969. chap. I.A.

²² See Report of the Official Delegates to the International Statistical Congress held at St. Petersburg in August, 1872 (Washington, D.C., Government Printing Office, 1875), p. 46.

²³ UN Principles and Recommendations for Population and Housing Censuses, Rev. 3, 2015, United Nations publication sales number E.15.XVII.10, available from https://unstats.un.org/unsd/publication/seriesM/Series_M67rev3en.pdf

in Norway²⁴, Bhutan and Mongolia. Further, in some countries, a married spouse is not allowed to register a change of address if it is not also registered by the other spouse (for example in Norway).

67. The incentive for registering a change of address relates to receiving mail, income and social security transfers, and to exercising the right to vote in local elections. There may be cases where a resident could try to avoid registering a change of address. Such cases include, for example, when they move to an area with a higher tax rate, or because the costs of commuting from the place of residence to the place of work might be tax deductible.

68. It is, therefore, of paramount importance for the quality and the usefulness itself of a population register to be continuously upgraded. For this purpose, the authority operating the population register must receive timely information at least about live births, deaths and changes of residence (including immigrants and emigrants). An efficient connection with the civil registration authority is therefore a fundamental element for the proper functioning of the population register. See **Box 2** for a brief description of the Central Population Register of Norway.

²⁴ For procedures to report an address change in Norway, see <http://www.skatteetaten.no/en/person/National-Registry/Moving/>

Box 2

Norway. The population register

The Central Population Register (CPR) of Norway was established in 1964 based on the 1960 Population Census. A unique 11-digit personal identification number (PIN) was introduced at the same time. The CPR included everybody who has ever been a (legal) resident of Norway since 1960, regardless of their citizenship. Persons who die or emigrate are not deleted from the register, but a code for their status is changed.

The most important stock (or status) variables in the CPR are: PIN (includes date of birth and sex), residence status (resident, deceased, emigrated, no permanent address, disappeared), address, municipality, dwelling number, place of birth (municipality or country), name (incl. first and middle names), surname prior to marriage, citizenship, country of immigration, country of emigration, marital status, PIN of spouse, mother and father.

All vital events and also migrations and address changes are registered in the CPR. The most important flow variables are births, deaths, marital changes (incl. same-sex marriages, separations, divorces and annulments), emigrations and immigrations, internal moves in Norway, address changes, name changes, citizenship changes, gender changes and PIN changes. When a report of a change is received by the CPR the information is checked, for example, that the spouses of a new marriage are not already married.

The inclusion of the PINs of parents and spouses in the CPR makes it possible to establish links between siblings, cousins, children, grandparents and other relatives. This is very useful for statistics and research, for example, for studying hereditary diseases and behaviours (e.g. early childbearing and marriage, divorce, and long life).

The PIN is used in a large number of other administrative registers, which makes it possible to link information in different registers for statistics and research. The CPR is also used to draw samples for sample surveys. The contents, coverage and quality of the administrative registers have become so good that it is not any longer necessary to conduct traditional population and housing censuses for statistical purposes. The last regular census was conducted in 2001, whereas the 2011 census was completely based on register data.

69. It has to be stressed that the primary function of the population register is to provide reliable information for the administrative purposes of government, particularly for programme planning, budgeting and taxation. The registers are also useful in other administrative areas, such as establishing personal identification²⁵, voting, education and military service, social insurance and welfare, and for police and court reference.

70. In general terms, a population register is not required to be a physical list (either in paper or electronic format) of single individuals available in a defined place. A population register can

²⁵ For more details on the relationship between civil registration, population registers and identity management systems, please see the following subsection F below.

indeed be a network of local registers, but they need to be linked in a coordinated way. Further, the single record of a population register may well refer to units other than individuals (e.g., families), but without preventing the information related to a single person from always being retrievable. To assist in locating a record for a particular person, household or family in a population register, an identification number could be provided for each entity.

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

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

73. In the recent practices of countries/areas introducing and maintaining population registers, assigning a unique identification number, most commonly referred to as “Personal identification number – PIN”, to each individual upon his/her birth and retiring it only after his/her death, proved as critical instrument for ensuring the quality of individual information, the linkages between various registers, avoiding duplications and more reliable control of quality of the registers’ content. The importance of PIN’s is even more exacerbated in the context of identity management mechanisms that are being developed in a growing number of countries for the purpose of issuing secure identification to all.

74. From the point of view of generating regular, accurate, timely and reliable vital statistics the introduction and functioning of population registers represent a substantial step in the right direction. As mentioned, population registers are operated by the government for administrative purposes; by itself, this results in systematic procedures where all the protocols and responsibilities of all involved institutions (public and private health institutions, registrars, population registers’ operators, official statistical office) are well developed and integrated as everyday routine. Population registers used as source of vital statistics ensure up-to-date access to individual information as well as opportunity to link individual information with other sources of data, increasing the quality of the information in the process.

75. For example, a great advantage of computing vital statistics from population registers is the possibility of calculating directly specific demographic rates with potentially no numerator-denominator bias. For instance, it could be possible to compute specific fertility rates for particular disaggregations, such as employed and/or immigrant women, parity progression ratios, life expectancy by educational attainment, indicators on mixed marriages by ethnic group/foreign background, divorce rates by socioeconomic class of the spouses, etc. This requires full matching between civil registration and population register data as well as the same level of detail of

information in the two sources, meaning that the certificate of the event (birth, etc.) must contain the same topics (variables)—with the same classifications—as those available in the population register. In general, the use of the population register provides a broader opportunity to correctly identify the population at risk of an event.

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

77. In practice, a population register cannot be deemed as such without being linked with the registration of vital events, which constitute information fundamental to its updating, together with the changes of address. In this respect, population registers are a kind of “continuous census”, encompassing the structure of the population at any given point in time, with all modifications occurring within it on a moment-to-moment basis. For example, the population register allows for producing population stock information, population by sex and age at any given time. In a perfect system, the accounting of the demographic balance would be intrinsically correct for any given interval of time, be it a year, a month, a week, etc. In fact, however, factors such as registration delays, lack of coordination, difference in definitions, among several others, may diminish the quality of the population register. Thus, making the civil registration system a vital component of a computerized population register would offer the most appropriate and advanced means of generating relevant, accurate, timely and comprehensive vital statistics. While building such a system would be resource-intensive at first, the dividends would extend over a prolonged period of time.

F. Civil registration, identity management and vital statistics

78. While there is a lack of an internationally agreed definition of identity management, the term most commonly refers to producing a proof or legal tender of identity to each individual and maintaining systems for managing information and documents associated with one’s identity. There are various estimates on the number of people in the world without any official confirmation regarding their identity; irrespective, in all cases there is a considerable number of people unable to prove their identity and, accordingly, to gain access to a number of services, both provided by government and private sectors.

79. The accelerated development of advanced technologies related to management of identities is bringing to the forefront concepts such as “digital identity” for all individuals, thus introducing yet another conception built upon the original notion of individual identity which was primarily analogue and expressed in the form of, for example, birth and death certificates. Computing power extraordinaire available to both public and private institutions nowadays allows for

extremely fast and efficient manipulation and processing of those digital identities for a long list of different purposes, from taxation, education, conscription and state security, to name just a few. Thus the rising importance in developing and implementing modern identity management systems as a tool for protecting and serving the population.

80. Indeed, this is not at all a one-way street that benefits only the government's administrative and related purposes; quite the opposite, documented personal identity is a *sine qua non* of present-day social and economic paradigm. Without it individuals are deprived of accessing services that are or may be available to them, from basic health care to banking accounts. That fact, properly presented and documented, provides powerful incentive for eventually achieving the ultimate goal of no one left behind.

81. In that context, and as per the *Principles and Recommendations*²⁶, the essential purpose of civil registration is to furnish legal instruments of direct interest to individuals. Societies today, even the least developed among them, exhibit considerable complexity in interpersonal relations and increasing bureaucratization in dealings between individuals and the State. Hence, it is important, to ensure certainty in legal matters, that the individual be provided with probatory instruments which allow him or her to prove, with ironclad certainty, the facts relating to his or her existence, identity, and personal and family situation. The principal *raison d'être* of civil registration—its basic purpose and one that must be facilitated by the State—is to serve as an institution capable of disclosing facts relating to civil status based on technical legal principles, through which individuals can be assured of the legitimacy and authenticity of civil status-related facts in order to accredit them to other individuals or the administration itself, by means of public registration documents known as certifications.

82. Consequently, in the contemporary paradigm, civil registration provides both the certification of identity for a new-born as well as critical entry into the identity management system, whether through the stand-alone population register or, in the case where population registers are subsumed by the identity management system, directly into it. Taking it from there, the identity management agency will, in due course, add layers of additional and relevant information, as per the law, including photograph, fingerprints and other biometrics. Issuing identity cards, which, in turn, will allow individuals to access government and private services, as well as issuing other documents, such as drivers' licences, passports, bank cards and so forth, will be within the authority of the identity management agency. In a number of countries, the integration of civil the registration system with the identity management system has been a key factor in the creation and maintenance of a secure, efficient and interoperable population data system. This integration has reaped benefits for both the government and the individuals in terms of access to social rights, improved control of public expenditures and improved underlying data quality for the production of vital statistics.

83. In countries where the civil registration system has been neglected for prolonged periods of time, the identity management agency will initially have to respond to a particularly substantive

²⁶ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 286.

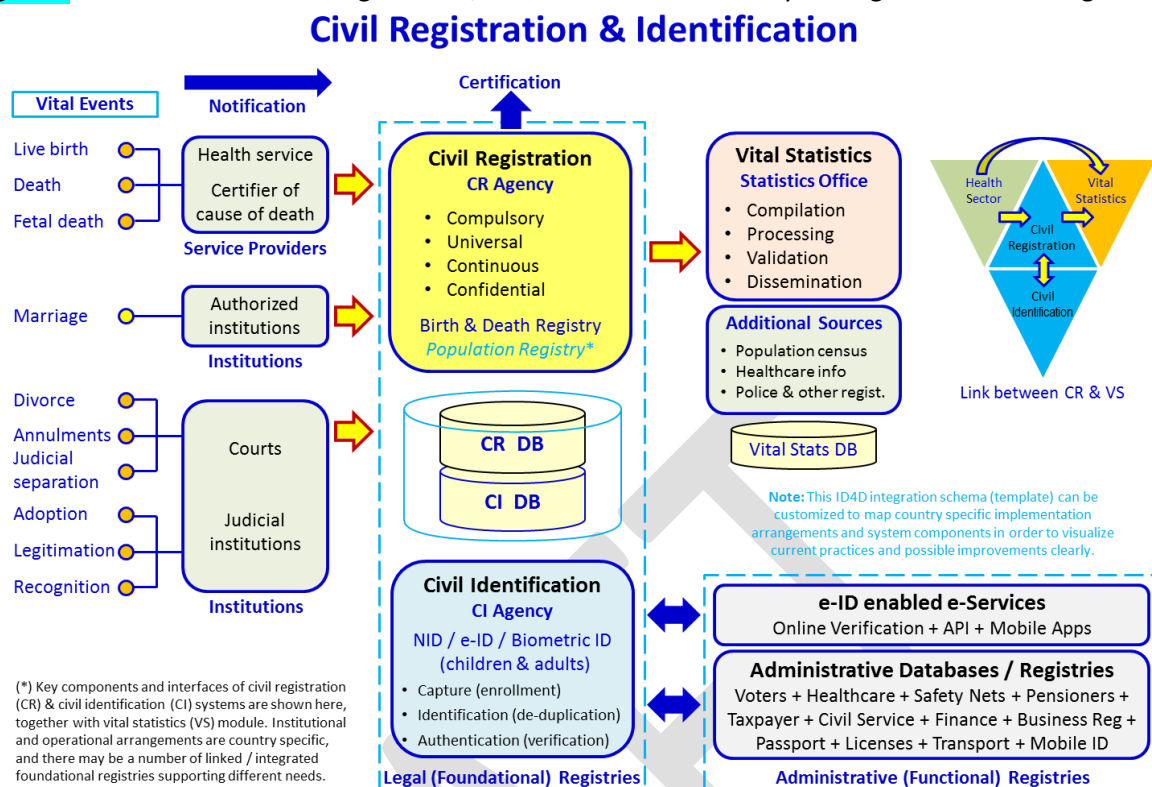
challenge: issuing identity documents to living individuals both adults and children whose birth was never registered or who never received their birth certificates. Thus, the agency will have to develop mechanisms to ensure the registration of every single birth in the country, as well as death, while at the same time issuing identity documents to those that never had one. Ultimately, however, it is expected that the agency will turn its operations into routine procedures for issuing birth and death certificates and identity cards – a seed document for all other needed in the modern world.

84. Another particular challenge for an identity management agency, especially if the civil registration function is absorbed by it, would be to ensure the production of regular, accurate and reliable vital statistics. All the information regarding the occurrence of the event, the characteristics of the relevant actors as per international statistical standards, need to be incorporated into the reporting protocols and procedures. Establishing the regular channels of communication with the national statistical authority is yet another critical component of the whole process of instituting a holistic civil registration, vital statistics and identity management system at the national level.

85. **Figure 4** below presents one of the models that are currently being introduced and implemented in a number of countries developing holistic approaches to linking the civil registration function, identity management and vital statistics function²⁷. The civil registration function, by its nature in terms of legal implications, is still distinct as its procedures for issuing legal tenders related to civil status of individuals, by definition, require adequate and strict protocols. The establishment and maintenance of population registers, in this model, goes hand in hand with the civil registration function. The vital statistics function remains with the national statistical authority which is responsible for producing regular vital statistics based on records submitted by the population register or the civil registration agency.

²⁷ Further information on identity management systems can be found in the CRVS eLearning course, available at <https://olc.worldbank.org/content/civil-registration-and-vital-statistics-systems-advanced-level-facilitated> and <https://olc.worldbank.org/content/civil-registration-and-vital-statistics-systems-basic-level-self-paced-format>.

Figure 4. Overview of the civil registration, vital statistics and identity management interlinkages



Source: Civil Registration and Vital Statistics eLearning course, World Bank Group Open Learning Campus, 2017²⁸

86. As is the case in the civil registration and vital statistics systems that were developed in a number of countries at the end of the previous century, the intrinsic logic of this model is based on reporting the occurrence of each of the vital events, such as births and deaths, and all the relevant characteristics, by the authorized and responsible institution that notifies the civil registration authority; the civil registration authority verifies the actual occurrence of the event and the identities of persons involved, registers officially the occurrence of the event and issues a certificate that is a legal tender; it also collects all the relevant information for statistical purposes and forwards it to the national statistical authority. The civil registration component then makes an entry in the population registers based on the change of civil status of the individuals. The identity management agency uses the population register to provide additional biometric information, as per the law, and to maintain the civil identification database, together with issuing the basic personal identity document. Assigning the personal identification number to each newborn and the retirement of personal identification number of the deceased person (by flagging it or changing its status from “living” to “deceased”), in this model, is the function of the civil registration component. Having a PIN makes it much natural to link the occurrence of vital events to particular individuals.

²⁸ Available at <https://olc.worldbank.org/>

II. Civil registration operational functions and activities

A. Introduction

87. Irrespective of whether the civil registration function is established as an independent centralized or decentralised system or whether it is incorporated into the larger institution that also manages identification of individuals, there are a number of operational standards that need to be established and operationalised. Consequently, this chapter looks at the very specific details of carrying out the daily operations of the civil registration and vital statistics systems. Section B, “Functional components”, examines the detailed procedures for gathering, storing and editing information. Section C, “Civil registration system activities”, examines how to respond to the public and its needs concerning the vital records in the system. It also considers the needs of those who are reporting the data to the system, and discusses how to manage use and confront the fraudulent use of personal documents issued by the civil registration. Coupled with this, section C, “Civil registration system activities” displays methods of integrating the functions of registration and statistics under various structural arrangements explored in Chapter I above. The section ends by considering how data are brought into the system, and how they are stored within it. For guidelines on how to check data for accuracy and completeness, please refer to Chapter IV.

88. As mentioned in the previous chapter, vital statistics and civil registration are separate entities, but it is crucial that they be established, maintained and exploited as components of a coordinated and coherent system for registering and producing vital statistics. In addition, the emergence of the interconnectedness between civil registration and identity management systems adds yet one more dimension to the structure of the civil registration and vital statistics system. A graphic representation of these relationships and functioning is presented in Figure 1 (Chapter 1). Civil registration is defined as the **continuous/permanent, compulsory, universal** recording of the occurrence and characteristics of vital events pertaining to the population, as provided through decree or regulation in accordance with the legal requirements in each country. It is important to highlight the quality of universal in relation to the people’s right towards the registration of vital facts. Established in the 1948 Declaration of Human Rights and supported through other global accords, every person has the right to an identity as bestowed through civil registration. In this regard, laws, policies, rules and regulations must not be a hindrance to the realisation of this right. In particular, the registration of events must be performed even if the time frame given by law has elapsed, regardless of migratory status, and any other request that may act as an obstacle to registering the vital facts occurred in the territory. Civil registration is carried out primarily for the purpose of registering vital events and therefore establishing documents as per national law. The usefulness of these records as the best source of vital statistics is well established. The procedures for recording vital events are equally important for civil registration in legal terms and for vital statistics in the context of source of statistics; hence, the work of civil registrars and that of statisticians are interdependent.²⁹

²⁹ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 274.

B. Functional components

89. The present section describes the procedures for registering a birth and a death occurring in various settings. Also considered are special processing requirements, matching registration records, and operating units for processing record changes and responding to users' requests.

90. The appropriate informant or source of information, and suggested alternates, in priority order of preference for the different types of vital event are given below, as presented in the *Principles and Recommendations*³⁰.

Live birth and foetal death: The head of the institution (or designee) if event occurred in an institution, or the mother, the father, the attendant at the delivery, the nearest relative of the mother, or any other adult person having knowledge of the facts.

Infant death: The head of the institution (or designee) if event occurred in an institution, or the mother, the father, the nearest relative of the mother, or any other adult person having knowledge of the facts.

Death of an adult person: The head of the institution (or designee) if event occurred in an institution, or the nearest relative of the decedent, or any other adult person having knowledge of the facts.

Marriage: the bride and the bridegroom.

Divorce: either one of the parties, or the petitioner of divorce.

1. How to register vital events

91. How to register and transmit a record of a vital event from where the event occurs to the civil registration and vital statistics system depends on three major factors that cause a variation in the process. One is the type of vital event involved. That is, whether the event is a birth, a death, a foetal death, a marriage or a divorce will make a difference in the registration and transmission process. Second, the type of structure of the system - whether the system is centralized, decentralised or a local programme - plays a key role in the registration and transmittal processes. Third, the place of occurrence – whether the event took place in a health facility or not.

92. The registration of a vital event can be by the place of occurrence or by the place of usual residence. Most countries have adopted the place of occurrence as a norm for the registration of births, deaths and foetal deaths. Registration of vital events by place of occurrence facilitates and accelerates the registration process. As electronic systems become more advanced and networked within countries, a degree of flexibility is possible, allowing registration at any point where the registrants can access the system. This can improve access and therefore coverage. In any case, when recording information, it is important to obtain both place of occurrence and place of residence, so that tabulation by both places can be produced.

³⁰ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 355.

Registration of Births

1. Birth in a health facility under a centralized system

93. In this case, it is best to use the medical record function of the hospital for the reporting of the event to the local registrar. Information is gathered from the mother using a birth notification form (or a medical certificate form) to supply answers that will be placed on the official registration record. If the birth notification includes statistical data, it may ask for medical information about the prenatal history of the mother. In any case, it is best to obtain data from records submitted to the hospital/medical records unit by the patient's doctor just before the expected delivery date. The completed document should contain a certification by the hospital administrator or that person's designee that the birth did take place as stated in the document. This provides the evidentiary proof- that a birth has occurred on that date.

94. The hospital keeps a copy of the notification form, gives another copy to family members and then sends the original notification form to the local registrar (by physical or electronic means). The local registrar reviews it for accuracy and completeness, then prepares the registration record (which is, in principle, different from this notification form as it contains additional information that accompanies all official records) and signs/approves it (physically or electronically). The local registration office retains a copy of the birth record and files it so that the registrar can issue copies of it. Due to its legal implications, the registration system demands that the act of registering a birth be a formal one, by the parents or authorised persons and based on a birth notification form certified by the hospital, medical doctor or midwife who attended the birth. The presence of both parents is particularly important when registering births out of wedlock.

95. The process of hospitals reporting events to the local registrar can be very efficient in terms of information quality and timeliness. However, this will be affected by the extent with which hospitals comply with forwarding notifications to the registrar. This is particularly relevant in countries where health care is provided by private and public institutions, and/or where the health sector is fragmented. Some health institutions might have more strict procedures than others. This highlights the importance of defined roles and data sharing between health and registration authorities (in both directions) to avoid processes that are onerous and discourage completion of registration topics. A great solution to this is the Jamaican example presented in **Box 3** where bedside registration is completed and hospital records can subsequently be updated with the legal identity of the child.

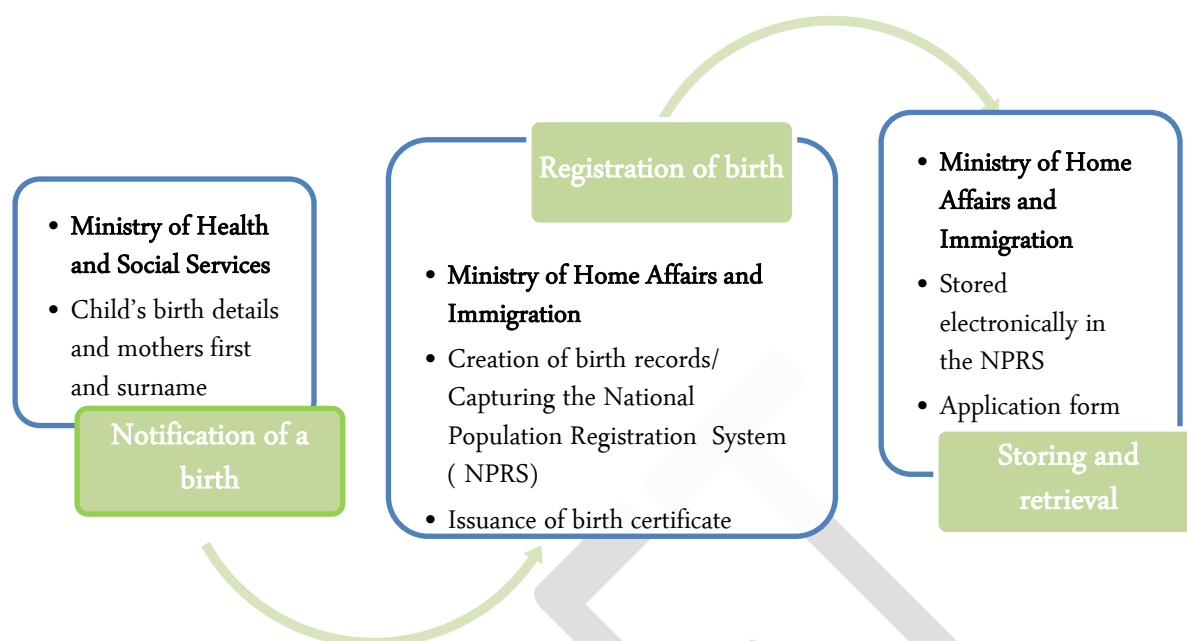
96. If the civil registration of the country is not automated at all, or just partly automated (only in major cities, for example) this copy of the registration record that remains at the local office may be a photocopy, a carbon copy or an entry in a bound book (remember, the entry in a book would require the preparation of a separate statistical birth form). Then the original record is forwarded to the national registration office (authority) for review, indexing, processing, issuing of certificate copies, storage etc. If the national office also operates a statistical system and uses a combined civil registration and vital statistics form, the civil registration office can forward the birth record once it is computerized. In order to avoid duplication, normally the civil registration authority at the central level has the responsibility to report to the national statistics office. In countries where there is no Registrar General, the civil registration offices at subnational level

(major civil division, state, province, etc.) report to central level statistics. Regardless of how a country and the civil registration and vital statistics are organised, it is essential to avoid having fragmented or duplicated flows of information, the approach must be holistic and integrated.

97. In the contemporary environment, all the transactions and transmissions are expected to be digital, using local area networks or internet. Upon the occurrence of the event, the hospital will send an electronic notification form to the local registrar; the local registrar will verify the information for accuracy and completeness, logs it as an official registration record and issues the birth certificate to the family; the local registrar will then forward the record to two addresses: the central civil registration authority and to the either provincial or central statistical service (depending on the arrangements and the structure of the national statistical system). The central authority will maintain the civil registration database and will submit it as an input into the national identity management system on regular basis – a daily update is now the frequency of choice in many national settings (as an example, see process map for the Namibian case in [Figure 5](#))

98. In principle, locating a local civil registration office within a major hospital or health facility where the births and deaths most often take place is the most advantageous approach in terms of efficiency and accuracy, as well as service to the public. This option speeds up registration, and improves accuracy, timeliness and completeness of registration. In this case, the reporting of vital records and statistical forms is made directly to the national authorities for civil registration and vital statistics by the staff of the hospital that are, by virtue of their responsibilities, directly familiar with the event and the persons involved. An example of this practice is found in the programme called “Bedside Registration”, implemented by the Registrar General’s Department of Jamaica (see [Box 3](#) for details).

Figure 5. Registration process for birth occurred in a health facility in Namibia



Source: Workshop on the Principles and Recommendations for a Vital Statistics System, Revision 3, for African English-speaking countries, held in Addis Ababa, Ethiopia, 2-5 December 2014³¹

³¹ All documentation available at: https://unstats.un.org/unsd/demographic/meetings/wshops/Ethiopia/2014/list_of_docs.htm

Box 3

Jamaica. Experience in improving CRVS coverage through the Free First Birth Certificate Initiative and Bedside Registration Programme

The Government of Jamaica introduced the Free First Birth Certificate Initiative, as well as the Bedside Registration Programme, implemented by the Registrar General's Department (RGD). In the former, all children born as of 1 January 2007 who are registered with a name are entitled to one free copy of their birth certificate. In the latter the Department placed Registration Officers in hospitals to conduct birth registration at the bedside to further improve coverage. Before the advent of these initiatives, there were several issues plaguing birth registration including lengthy delays in receiving birth notifications from hospitals or in some cases, failure to submit. This was due to the fact the many institutions withheld birth notifications for mothers who had outstanding hospital payments. Additionally, many children were registered by the RGD but were not named, as the mothers failed to visit the Registrar to complete registration for those registrations done from notifications received from the hospitals. Finally, a large percentage of fathers were not adding their particulars to the birth records of their children.

These steps significantly improved civil registration on many levels especially in respect of:

- Increase in the percentage of father's adding their particulars to the child's birth record at the time of registration.
- Increase in the percentage of children named at birth.
- Reduction in previous delays in birth registration since registration is now being completed at the "bedside".

See below the average percentages for hospital births before and after bedside registration was implemented:

<u>On average</u>	<u>Before Bedside Registration (2005)</u>	<u>After Bedside Registration (2017)</u>
Percentage of father's adding their particulars at registration	51.0%	70.6%
Percentage of children named at birth	27.8%	98.7%
Percentage births registered within 3 months	90.0%	99.7%

II. Birth outside a health facility under a centralized system

99. In the case of a home birth under a centralized civil registration system the person attending at the birth is responsible by law for completing the notification form. The usual order of preference is to have the document completed by a medical doctor, a midwife (or a traditional birth attendant, if literate) who is present at the delivery; by the father, if he is present at the delivery; by another person present at the delivery; or by the mother, if no one- else is able or available. This document is then brought to the local registrar, who prepares the birth registration record and signs it. If those attending at the birth are unable to complete the notification form, then the mother, the father or a close relative should report (orally) the event within a stipulated period to a local registrar, who prepares the official birth record. Many countries require one or more witnesses in order to register a birth where no notification form exists. The original birth record is transmitted directly to the national registration and vital statistics authorities, and a copy is retained for the local registrar files for issuance of certificate and other registration functions.

100. In the case of home birth, the accuracy of the information contained in the registration record may not be up to par with that of a hospital birth, particularly if it was not attended by a medical doctor or midwife. This is one of the reasons why the *Principles and Recommendations for a Vital Statistics System, Rev. 3* include “Attendant at birth” as a core topic.

101. It is important to ensure that a birth is registered within the time stipulated by the registration law. In general; the shorter the time allowances the more accurate the information contained in the birth record. Time allowance for live birth may range from the date of occurrence up to one month. However, according to the size of the jurisdiction in question, an informant may not report a home birth for a considerable length of time after the event, which would then fall under late registration procedures. Note that **late registration** is the registration of a vital event after the prescribed time period, but within a specified grace period (usually one year after occurrence of the event), whereas **delayed registration** is the registration of a vital event after the prescribed period determined in existing laws, rules or regulations, including any grace period.³²

102. Keeping the number of delayed registrations to a minimum limits the possibility of introducing errors into the statistical reporting of births. A country that in principle has many home births should take a series of actions to assure reporting of such events as soon as they occur. Active involvement by the local registrar within the society is a *sine qua non* of such endeavour.

III. Birth in and outside a health facility under a decentralized system

103. The registration of births, in a decentralized system, is handled in a similar way as in a centralized system. The difference is that the local registrar transmits the original vital record directly to the state or province registration office instead of the national office. Then the state or

³² *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014.

provincial registration office forwards the information to the national office for the production of vital statistics for the country as a whole.

104. It's important to register events in a standard way in all provinces or states (major civil divisions). However, it has to be emphasized that the content of registration records/forms in a decentralized system may not be identical from one province or state to the other, as it depends on provincial and state legislation, rather than a uniform one at the national level. That would require a substantive effort at the national level to harmonize both the legal aspect of civil registration (for example, what information is necessary to be presented in the birth certificate for all provinces/states to recognize it) and for the production of comprehensive vital statistics (for example, what variables have to be included in all the records from all the provinces/states).

105. Equally important, each record/form needs to have a harmonized and unique identifier, which is more successfully achieved in a centralized system or a decentralized system with uniform legislation, than in a fully decentralized system. As elaborated in Chapter 1, contemporary civil registration systems in many countries are authorized to assign a unique personal identification number (PIN) at birth and to retire that number upon death of the individual, which enables exact matching of records from different sources and, by definition, increases the quality and accuracy of the information. However, not all countries assign PINs' to individuals; hence the importance of the unique identifier of each record/form that can be used for computer matching and for spotting duplications and omissions.

Registration of Deaths

106. The registration process for deaths depends on the particular arrangements for these occurrences in a country. It may be common to have a professional mortician, funeral director, medical examiner or a coroner system throughout the country. That is, a coroner or medical examiner reviews every unattended or sudden death. In some other instances, the family is responsible for notifying authorities about the death. Depending upon such circumstances, the method of registering and reporting deaths will vary.

107. The *Principles and Recommendations for a Vital Statistics System, Rev. 3* include "Certifier", "Type of certification" and "Cause of death" as a core topics to be collected on deaths. This is important, among other things, in relation to the quality of the information contained in the registration record.

108. Another item to be considered is whether the death record is required for the processing of legal claims for insurance or inheritance. This is quite often the case in developed countries or in large metropolitan areas of many countries. If this is the case for most deaths, then it will encourage families to report the occurrence of a death and provide the data promptly and as completely as possible. Another technique that is used to promote accurate death registration is to require an institution where a death occurs (e.g. hospitals, clinics, nursing or elderly care homes) to prepare listings of deaths occurring in the institution each month. Those lists can then be used by the local registrar to determine whether the death was reported and the death record prepared. Also, the requirement of death registration prior to the issuance of a burial permit is

often use to encourage universal registration, this is particularly useful in urban settings where regulated cemeteries perform the majority of inhumations and cremations. Further details on this practice are offered in section IX below ([paragraph 129](#) onwards).

IV. Death in a health facility

109. If the death occurred in a hospital, the physician attending at the institution will be responsible for supplying the medical certification of cause of death, filling out the notification of death and informing the civil registration authority of the occurrence of the death. One copy of the notification of death is issued to the decedent's family in order for them to complete the death registration process and request the death certificate and, if applicable, the burial permit (see section on burial permits below).

110. A member of the family or someone close to the deceased individual must supply personal facts about the decedent to ensure accuracy. Those facts are generally reported separately from the certification information completed by the physician or coroner. The personal data are provided to the local registrar. However, coordinating the filing and eventual matching of these sets of information in a timely manner is not an easy task. Many factors will influence the choice of procedure for doing so. For example, how is the hospital system organized? Are many individuals brought for care from rural areas to a central hospital in a large city? When an individual dies far from his residence, the family may report personal data to a local registrar geographically remote from the point where the medical certification information for the death is completed. Common information about the decedent's place of residence on both the death medical certification and the death registration record will become particularly important in this situation for matching the separate records.

V. Death outside a health facility

111. There will also be situations in which death occurs outside of facilities, mostly at home, where neither a physician nor a coroner is available. In such instances, frequently occurring in rural areas, an arrangement should be made between the local registrar and the local law enforcement authority. The law authority assumes the coroner's duties, and the local registrar gathers the necessary information from a close relative of the deceased to complete the remainder of the death record. Sometimes, the local registrar may need to assume both roles to guarantee the completeness of the death record system.

112. For unnatural deaths (suicide, homicide, accident) the coroner, medical examiner or investigating authority supplies the cause of death certification after completion of an examination of the facts surrounding the death.

VI. Funeral director

113. In the case that a funeral director, professional mortician, crematorium officer or a cemetery manager is responsible for processing most dispositions, then it is most likely to place the responsibility for filing the death notification form on the funeral director. In this situation, the

funeral director obtains the necessary personal information from a close relative of the decedent or the person that lived with the deceased, and obtains the cause-of-death information and death medical certification from the attending physician or coroner. The funeral director would present a completed death notification form to the local registrar, who completes the death record and signs and issues a burial/transit permit (sometimes called a final disposition permit). The latter allows the funeral director to proceed with final disposition of the body. To facilitate this process, a good practice is to establish a local registration office inside or next to large funeral homes.

114. Not all national systems have fully functioning networks of morticians or professionals responsible for funeral homes or crematoriums. There are however, local registrars to whom the family presents the information regarding the death and from whom it receives an authorization for burial. Such local registration offices have to be in convenient locations and open at all times. They serve the same function relative to the burial permit as the funeral director.

115. Burial permits or proof of registration as a pre-condition for disposing of the deceased in the cemetery is not a universal practice resulting in the fact that in a number of countries the burial occurs without any official trail. The first step in establishing such a practice would be incorporating this requirement into the civil registration law; it would be then on the local authorities managing cemeteries to ensure the enforcement of these rules.

116. Procedures such as those described here usually set specific time limits for obtaining the medical certification of the death and for filing the completed death notification form with the local registrar. Generally, such requirements specify that the physician or coroner must sign the certificate before burial, cremation or removal can take place. That requirement guarantees that all necessary information about the nature of the death is obtained while the body is still available for testing. Depending on the cultural practices surrounding death and final disposition of the body, those time limits can vary. If it is normal cultural practice to dispose of the remains quickly, then a time limit of 24 hours may be imposed. Normally, where a professional is handling the final disposition, the time limit for obtaining the certification of the cause of death does not exceed three days. The time limit within which the complete notification form is to be filed with the local registrar may be five days. The local registrar completes the death registration record and forwards the original to the national registration office in a centralized system (or to the state or provincial registration office in a decentralized system). Reporting to the higher level should be made within a stated time period that is adhered to rigorously.

VII. Alternative procedures

117. Alternative procedures refer to protocols that are established in the absence of funeral directors, professional morticians or even cemeteries for obtaining the necessary death facts. The physician attending the decedent for the illness that led to death may specify the medical certification of the cause of death. In addition, informal notifiers include religious authorities and other local leaders. However, these actors do not normally have legal responsibilities in the registration process, which makes them less than ideal for accurately and sustainably supplying the necessary death facts. At best, the practice of using informal notifiers of deaths might be

useful as an interim measure while the level of completeness of death registration is very low, particularly in rural and remote areas.

118. Therefore, the death certificate is an essential document which not only provides a final and permanent confirmation of the fact of death but also enables the inheritance and settlement of an estate and, in many jurisdictions, the burial of the deceased, as well as other entitlements pursuant to the legal arrangements in force (such as a pension).

VIII. Cause of death

119. Equally important for the vital statistics system, are the circumstances and medical causes of death, which explains the requirement that the civil registrar issues a death certificate only if the notification of the cause of death is accompanied by a filled-out medical certificate of cause of death.³³

120. In order to provide a comprehensive and comparable tool for identifying causes of death and diseases in general, WHO develops and maintains the International Statistical Classification of Diseases and Related Health Problems (ICD), including a start-up list designed as an entry point to the full classification. The purpose of the Classification is to permit the systematic recording, analysis, interpretation and comparison of mortality and morbidity data collected by countries and agreed to be reported to the WHO. The Classification is designed to translate diagnoses of diseases and other health problems from words into a code, which permits easy storage, retrieval and analysis of data. The original use of the Classification was to categorize causes of mortality as recorded at the time of the registration of death and only later was its scope extended to include diagnoses for morbidity. Mortality data coded using the ICD make a substantial contribution to national and global public health policies.

121. For deaths attended by a medical doctor (mostly occurring in hospitals), physicians complete the International Form of the Medical Certificate for Cause of Death³⁴, recommended by the World Health Assembly. It is the responsibility of the medical practitioner signing the medical death certificate to indicate the sequence of morbid conditions leading directly to death from the tentative underlying cause to the immediate cause of death. Coding staff, often situated in the health or statistical agencies, use the ICD to assign and code the underlying cause of death, 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”.³⁵

122. Once the form has been filled out and signed by the medical practitioner, it is the responsibility of the civil registrar to ensure that the form (either in paper or electronic format, depending on the prevailing system) is combined with other information needed for statistical purposes and submitted to the statistical authorities for processing and the production of vital

³³ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 491.

³⁴ Available from http://www.who.int/healthinfo/civil_registration/ICD_10_SMoL.pdf?ua=1. Also, please see Appendix 1

³⁵ ICD 10, WHO, 2007.

statistics. It is of critical importance to emphasize that the cause of death as specified by the medical practitioner may be disclosed to the closest relatives only. However, statistical authorities may share anonymised cause of death data with government and international agencies for epidemiological and public health purposes, in line with privacy and confidentiality agreements in place in the country.

123. When deaths occur at home or where medical certification of the cause of death is not possible, WHO has developed international standards on the use of verbal autopsy³⁶. Verbal autopsy is an interview carried out with family members and/or caregivers of the deceased using a structured questionnaire to elicit signs and symptoms and other pertinent information which can later be used to assign a probable underlying cause of death. Verbal autopsy is an essential public-health tool for obtaining a reasonable direct estimation of the cause structure of mortality at a community or population level, although it has not been validated as a method for attributing causes of death at the individual level. For studies, it is essential that the collated database clearly indicate the source of the information on cause of death (medical certificate vs verbal autopsy) to ensure that it can be analysed properly at a statistical level.

124. For this purpose, verbal autopsies involve the use, by a trained interviewer, of a questionnaire designed to enable him or her to collect information about signs, symptoms and demographic characteristics for a recently deceased person from an individual familiar with the deceased. Under the WHO standards for verbal autopsy, any of three questionnaires may be used: for a death of a child aged less than four weeks, for a death of a child aged four weeks to 11 years, and for a death of a person aged 12 years or above. To minimize recall bias, it is recommended that verbal autopsies are conducted as close to the death date as culturally appropriate, meeting with a close family member no later than a year after the death.

125. It is important to note that a medical certificate for the cause of death or a verbal autopsy record may be used by a registrar as notification of death, where the death has not been otherwise notified.

126. Should the verbal autopsy method be part of civil registration in cases where there is no possibility of obtaining a medical certification of the cause of death? In this regard, it should be pointed out that the verbal autopsy method is fairly complex, and it involves the selection and thorough testing of a sample population. The interview needed for the filling out of the appropriate questionnaire is time-consuming, and cultural traditions might not favour such an engagement with a government official. This results in the need for substantial investments in data collection and supervision, as well as comprehensive training of civil registrars and health workers in the verbal autopsy method to identify a population-level cause of death for individuals without medically certified deaths. The cause of death results yielded by this method differ from medically certified deaths and require careful determination in their presentation- at the individual level on medical death certificates and at the population level in vital statistics reports in which causes of death are presented. As a matter of fact, a cause of death derived by the verbal autopsy method

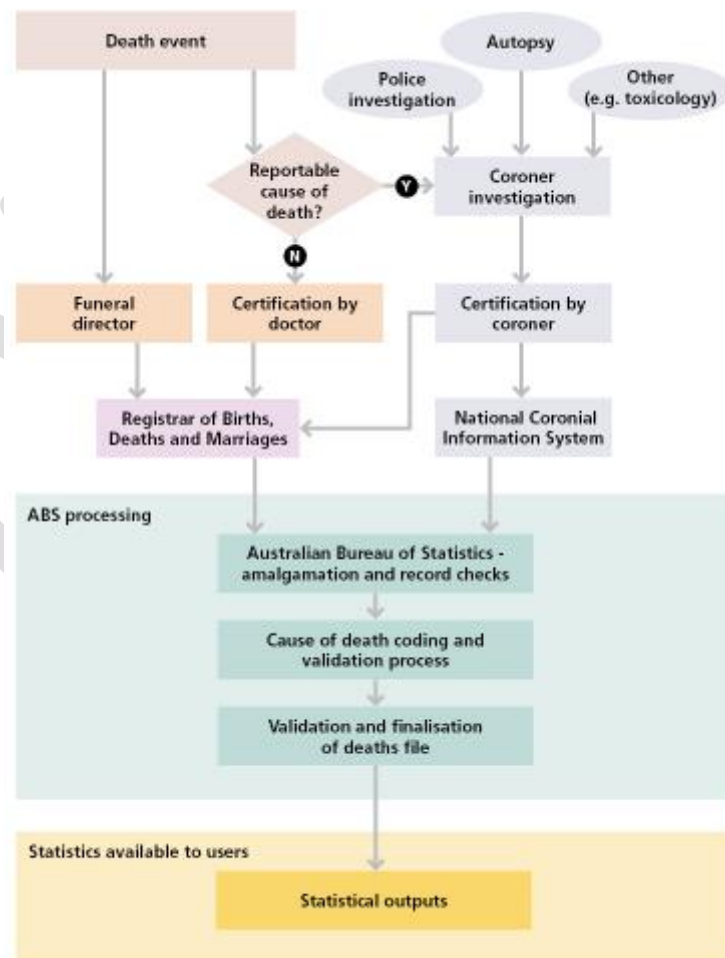
³⁶ WHO, 2016. Available from <http://www.who.int/healthinfo/statistics/verbalautopsystandards/en/>

should never be included in any legal document. All of these factors must be taken into account when attempting to answer the above question.

127. Building a sustainable data collection system for cause of death, including death registration data and cause of death can involve multiple agencies and records (as examples, see process map for the Australian and Korean cases in [Figures 6 and 7](#), and Canada in [Box 4](#)). As the Australian example illustrates, when a coroner certifies the cause of death, it is important having a process in place whereby the coroner informs the civil registration authority and the statistics office, so that their databases are updated and harmonised.

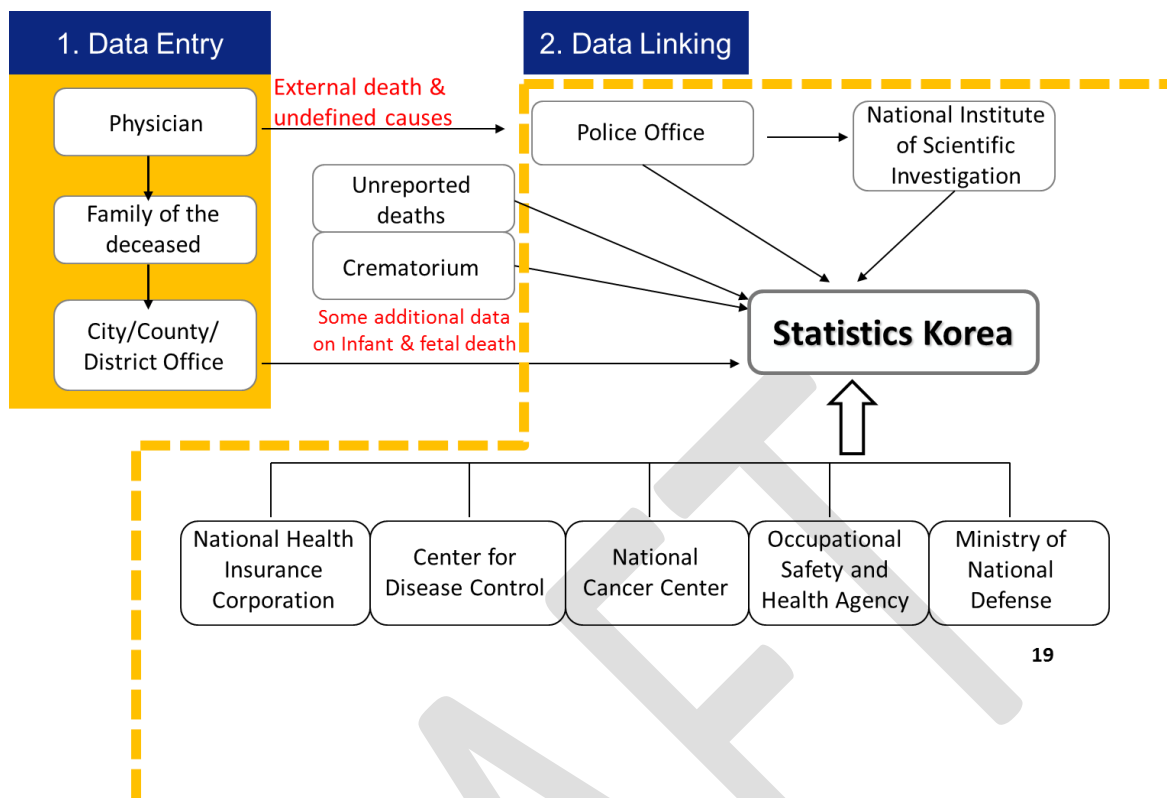
128. Since the process for collating mortality data is critical, and sometimes complex, it is important that a committee be established to include the Civil Registration Authority, Ministry of Health, National Statistics Office and other stakeholders, to identify the appropriate process for collecting mortality information, including death registration data and cause of death data, using the guidance provided in the *UN Principles and Recommendations for a Vital Statistics System*, and advice on ICD and verbal autopsy application from WHO.

[Figure 6](#). Cause of death statistics system in Australia



Source: Statistics Australia

Figure 7. Cause of death statistics system in Republic of Korea



Source: Statistics Korea

Box 4

Canada. Cause of death querying

Cause of death coding is done centrally in Canada, however, the provincial and territorial vital statistics offices screen the medical death certificates before submitting them to Statistics Canada. A querying process is performed at the provincial level, whereby certifiers are contacted in order to resolve cases presenting the situations listed below:

- Illegible entries
- Abbreviations (missing the full text)
- Missing age of decedent
- Missing sex of decedent
- Missing manner of death
- Missing or unclear circumstances in which the injury was sustained (if injury is reported)
- Missing or unclear condition for which the surgery was performed (if surgery is mentioned)
- Missing or unclear condition for which the drug was taken (if drugs are mentioned, this does not include drug poisonings)

IX. Using a burial/transit permit

129. This method can be of help to enhance completeness of death registration. The method allows for an additional check to guarantee that the physician or coroner places a certification of cause of death on the death medical certificate in a timely fashion. A permit is usually issued by a local registrar once the death record is correctly completed, including the signed and completed cause-of-death certification. The crematory or cemetery requires the permit or a proof of registration before final disposition of the body. This system will be truly effective only in jurisdictions where the cemetery or crematory is properly fenced and guarded and a sexton or some similar individual is on duty to collect the permit. A variation on the issuance of the permit by the local registrar is to use a self-issuing permit. This is accomplished by having a carbon placed behind the section of the death record that lists name and date of death as well as the portion where the signature of the certifier is placed. The carbon copy can then be used as the burial/transit permit. It will show that the physician or coroner has completed a medical certification of death. This variation solves the problem of a local registrar or recorder not being available during non-business hours or on weekends and holidays. However, the death record must be completed with the local registrar on the next working day.

Registration of Marriages

130. As stated in the *Principles and Recommendations for a Vital Statistics*³⁷, a marriage is the act, ceremony or process by which the legal relationship of spouses is constituted. The legality of the union may be established by civil, religious or other means as recognized by the laws of each country. Countries may wish to expand the definition to cover civil unions. In that case, registered partnership usually refers to a legal construct, entailing registration with the public authorities according to the laws of each country that becomes the basis for legal conjugal obligations between two persons. The registration of marriages provides tangible proof of the official recognition of the process of family formation.

131. Thus, unlike births and deaths, marriages are social constructs, thus, they are conducted in a manner that is completely dependent on particular societal conventions. Therefore, there is no standard registration procedure that is valid across countries. As Figure 1 in Chapter I shows, marriages can be celebrated by a variety of authorised actors and institutions, the most common being religious leaders, justices of peace, court clerks and community leaders. These authorised actors and/or the spouses have the obligation to inform the civil registration authority about the event in order for it to be properly registered.

132. A more specific recommendation on the process and flow of information cannot be offered given the wide diversity of marriage practices, including common law marriages. Nevertheless, the

³⁷ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014.

key recommendation is that all marriages occurring in the country need to be accounted for and registered according to the law.

2. Special processing requirements for registration records

133. The present section will look at some special processing requirements and methods used to amend records, process adoptions, and process legal changes to records. Most of these methods are concerned with birth records, but there are some changes that must be processed for deaths as well. Some countries may also maintain amendment procedures, for marriage records, for example, to note when a marriage ends in divorce or judicial separation.

I. Amendment of records

134. Amendment of records refers to correcting the records that have been filled with incorrect information; amendments are specified and stipulated in the law. Usually administrative procedures are much more expedite than judicial procedures when amending a record, however, this choice will depend on the legal and normative framework in place. Recently, and for certain types of amendments, countries have favoured administrative procedures in order to improve their services to the public and response times. There are several levels at which corrections are made. These levels are time-relative. Some mistakes can be caught almost immediately when the record is first processed in the local registration office. Call this level the early query level. There is a second set of errors that are also dependent on some person outside the office supplying additional or corrected information. This second set cannot usually be caught immediately, although many such errors become apparent during the first year of the record's existence.

135. An administrative procedure is best suited for amendment of manifest mistakes or omissions; whereas a legal procedure is the optimum path for amendments that might have legal consequences, as those related to maternity, paternity or change of sex. Consequently, it is advisable to have separate methods for making amendments during the first year of the record's existence from those made further along in the existence of the document. This same time distinction for records relative to the one-year mark can also be useful in the filing of a delayed registration of birth.

136. A log should be maintained of all changes. In addition, the system for referencing amendments must allow for reconstruction of history, i.e. for tracing back chronologically to original records. This is elaborated in detail in Chapter III.

137. The local registrar can be empowered to take care of **early query corrections**. For example, on inspection of the birth record it is noted that a parent's date of birth is listed with the same year of birth as the child. This is an obvious clerical error. A telephone call to the hospital or a note to the informant can generally help the local registrar to obtain the correct information. It has to be emphasized that in the contemporary setup of the registration process, the local registrar will have a set of computer tools to assist in this early query editing. As the records are created and/or transferred digitally, a series of computer edits will signal the registrar the existence of a potential

error, such as described above, that the year of birth of a new-born is identical to the year of birth of the father. Thus, the early query corrections are incorporated in the computer application related to creating a registration record. Digital validations and alerts minimise errors when entering information in the civil registration system, as does the use of a unique identifier (PIN), because there are certain fields and pieces of data that are attached to every individual PIN and cannot be easily modified, such as the date of birth of the parents in the example used above.

138. However, there would still be a need to carefully check the content of the registration records before submitting it as a final entry into the system. The spelling of the names needs to be carefully checked, for example, and while computer applications can assist, the final decision has to be made by the registrar and individuals involved.

139. Aside from early corrections, there might be a need for amendments that fall under the “current year” category. One of these would refer to paternity establishment (recognition, the legal acknowledgement, either voluntary or compulsory) of the maternity or paternity of a child born out of wedlock. The particular laws governing a country (or state or province) will cover how paternities are established. Some jurisdictions will allow the addition of a father to a record by affidavit of the unwed parents. Other jurisdictions may require some sort of court or legal action to establish the paternity. In any case, a method to add the father’s information to the birth record must be developed and used consistently throughout the civil registration system. The civil registration authority must prepare manuals of instructions detailing the procedures concerning rules and regulations relative to the laws on paternity establishment, use of surname and other related subject matters. In the same spirit, a series of trainings for local civil registrars, medical record officers, foreign service posts personnel and other concerned staff need to be conducted by the civil registration authority to ensure uniform implementation of the laws, rules and regulations.

140. The simplest case is where no previous information concerning a father appears on the record. Here, with the appropriate legal requirements met (affidavits or court determination), the information can be added directly to the original record. Copies of the required legal documentation are placed in a file. This file must be connected to the birth record by use of the unique record number already assigned to the birth. When making changes to current year records, remember that it is important to forward the amended records to the statistical agency, so that the vital statistics accurately mirror the content and the information in the civil registration database.

141. In some cases, another man’s name and information may already appear on the birth record as father. Perhaps the mother was married at the time of birth but the husband was not the natural father. Perhaps there was a court contest concerning who the father was. In such cases, it is necessary to prepare a new birth record reflecting the new facts of parentage. Place the original record in the file with the associated legal documents used to establish the amendment. Note that the new birth record must bear the same number as the original birth record that was sealed, including the PIN assigned to the new-born (if one was assigned). Particularly important is to ensure that the new record is forwarded to the central civil registration database and to the statistical agency, while the old one is removed.

142. Other amendments during the first year may include addition of first or middle names for the child, changes to parents' age or birthplace, or perhaps spelling corrections. According to the type of system that is in place, these corrections follow the same logic as presented in the preceding paragraphs: correcting the records and ensuring that the corrections are reflected in the main civil registration and vital statistics databases, as well as in a log.

143. Other amendments occur further along in time, such as change of name or sex, and typically involve some sort of court decision. If legally available, the procedure of change of sex has to be treated as an amendment, not a replacement of records. It may trigger the issuance of a new PIN, if the country uses PINs that contain an indication of sex. In any case, a link file needs to be created in order to have the original and the new identities related to each other permanently.

144. In many communities across different countries children are named only after a certain period time following their birth. This gap between the date of birth a child and its actual naming can range from a few days to even several weeks and is mainly linked to and can vary according to religious practices and social norms of different communities. In many countries registration laws provide that every child has to be registered with a name. This often acts as serious hindrance in registration of birth in countries in which communities delay naming of their children. Quite often the period of delay in naming exceeds the cut-off period for registration as provided for in the law. This causes immense hardships to parents as in such cases they have to follow a more complicated process of late and/or delayed registration after the cut-off period. With increasing number of institutional deliveries more and more countries are providing registration facilities within the hospital for delivery of prompt registration services including issuing birth certificates to mothers before they are discharged from the hospital. However, in countries where delayed naming of children is a common phenomenon, the whole purpose of the creating such services within a facility is defeated as such mothers (who do not name the children before or immediately after their birth) are denied registration resulting in a huge missed opportunity.

145. In order to overcome this bottleneck some countries are encouraging parents to decide the name of their children before or immediately after birth. However, religious practices and social norms are hard to change in a short period of time and perhaps not desirable. Some countries have found a way out of this problem by making a provision for allowing registration of birth without a name, i.e. Baby Girl and Baby Boy, and then providing a separate cut-off date for insertion of a name following a due process. However, in such situations it would be incumbent for the registrar to obtain a written request with accompanying documents if needed and, having been satisfied about the veracity of the request, insert the name of the child and also make appropriate noting in the remark column of the register that would include among others the date of insertion. A certificate of birth showing the name of child can be issued promptly to the parents.

II. Adoptions and other legal changes

146. **Adoptions** form another major class of record changes that should be considered here. Again, countries (or states or provinces) will vary concerning legal regulations and arrangements about adoptions. Most jurisdictions will have a provision for sealing from view the pre-adoption

facts of birth, and keep the adoption as a confidential matter. Preparing a new birth record reflecting the new parents' birth facts accomplishes this for the birth record. In principle, the place and date of birth of the child remain unchanged, as well as PIN, if one is assigned. The new record unique identifier/number also should remain unchanged. The original record and the supporting legal documents surrounding the adoption are sealed using the-unique record number as a cross-reference. This is important in case it is necessary to retrieve the original if the adoption is later annulled or if it is necessary to refer to it for administrative purposes. The original information regarding the parents of the adopted child can be of crucial importance in the case, for example, of genetically transmitted diseases, where un-sealing of the original record can be of critical importance for medical treatment.

147. Worth of mention are the so called "simulated births", which is an illegal practice that aims at avoiding the lengthy and complex adoption legal adoption procedure. It has been observed that the adoptive parents, with or without the consent of the natural mother and/or father, register the birth directly in their own names (as though they were the birth parent of the child). If the age of the adoptive mother is still within child-bearing age, and since the function of the local registrars is ministerial, the registration of a simulated birth may not be detected. Procedural safeguards must be in place to prevent this practice.

Box 5

Surrogate motherhood

Surrogacy, an arrangement between a woman who accepts to carry a pregnancy for another person or persons who, after birth, become the newborn's parents, is becoming more common in the contemporary world. National laws regulating surrogacy vary substantially, from totally banning the practice, to allowing it, specifying conditions to include in the agreement between parties.

By definition, surrogacy raises a number of ethical issues, primarily related to the fact that women are compensated for initiating and/or maintaining the pregnancy of a baby to be adopted by unrelated individuals. Equally important is the moral dimension of the core arrangement: how far should women go about the use of their bodies? What are the ethical implications of an induced abortion in such an arrangement, or if a health issue arises in the woman or the fetus during the pregnancy? It also raises a number of questions about motherhood in both natural and social terms.

From the point of view of legal theory, the legal arrangements for surrogacy are also subjects of increased discussion. The core of the issue is the nature of the surrogacy contract: is it akin to contracting labor? Such an arrangement requires the specification of rights and obligations for each contracting side. In addition, should both altruistic surrogacy (when pregnancy-related expenses are reimbursed) be treated in the same legal framework as commercial surrogacy (when compensation extends beyond pregnancy-related expenses)?

Irrespective of how and if surrogacy is regulated, the essential logic of civil registration, in the cases where surrogacy is legal, would call for the registrar to complete a birth registration record with all the information on the birth mother, as the legal assumption is that she is the child's legal mother. Only after that, the surrogate parents would initiate the process of legal adoption and the procedures described above would be implemented.

148. **Delayed birth registrations** form another class of records that should be considered within the elaboration of amendments and corrections. A late registration is the registration of a vital event after the legally specified time period but within the grace period; the grace period is usually considered to be one year following the vital event.³⁸ Delayed registration is the registration of a vital event after the grace period has expired. Even in the best of civil registration systems, it is likely that delayed registrations will occur. Depending on the extent of the delay, these registrations may result in omissions from the tabulated vital statistics if they are made after the file of records for a particular year has been subjected to final processing.

149. It has to be emphasized that delayed birth registration is, in fact, neither an amendment nor a correction. It is considered here, however, since it is similar to the corrected record in that specific documentation is required beyond what is normally required to file an original birth

³⁸ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 369.

record. Registering a birth after the legally stipulated time for its registration has elapsed is generally broken down into several chronological categories³⁹. If the delayed birth is filed within one year of the date of birth, the procedure is simplest. Sometimes a physician or midwife was present at the birth or the birth was at an institution, but for some reason the record was not registered in a timely manner. In such cases, completion of the birth record by the appropriate attendants and by the local registrar is generally acceptable.

150. If the birth was a home birth, the record can usually be completed with the help of the local registrar during the first year. After a year has passed, it is usual to require additional proofs of the facts of birth due to the legal nature of the record. It is not unusual to require affidavits of those present at the birth. A medical record during pregnancy or a record of a subsequent paediatric visit would prove a pregnancy took place. A utility, tax or rent bill may serve as proof of residency at the time of birth. These requirements not only guarantee the accuracy of the information supplied but also prevent the filing of a false birth record for fraudulent purposes.

151. For longer delays, the placing of a delayed record of birth on file requires several substantial additional proofs of the facts of birth. In some instances, it may require judicial procedures and decisions. The filing of a delayed record so many years after the event is a service to the citizen who otherwise would have to supply alternative proofs of birth to various requesting agencies throughout his or her lifetime. Thus, in designing the list of required documents for late registration of a birth, the registration law should require as a minimum the documents that the most stringent outside agency would require. The registration office lists on the delayed birth record the specific documents presented as proofs and guarantees their authenticity. Thus, the citizen only needs to go through this procedure once. To be less stringent in requirements would be a risk to the integrity of the registration system.

152. Delayed registrations filed more than a year after the event are not generally included in the vital statistics for the year of occurrence. If there is a large percentage of such cases, vital statistics can be distorted. Public relations campaigns should try to keep delayed registrations to a minimum so that vital statistics accuracy remains high. In countries where PINs are assigned to every individual at the time of birth registration, and this PIN is required by all service providers, particularly health care, the proportion of delayed registrations is almost negligible.

C. Civil registration system activities

153. This section elaborates on ways to respond to the public's need for vital records; it also looks at the needs of those who are reporting legal, demographic, or statistical data into the system, and it considers record flow and prevention of fraudulent use of the documents in the custody of the civil registration.

³⁹ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 369-373.

1. Services to the public

154. At the time of a vital event -birth, death, foetal death, marriage or divorce – the careful and detailed recording of the facts surrounding the event is a decisive confirmation that the event actually occurred. Therefore, the **free registration of the vital events** occurring in the jurisdiction is the bureau's first service to the public. In this respect, it is the responsibility of the registration authority to reach even the most remote and hard to reach geographical areas of the country. Mobile registration units, where accessibility to registration centres is limited for the population, can enhance coverage of registration. In this technique, registration staff travel (by boat, small airplane or other vehicle) to various rural sites at scheduled times and register events occurring during the interval since the previous visit. Village leaders, local health workers, traditional birth attendants or families themselves may report the information. This strategy is considered an interim measure until the capacity to maintain permanent local registration offices in such areas is developed.

155. The second service is issuing a certificate free of charge that confirms not only the occurrence of the event, but also the identities of all persons concerned. **Preserving** the records is an equally important service to the public – ensuring that they are safe from disasters, natural and man-made ones.

156. In the contemporary circumstances the civil registration records are, in most cases, digital in nature. They are stored in servers maintained by the civil registration office. Preserving the records essentially would refer to having undertaken all the procedures for ensuring that servers are backed up regularly and that a fully developed mechanism is in place in that regard. A practice to install servers with identical content and updating procedures in different geographical locations in the country proved to be advantageous in cases of disasters, as it is very seldom that the whole country is affected by one such event. In certain circumstances, those mirror servers were located in a faraway country, thus ensuring even more certainty in preserving the records. Privacy and confidentiality risks need to be thoroughly studied in these cases; and measures to minimise those risks.

157. It has to be outlined that computerisation of the civil registration is a recent development and that in many countries the preservation of civil registration records relied on analogue technologies, such as microfilms. The approach to keep a system that is in place, and gradually introduce a more efficient system leads to a combined system that has elements of two or more of the systems. Using microfilm as a back-up as one gradually changes to a computerized system of issuance is a common practice. A dual system combining computerization and optical disk technology can offer the best qualities of each system.

158. **Production of certified copies** of the records that have been registered and preserved is another major civil registration office activity. This service can vary from abstracts hand copies from a paper record (in the case of old records that were not computerized) to computer issuance of the record in a choice of formats. The size of the jurisdiction's file, the level of demand from the public and the availability of resources will motivate the response in this area. It has to be outlined

that there should be a policy directive, established in law and regulations, stating that information on individual vital event records is not to be disclosed except to specifically authorized persons, such as the registrants themselves; their legal representatives; a close relative, such as a spouse, parent or a son or daughter; or other person having a direct and tangible right to the facts contained in the record.⁴⁰ Checks and safeguards should be put in place for retrieval of records (both hard copies and electronic) to minimize fraud. An example of effective checks and safeguards is found in the electronic retrieval system, implemented by the Civil Registration and Identification Service of Chile (see [Box 6](#) for details).

Box 6

Chile. Checks and safeguards in the production of certified copies, implemented by the Civil Registration and Identification Service (SRCI)

The Civil Registration and Identification Service performs registration and certification of vital events by means of a centralised database. When the unique identifier (PIN) of the registrant is introduced, the system automatically fills in the fields that can be retrieved from family members' records. These fields are hard coded, so only authorised registrars can modify them. In order to obtain certified copies, users can access a public database online, where documents can easily be retrieved. Downloaded documents contain a digital verification code that can be read and validated by other service providers, such as health, insurance and education institutions, among several others. Thus, the security features of the paper are given diminished attention in comparison with the digital seal, chain or code, which allows not only verification of the validity of the information contained in the document, but also allows for electronic transmission of the data. This system also enables the obtainment of certified copies, recognised by the Hague Apostille Convention, from overseas.

159. In contemporary settings, the issuance of certified copies is based on a fully automated procedure whereby the search engine identifies the appropriate record in the database, retrieves it and sends it to the printer. However, the paper used for the actual printing has to have features that are difficult if not impossible to replicate. Those security features protect from forgery, counterfeiting or tampering and include watermarks, intaglio printing, and holograms, to name a few.

160. Another consideration in a copy issuance programme is the format that one is going to offer the customer. Offices can offer computer copies and wallet-size copies. Of course, the more options offered the more resources are needed. In a computer-based system, it is feasible to offer both the full-size computer copy and a wallet-size computer copy. All it takes is an additional computer program to generate the wallet-size copy, and usually an additional printer on which the

⁴⁰ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 394.

wallet-size paper can be kept loaded. Depending on the capacity of the system, it could also be calibrated to produce and disseminates soft copies or digital identities⁴¹.

161. While the traditional method for retrieving a certified copy of a civil registration record involved walking to the local civil registration office and requesting the copy at the counter, contemporary circumstances require developing many more different procedures to accommodate the public. Requests by mail, for example, would require checking physically the content of each such envelope in terms of whether all the necessary items are included, such as the information regarding the requester, the fee and so forth. Option of placing requests for certified copy of the civil registration records by telephone also have to be carefully weighed against a number of factors, such as the processing of the fee and checking the identity of the requester.

162. More specifically, the civil registration system has to ensure that the requests can be made online; the omnipresent and growing use of internet for all kind of transactions makes developing such services a necessity. It is also complimentary to the context of the e-government, that is, the use of current information and communication technologies to improve the service delivery and functioning of public sector services – in essence, consisting of digital interactions between a citizen and the government. In that context, the civil registration authority has to invest in developing online electronic forms that would allow placing requests for certified copies of civil registration records, together with delivery mechanisms and thorough safeguards. An electronic portal that offers multiple services to the public, including requests for copies of certificates, with a secure system for logging in is highly recommended⁴².

163. Concerns that need to be addressed in developing such interfaces range from ensuring privacy and confidentiality of transactions, efficiency in terms of delivery, resources necessary to guarantee uninterrupted communications, costs of maintenance and backup as well as appropriate staffing.

164. See **Box 7** below for an overview of civil registration services rendered to public in India, and **Box 8** on lessons learned in New Zealand from a cross-agency project to improve civil registration services.

⁴¹ For a more detailed elaboration on digital identity, see Chapter VII.

⁴² In Norway, such a portal is called “Altinn” (<https://www.altinn.no/>)

Box 7

India. Services to the public

The records of registration of births and deaths are permanent records in India. The Registrar of births and deaths at local field level is required to maintain the registers of births and deaths and send periodic reports based thereon to the concerned higher level authority such as District Registrar for compilation of requisite Vital statistics. The registration of births and deaths is being done online as well as offline. In some of the States, registration is being done through the Civil Registration System Software. The Chief Registrar of births and deaths is required to publish a statistical report on the registered births and deaths during the year for the public. A vital statistics report based on the civil registration system has been published by the Office of the Registrar General at national level.

Despite mandatory registration, the country has not yet achieved the target of hundred percent registration of births and deaths. In India, to evaluate the completeness of the civil registration system, the level of registration for births and deaths is calculated in terms of the percentage of registered births/deaths to the estimated births/deaths. The estimated births/deaths is calculated through the Sample Registration System. The level of registration determines the performance at the state level as well as the nation. As per the latest registration data released by the Office of the Registrar General for the year 2014, the level of registration of births is 88.8%, and 74.3% in case of death at the national level. The level of registration of births was only 56% in 2000 whereas in case of deaths, the progress has been from 49%.

Box 8

New Zealand. Lessons learned from the first cross-agency life event project (SmartStart)

With SmartStart, parents have access to an online tool that makes it easy to access services and support during their pregnancy and baby's first years. SmartStart has made it easier for parents and caregivers to access relevant information and services for themselves and their babies from conception to early childhood, through the delivery of customer-centric, cross-agency digital tools and processes.

This was a multi-agency initiative delivered by: Department of Internal Affairs, Inland Revenue, Ministry of Social Development, and Ministry of Health. SmartStart went live on 5 December 2016. In the first month, 15,000 people had interacted with this life event service (for more information contact smartstart@dia.govt.nz).

At a project level, it has been learned that:

- Customers know what they need and want. Early communication with them is necessary, as well as a mechanism to obtain frequent feedback on the project progress.
- Delivering a working prototype for feedback will have a profoundly positive impact on the scope and quality of the life event service.
- The relevant government institutions will need to change how they are organised for and lead work. Accept that there will be new roles and teams created within your organisation and across the agencies involved.

At a system level, it has been learned that:

- A new funding model to meet the needs of an iterative service delivery project delivered by multiple agencies is beginning to emerge.
- Meeting the governance requirements across partner agencies should not be underestimated.

Checklist that could help with decision-making:

- Agree a lead agency and respect the decision-making authority this entails.
- Find the customers, meet them regularly and authentically nurture those relationships throughout the programme.
- Go to customers with a working prototype early, and go back often to get their feedback on development.
- Value employees and recognise their success.
- Co-design the governance approach with partner agencies, being careful to incorporate each agency's specific requirements.
- Schedule time for the people working on the project to get to know each other and establish connections they can call on.
- Design and implement an approach to sharing project progress openly, consistently and on-demand.
- Build a team of stellar story-tellers to passionately share the vision and enrol others to participate or support your work.
- Engage widely to gather ideas and generate supporters.
- Transformation isn't complete until customers are using the product.

165. An **amendment programme** is also a necessary part of the vital records response to the public. Vital records are dynamic documents that require correction and change. Addition of a father's information, preparation of new documents in cases of adoption, updates to reflect legal name changes, corrections of erroneous information and annotations on the records are all actions that would fall under the amendment programme. **Section B.2 in Chapter II** above has outlined the specific methods to be used in the special processing that this programme requires. A special fee for these time-consuming and detailed activities is usual.

166. The civil registration system needs a **delayed registration programme** for members of the public whose events are for one reason or another not registered in a timely manner. It can be applied to any type of vital event. The most common cases are delays in reporting births for registration. The registration law and regulations should provide the instruction for processing these cases, including fees. There might also be long periods of delay. For example, a customer forty-five years of age may request his birth to be recorded. This sets the delayed registration programme in motion to care for the needs of this individual.

167. For long periods of delay and because of the legal nature of the birth record, a judicial procedure is necessary to prove the facts of birth. To accelerate the process, the following would be helpful: an old school record, a baptismal record, a voting record, a hospital record or a combination of these records that shows the individual's facts of birth. Before the judicial order, the local registrar proceeds to record the birth. The system should have the fees established for delayed registration. A scaled fee is recommended according to the length of delay.

168. By design and according to international standards, the civil registration system should serve the public universally, neither discriminating nor targeting particular population groups. In practice, however, there are certain population groups that need to be catered for with special procedures and considerations.

169. In regards to refugees, country legislation and practice may differ in the way citizenship is registered at birth. In some countries children born in the country of asylum of refugee parents are registered as refugees while they become ordinary residents or citizens in others. If the legislation allows refugees to become residents, civil registration should be unproblematic. In countries where they are given a special status, the civil registration system needs to be flexible enough to accommodate this, either through a specific variable which specifies this status or by a different type of ID number⁴³.

170. The Office of the United Nations High Commissioner for Refugees (UNHCR) and other humanitarian organizations have established systems for registering vital events and providing identification documents among refugees. The event is, however, usually better authenticated if registered with a national civil registration system. In Kenya and Uganda, there is currently ongoing work to transfer the UNHCR refugee registration data to the Government. It will be up to

⁴³ H. Brunborg (2015): Civil Registration and Vital Statistics for Refugees. UNHCR Statistical Yearbook 2014, Chapter 5, pp. 67-73, <http://www.unhcr.org/56655f4c16.html>

the Government to decide whether these registers will continue to exist as separate registers or whether they can be integrated into the national civil registration system.

171. Stateless persons find it difficult or impossible to register their vital events in some countries, often because the local registration officers are not aware of the right everybody has to register their vital events, and in other cases because of national legislation. Stateless persons are particularly vulnerable if they have no access to civil registration, since a birth certificate is an essential document for acquiring a legal status in the country of residence, including the right to acquire an ID card, to live in the country and to become a citizen.

172. For internally displaced persons (IDPs) there is no issue of citizenship, but there are often challenges for proper identification as the displaced person may be unable to access and obtain copies of vital records at their place of origin. It might be too dangerous to go there or the records may have been destroyed because of an armed conflict or a natural disaster. Thus, they may face the same challenges as refugees and stateless persons. An electronic civil registration system with a nationwide database (or network of databases) allowing access to records throughout the country can alleviate the situation of IDPs. See [Box 9](#) for the case study of Norway on the special cases of refugees, stateless and displaced persons in the context of civil registration.

Box 9

Norway. Refugees, stateless and displaced persons and CRVS

All vital events that occur in Norway, including those of refugees, asylum-seekers, and stateless persons, are registered in the Central Population Register (CPR). A birth certificate is sent to the parents of a child if they have recorded an address, or it is issued on demand. The same is the case for family members of a deceased person.

There is, however, a difference in how these events are handled by the CPR: All those formally residing in Norway, including foreign citizens, are given a unique personal identification number (PIN) and are registered in the Central Population Register. Asylum-seekers on the other hand are given a temporary PIN ('D-number') issued to non-residents with obligations or rights in Norway. This includes children born while their parents' asylum applications are being considered. If the parents are later recognized as refugees and given a permit to live in Norway, the child will be registered as an immigrant. Children born in Norway of refugee parents are not considered refugees but their residence status is identical to the status of their parents if both are foreign citizens.

Persons living in Norway, but who are non-residents, including those who are born in Norway, are not included in the annual vital statistics.

173. There is also a need to establish a **programme to respond to internal uses of records**; it is probably better to say that there needs to be two programmes to respond to internal uses. There are internal uses that will generally need a response from the certification unit of the registration

bureau, and there are other internal uses that will more properly need a response from the monitoring and operations unit.

174. From the point of view of internal use of the records there is a whole set of operational statistics that are usually generated by the civil registration office with the purpose of assessing and monitoring the operations in terms of, for example, an average workload of the registrar, i.e. how many entries he or she makes per day; the average time needed to process and enter a civil registration record; the number of edits and corrections that are introduced on average; the number of late and delayed registration by region and civil registration district. All of these are critical information needed for improving the services and functioning of civil registration offices. For further elaboration, see below [section 3](#), on monitoring.

175. Another part of the programme for internal uses needs to deal with appropriate ways to make the data available to researchers and relevant officials within the civil registration and vital statistics system. From a statistical point of view, internal use of the vital records data includes the production, by the national statistics office, of an annual statistical report concerning birth rates, death rates, leading causes of death and so on. Data should be available to researchers in the maternal and child health programmes, the epidemiology programmes, and the planning and evaluation sections of the registration department, the ministry of health or the national statistical agency, among other pertinent governmental agencies. For more on applications and utilization of civil registration information, see [Chapter VI](#).

176. To these governmental uses of the vital records data, the programme must also add the ability to respond to public users of the data. This involves reviews of the right to the data relative to confidentiality and privacy concerns. It also involves review of research protocols to assess the value of the proposed research and the researchers' qualifications. Involved, too, is the development of efficient methods of sharing the data with approved external users. More on the release of data, anonymization and other considerations can be found in [Chapter VI](#).

177. Some external uses may be mandated by statute. For example, the demographer in the jurisdiction may need data to prepare population estimates. There may be a statutory requirement that death records must be linked with voter records to purge the voting rolls.

178. The programme for internal and external use of the data is a varied one that must respond to many different requests from a wide assortment of users. It is an important programme that emphasizes the reason for investing sizeable resources in collecting data properly so as to successfully use them to operate many services that society requires.

2. Field programme

179. Field programme refers to a set of activities aimed at enhancing the efficiency and coverage of civil registration. The field programme is a necessary component of the management of the registration services and efficient operation of the system. This is true for both a centralized system and a decentralized system. This can be seen clearly if taking into consideration the

individuals that the field system will be designed to help. They are the local registrars, the morticians, the hospital medical records personnel, the coroners, the physicians, the midwives, court personnel and any others who might be involved in recording or reporting a birth, death, foetal death, marriage or divorce. In either a centralized or decentralized system, reporting is made to local registrars who register the events. Also, the other individuals will be part of the system and will need the services of a good field programme.

180. The components of a good field programme are several. An initial product of the field programme is the set of instruction manuals and Standard Operating Procedures (SOPs) needed by local registrars and by each of those who supply notifications to the system. These should be very careful and thorough outlines of what local registrars and each of those notifiers has as his or her responsibility. Since the majority of civil registration systems rely on local registrars, it is necessary to begin the instruction manual production with one for this group, because the local registrar must be aware of the entire array of activities for correctly registering vital events. The instruction manual should include preparing and filing the records, handling legal requirements to prepare the records, their safe keeping, and issuing certificates, making amendments and corrections, transmittal of vital records to the registration authority and collecting data for statistical purposes. The local registrars need to be familiar with the laws and regulations governing civil registration and vital statistics in the country or state or province, and copies should be made available to them. This is only achieved through training and continuous education⁴⁴. An important part of the manual will be the description of their duties and responsibilities, since they are the cornerstones of the registration system. As the vital records are legal instruments, local registrars must have solid knowledge of family law so that they will be able to efficiently participate in the process of family organization to which civil registration contributes. The local registrars should be provided with all necessary instruction to make them competent to solve several registration related matters, including the possibility of modifying the vital records in those cases provided by law, without the need to consult the authority for civil registration.

181. The manuals and SOPs for notifiers (morticians, coroners, midwives, hospital personnel, physicians, court clerks, marriage officers) will be specific to the responsibilities of those individuals. The funeral director or mortician manual, for example, will deal only with the requirements for filing death notification records. On the other hand, the physician manual will need to have sections on completing cause of death and cause of foetal death, as well as sections on completing birth records. All of the manuals should contain copies of the specific documents for which that notifier will be responsible. Besides specific instructions on how to complete each item, it is also necessary to explain why the item is important and how it will be used. Such explanations, combined with training, help elicit more complete and accurate responses.

182. Preparation of the manuals and SOPs is a time-consuming task but repeatedly pays real dividends. To continue reaping these dividends, it is essential to keep the manuals updated. Manuals must reflect change in forms or in administrative policies as soon as they occur. Consequently, if hard copies are being produced, a loose-leaf manual is suggested, which can have new pages or updated pages inserted in appropriate places without having to reprint the entire

⁴⁴ Please see section on Maintenance of field operations, [paragraph 258](#) onwards.

document. While in contemporary circumstances electronic formats and online versions of the handbooks (soft copies, Wikipedia-style resources and other online resources, interactive software, among other options) will be the vehicle of choice, printing may still be needed in case of local registrars' offices with sparse access to the internet. Regardless of the type of manuals deemed appropriate, provisions need to be made to be able to update and revise their content as effortlessly as possible, and with consistency in all the territory.

183. A helpful adjunct to the instruction manuals for keeping local registrars and notifiers informed is a monthly or quarterly newsletter. The newsletter is a handy device for many things. It can keep staff up to date on changes and alert everyone to any common errors that are being detected. It can also provide a medium in which problem questions can be asked and answered, and can offer motivational material, such as timeliness reports or helpful hints from local providers. The newsletter can also list notifications of educational meetings or seminars throughout the jurisdiction. Other suggested channels for discussion and exchange among peers could be communication through an intranet, a dedicated electronic forum (e-forum) or a more generic electronic bulletin board, where registrars can post comments and queries.

184. **Field visits** are a crucial part of the civil registration programme. Serving as educational and motivational, field visits let the local registrars and the providers in the field know that they are an important part of the civil registration records team. Periodic checks of the local registration offices should be part of the annual work plan of the system's administering office to verify that local registrars are recording and reporting vital events in strict compliance with the law. Since these visits to the field are costly, careful planning is necessary to maximize their benefit while keeping their frequency within resource limitations.

185. There are several types of visits. Routine visits should be made to ensure strict compliance with laws and regulations, that such items as logs and registers are being kept up to-date, that register files are being maintained in order and in secure fashion, and that reporting of vital events runs smoothly. Routine visits also answer any problems that may have come up in the particular area. When staff make these routine visits; they should try to visit with not only local registrars but also as many key providers and notifiers in the area as possible. That is, visit the local registrar but also pay visits (or make calls) on any midwives, morticians, coroners or hospitals in the area. If a physician is having any problems with reporting vital events, this is a good opportunity for a visit.

186. Initial visits are made when a new registrar, coroner, mortician or medical records personnel appear on the scene in a particular area. An early start with the on the spot training will make the transition more efficient.

187. Educational visits need more preparation and are more formal in nature, and may involve a full team of trainers from office staff. Examples of this type of visit are regional seminars and annual meetings. Both are worthwhile investments of staff time. One employs the regional seminar if the geography of the jurisdiction is such that it is easier for a particular group of individuals from one section of the jurisdiction to gather for in-depth training. For this type of seminar, several can be held in different geographical areas during the year, responding to the particular needs of that area. On the other hand, one uses the annual meeting to bring together as

many local registrars and a provider in the entire jurisdiction as is possible. This allows an opportunity for free exchange of ideas and experiences that can be very beneficial to general communication throughout the registration system. Developing e-learning tools to complement educational visits enlarges the impact of the learning process for all levels of staff. See [Box 10](#) for details on how the Philippine Statistics Authority undertakes its educational events.

Box 10

The Philippines. The National Workshop on Civil Registration

The Philippine Statistics Authority (PSA) organizes a National Workshop on Civil Registration (NWCR) every two years. Participants are local civil registrars, local executives (Mayors, Village Captains), PSA staff and other stakeholders. The National Workshop on Civil Registration serves as a venue for updating the local civil registrars on the latest laws, rules and regulations, memorandum circulars and other information on civil registration. Papers on topics using vital statistics are also presented.

Awards for best Local Civil Registrar's Offices are also presented during the NWCR. Local Civil Registrar's Offices are rated according to the timeliness and complete submission of civil registration documents to the PSA as well as the quality of information on the documents.

In between each National Workshop on Civil Registration, the PSA organizes a National Convention of Solemnizing Officers (NCSO). Target participants are priests, pastors, religious ministers, mayors, judges, Shariah court judges, imams, tribal chieftains and other authorized persons who solemnize marriages. Local Civil Registrar's Offices may also participate in the National Convention of Solemnizing Officers. Updates on marriage laws, rules and regulations on registration of marriages and other related topics on marriages are discussed in the NCSO.

188. The maintenance of the field programme of civil registration is particularly vital in emergency situations. A child's vulnerability to abuse is very high when an emergency is unfolding; boys and girls routinely become separated from their families or care givers and are vulnerable to physical abuse, neglect, sexual and economic exploitation, discrimination, violence and recruitment into armed groups. Civil registration as a functional system can help build a protective environment for children in many ways. If vital events, predominantly births, are registered and the records are well kept, family tracing for separated children becomes easier as there is documentation of their parents and their origin. In cases of child marriage or the worst forms of child labour, proof of age can help aid children and prosecute perpetrators. Birth registration also can help children claim their inheritance rights. A set of good practices in the context of emergencies is presented in [Box 11](#), which is an extract of a report published by Plan International on this subject⁴⁵.

⁴⁵ Birth registration in emergencies: a review of best practices in humanitarian action, Plan International, April 2014

Box 11

Civil registration and vital statistics in emergencies

Emergencies pose specific challenges to formal Civil Registration and Vital Statistics systems. Infrastructure may be damaged, documents destroyed or lost and pre-existing weaknesses in the formal registration systems may be exacerbated. These challenges require actions from government and non-government actors, such as the revision, adaptation and/or development of systems, measures and techniques for civil registration.

To ensure effective civil registration in emergencies in current and future disaster responses, it is recommended that:

- Governments ensure that CRVS line ministries work closely with disaster risk management line ministries and humanitarian actors, to identify appropriate measures for preparedness and for strengthening CRVS systems in emergencies.
- Humanitarian actors ensure that a situation analysis for civil registration and Vital statistics becomes an integral part of humanitarian assessments, and that they incorporate civil registration actions as part of emergency preparedness, response and recovery.
- Donors allocate funding for civil registration as part of preparedness in humanitarian response and recovery. While civil registration may not be an immediate, life-saving priority in humanitarian response, it is clearly an important tool for protection before, during and after emergencies. However, funding for civil registration efforts in emergencies may need to link to longer term funding initiatives.

Good practices...

...in preparing civil registration in emergencies:

- Work in child protection alliances with UN agencies and NGOs.
- Conduct a situation analysis or baseline assessment.
- Raise community awareness.
- Use information to develop action plans.
- Involve children and communities in the design of civil registration interventions.

...in conducting civil registration in emergencies:

- Build on (pre-)existing systems to make them accessible to affected populations.
- Establish systems for issuing vital events notifications
- Exploit the use of mobile phone technology.
- Integrate civil registration with primary health care services.

...in ensuring sustainability of civil registration systems:

- Adapt or formalise temporary civil registration mechanisms.
- Decentralise civil registration down to sub-district level.
- Advocate for legal reform.
- Ensure ongoing monitoring.

189. Although it may not be possible to include immediately all the components listed above in the field programme, it is essential to work towards a programme that includes each component in as much depth as possible. The dividends to the general health of the civil registration system will be very quickly visible.

3. Monitoring

190. A performance monitoring programme must be in integral part of the civil registration system activities. Periodical information on the system performance has to be generated in order to ensure that the civil registration system is being conducted effectively. The four principles of civil registration can serve as a frame within which system performance can be understood and within which performance indicators can be formulated. As per the *Principles and Recommendations for a Vital Statistics System*, civil registration must be: **compulsory, universal, continuous and permanent, and confidential**⁴⁶.

191. Before elaborating any further on the possible performance indicators that might be used for monitoring the effective conduction of a civil registration system, it has to be emphasized that the generation of this kind of information is not related to the production of vital statistics. These performance indicators, or process statistics, are meant as an aide in the management of a civil registration system.

192. Let us focus first on the principles of compulsoriness and universality. For this, it is recommended that the total number of registrations of each type of vital event be tracked at least on a monthly basis, and at every geographical or administrative level. Similarly, the total number of certificates issued for each type of vital event should be tracked periodically and at every geographical and administrative level. With these simple indicators, a manager, national or local, will be able to detect unexpected drops or spikes in the registration flow. Comparison to the expected or historical number of vital events, particularly at the local level, will also shed light onto the extent of registration. In the same fashion, comparison of vital events reported by hospitals (mainly births) against the events actually registered can provide useful insights. Computation of crude and net rates will indicate whether the levels of demographic phenomena are within expected ranges, and will pinpoint certain areas or types of event where the registration system is falling short. The ratio of registrars to the size of the population in each locality, and the average distance to the local registration centre can also serve as useful indicators to monitor the capacity of the system to serve the entire population.

193. Focusing on the character of **continuous and permanent**, other performance indicators can be formulated. A manager, at the national and local level, must know the average (monthly, weekly) number of registrations undertaken per registrar, or the average time that each type of vital event requires to be registered. These can be used as benchmarks for monitoring the actual output of registrars and identify areas for improvement, make adjustments to workloads or other administrative arrangements in order to improve services to the public. In addition, reports on

⁴⁶ Please see Chapter II of the *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014.

time usage of the registration software in each registration centre can be employed to monitor the actual time that local or remote offices are open to the public. The availability of an online system to request registration of a vital event and its consequent efficiency, can also be an indicator of a **continuous and permanent** civil registration system.

194. Finally, in terms of **confidentiality**, performance indicators may be embedded into the registration process and subsequent flow. For example, is there a protocol in place for protecting information on cause of death from being disclosed? Are there safeguards in place for accessing online records? Are the physical settings of the local registrar and registration centre facilities favourable to confidentiality? Are records anonymised before being transmitted to other agencies? Is staff trained on confidentiality and disclosure rules and regulations?

4. Civil Registration and Vital Statistics system: Coordination activities and functional relations

195. Whether the structure is centralized or decentralized, coordination activities must be built into the civil registration and vital statistics systems from the start. This is true whether or not the civil registration system is in a separate agency from the vital statistics system. It is in the very nature of the vital statistics function to use the local registrars, providers and notifiers and the same record, to collect information for legal purposes and for statistical uses. This demands close coordination and collaboration among the various components of the civil registration and vital statistics systems. The health sector, the certification unit, the registration unit, the statistics unit and local offices must coordinate activities for an efficient operation. In centralized systems or the single agency option, leaders of the central offices involved (certification, registration, statistics, health and justice] should meet together on at least a biweekly basis to discuss matters of an overlapping nature. As mentioned in Chapter I, the establishment of an inter-agency committee, with representation from appropriate programmes can address coordination issues. It will often be discovered at the committee meetings that changes planned by one unit may drastically affect another unit in ways that without open discussion and coordination would never have been anticipated. This becomes even more instrumental when the units are in separate agencies. Coordination efforts should be as strong as possible. Some specific instances where coordination is crucial will be outlined here, but these are just examples.

196. The design and use of collection forms is an area where all stakeholders (Civil Registration Authority, National Statistics Office and Ministry of Health, at the very least) of the civil registration and vital statistics systems must be in close coordination. Some jurisdictions will have forms for collecting legal information separate from those used to collect statistical information. Other jurisdictions may use a single form (electronic or paper), which is clearly advantageous. In either case, the certification and the statistics agencies must have input into the initial design of the collection instruments to guarantee that the information that they need to collect is on the form⁴⁷. The registration agency needs to be directly involved in the structuring of the instruments.

⁴⁷ For complete elaboration of the topics and themes to be covered in a vital statistics system, please see Chapter III of the *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014.

This will make the data collection as easy as possible and the transfer of the data to the master files most efficient. Similarly, all three stakeholders must be involved in any changes to the collection instruments.

197. In the paradigm where the notification function, the civil registration function, the vital statistics agency and the identity management agency are connected in a holistic manner, the coordination is nevertheless an important necessity, not only in the initial development of the system and formatting of the electronic records and their content, but in the operational phases as well, in terms of establishing and perfecting editing procedures and protocols, correcting entries and harmonizing products. Successful examples consist of establishing inter-agency coordination committees that meet at regular intervals, exchange of field visits and organizing joint seminars involving registrars, statisticians, health personnel, IT and identity management experts. As there is a whole set of international standards for civil registration and vital statistics, such body enables a more efficient and wholesome implementation of these standards at the national level. Please see [Box 12](#) on the particular arrangements of this type of coordination committee in The Philippines, Uzbekistan, Chile and Canada.

Box 12

Inter-Agency coordination mechanisms for CRVS

- In **The Philippines**, there is an Inter-Agency Committee on Civil Registration and Vital Statistics. Members are permanent representatives from the Department of Health, Department of Education, Department of Justice, Department of Foreign Affairs, Department of Interior and Local Government, National Commission on Muslim Filipinos, National Commission on Indigenous People and the Philippine Statistics Authority (PSA). The PSA serves as the technical secretariat of the Inter-Agency Committee on CRVS, which will tackle the implementation of the work plans for the Asia-Pacific CRVS Decade (proclaimed at the Ministerial Conference on Civil Registration and Vital Statistics in Asia and the Pacific). It will also be tasked to generate the Sustainable Development Goals indicators concerning CRVS, among others.
- In **Uzbekistan**, a resolution was approved in order to have the Ministry of Justice, the Ministry of Health and the State Statistics Committee conduct quarterly comparisons of figures at the regional level. This resolution aims at achieving complete and accurate compilation of vital statistics.
- In **Chile**, an interinstitutional agreement was signed in 1982 by the Ministry of Health, the Civil Registration and Identification Service and the National Statistics Institute for the elaboration of vital statistics. By virtue of this agreement, a Tripartite Committee was created to oversee the vital statistics system. Civil Registration is tasked with collecting statistical data when registering vital events using the layouts and forms agreed by the Tripartite Committee. Thus, all required information (health related, legal and statistical) is contained in a single form for each type of event, and is collected from the registrant at the time of the occurrence of the event (if the event occurred in a medical facility) or at the time of registration. Civil Registration grants both the National Statistics Institute and the Ministry of Health secured electronic access to its database, so that vital and health statistics are compiled. All official statistics are solely published by the National Statistics Institute. This agreement has proved a dynamic model that allows successful inter-agency cooperation, and improved vital statistics coverage and timeliness.
- The cornerstone of **Canada's** national system of vital statistics is the cooperation and collaboration among provincial and territorial civil registrars and the federal government. The partnership was created in 1919 following two conferences on the establishment of a national

198. Lately a number of countries undertook the formation of national agencies tasked with issuing identity cards to all individuals in a country, a process that includes collecting photographs, fingerprints and other biometrics (such as iris scan). Such agencies usually incorporate the civil registration function, i.e. registering births, deaths, marriages and divorces, and maintaining a population register, including addresses of usual residence of residents and other characteristics. In this context, it is of paramount importance to implement international standards related to both civil registration and vital statistics, ensuring the production of comprehensive and regular vital statistics, while at the same time ensuring the compliance with compulsory, universal, **continuous and confidential** principles of civil registration.

199. The civil registration function should not be treated as secondary to the identity management function. These functions must interoperate, and mechanisms should be put in place so that vital statistics can be generated on the basis of civil registration information. The production of relevant and regular vital statistics is assured by regular, daily, transmission of new records to the statistical agency for editing and processing, and by ensuring that the all the information, as per international standards, is incorporated in the record. The concurrence with international principles for civil registration has to be embedded in the core functions of identity management agency.

200. One of the major objectives of this handbook is to present vital statistics and civil registration as separate entities, but with the ultimate goal being to establish, maintain and exploit these two entities as components of a coordinated and coherent system for registering vital events and for producing vital statistics. The procedures for recording births and deaths are equally important for civil registration in legal terms and for vital statistics in the context of source of statistics; hence, the work of civil registrars and that of statisticians are interdependent.⁴⁸

201. Vital statistics generated out of a complete civil registration system offer the most valuable regular, accurate and relevant information on fertility and mortality, including for small areas; enable the computation of proximate population estimates and projections; enable the identification of fertility patterns at small-area levels; and serve as the basis for cohort studies, and

⁴⁸ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014., para 274.

the construction of life tables—to name but a few of the many uses of vital statistics generated directly from civil registration which illustrate its critical importance in providing relevant statistical information.

202. Civil registration, in turn, is defined as the **continuous, permanent, compulsory and universal** recording of the occurrence and characteristics of vital events pertaining to the population, as provided through decree or regulation in accordance with the legal requirements in each country. Civil registration is carried out primarily for the purpose of establishing the documents provided for by law. The usefulness of these records as the best source of vital statistics is well established.⁴⁹

203. None of the major components of vital statistics and civil registration systems exist in a vacuum. Civil registration and vital statistics systems must coordinate with other functional units of government. To do this effectively, members of the vital statistics and civil registration staff need to serve as members of various committees throughout the government. For example, if there is a birth-defects registry, it is important that a member of the staff attend the major organizational or board meetings of the registry. This will help to coordinate what input the bureau provides, and to find out if there are any ways in which the registry can be of help to the registration system. Since the registry will most likely be the recipient of information from other sources besides the birth record, it probably can serve as a check on the completeness and accuracy of data on the birth record.

204. There are also a number of systems in which the civil registration and the vital statistics components are located under separate government institutions. Efforts to maintain open communication in such situations are essential and can pay many dividends. Duplication of effort can be held to a minimum when each component knows what the other is doing or is planning. Furthermore, redundancy of registration data will be minimized as well as overlapping and inconsistencies in data files. In such structures, coordination can best be achieved by establishing an inter-agency committee for civil registration, vital and health statistics that operates on a **permanent and continuous** basis. Mutual cooperation and collaboration are essential among the collectors of data and producers of vital statistics. It is in the interests of countries to establish such committees and to give them all necessary support. The inter-agency committees will have an advisory role as well. The ultimate goal is to develop and maintain a single database/population register at the civil registration authority that can serve the statistical, health, electoral rolls, identification services and other purposes.

205. Review committees are another source of coordination with other health agencies. It is advantageous that members serve on committees that review maternal deaths or perinatal deaths. Such attendance will alert these committees to some uses of the vital statistics data and the civil registration system. In all likelihood, the attendance at the meetings will also broaden the perspective of the staff member and alert the staff member to the needs of other areas of the health field.

⁴⁹ Ibid. para 279.

206. Besides coordinating with other agencies in the health and juridical fields, it is also important to coordinate the vital statistics and registration programmes with similar programmes on a national and international level. Having members serve on committees and belong to associations of professionals brings new ideas and new methods into the organization.

207. The use of **standard classifications, nomenclature and common codes** is a *sine qua non* of a holistic system of civil registration, vital statistics and identity management. The very basic premise of standardizing these functions refers to the consistent use of a unique code for localities and administrative sub-divisions of the country. If the territory of a civil registration district differs from the delineation of administrative sub-division, it would not be possible to harmonize and present small-area statistics that are crucial for decision-making at the local level. The code that refers to the place of residence of the mother, in the case of births, for example, and that is part of the registration record, has to come from the same codebook that is consistently used by all the components of the system, including the health system, and compatible with other data collection exercises such as population censuses. The major references in regards to cartography and geographical coding are the *Handbook on geographic information systems and digital mapping*⁵⁰ and the *Handbook on Geospatial Infrastructure in Support of Census Activities*⁵¹.

208. It is the same requirements when it comes to the definitions of vital events. The international standards present these definitions in detail⁵² and those should be fully implemented in national practices. The importance of using the same definition for the same event cannot be overemphasized, not only by all components of the system, but also throughout the entire country.

209. When it comes to implementing standard classifications, the one most pertinent for civil registration and vital statistics refers to the International Statistical Classification of Diseases and Related Health Problems (ICD)⁵³. ICD is a system of categories to which morbid entities of either external or pathological causation are assigned according to the established criteria.⁵⁴ It is important that the nosologists⁵⁵ applying the ICD codes for cause of death have training in the universal methods of translating the literal causes listed on the death record into an underlying cause of death code from the ICD. Such consistency is necessary to make the data comparable throughout the system. This effort to coordinate the activities of individual nosologists is being alleviated by technology. Selection and coding of underlying cause of death by computer software are available⁵⁶ and used widely but cannot completely replace nosologists. The use of computer

⁵⁰ United Nations publication sales no. 00.XVII.12, New York (2000), available from https://unstats.un.org/unsd/publication/SeriesF/SeriesF_79E.pdf

⁵¹ United Nations publication sales no E.09.XVIII.8, New York (2009), available from https://unstats.un.org/unsd/demographic/standmeth/handbooks/Series_F103en.pdf

⁵² Ibid. para 2.

⁵³ Currently in its tenth revision (ICD-10); the introduction of the 11th revision is on its way.

⁵⁴ https://www.cdc.gov/nchs/ppt/nchs2012/li-14_minino.pdf.

⁵⁵ Nosology is a field of medicine focusing on classification of diseases.

⁵⁶ Examples of these software include Iris, Mortality Medical Data System, STYX and Automated Classification of Medical Entities, among others. A brief description and features of some computer applications for assisting in the coding of the underlying cause of death is presented in [Appendix 2](#).

software for coding requires support from trained coders to analyse the cases that the software was unable to process.

210. Aside from the ICD, a number of other relevant classifications need to be firmly incorporated into all the components of the system. Some of these classifications are developed at the international level and are implemented in national statistical practice. This is the case with the International Standard Classification of Occupations (ISCO). The current version, ISCO-08 comprises 43 sub-major groups, 131 minor groups and 425 unit groups of occupations. Similarly, the International Standard Classification of Education (ISCED), a statistical framework for presenting information on education, in its current revision (ISCED 2011) consisting of nine levels (instead of seven levels in the previous version), needs to be fully implemented throughout all the segments.

211. Aside from inter-agency coordination described above, the **intra-agency coordination** requires particular attention as each office implementing registration, certification and statistics activities needs to reach a level of understanding of the other components' needs and responsibilities. For example, when the certification component completes a new record following an adoption, it must be aware of the importance of communicating to the registration component. It must communicate exactly what changes have been made to the document so that the registration section can have those changes reflected in the registration record, and, ultimately the master file. In turn, the registration section must be aware of the needs of the statistical component concerning the changes that the adoption causes to the statistical database. Although the child's name or the parents' names changes are not of particular interest to the statistical component, the demographic characteristics associated with the birth certainly are. Although the adoptive parents may be of different ages than the natural parents, the statistical component would not want this reflected in the statistical database. For statistical purposes, the data on the natural parents are what the statistics section needs. At the same time, the certification unit wants the age of the adoptive parents to appear in the copies of the certificate that it issues. The registration section has to be aware of these disparate needs on the same data item and routine protocols to address them in appropriate manner.

212. Although this is a particularly poignant example of the need for communication among system components because it involves all of the components, it is not the only instance that makes communication essential. The discussion above of the delayed registration programme and the correction and amendment programme supplied other examples of the necessary communication from one component to the others.

213. If the registration component is to run a successful field programme to increase completeness and accuracy in reporting, it is essential that each of the other components discuss exactly what each question on the vital records is designed to obtain. The Principles and Recommendations of Vital Statistics present clear definitions and characteristics for vital statistics tabulations. For example, a question on the death record asks for the education level of the deceased. The statistics component knows that this is an important variable which it uses as an indicator of socioeconomic status. It is essential that this be communicated to the registration component, which in turn must explain this to responders, local registrars and other collectors of

information. Further, an effective way to ensure and maintain collection of certain topics is to have them inserted in the legal framework. This minimises the risk of suppressing important topics without due consideration of repercussions. Of course, the legal framework should mirror international standards as elaborated in [Chapter I](#).

214. Examples of the importance of communication are many. The point to be made is the significance of intra-agency communication. Management must encourage cross communication and cross-training among the components to have efficient systems that produce the quality work of a team. The more each member of each component knows about the workings of each other component, the better will be the level of cross checking and use of the functions of one component to aid the other.

DRAFT

III. Maintenance of civil registration and vital statistics components

A. Introduction

215. The topics covered in the present chapter are concerned with the maintenance of established civil registration and vital statistics systems. In particular, the chapter is concerned with the operational requirements of maintaining effective and reliable systems. The operational requirements of a maintenance programme include the modification of records; internal review of system's functions; preservation of stored records; and the maintenance of field operations. Modernising and maintaining the operational requirements is a *sine qua non* of contemporary government functions, so as to improve services the public at individual and to increase the efficiency of the State at the macro level as well. A full elaboration of digitising civil registration and vital statistics can be found in [Chapter VII](#).

216. As mentioned in previous chapters, vital statistics and civil registration are separate entities, but it is crucial that they be established, maintained and exploited as components of a coordinated and coherent system for registering and producing vital statistics. In addition, the emergence of the interconnectedness between civil registration and identity management systems adds yet one more dimension to the structure of the civil registration and vital statistics system. A graphic representation of these relationships and functioning is presented in figure 1 (Chapter 1). Civil registration is defined as the **continuous/permanent, compulsory, universal** recording of the occurrence and characteristics of vital events pertaining to the population, as provided through decree or regulation in accordance with the legal requirements in each country. It is important to highlight the quality of universal in relation to the people's right towards the registration of vital facts. Established in the 1948 Declaration of Human Rights and supported through other global accords, every person has the right to an identity as bestowed through civil registration. In this regard, laws, policies, rules and regulations must not be a hindrance to the realisation of this right. In particular, the registration of events must be performed even if the time frame given by law has elapsed, and regardless of migratory status, and any other request that may act as an obstacle to registering the vital facts occurred in the territory. Civil registration is carried out primarily for the purpose of registering vital events and establishing the documents as per national law. The usefulness of these records as the best source of vital statistics is well established. The procedures for recording vital events are equally important for civil registration in legal terms and for vital statistics in the context of source of statistics; hence, the work of civil registrars and that of statisticians are interdependent.⁵⁷

⁵⁷ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 274.

B. Operational requirements

217. Currently, most countries are transitioning to electronic methods as means for operating and maintaining their civil registration and vital statistics systems, in the context of e-government. Such a technological transition ought to be accompanied and supported by a relevant legal framework that dictates and regulates the operation and design of technology-based civil registration and vital statistics systems.

1. Modification of records

218. Modification of original records, based on strict procedures as per the Civil Registration Law, can be made in certain circumstances, as described in the previous chapter.⁵⁸ The present section examines the methods for making those corrections to the file, and the ways to maintain the integrity of the file and maintain a log for the change that is made. The discussion focuses on ways to accomplish these modifications for each type of medium in which the records are stored.

III. Hardcopy files⁵⁹

219. Hardcopy files refer to records stored on paper. There are several ways to make the required change to such records. The first possibility is to prepare a completely new record. This is done, for example, in the case of an adoption where substantial a change is made to the birth record and there is a need to ensure confidentiality. The procedure employed is to remove the original birth record from its place in the file. Using the facts contained on the original, in combination with the changes accomplished by the adoption order, a new birth record is prepared. The new record shows the names of the new parents and the child's adopted name. The new birth record should bear the same unique file number as the original. The new record then replaces the original in the birth record file. The original record and the order of adoption are then placed in a sealed file. This file can only be opened by the order of a court or for administrative needs of the registrar. The sealed file is assigned a number of its own, and this number is placed inconspicuously on the new record as reference. This will allow the registrar to locate the original record in the case of a court order to open the sealed file or in case the adoption is annulled at some future time.

220. This procedure preserves the integrity of the file since only one record remains on file for the adopted individual. The original record has been removed and placed in a sealed file, while the new record bearing the unique birth record number is now maintained in its place. Meanwhile, the association of the sealed file number with the new record now in the file permits the registrar to trace the process back to the original document should this ever be necessary.

⁵⁸ Proper reference will be entered at the later stage.

⁵⁹ While it is assumed that most contemporary civil registration systems are based on the use of computer networks and technology, this elaboration of methods for modifying hardcopy records has two primary purposes: to provide guidance for systems that are still paper-based, and, more importantly, to provide an elaboration of the essential logic and rationale behind modification of official records.

221. A second method of correcting hard copy files is to make an addition to an existing record in the file. This is often used to add the name of a father to a record after the parents of a child born out of wedlock are married, or after the father acknowledges paternity and requests that his name be added to the record. In such cases, the original record is retrieved from the paper copy file, and the father's name or other missing information is added to the record. The record is marked "amended", and the date of the amendment noted on the record. A section of the record can be designed for amendments. In the case of a paternity affidavit, the affidavit itself should be permanently preserved in a separate file in case any question arises later related to amending the record.

222. A third method, often employed in the case of a legal change of name, is to simply cross through the original information. The new information is entered in the same space above the crossed-out information. This is often employed in legal name changes in order to guarantee an identity trail connecting the original name to the amended name. Also, an annotation in the corresponding section of the record should be made and dated.

223. It should be noted that the above methods are illustrated as favourable for particular types of amendments or corrections. This is not to imply that the particular method can be used only for the type of amendment as presented above. The registrar will determine which would be the best method to use given the circumstances, the instructions in the registrar's manual and the law.

224. The methods described work most easily when the hard copy records are in loose-leaf format. If the records are in bound books or bound ledgers, additional steps may be necessary.

II. Microfilmed files⁶⁰

225. Amending and correcting registration records kept on microfilms presents specific challenges. For example, in the case of an adoption it is necessary to replace the copy in the file with a new record; how can it be done with a microfilmed record? In the past, solutions included punching a hole in the microfilm where the original record resided. In addition to the tedium of accomplishing this task, the punched hole also weakened the microfilm, which would subsequently break where the hole had been punched. Similarly unacceptable was an attempt at splicing in the new record. This not only weakens the film in the area of the splice but often damages adjoining records on the film.

226. Ultimately, the most appropriate solution for amending microfilmed registration records is to create a separate roll of microfilm which contains the amended records only. The original record is left in its place on the original microfilm roll. What must be developed next is a method to keep a searcher from accidentally going to the original record that still remains on the microfilm. The method should send the searcher to the location of the amended record, which is now on the new roll of microfilm. The roll containing the amended record is referred to as the "relocation roll". Each amended record, as it is assigned to the relocation roll, is given a relocation

⁶⁰ Similarly as for the hardcopy records elaborated in the previous subsection, the presentation of procedures in the case where civil registration records were microfilmed has a sole purpose to provide examples for civil registration that still are using this medium.

number. It may be called, for example, the “R” number. It is this “R” number that allows the searcher to locate the amended record on the relocation film. The “R” number replaces the unique birth record number in the index to the records (but not on the amended record itself, which retains the original unique number). The original number, therefore, no longer appears in the index. This prevents the searcher from accidentally going to the original record rather than the amended record.

227. To illustrate the procedure, consider this hypothetical example. A child born as John Smith is adopted by Mary and George Brown. A new record is prepared that shows the new parents’ names and the child’s new name as John Brown. The unique record number which appeared on the original record is used on the newly prepared paper record. This new record now becomes the official birth record for John Brown. A copy of the original record for John Smith is printed from the microfilm and placed in the sealed file with the adoption order. The number of the sealed file is placed in an inconspicuous place on the amended record. Thus, the registrar will have a path back to the original record if this is ever necessary in the future.

228. The newly prepared amended record showing John Brown with his parents Mary and George Brown is now placed in the relocation file and assigned the next sequential “R” number. It might be, for example, the 1,678th amended record. It would then be assigned the number R1678. Using the “R” as a part of the number will alert the searcher to look for the record in the relocation files. The number is placed on the record where it can be used to search the microfilm roll, perhaps in the lower left corner. It also becomes the number which now identifies the record in the birth index. The original number is removed from the birth index and replaced in the index by the newly assigned “R” number. When a sufficient number of “R” records to fill a roll of microfilm have been accumulated, then the set of relocation records is filed and becomes the next roll of microfilm in the relocation file. Of course, there should be separate relocation files for live births, deaths, marriages and divorces.

III. Computer files

229. Computer files in this context refer to entries or records in a data base, not to be confused with scanned images of civil registration documents. Computer files are amended in a database (on-line or on local computers). For example, to accomplish the changes necessary to reflect the adoption of John Smith described above, a copy of the original record would be made and stored with the adoption documents in the sealed file, and then the corrections could be made in the database. Another example, if legally possible, is the procedure of change of sex. This has to be treated as an amendment and may trigger the issuance of a new PIN, if the country uses PINs that contain an indication of sex. In any case, a link file needs to be created in order to have the original and the new identities (and PINs) related to each other permanently in the master database.

230. In the contemporary environment, with interactive applications for manipulating the register database and with numerous physical locations within the system where such interactions can occur, it is of critical importance to ensure that the access to the database is subject to strict protocols. In the case of paper files, remarks or annotations are written on the margin of the

original document; the same logic is applied to computer files in a data base. Thus, it is necessary to develop routines and maintain a log that would indicate the amendment to the record, the person who amended it and the documentation that triggered the amendment.

231. As maintaining confidentiality is one of the major principles of civil registration, access to the applications for amending the records has to be restricted to only a certain number of registrars' staff. In addition, computer routines need to be developed so that each amendment is reported to management for quality control purposes.

2. Preservation of stored records

232. Depending on the size of the population it serves and the organizational structure of the civil registration system, a central registration office for a district or province may process 100,000 new records each year and will, in the course of only one decade have well in excess of 1,000,000 records in its files (when corrections and amendments are included). Many jurisdictions will generate records at rates that will make these illustrative numbers look quite small; for that reason, the present section is devoted to methods for preserving stored records of different types. It considers the storage of paper based civil registration records, microfilmed civil registration record and computerized civil registration records.

I. Paper-based records⁶¹

233. Paper based records are quite often the initial format in which the civil registration record appears. Whether at the local office or the central office, the paper record is subject to loss from fire, water damage or just simple wear and tear. In cases where the record is in loose-leaf form, it is also subject to loss or misfiling. This danger is reduced when the records are stored in bound books. As computerization takes hold, however, the use of bound books will gradually disappear, and only historical books will need to be preserved.

234. Guarding against loss by fire or water damage is a serious consideration. Often the paper record, in addition to being on a fragile medium, may also be the only existing copy of the record: even in cases where a copy is kept at both local and central levels, the loss of a copy at one level makes the other copy more vulnerable. For these reasons, digitising all paper civil registration records, as complex and resource-demanding process as it is, needs to be incorporated in the initial setup of the holistic notification, civil registration, vital statistics and identity management system. Until the digitisation of all records is achieved, measures to manage and protect paper records need to be put in place. To guard against fire loss the paper records should be stored in a room or a vault constructed of materials that will resist fire and heat for a period of time to allow

⁶¹ As mentioned previously, the prevalent format for civil registration records is computer based and stored in databases such as population registers. However, paper-based recording is still an existing practice; furthermore, there are a number of transition examples where new records are computerized but not all of the paper records are scanned and entered in the data base, as this is a resource-intensive process. That would also be the case for microfilms that were - and still are used for general archiving - in the context of civil registration records. Thus the elaboration of all three.

the fire to be extinguished before damage is done. To equip the vault with water spray would just introduce a different type of hazard. Some offices have used halon systems to smother the fire in the vault area, but this practice is diminishing because of cost and environmental impact. The danger of water damage can also exist from flood and rains.

235. Wear and tear from the handling and refiling of paper records is also a threat to such documents. Paper records stored in a normal sized file drawer will not survive well the pushing and pulling that handling and refiling, opening and closing the drawer entail. It is suggested here that expandable folders be employed to hold 75 to 100 records each. The folders can be labelled with the range of record numbers contained in each folder. The folders are then placed in the file drawer. This will greatly diminish the wear and tear caused by the opening and closing of the drawer; it also makes it easier to locate a particular record and easier to refile it properly without disturbing many of the records surrounding it.

236. Even these precautions are time limited since the paper records are much too fragile. Hence the necessity of digitising paper civil registration records as soon as possible. Once digitised, the original paper records can be offered to the national archives. The registration law(s) should address, among others, those issues of backing and preserving civil registration records, as well as recognition of digitised and scanned copies in lieu of original records. The option of giving the paper copies to the national archives once certain time periods have elapsed, and if a population register has been established, may be considered in the context of the paper being subject to deterioration due to climate or to problems due to lack of storage space and especially for the purpose of preserving valuable genealogical information that can be used for long period of time.

237. In turn, paper records with data on old vital events may be a valuable source for future statistics and research and should not be destroyed. The historical records become more accessible if they are scanned. This will also stop the physical deterioration of records on paper (and also on microfilm). To make old records more accessible for computer use it is necessary to transcribe them into OCR records (Optical character recognition). There is software that transcribes printed material well, but most hand-written material cannot be transcribed using computer programmes. In such cases, it is necessary to enter the data manually into the computer, although several methodological developments have been made which will reduce the transcription costs significantly. Moreover, handwritten dates may often be transcribed correctly and the family name is often the same for all family members in a household, which will reduce the amount of manual work. There are many cases of computerizing old records, both of vital events and population censuses. Please see **Box 13** below for two of these examples, concerning Albanian⁶² and Norwegian historical records.

⁶² V. O. Nielsen, H. Brunborg, V. Aalandslid, D. Roll-Hansen & C. Hendriks: Status Analysis on Civil Registration and Vital Statistics (CRVS). Documents 2014/41, Statistics Norway. <http://www.ssb.no/en/befolkning/artikler-og-publikasjoner/status-analysis-on-civil-registration-and-vital-statistics-crvs>.

Box 13

The importance of storing and preserving old records

After the new civil register for **Albania** was established in 2011, Statistics Norway helped to scan the old hand-written books so that the history of each person, including the dead, would be available. This has proven to be very useful for, among others, the determination of property rights.

The Historical Population Register (HPR) for **Norway** is intending to transcribe and link all recorded data on individuals in censuses and church books (parish registers) and other sources since the first nominal census in 1801 until today, including the linking of the historical data with the modern CPR, which was established in 1964. The register aims to include as many as possible of the 9.7 million people who were born in or immigrated to Norway between 1735 and 1964. The project will in principle consist of three parts: a) Scanning original documents, b) Transcribing data, i.e. digitising data to make it machine readable, and c) Linking records using name, data and place of birth and other available information as matching criteria. The HPR will be an important source for statistics and research. The linking of data from different sources will make it possible to establish links between family members and other relatives. This is essential for doing research on, for example, hereditary diseases as the register will include information about parents, grandparents and other relatives.

II. Microfilmed records

238. Microfilming techniques were widespread tools of choice for archiving and safekeeping a variety of documents, including the civil registration records in the past decades. Consequently, a number of civil registration systems have rolls and rolls of microfilms with records of births, deaths, marriages and divorces. Retrieving the information from a microfilm is a straightforward process, requiring only a basic apparatus and a meticulous index. However, processing the microfilmed records for either statistical purposes or for amendments is practically impossible and requires those records to be digitized.

239. Digital conversion of microfilms (including microfiche or flat sheets) requires using an optical scanner that captures the film in a raw digital format. It is also necessary to use Optical Character Recognition features for creating a digital record that contains the same information as the microfilmed one. While the equipment and the process is becoming less and less expensive in contemporary technology environment, it still necessitates thorough checking of each scanned record against the original one on the microfilm to ensure they are identical.

III. Computerized records

240. In the case of digital civil registration records the procedures for storing and preserving records rely on current general practices for maintenance and backup. A common approach consists of having two servers simultaneously online and mirroring each other so that each interaction and input of new record is recorded on both. Another common practice is to have daily

backups from the main server maintaining the database/population register, thus ensuring the preservation of records. Frequently, the mirror or back-up server(s) are located in a different geographical area, even a different country, as a risk mitigation strategy. If this course of action is taken, data protection measures for the mirror server must be taken, particularly if the service is outsourced to a private company.

241. As mentioned before, in a number of cases there would need to have at least two systems coexisting at the same time. One would be the modern approach of automated, digitized entry and storage of records using computer networks. However, there would also be records in the old format, either on paper or microfilm or both, that would need to be digitized and incorporated in the database. In addition, the automation may not be available in all areas of the country, as a consequence of remoteness or lack of infrastructure. That would then require introducing portable electronic devices for recording the occurrence of vital events and issuing certificates. These records would then need to be uploaded in bulk into the main database. Then there are transmissions from diplomatic/consular missions abroad regarding the occurrence of vital events to nationals. Hence the need to design appropriate protocols for inputting and storing all these entries in consistent and routine manner.

3. Internal review mechanisms for system functions

242. The present section outlines some internal review mechanisms that should be put in place to maintain uninterrupted daily systems functioning and to detect aberrations. The mechanisms need to be in place in all parts of the system: notification, registration, certification and statistics. The section examines internal review mechanisms at both the management and staff levels. It looks first at those needed in the notification mechanism and the registration area, next at those needed in certification and finally at the mechanisms needed in the vital statistics component.

I. Notification

243. It cannot be assumed that information on the occurrence of vital events and their characteristics reach the registration offices by itself. Nor can it be assumed that the information actually reaching the registration office is thorough, complete or accurate. Therefore, the registration agency must actively engage the notifiers and informants, mainly health personnel, courts personnel and marriage officers.

244. Notification protocols need to be clearly spelled out in the rules and regulations for each type of notifier, and regular training on this matter should be conducted for both registration staff and notifiers. Other information materials can be prepared for this purpose, such as instruction manuals, leaflets or targeted multimedia resources. This will ensure that health personnel, courts personnel and marriage officers are aware of what is expected from them in terms of vital event notification, who is their counterpart at the registration agency and where to find help if needed .

245. Moreover, checks and balances need to be in place to ensure that the notification protocols are being followed. Reports on the quantity and quality of information relayed by notifiers will be a helpful tool in identifying training needs and improvement areas.

II. Registration management

246. Identifying patterns and anticipating workload is one of the major responsibilities of the registration management. Consequently, the management needs to gather and analyse information regarding the monthly frequency runs from the civil registration register to assess the completeness and accuracy of the registration process. The number of events of each kind that should be reported during a particular month can be anticipated based on previous history and population levels. Similarly, a set of variable ranges can be developed (e.g., age of mother, birth weight, number of deaths by cause) and when the frequency is outside the range or in some cases when the specific variable such as the mother's age is outside the expected range, a query should be initiated. The frequency checks each month can also be used by management to monitor the number of missing or unknown values. A higher than anticipated count of missing or unknown values could signal some failure in the reporting system. The system failure needs immediate attention.

247. Another issue that requires regular monitoring refers to the reports of editing records in the phase of data entry. In contemporary environment, editing applications are developed in the phase of entering the information in electronic forms that are translated into registration records in the civil registration register. For example, if the person entering the data erroneously enters "male" under the sex of the mother, or the date of birth of the mother is not plausible (implying that the mother is aged 10 or less, for instance), the embedded editing procedure will stop the data entry and signal the need for correction. The report of each such intervention is a valuable guide to management in terms of improving the data entry training, for example, or to analyse the cause of data entry errors.

248. A long list of other operational management statistics needs to be generated on a regular basis. For example, reporting on the timeliness with which data are being reported from the field offices or suppliers; are the prescribed time limits for completing the cause of death certification being met? Are local registrars reporting events to the central office in a timely manner? Are hospitals forwarding the birth data to the registrar on time? What is the average workload of a registrar office? (See also Chapter II, section C on Monitoring for complementary information). These and other operational management statistics ought to be analysed and sent back to the respective local registrar offices with a view of quality improvement.

249. Outside of the civil registration component, the management has to use other sources of information to assess the functioning of the system. One that is most commonly used refers to comparing the number of births and deaths with the population estimates and projections produced by demographers within the national statistical office or similar institution. Namely, these estimates and projections are a routine product, usually based on population censuses and sample surveys. They are especially relevant for assessing the coverage of civil registration at sub-national levels as they provide with the estimated number of births and deaths; these are then

compared with the registered numbers of these events and discrepancies will indicate the need for remedial actions by the civil registration component.⁶³

III. Registration staff

250. As has been seen throughout the Handbook, the vital record is a dynamic document, even if digital, that is often subject to the need for change or correction throughout the lifetime of an individual and even after death. Many of the correction procedures occur during the period when the record is in the registration processing mode. Therefore, there is a need to develop a set of applications that should be used to check that changes submitted to be made to the record are accomplished. There should be two parts to the change process for the records: in addition to the entry of the required change into the system, a log should be generated to indicate that the change has taken place. This is particularly important in the registration area, where the majority of changes are processed in batch mode. When the change is made in an on-line system, the change can be immediately displayed - this visual check serves as its own monitoring system. However, there is still a need to generate a log listing all the changes and affected records on a regular basis for the purpose of understanding the frequency and the reasons for record amendments.

251. There are two key places in the registration processing segment when a reminder flag needs to be attached to the record. One is in the query process. It is often necessary to send a query to a physician concerning information listed on the death record. Triggers for sending a query to the certifying physician can include illegible entries for the cause of death; use of non-standard abbreviations for cause of death; age or sex of the decedent missing; injury circumstances (if an injury was reported); reasons for surgery (if a surgery was reported); and condition for which a drug was taken (if drugs are mentioned). The query process should include a reminder flag that will alert the nosologists if no response has been received from the physician in a reasonable period of time. Otherwise, the daily flow of records to be coded may cause the nosologist to neglect following up on the query in question.

252. The second situation in which a reminder flag should be in place is somewhat similar. This is for records that arrive in the office with cause of death marked "pending" or "pending autopsy results". A final record should be filed with a complete cause of death within a specified and reasonable period of time (a month, for example). If not, the reminder flag should alert the registration staff to query for an updated record so that processing may continue.

IV. Certification management

253. Certification management has a responsibility to respond to the public with efficient customer service. To do so requires having in place internal system review mechanisms that will yield both work flow data and revenue data. Monthly work flow data should be generated by

⁶³ Chapter IV is solely dedicated to the elaboration of various methods for assessing the completeness of the coverage of the civil registration system, as well as for assessing the quality of information it collects. The reference here is necessary to outline the need to plan and administer these methods as a regular and routine part of the operations of the civil registration system.

management from each service area. How many adoptions, corrections and paternities were processed? How many certified copies were processed by mail? How many done over the counter? How many online? What was the turnaround time for each of these services? That is, how many workdays did it take to service each type of customer request? This type of information is necessary for management decisions concerning where to best use the human resources and to improve the efficiency and service delivery. It alerts management if a seasonal overload of business requires the addition of temporary help in a particular area of the operation.

254. Management also needs monthly information concerning the amount of revenue generated. This information is particularly important for comparing revenues generated in the current year with the same time period in previous years in order to make decisions about required changes in the workforce and in fees for the various services.

V. Certification staff

255. Certification staff is responsible for a number of areas where internal review is important. The increased use of fraud and counterfeit-resistant paper to issue certified copies of civil registration records has also increased the need to protect blank forms for certificates from theft. This is usually achieved by the use of pre-printed control number on each form. Applications need to be developed for matching each control number with the civil registration record for which the copy is issued and to store the information regarding the issuance of the copy into the database, together with the control number of the paper certificate. Then, the system should generate a daily log of the starting number for each day and the ending number for the day is compared with the numbers of copies issued and to the cash register sales information system. Allowance is made for any ruined copies or copies voided for other reasons. The control system would also include a listing of all paper stored in the office. Furthermore, the paper should be stored in a secure area at all times. Should a theft occur, this internal control can identify for authorities exactly what numbers are on the stolen papers, thus potentially preventing their misuse.

256. Another quality assurance mechanism in this segment refers to the matching of the number and type of certificates issued daily with the cashier's receipts collected as administrative fees (for those services that carry a fee). This should be incorporated as daily matching, generated for each registrar's office, in order to ensure that all the fees were properly collected and processed. In the case that the registrar's office operates without or with a rudimentary computer support, the matching would certainly be more cumbersome and time-consuming – however, it is essential to prevent possible fraudulent acts by the staff.

VI. Statistics staff

257. Staff in the statistics component of the system are responsible for instituting a number of internal quality control mechanisms, primarily in the process of generating vital statistics. This process requires checking individual records for errors and then aggregating them into tallies at different levels of aggregation. If the volume of data is very high, this can be done on a sample of records. The essential difference between a registration and statistics staff is in the fact that registration staff focuses on an individual civil registration record and that calls for a case-study

approach. Statistics is all about aggregates and comparing records – a process that requires a quantitative approach. Potential errors can be spotted using aggregated data by means of scatter plots, cross-tabulations, box plots and distribution graphs, i.e. by carefully using descriptive and diagnostic statistics, outliers and suspicious values can be identified. It also involves comparing content of the records for similarities across the areas of the countries. For example, tabulating the number of live births by age of mother and district where mother resides may result in identifying a certain district where mothers are considerably younger than in the rest of districts. It may be that this is due to the different population structure of that particular district with increased proportion of younger population. It may also be that this is the consequence of errors in compiling the information at the phase of creating a civil registration record. It may also be a glitch in the computer application used for data entry or for data editing.

258. Furthermore, since statistics staff has extensive experience in processing individual statistical records coming from a population census or a survey, including complex sets of edits that each record is subjected to in order to ensure internal consistency, it is necessary to solicit their input in the phases of developing data entry and editing procedures in the civil registration component. This is especially important since a number of information about the event and persons involved that needs to be collected and entered refers to statistical variables, such as age, sex, marital status, educational attainment, economic activity and so forth⁶⁴, and statisticians already developed a checking logic, for example, whether an 18-year old can hold an advanced university degree, that should be used in developing data entry edits for a civil registration record and for placing a flag, requesting for going back to the source and identifying which of the two information(age or educational attainment) needs to be corrected.

4. Maintenance of field operations (local registrar)

259. Quality assurance in general terms refers to all the measures undertaken in the process of delivering results aimed at minimizing errors and optimising the quality of the final product. In the case of civil registration at the local level, quality assurance, in addition to the internal monitoring and review mechanisms that must be in place to maintain the civil registration and vital statistics systems in general, it is also necessary to develop a number of elements focusing on those operations at the local level. These elements include Standard Operating Procedures (SOPs), handbooks, registration forms themselves, training, guidelines, seminars, newsletters and site visits. It is the purpose of the present section to take a close look at these components and how they can be used to assure the quality of records at the local registrar's level.

I. Handbooks

260. Availability of handbooks for local registrars maintains consistency throughout the system. They will help to maintain consistency both between operations in the central office and the local office, and among local registration areas. The handbook for local registrars should be considered

⁶⁴ For the complete list, please see *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 60.

a dynamic document, and management should pay particular attention to it. That is, it should be put together expecting that it will need to be changed and updated on a frequent basis. For this reason, it is recommended that the hard copies of the book be constructed in a loose leaf format as opposed to a bound book. This allows the replacement of individual pages when updates are needed. New pages can be added when additional sections become necessary. While in contemporary circumstances electronic formats and online versions of the handbooks (soft copies, Wikipedia-style resources and other online resources, interactive software, among other options) will be the vehicle of choice, printing may still be needed in case of local registrars' offices with sparse access to the internet.

261. The handbook provides guidance on processes to carry out the registration work on a step-by-step basis, including recording, reporting and, certification; preservation and safe keeping of civil registration records; and security measures. It should also include copies of the laws governing the operation of civil registration and vital statistics, as well as any specific rules and regulations passed regarding the subject. In addition, the handbook should contain any written policies that have been generated to interpret or clarify the laws and regulations. For example, the law might specify that civil registration record copies can be issued "to citizens demonstrating a tangible interest in the record". A subsequent regulation might define those having a tangible interest as "the registrant, certain members of the registrant's immediate family, or the legal representative of one of the aforementioned". A policy might then have been developed to define immediate family as "parents, grandparents, siblings, legal guardians and children", in accordance to the Family Law and other relevant pieces of legislation that are in place in the country. It is important that each local registrar have copies of the law, the regulation and the policy in order to apply the issuance of certified copies in a manner that is consistent with the central office and other offices in the country.

262. Another important item to include in the handbook is the most current copy of all the forms that will be needed to maintain the efficient operation of the system. This should include not only the official documents that are to be completed but also any worksheets suggested as helpful in completing the official forms, as well as any administrative forms for communication between the local registrar and the central office (supply orders, order sheets for blank documents, report sheets, log sheets etc.). For each of the official forms, there should also be step-by-step instructions on form completion. If a form asks for date of birth, specific instructions should indicate whether abbreviations for the month will or will not be acceptable, if it is permissible to use just numbers in reporting the date and the order to be used in giving the date, e.g., month/day/year or day/month/year.

263. When appropriate, the instructions for an item should indicate why it is being asked. For example, if a mother's age is asked, the instructions might indicate that this is a variable to be used in statistics for studies of what ages may prove to be risk factors for a successful birth. Such explanations are key to motivate registrars and can prove very valuable in the field when an informant is objecting to supplying a piece of information. The explanation should also indicate how the data will be used. This is important information to include, whenever available. All these rules, regulations and short explanations need to be embedded in the software being used for the registration process and in registration daily activities.

264. Communication is the underlying theme in handbooks. Therefore, a good handbook should also contain lists of individuals who can be contacted when problems arise, not only lists of people at the central office who can respond to questions in particular areas of expertise but also lists of other registrars, funeral directors, coroners and health professionals who might have to be contacted to get a specific form completed accurately. Management should nominate someone in the central office to ensure that changes, corrections and updates are sent to individuals possessing the handbook. This implies that a current list must be maintained of every individual possessing a handbook so that updates can be forwarded to everyone in the registration network. This can be done effectively by using email broadcasts, maintaining a dedicated e-discussion forum among registrars or through an intranet bulletin board.

II. Mini-handbooks

265. Subject-specific handbooks may serve a purpose when something of the magnitude of the local registrar's manual is neither needed nor efficient. For example, many doctors fill out death registration forms only occasionally. Hence, assistance at the moment of the completion of the death record could be very useful. There are few doctors who will take the time to seek that help from full handbook. A suggestion here is a single two-sided plasticized instruction sheet specific to the task of properly completing the cause of death on the death registration form. These sheets can be distributed to physicians, given to funeral directors to have handy if the physician needs one, or left in those areas of a hospital where they are likely to be needed. Where these have been used, the feedback from physicians has been positive and appreciative. Other instructions may include a guide for coroners relative to the completion of the manner of death (e.g., natural, suicide, homicide, accident etc.); step-by-step instructions for marriage officers on how to complete the marriage records; and instructions for court clerks on how to include a divorce decree in the civil registration system.

266. Coupled with this, the registration forms are used by local registrars and informants on a daily basis. Thus, they are in and of themselves a powerful educational tool. Registration forms need to be clear and self-explanatory, as well as give precise instructions when needed. Forms should be simple and user-friendly, easy to read and to follow. In fact, it is highly recommended that special versions are developed for certain population groups, such as disabled and indigenous persons.

III. Newsletters (electronic and hardcopy)

267. Newsletters fill yet another void in communication necessary to assure the quality of the registration process in local offices. New laws, regulations and policies/protocols are needed in the handbooks. A quarterly newsletter can usually get the information to local registrars and to those who need it more quickly and with accompanying explanations. It also highlights the fact that amendments should be arriving for the handbook. A newsletter can also be a great vehicle for keeping all in the system up to date on the latest personnel changes both at the central office and in the local offices.

268. The newsletter is a fine vehicle for giving out timeliness reports. It is suggested that these are most effective if they encourage participation by being positive reports. That is, the newsletter might report the 10 most timely hospitals or local registration areas. The competition is then to attain the position of one of the high scorers, and does not ruin the team spirit by embarrassing any specific area or institution. Another feature that has proved popular and useful in newsletters is a list of hints on how to do some portion of the job by successful local registrars. And it is always a good communication tool to include a question-and-answer section in each newsletter. To see an example, visit the newsletter⁶⁵ from the Registrar General of New Zealand addressed to funeral directors. This example contains information on preparing for and managing bereavement, new requirements for paper death registration, birth to death matching process, updated fee structure, news on the SmartStart⁶⁶ project and general reminders.

269. The ideas described above are aimed mostly at a newsletter produced by the registration section of the office. But some of those ideas are also applicable to a newsletter prepared by the statistics office. Such a newsletter would tend to emphasize the use of the data collected. This can also be very useful in encouraging more careful and complete reporting of the data by professionals in the field. A vital statistics newsletter would also include a report of studies and publications produced using the collected data. A section on quality assurance is also a popular feature of vital statistics newsletters.

IV. Training

270. The importance of continuous and comprehensive training cannot be overemphasized in terms of ensuring the quality of the civil registration and vital statistics processes. Developing training curricula needs to be a regular responsibility in the central office. Training programmes have to be tailored to specific audiences and refresher courses incorporated into the routine work programmes of civil registration offices countrywide.

271. The training plan should distinguish between internal training, which is oriented towards civil registrars, vital statisticians and other technical and administrative personnel, and external training, which is oriented towards policymakers, local officials, medical and health personnel and others impacted by and impacting the quality and uses of civil registration and vital statistics. Internal training should emphasize techniques, methods and skills, and should address issues of professional roles and functions. External training should be designed to inform groups about the needs and functions of civil registration and vital statistics systems, and should seek to develop improved understanding and cooperation. External training is a crucial improvement mechanism and should not be neglected: an environment characterized by cooperation and support is essential to its success. In the case, for example, of medical and health personnel who provide data to the system, the quality of the information is dependent on their understanding of the importance of accurate data and the uses to which they will be put. For these reasons, both internal and external training programmes should be an integral part of the civil registration and

⁶⁵ March 2017 issue available at <http://createsend.com/t/j-20AF7E74C477B50F>

⁶⁶ See **Box 8** in **Chapter II** for more information on this project.

vital statistics systems. The responsibility for these programmes, which should be carried out on a regular rather than an ad hoc basis, must be shared between both systems.⁶⁷

272. Thus, training should not be limited to civil registrars and statisticians. Specific courses need to be designed for medical personnel – separate ones for staff that act as informers and that are filling the information regarding the event and its occurrence and persons involved and then a separate one for physicians that are certifying the cause of death.

273. The establishment of a nationwide professional association of civil registrars and vital statisticians for the purpose of promoting, inter alia, the exchanging of views on the administration of registration laws, and devising strategies for the improvement of registration, is an important means for improving the quality of the work of registrars, statisticians and health workers and researchers. This approach is advantageous for both centralized and decentralized civil registration systems and especially useful when a country's administration of civil registration is decentralized. A single professional association is particularly useful in bringing all the personnel engaged in registration and analysis of a country's vital events together, either physically or through written communication, so as to promote uniformity, good registration practices, problem-solving and professionalism.⁶⁸ Further, an annual meeting of this professional association is highly recommended; this allows an opportunity for free exchange of ideas and experiences that can be very beneficial to the civil registration and vital statistics system. This meeting can take the form of an academic conference, with voluntary submission of papers, presentations of study cases, innovations, lessons, posters and similar tools and activities.

⁶⁷ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 632.

⁶⁸ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 337.

IV. Evaluation of the quality of civil registration and vital statistics systems

(This is an annotated outline, the content of this chapter will be finalized by Prof. Rao, taking into account feedback of the Expert Group)

A. Introduction

274. Importance of vital statistics from civil registration system for assessing population characteristics for planning, policy, and evaluation of various programs.

275. Currently, over two-thirds of the world's countries do not have valid and reliable vital statistics from civil registration, which is the optimal source for such data.

276. Given this critical data need, there is a current international focus on strengthening CRVS in developing countries.

277. As system strengthening initiatives take shape, there will be an increasing need for robust methodology to measure and monitor progress in data quality improvements in vital statistics at national and even subnational level.

278. This paper explains a broad framework for evaluation of the quality of civil registration and vital statistics, and provides a practical guide to implementation of various methods and techniques to evaluate various elements of the framework.

B. Considerations on quality of the Civil Registration and Vital Statistics System

279. Quality evaluation of CRVS encompasses two dimensions:

- a. Evaluation of quality assurance systems and processes.
- b. Vital statistics data quality assessment.

1. Importance of quality evaluation

280. Data quality evaluation is a critical primary step prior to analysis and utilisation of data for its intended purposes.

281. Findings from data quality evaluation are useful from two perspectives:

- a. firstly to identify and quantify data biases that can be corrected/adjusted to derive more reliable estimates of vital statistical indicators; and

- b. secondly, to identify systemic issues that result in data biases, such which could lead to interventions to prevent weaknesses in data quality.

282. Data quality evaluation is a constant requirement, even in countries with good quality vital statistics.

2. Confidentiality and privacy in the context of quality evaluation

283. Data quality evaluation should be preferably conducted with a degree of independence on the part of the evaluator, so that an objective assessment could be achieved.

284. Any systemic issues that affect data quality should be discussed largely in terms of processes rather than specific institutions and/or personnel, to maintain confidentiality and privacy.

285. Findings from evaluation should be discussed and utilised in a constructive environment.

C. Quality Framework of the Civil Registration and Vital Statistics System

286. A CRVS quality framework would involve:

- a. **Quality Assurance** evaluation, which would review the structural design, business processes, infrastructure, management and operations of the systems for vital event registration, issuance of legal documents, and compilation of vital statistics. AND
- b. **Data Quality Assessment** which would involve several domains including accuracy, generalizability, relevance, comparability, timeliness, and accessibility of the vital statistics and data^{69,70}

287. The processes and procedures that need to be implemented in applying this framework will involve a combination of quantitative/analytical/objective methods, and qualitative/observational /inferential/subjective assessments that provide contextual evidence of data quality, as well as evidence to design interventions to improve data quality

1. Evaluation of CRVS Quality Assurance

⁶⁹ Mahapatra P, Shibuya K, Lopez AD, Coullare F, Notzon FC, Rao C, et al. Civil registration systems and vital statistics: successes and missed opportunities. *Lancet*. 2007;370(9599):1653-63.

⁷⁰ Rao C, Lopez AD, Yang G, Begg S, Ma J. Evaluating national cause-of-death statistics: principles and application to the case of China. *Bulletin of the World Health Organization*. 2005;83:618-25.

288. Quality assurance in CRVS is assessed through a review of the processes for CRVS in regard to adherence to international standards, and assessment of institutional/human capacity for assuring data quality, using a standard framework.

289. The process review is done through mapping of business process of civil registration and vital statistics systems, identifying responsibilities and roles key institutions / personnel involved; and linking sequence of events from occurrence of vital event to issuance of relevant documents as well as inclusion in relevant vital statistical outputs.

290. Where relevant, the legal framework and administrative structure needs review to assess the potential for any data quality issues e.g rules for de facto or de jure registration; expatriate populations; offshore registration; vital events registration in disasters.

291. **Data standards** for vital event notification/registration/statistical presentation can be assessed through review of forms and reports used in CRVS processes, and conducting relevant modifications as required. . E.g definitions of notification time periods;; definitions for live births, foetal/neonatal deaths; rules/procedures for reporting causes of death/ data coding / statistical tabulations etc.

292. Institutional / human capacity can be assessed through a review of the staffing patterns, design and conduct of training programs for data recording, issuance of vital event certificates, statistical compilation, and vital statistics reporting.

293. The assessment should also include an assessment of political support for and community participation in CRVS.

294. The evaluation will also assess CRVS administrative coverage in regard to clear definition and description of geographical / administrative / population sub groups represented or excluded in the vital statistics data.

295. The quality assurance review should be linked with a data quality assessment, to evaluate the specific processes / procedures / institutions / human capacity that require modification or strengthening.

2. Data Quality Assessment

296. Data quality needs to be evaluated across three broad dimensions which are Data Accuracy; Data access and availability; and Timeliness of Data. Details of quality evaluation within each of these dimensions are as follows:

I. Data Accuracy

Statistical coverage

297. Definition.

298. Explanation/illustration with examples of various coverage situations (with references).

299. Importance of correct characterisation of coverage in terms of reporting or compliance coverage / statistical coverage (actual population represented in vital statistics reports).

300. Statistical coverage should be carefully measured and stated in CRVS report, particularly in the case of Sample Registration Systems, which operate only in certain sample population clusters.

301. In addition, as CRVS systems develop and expand within countries, there will be instances of vital statistics being compiled and reported for only some districts/provinces/urban/rural areas; and such details need to be correctly documented in vital statistics reports to enable proper interpretation of vital statistics data, in regard to their relevance to only the specific subpopulations represented in the statistics.

Data completeness

302. Definition and explanation.

303. Theoretical approach.

304. Range of measurement methods (direct methods / indirect methods).

305. Direct methods, pros, cons, assumptions.

- a. Typology of data sources.
- b. Issues that influence record linkage across data sources.
- c. Analytical methods – data matching & reconciliation; capture-recapture methods; combinations.
- d. Sources of bias & error; methods to quantify and adjust for the same.
- e. Requirements for reporting measures of completeness from direct methods.
- f. Operational challenges.

306. Opportunities to implement mechanisms to match records on routine basis at local level in CRVS, using data from local parallel reporting sources such as health information systems, administrative records etc. This exercise is along the lines of data reconciliation to try and improve the completeness of records from all local sources.

- a. Pros, cons, examples, practical guidelines.

307. Approaches to plan specific research initiatives to implement record linkage methods at national level, using civil registration and other **routine** sources such as censuses/national surveys.

- a. Pros, cons, assumptions, examples, practical guidelines

308. Guidelines to plan and implement **special** independent surveys to retrospectively record vital events, which could be used in applying record linkage and capture-recapture methods to evaluate completeness.

309. Overview of indirect demographic analytical methods.
- a. Theoretical approach (pros, cons, assumptions).
 - b. Data requirements and analytical approach.
 - c. Interpretation of results and operational challenges.

Data validity

310. Missing variables e.g age, sex, address, occupation etc.
311. Validity of registered causes of death.
- a. deaths assigned ill-defined causes.
 - b. deaths with implausible age-sex patterns by cause.
 - c. validity scores for specific causes in terms of sensitivity, positive predictive value.

Data comparability/reliability

312. Consistency of levels and trends in fertility and mortality rates over time (regular trends, rather than spikes and dips which cannot be explained by local phenomena).
313. Consistency between levels of general mortality and cause-specific mortality patterns.

II. Data Availability

314. Availability: Criteria for accomplishment.
315. Availability of detailed fertility and mortality tabulations (including deaths by age, sex, and cause).
316. Availability of small area statistics (e.g. vital statistics reports for each district/province).

III. Timeliness

317. Criteria for accomplishment.
318. **Production time:** interval between reference year for data and year of publication of statistical report.
319. **Regularity:** availability of time series of statistical reports for continuous period of 10/20 years, with regular production intervals.
320. Please see **Box 14** for details on the Canadian practice in regards to quality.

Box 14

Canada. Internal review mechanisms for vital statistics

Coverage. Although vital event registration data are received by Statistics Canada on a daily basis, and volumes are monitored on a weekly basis, data are processed on a yearly basis. Once all the microdata for a reference year are extracted, a reconciliation of data holdings takes place. During this step, different sources of data are gathered: the electronic National Routing System (NRS) messages, digitised images of event registrations, cause of death data from automated cause of death coding software extract, and the highest registration number reported by the jurisdiction. These are compared in order to determine whether all records have been received. If for example, there are more records on the cause of death coded data than there are electronic death messages for a particular jurisdiction, the jurisdiction is contacted and asked to send the missing data.

The next step is the elimination of possible duplicates within a jurisdiction, among jurisdictions, and over two years of data. Most of the possible duplicates identified through this process, which is based on a set of key fields, can be resolved at the central office which then cancels the duplicate record. For those that cannot be resolved, the jurisdictions for which there are duplicate records are contacted for resolution.

Missing, improbable, and erroneous data. The microdata are then run through a series of validation edits. Historically, vital statistics records in error have been corrected or verified by manually going to the digitised image (or microfilm) of the registration to confirm or correct the information in the field which failed the edit. This process is lengthy and labour intensive. Where possible, automated corrections or data conversions have been programmed for systematic errors, based on information available in other data elements. For example, if the age of mother field is blank but the date of birth field contains data, the age will be derived using the date of birth and date of event. This way the parity of the mother can be better verified during the editing stage. Another example is where the province of residence is missing and the postal code is available, the province is derived by looking at the first letter of the postal code. Certain edits correct logic errors (e.g. verify marital status as “single” for deaths of children under the age of 15).

The final piece of the evaluation will be to measure the value of the corrections on the precision of the estimates.

Cause of death editing is a separate process and a shared responsibility. The three larger jurisdictions maintain their own trained cause of death coding staff and code their own data. Statistics Canada provides cause of death coding for the remaining jurisdictions. Statistics Canada provides the training for all cause of death coders and also conducts a cause of death review where invalid cause, rare codes, first time used codes, age and cause correlations, maternal deaths are reviewed. The review also ensures consistent application of the classification and addresses known problems with the automated mortality classification system. Validity checks such as age and cause or sex and cause are addressed during the editing process.

D. Processes and procedures for Quality Evaluation

- 1. Rapid/Comprehensive assessments**
- 2. Quantitative/Qualitative assessments**
- 3. Elements and approach to documentation of data quality evaluation report**

DRAFT

V. Integrating civil registration, vital statistics, population registers and identity management

A. Introduction

321. As mentioned in previous chapters, vital statistics and civil registration are separate entities, but it is crucial that they be established, maintained and exploited as components of a coordinated and coherent system for registering and producing vital statistics. In addition, the emergence of the interconnectedness between civil registration and identity management systems adds yet one more dimension to the structure of the civil registration and vital statistics system. A graphic representation of these relationships and functioning is presented in figure 1 (Chapter 1). Civil registration is defined as the **continuous/permanent, compulsory, universal** recording of the occurrence and characteristics of vital events pertaining to the population, as provided through decree or regulation in accordance with the legal requirements in each country. It is important to highlight the quality of universal in relation to the people's right towards the registration of vital facts. Established in the 1948 Declaration of Human Rights and supported through other global accords, every person has the right to an identity as bestowed through civil registration. In this regard, laws, policies, rules and regulations must not be a hindrance to the realisation of this right. In particular, the registration of events must be performed even if the time frame given by law has elapsed, and regardless of migratory status, and any other request that may act as an obstacle to registering the vital facts occurred in the territory. Civil registration is carried out primarily for the purpose of registering vital events and establishing documents as per national law. The usefulness of these records as the best source of vital statistics is well established. The procedures for recording vital events are equally important for civil registration in legal terms and for vital statistics in the context of source of statistics; hence, the work of civil registrars and that of statisticians are interdependent.⁷¹

322. In a significant number of countries the full interoperability of civil registration, on one hand, and the vital statistics, on the other, is not completely realized, yet both components deliver their responsibilities in an efficient manner. This model is undergoing significant shifts with the emergence of population registers that require much closer and automated structure. With the heightened importance of assigning each individual with unique identity document that would provide effectual delivery of services and enhance identification of individuals for security purposes at the same time, the need to link civil registration, as the entry point for assigning identity documents (birth and death certificates), vital statistics and identity management resulted in instituting yet another contemporary model based on high levels of application of information technology. This chapter will focus on the flow of information and accompanying arrangements for each of these three models⁷²: civil registration and vital statistics as separate components without population registers; civil registration and vital statistics with the use of population register and, finally, the holistic functioning of civil registration, vital statistics and identity management.

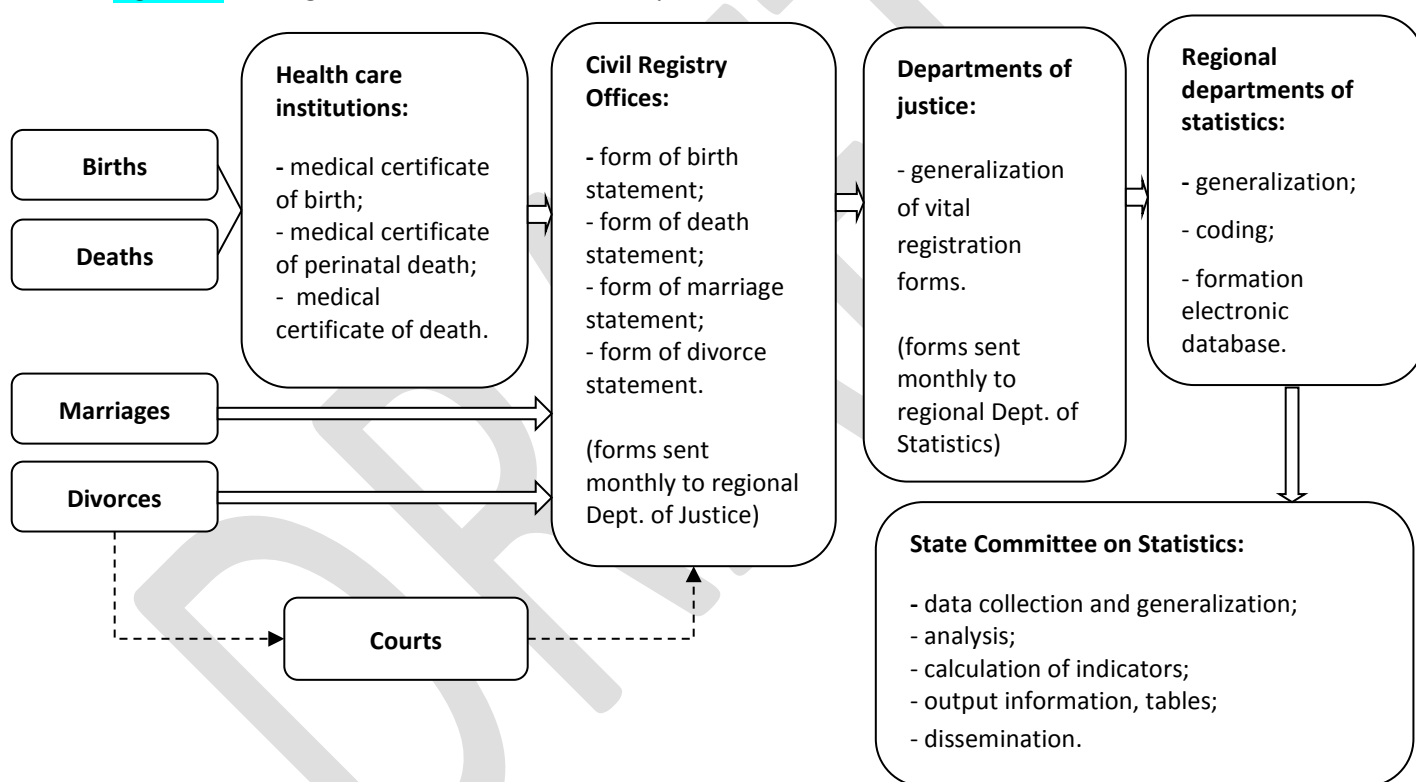
⁷¹ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 274.

⁷² These three models are presented in Chapter I of this handbook.

B. Civil registration and vital statistics – separate agencies

323. In this model the functions of civil registration, on one hand, and vital statistics, on the other, are delivered by separate agencies; this requires careful and functioning division of labour as well as coordination to ensure the efficient transmission of relevant and accurate information. See below a graphic example of this division of labour. This flow chart or business map is part of the works of a series of regional workshops on applying Principles and Recommendations for a Vital Statistics System, Rev. 3 held by the United Nations Statistics Division in partnership with relevant regional stakeholders.

Figure 8. Civil registration and vital statistics systems in Uzbekistan



Source: Sub-regional Asian workshop on applying Principles and Recommendations for implementing the Regional Action Framework for strengthening CRVS, held in Istanbul, Turkey, 15-18 September 2015⁷³

⁷³ All documentation available at: https://unstats.un.org/unsd/demographic/meetings/wshops/Turkey/2015/list_of_docs.htm

324. In the case of birth, the Principles and Recommendations for a Vital Statistics System advises the collection of following information⁷⁴:

1. Date of occurrence of birth
2. Date of registration
3. Place of occurrence
4. Place of registration
5. Type of birth (single, twin...)
6. Attendant at birth
7. Name of the new-born
8. Sex of the new-born
9. Weight of the new-born
10. Name of mother
11. Date of birth of mother
12. Marital status of mother
13. Educational attainment of mother
14. Place of usual residence (address) of mother
15. Duration of residence at the current address of mother
16. Place/country of birth of mother
17. Children born alive to mother during her entire lifetime
18. Foetal deaths to mother during her lifetime
19. Date of last previous birth by mother
20. Date of marriage of mother
21. Name of the father
22. Date of birth of father
23. Marital status of father
24. Education attainment of father
25. Place of usual residence (address) of father

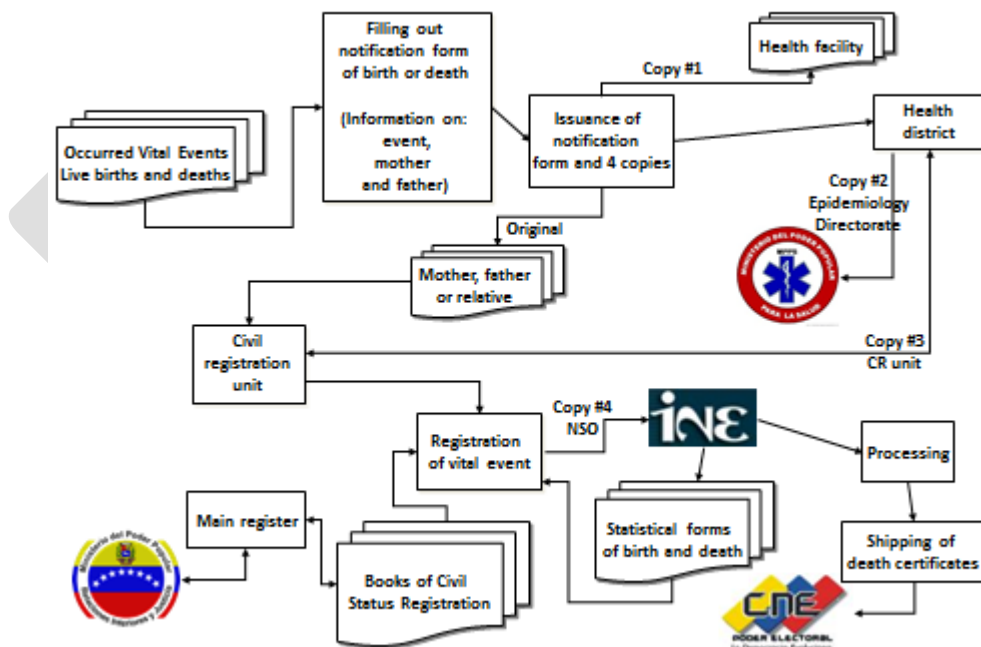
325. In addition to these characteristics – twenty-five pieces of information, as presented - recommended as core topics by the international statistical standards, there would also be other pieces of information that would have to be collected or assigned, such as the unique identifying number of the event that usually consists of the civil division code where the birth occurred, the code for the registration office where it was registered and set of random numbers. Also, in a number of countries, supplementary personal characteristics of the mother and the father may be of particular interest, such as literacy, ethnicity, employment, occupation. Public health concerns may also influence additional sets of information that have to be collected, for example, related to number of prenatal visits by mother and the exact month of pregnancy when prenatal care began. Thus, the list of information items is comprehensive and requires developing procedures and routines that would ensure complete and accurate collection of information.

⁷⁴ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 66.

326. Informants (notifiers) play a critical role in collecting the bulk of information. Consequently, number of countries specifically designate—through the civil registration law—the health institution or its head as responsible for acting as an informant of births, foetal deaths and deaths occurring in the institution. In practice, it is the staff of the health institution that actually collects the information and fills the form. The form, in turn, can be in paper or electronic. In the case of paper form, once filled, it is submitted to the registrar’s office, where verification of the information in the form takes place. The registrar, as an official of the State, has the authority to request identification documents from the parents, and will check whether name, date of birth, address correspond to those in the form. Additionally, the registrar will fill any missing information in the form by directly acquiring it from the parents, thus ensuring completeness of the collected data.

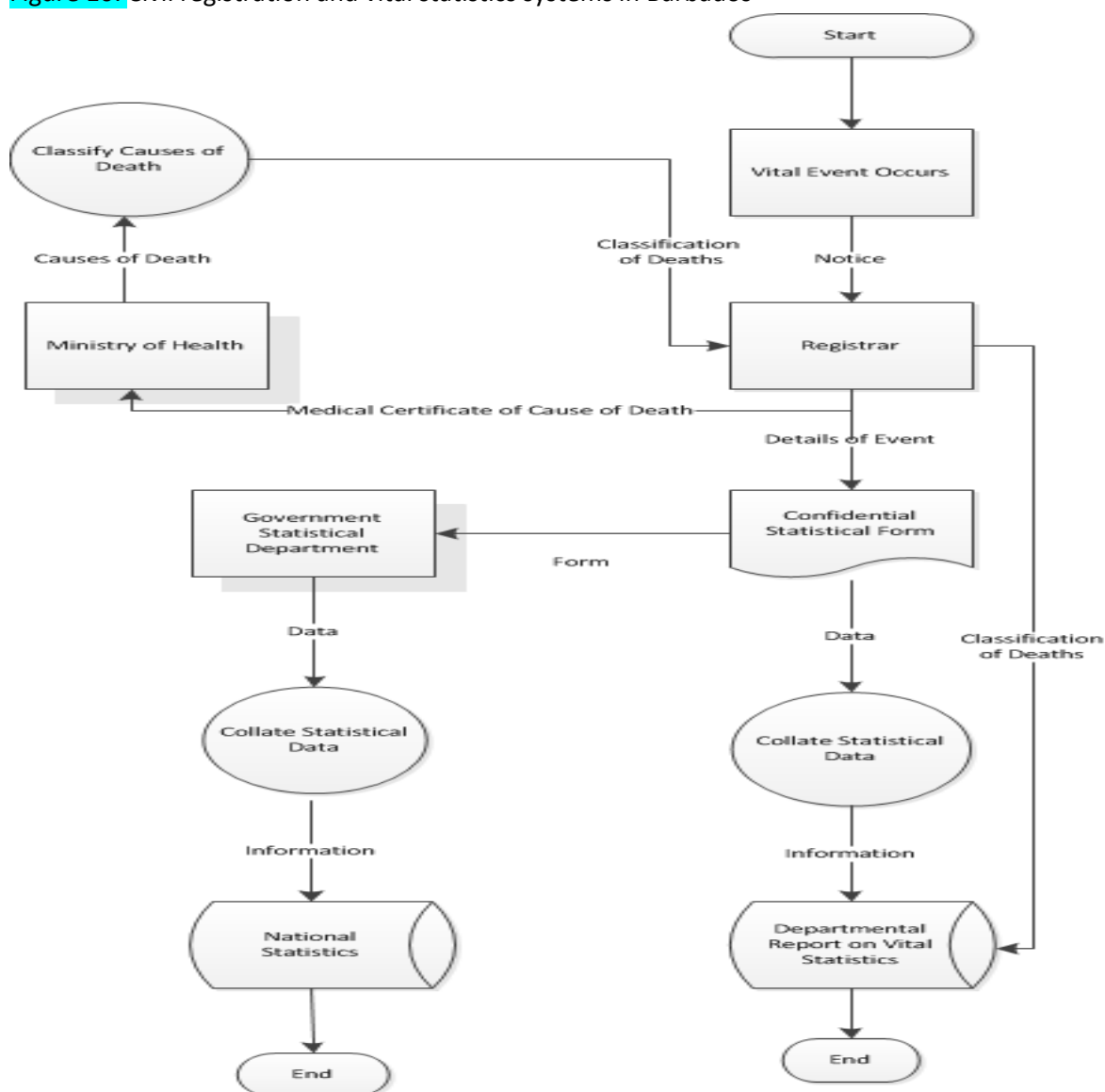
327. The registrar will then make an official entry into the civil register, with all the information required by law and this usually refers to names of parents, name of new-born, addresses, age, marital status, and, depending on the country additional information regarding ethnicity, religion and so forth. Once the official record is entered, the registrar issues a birth certificate to parents, which represents the seed document for the new-born’s identity and provides him/her with the entry ticket for various services such as immunization, health care, education and so forth. Country examples of the birth and death registration process are presented in business process maps, [Figure 9](#) and [Figure 10](#).

[Figure 9](#). Civil registration and vital statistics systems in Venezuela



Source: Workshop on the Principles and Recommendations for a Vital Statistics System, Revision 3, for South American countries, held in Santiago, Chile, 9-12 November 2015⁷⁵

Figure 10. Civil registration and vital statistics systems in Barbados



Source: Workshop on the Principles and Recommendations for a Vital Statistics System, Revision 3, for Caribbean countries, held in Port of Spain, Trinidad and Tobago, 1 - 4 December 2015⁷⁶

328. As for the form (paper or electronic), the registrar is responsible for transmitting it to the statistical component. In practice, the registrar's office will compile all forms for a certain period of time, usually a week, and then forward them as a batch to the regional outpost of the national statistical system. The national statistical system, in most cases, has regional offices that are fully

⁷⁵ All documentation available at: https://unstats.un.org/unsd/demographic/meetings/wshops/Chile/2015/list_of_docs.htm

⁷⁶ All documentation available at: https://unstats.un.org/unsd/demographic/meetings/wshops/trinidad/2015/list_of_docs.htm

equipped to collect and process data from administrative records, surveys and censuses. In the case of forms in paper, the staff of the regional statistical office will then key the information into a computer file, proceed with the coding, run editing procedures and notify back to the registrar's office any discrepancy identified in this process. In the case of electronic form, the data entry is performed by the registrar; however, all the other procedures (coding, editing, etc.) would be administered by the statistical office. Ultimately, digital records for all events will be compiled by the central statistical office, where national totals and tabulations will be produced; this does not prevent regional statistical offices to produce the same tabulations for regional level.

329. Such an arrangement requires an appropriate administrative setup for coordination of activities and for establishing procedures and protocols for ensuring the flow of information and for delivering the responsibilities of each of the two components – an inter-agency coordination committee. As the two key foundations for the reliability of records are completeness and timeliness, achieving these would be the primary focus of the committee that should include participants from all levels of both the civil registration and vital statistics systems, as well as the health sector. This provides an essential insight into the broad and comprehensive use of the information that the registration system provides. This perspective of the system can help focus and direct the agencies involved in obtaining complete, timely and quality data for the registration office. The registration and statistical staff should present and discuss at the committee's sessions the potential use of the data. The committee should address local use for immunization programmes, disease categories and associated illnesses, related health-care needs and services, and available resources. This type of cooperative involvement and information exchange among the various agencies and local registration offices will improve data integration. For more information on coordination mechanisms, see Chapter II, Section C.

330. The inter-agency coordination committee would need to develop and maintain instructions regarding definitions of vital events, coding schemes, generation of the unique identifier, content of the form, statistical definitions of characteristics of the event and the persons involved, training curricula for informants, registrars and statisticians, quality control mechanisms, field visits, procedures for reporting and recording events, content and format of certificates, transmission protocols, content and periodicity of statistical reporting and all other standardized activities as necessary. This committee is the coordinating body for data items and definitions, collection and monitoring, access and utilization, and the legal and administrative functions needed to manage the programmes effectively (see Box 12 in Chapter II for a few case examples on how this type of committee works).

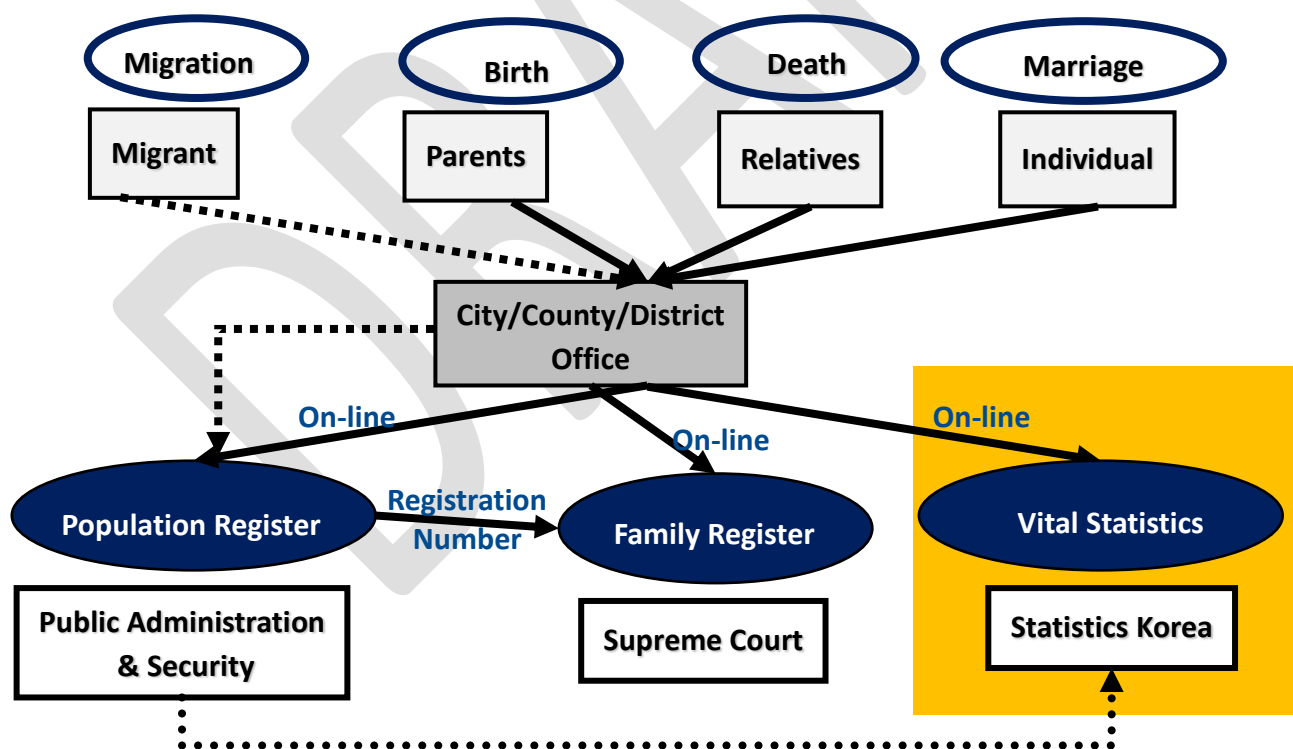
331. In addition, working committees for specialized functions should be considered to maintain the operational aspects of registration and vital statistics. Such working committees can revise the legal framework, conduct education and communication- programmes and enhance the accuracy, completeness and timeliness of civil registration and vital statistics. A sub-committee may focus on the operational aspects of the two programmes. Here, the issue would be the interaction of staff in the processing of records. Each programme requires access to the vital records in order to complete its respective functions. Delays in reporting, errors and reduced staffing within a particular unit involved in the process could influence each programme's activities. To address

these types of issues, the working committee could establish options for conducting specific processing functions, depending on the issue under review.

C. Civil registration, vital statistics and population registers

332. With the introduction of population registers as functioning government mechanisms, the functional, if not administrative, integration of civil registration and vital statistics emerged even more strengthened and standardized in terms of operational activities. Population register, nowadays, is essentially a computerized database with a separate record for each individual in the country. This population register can be a centralized database or it can consist of regional/provincial databases that are inter-linked. Agencies in charge of operating and maintaining a population register differ from one country to another. Quite often it is the responsibility of home affairs and police. In other cases it is under the responsibility of tax authorities. There were cases where it was located in the national statistical office; yet, they were subsequently moved to an agency that has more direct access to the population. See below a graphic example of how this division of labour works in the Republic of Korea.

Figure 11. Civil registration and vital statistics systems in Republic of Korea



Source: Expert Group Meeting on Management and Evaluation of Civil Registration and Vital Statistics Systems, held in UN Headquarters, New York, 20-24 February 2017⁷⁷

⁷⁷ All documentation available at: <https://unstats.un.org/unsd/demographic-social/meetings/2017/new-york-egm-on-management-and-evaluation-of-crvs-systems/>

333. It has to be stressed that the primary function of the population register is to provide reliable information for the administrative purposes of government, particularly for programme planning, budgeting and taxation. The registers are also useful in other administrative areas, such as establishing personal identification, voting, education and military service, social insurance and welfare, and for police and court reference.⁷⁸

334. In practice, population registers nowadays rely on robust computer structure designed to meet their essential uses as presented above. They are designed specifically neither for civil registration purpose, nor for the production of vital statistics; hence, their use for these functions requires adaptations for all of the mechanisms involved.

335. From the side of the population register, the first step is ensuring that all the definitions used are identical with those used in both the civil registration and statistical components. This requirement will necessitate harmonization that might not be always straightforward. For example, the population register definition of a resident may require that a certain period of time is spent in the country for a person to be entered in the register, for example three months. In the case of a new-born who died after a few weeks, then, this requirement would not be met which, in turn, requires developing particular protocols to address such occurrences.

336. In this model, the process is very similar with the one presented in the previous sub-section. Informants fill the form, in either electronic or paper format, containing all the required characteristics (see above, [para 324](#)) and submits it to the registrar. The registrar verifies the information, assigns the personal identification number (PIN) that will follow the new-born throughout his/her life, issues the birth certificate and makes an entry in the population register. Making the entry in the population register can be done online or uploaded in batches, depending on the actual computer infrastructure designed to hold and maintain the population register.

337. The content of a specific population register varies from country to country. It certainly would always contain the names of a person and her/his parents, date and place of birth, address, personal identification number (PIN) and the unique civil registration record identifier.

338. In fact, it has to be outlined that a population register needs to be organized as a set of databases that are linked by a unique identifier, ideally the personal identification number (PIN). Thus, there would be a master database containing all the PINs. There would be another database with names, addresses, place and date of birth. Another would contain the characteristics of the event, in this case birth, including the unique civil registration record identifier, and this database would double as civil register that would allow for amendments such as adoption and recognition. Yet another should contain other characteristics, including those relevant for the production of vital statistics. Another would contain the causes of deaths. Each database is indexed using PIN's, allowing for extraction of short or longer information, as needed.

⁷⁸ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 455.

339. In this setup, the national statistical office would be authorized to access the population register for extracting records and variables necessary for production of regular and accurate vital statistics⁷⁹. The frequency of accessing and the content of the extraction ideally should be spelled out either in the law governing population register or in the law on statistics or related regulations. In principle, the statistical component does not need to have access to all the information in the population register, such as names, for example. However, it is necessary that there is unique identifier made available to statisticians, as in the processing, editing and aggregating records errors and inconsistencies can be identified and then reported back to the institution responsible for maintaining population registers. See **Box 2** in **Chapter I** and **Box 15** below for details on how the population register functions in Norway.

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⁷⁹ See *Register-based statistics in the Nordic countries*, United Nations publication sales number E.07.II.E.11 (2007), Geneva, available from <https://unstats.un.org/unsd/dnss/docViewer.aspx?docID=2764>

Box 15

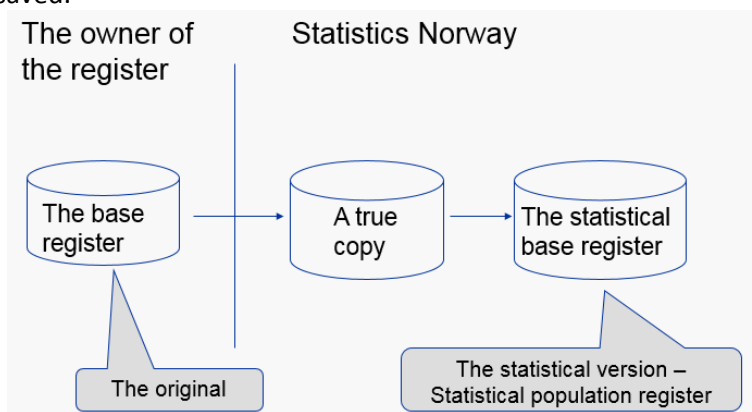
Norway. Administrative and statistical databases/registers

The Norwegian Tax Administration (NTA) has been hosting and running the Central Population Register (CPR) since 1991, when it was transferred from Statistics Norway. The original integration was carried out by Statistics Norway who linked different registers together to create a statistical population register; this included establishing a common set of definitions. Statistics Norway receives updates on vital events and other changes in the register every night, five days a week. This routine has been established because many users of the population register need daily updates for administrative purposes. Since it is available, Statistics Norway decided to follow the same updating routine.

Every morning, Statistics Norway staff verify the updates received. If there are errors, the NTA is contacted and issues are solved. In some cases there are errors in the transfer, in other cases there are errors in the actual records. The Statistics Norway verification therefore works as an important quality check of the official records.

The figure below shows the relationship between the administrative and statistical population registers. Statistics Norway maintains two versions of the population register:

- a true copy of the administrative register,
- a separate statistical population register (SPR) where internal adjustments and amendments are made and saved.



The key reason for this approach is that the administrative register is incomplete and may include errors and other shortcomings, such as missing data. Statistics Norway has access to many other administrative data sources and can link them to the copy of the CPR to check for possible errors. Some of this information cannot be shared with the NTA for confidentiality reasons, but nevertheless has an impact on the quality of the statistics produced. The information is therefore used to modify the records in the SPR only. With these quality improvements, the SPR is a better source for statistics production in most cases.

There have been few, if any, changes to the system since 1991, but now the population register is about to be modernized. The user forum, which includes a broad set of public and private stakeholders, is involved in the work and provides feedback to any changes. For statistical purposes, the Statistics Act ensures participation of Statistics Norway in this process.

340. Integrating civil registration, population registers and production of vital statistics results in a dynamic mechanism that is updated in a daily basis, with routine operations encompassing all three components, from issuance of birth, death, marriage certificates, to the manipulation of individual information for administrative purposes and generating regular and timely vital statistics. It also has a significant impact on reducing the costs of all three functions in the long run; albeit savings would be reflected in the short time as well. From the point of view of service delivery, such a mechanism allows individuals much faster and complete access to various documents necessary for the contemporary environment.

341. The linkage of the population register with the civil registration system allows the reconstruction of the history of life events of individuals. Whether the date of the events is properly recorded, this high level of detail can be used also for estimation both of the duration of a demographic state (e.g., duration of the state of “married” or of “parity one”, etc.) and of the related probabilities of transition, as well as for longitudinal studies. Further, it may allow the definition of specific geographical aggregates of interest, such as population living in the coastal areas, or in particular disadvantaged localities, whose boundaries do not necessarily conform to the administrative boundaries.^{80 81}

342. Confidentiality of individual information is of paramount concern and one of the basic principles for all three components: the civil registration, population register and vital statistics. Thus, strict and unambiguous procedures and rules regarding ensuring the confidentiality and protecting the privacy of the information contained in the population register have to be part and parcel in the law regulating the use and maintenance of population registers. This law should also describe punishments accorded to government officials who fail to protect confidentiality or unduly disclose private information.

343. In conclusion, making the civil registration system a vital component of a computerized population register would offer the most appropriate and advanced means of generating relevant, accurate, timely and comprehensive vital statistics. While building such a system would be resource-intensive at first, the dividends would extend over a prolonged period of time.⁸²

D. Civil registration, vital statistics and identity management

344. In principle, identity is a concept of oneself. As such, identity can have numerous dimensions, or layers, such as cultural, ethnic, religious and these can evolve and change over time. However, in the context of modern societies and their functioning, it is the individual’s legal identity that counts, as it provides access to services, exercise of rights and entry in the legal framework. Thus, in this context, identity would refer to the one established by issuing a birth

⁸⁰ The other outstanding advantages of this model refers to a wealth of longitudinal information critical for researching and understanding population dynamics and structure, migration and a number of other phenomena; these are not elaborated here as the focus of this chapter is on the operational structure.

⁸¹ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 479.

⁸² *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 484.

certificate, with the name, date and place of birth, names of parents of a new-born that is official certification of the occurrence of the event and the persons involved, and is retired upon the issuance of the death certificate of that person (by flagging it or changing its status from “living” to “deceased”).

345. As presented in the documentation collected for the purpose of monitoring the state of the art of civil registration and vital statistics worldwide⁸³, the number of individuals without the basic birth certificate is considerable as a consequence of lack of civil registration functions or incomplete coverage in their respective countries. As mentioned previously, it is important to highlight the quality of universal in relation to the people’s right towards the registration of vital facts. Established in the 1948 Declaration of Human Rights and supported through other global accords, every person has the right to an identity as bestowed through civil registration. In this regard, laws, policies, rules and regulations must not be a hindrance to the realisation of this right. In particular, the registration of events must be performed even if the time frame given by law has elapsed, and regardless of migratory status, and any other request that may act as an obstacle to registering the vital facts occurred in the territory.

346. Governing without comprehensive understanding of the size and structure of the population and without assurance that the services are delivered to the people they were intended to, forced many countries to pay full attention to issuing identity documents to all. In addition, sharing of resident information enables the provision of joint services from multiple government agencies and a reduction in the time spent reviewing and verifying identity and resident information. The information-sharing systems help the government enhance its capacity to meet citizens’ needs with targeted solutions.⁸⁴ That, in turn, resulted in instituting a special government agency that would be tasked with issuing each individual identity documents with unique identifiers, such as photograph, fingerprints and other biometric characteristics.

347. Civil registration, that is, recording of vital events of individuals and ascertaining their occurrence by issuing certificates, is a basis for legal/civil identification of individuals. Thus the most pressing first steps that those identity management agencies undertake is to integrate the civil registration function in the work of the agency. In doing so, the civil registration function operations are not exposed to any significant and substantive change; the submission from the informant to the registrar remains as before, as well as official certification and issuing a certificate. In this model, the identity management agency becomes the custodian of the population register as described in subsection b) above.

348. While the integration of civil registration and identity management functions was implemented in a more or less straight forward and uncomplicated manner, the incorporation of the vital statistics component is subject to a more difficult process. Part of the reason can be found in the fact that the national statistical system, of which vital statistics is a part of, is administered

⁸³ Please see UNSD’s http://unstats.un.org/unsd/demographic/CRVS/CR_coverage.htm.

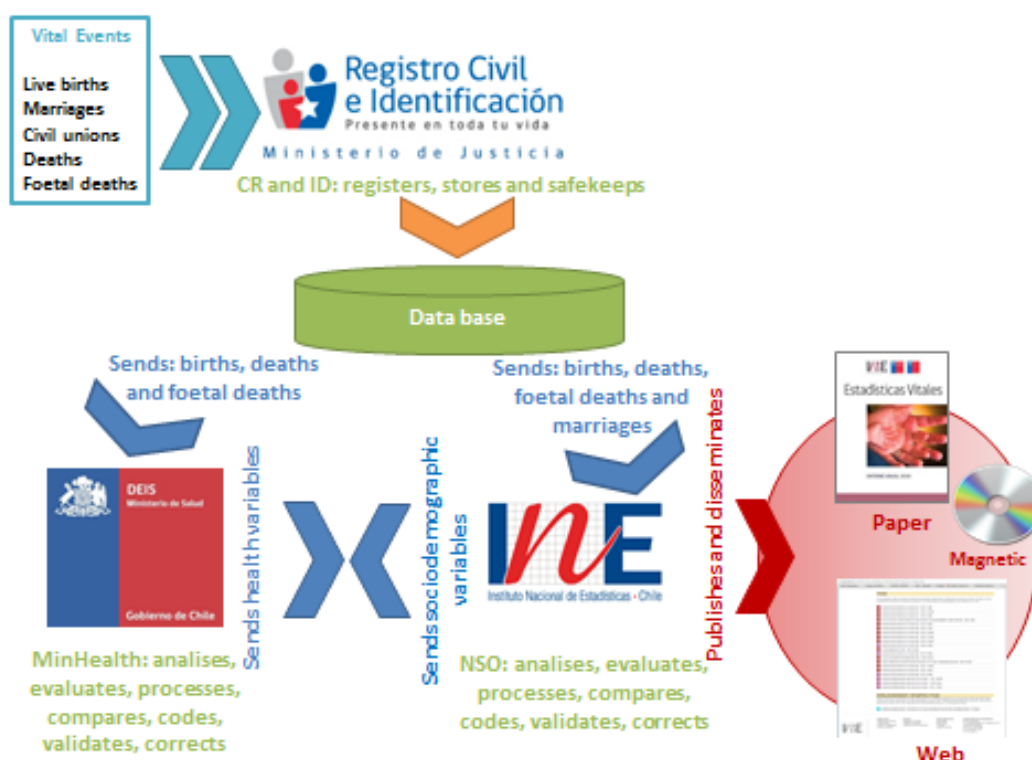
⁸⁴ Proceedings of the International Identity Management Conference, Seoul, Republic of Korea, 23-25 September 2014, as presented at: https://publications.iadb.org/bitstream/handle/11319/7125/International_Identity_Management_Conference_Proceedings.pdf?sequence=4

by the national statistical office – an institution in long existence and specific role in the government structure. For a set of different reasons, mainly the incomplete coverage of civil registration, the national statistical office, relied on other sources of data to generate vital statistics indicators. On the part of the identity management agency, generating vital statistics was not a priority – rather, all efforts were made to use contemporary technology to issue biometric identity cards to every individual, with a focus on national security and law enforcement.

349. Integrating the vital statistics function in this model, in a holistic and routine manner, is *sine qua non* of making the system efficient and wholesome. As described above, the informants and notifiers should be trained and equipped to collect all the characteristics as per international standards, the registrar has to verify and certify the content and ensure the entry in the population register databases. The central statistics office has to adjust and develop routine procedures for extracting data from the identity management system and/or the civil registration database in order to generating complete, accurate, reliable and regular small area vital statistics. As this model is now implemented and functioning in an increasing number of countries, the benefits to the population it serves, the easy availability of identification documents that allow access to different services, as well as enabling the government the precise developing of the types of social services for their respective jurisdictions, clearly and unambiguously indicate the appropriateness and efficiency of this paradigm.

350. Care must be taken not to lose the distinct components of the system in equal standing, i.e. civil registration is the building block that must continuously feed information on vital events on the one hand to the identity management system for it to maintain its relevance, and on the other hand to the statistics office in order to produce tabulations, rates, ratios and other figures that guide policy formulation. These components ought to provide feedback amongst each other in a virtuous circle of improvement. See below a graphic example of the division of labour under this paradigm. This process map is part of the works of a series of regional workshops on applying Principles and Recommendations for a Vital Statistics System, Rev. 3 held by the United Nations Statistics Division in partnership with relevant regional stakeholders.

Figure 12. Civil registration and vital statistics systems in Chile



Source: Workshop on the Principles and Recommendations for a Vital Statistics System, Revision 3, for South American countries, held in Santiago, Chile, 9-12 November 2015⁸⁵

351. Other advantages of a unified system is that it is conducive to smoother registration procedures, makes the system more cost efficient and is more accessible to the public. When looking at ways of streamlining processes, cutting red tape and improving services, countries must seek opportunities for collaboration among agencies and with all levels of government. This is the case of service bundling, often with civil registration at its core. **Box 16** below presents an example of this practice in Canada, which takes advantage of a seamless integration of identity management, civil registration and vital statistics. Another example of this integration effort is presented in **Box 17**, with the case of Uzbekistan.

⁸⁵ All documentation available at: https://unstats.un.org/unsd/demographic/meetings/wshops/Chile/2015/list_of_docs.htm

Box 16

Canada. Service bundling and integration

Service bundling enables various federal and provincial departments to improve service to clients by delivering programmes without developing completely separate systems for each programme. For example, when a parent fills out a birth registration form, they can indicate whether or not they would like to apply for a social insurance number for the newborn and for federal benefit programmes to which they may be entitled. This information is captured by the provincial register as part of their registration process and the automatically distributed to the appropriate federal government department through the National Routing System (NRS). This integrated service motivates early birth registration and has proven popular with parents as they only have to provide the information once in order to register their child's birth and access key federal services.

Service Canada also uses the NRS to validate birth certificate information submitted in support of a social insurance number application. This reduces the potential for fraud as the information that is on the birth certificate must match the information in the provincial civil registers. Federal departments enjoy cost savings and are assured of the integrity of the information as it is provided directly by the provincial issuing authority.

The Canada Revenue Agency and Service Canada also receive timely death notifications through the NRS. Both organisations rely upon this data for the integrity of their programmes. For Canada Revenue Agency, these data help to reduce overpayment of benefits. Similarly, for Service Canada, the integrity of the data that are maintained in the Social Insurance Register is enhanced to reduce overpayment by programmes that rely upon this information, such as the Canada Pension Plan. Receipt of death data also provides a springboard for survivor benefits.

Box 17

Uzbekistan. Electronic Archive of the Registry Office

Starting January 2014, the Unified Electronic Archive of the Registry Office system was introduced. The registry office bodies at subnational level furnish information on civil status (e.g. birth, marriage, divorce, death) to the State Personalization Center, under the central Government, which subsequently assigns a personal (ID) code.

Passports and other documents of citizens of the Republic of Uzbekistan should include such identification number, according to national legal framework and international standards of the International Civil Aviation Organization (ICAO) for machine readable documents.

In order to ensure accuracy of the entered data, the State Personalization Center provides access to the database of biometric passports. The registry office bodies can instantly verify information and fill forms with the data about persons using this mechanism.

In parallel, birth and death registration information is also provided to statistics bodies at subnational level.

Finally, death registration information is relayed the Pension Fund under the Ministry of Finance for the purpose of excluding the deceased persons from the list of pension beneficiaries.

352. Many countries⁸⁶ have integrated their civil registration, vital statistics and identity management systems. An important advantage of this model is that it makes it easier to assign a PIN at birth, rather than when a person has reached certain age in order to obtain an ID card (usually at age 15, 16 or 18). Late assignment of PINs makes it harder to capture children who die before the threshold age, and to link their deaths to other data sources, such as the population register. Introduction of a PIN at birth will increase registration coverage of infant deaths and improve estimates of infant mortality.

⁸⁶ Examples include the Nordic countries, Botswana, Bhutan, Mongolia among others.

VI. Application and utilization of civil registration and vital statistics information

A. Introduction

353. The topics covered in the present chapter are concerned with the use and application of civil registration information and records, and vital statistics and data, including total counts, tabulations, rates, ratios and microdata. In particular, a distinction is made between the use within each system (registration and statistics, respectively), and use for applications outside the system. External applications of civil registration information and vital statistics include data sharing with both public and private entities; thus a heightened importance must be placed on confidentiality issues.

354. As mentioned in previous chapters, vital statistics and civil registration are separate entities, but it is crucial that they be established, maintained and exploited as components of a coordinated and coherent system for registering and producing vital statistics. In addition, the emergence of the interconnectedness between civil registration and identity management systems adds yet one more dimension to the structure of the civil registration and vital statistics system. A graphic representation of these relationships and functioning is presented in figure 1 (Chapter 1). Civil registration is defined as the **continuous/permanent, compulsory, universal** recording of the occurrence and characteristics of vital events pertaining to the population, as provided through decree or regulation in accordance with the legal requirements in each country. It is important to highlight the quality of universal in relation to the people's right towards the registration of vital facts; in this regard, laws, policies, rules and regulations must not be a hindrance to the realisation of this right. In particular, the registration of events must be performed even if the time frame given by law has elapsed, and regardless of migratory status, and any other request that may act as an obstacle to registering the vital facts occurred in the territory. Civil registration is carried out primarily for the purpose of establishing the documents provided for by law. The usefulness of these records as the best source of vital statistics is well established. The procedures for recording vital events are equally important for civil registration in legal terms and for vital statistics in the context of source of statistics; hence, the work of civil registrars and that of statisticians are interdependent.⁸⁷

B. Application of civil registration information

355. The information collected through the civil registration system can be used to assess performance, support managerial decision-making and management structure development, and organize operational work flow among different programme functions. Each of these activities can obtain relevant information from the programme in either a centralized or decentralized system.

⁸⁷ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 274.

1. Applications within the registration system

356. The use of registration information in the three areas described in the present section relate to intra-agency applications, either within the registration programme or outside the programme but within the agency. Information can be descriptive or qualitative, or may consist of frequency counts of vital events reported and registered. Such issues as the completeness, quality and reliability of information are critical to their use. Where there are concerns regarding these issues, steps should be taken resolve them.

I. Assessment of civil registration performance

357. There are a number of activities in the registration programme to establish performance standards. These relate primarily to services provided to the public but may include internal programmatic activities as well. With respect to public services, the availability of the information for issuing certified copies of records, the process for amending records, the time period required to provide these services, the waiting time in the civil registration office, and how many times a user has to go back to the registration office in order to have a request fulfilled, are essential measures of performance.

358. Other public services that reflect performance include making changes to records, maintaining the proper documentation for changes that are made, and following legal standards in making the modifications. Ability to complete, document and record the legal basis for making changes to records is a measure of performance. As described in earlier chapters of the Handbook, changes for adoptions, legitimation, paternity issues and such items as name, date of birth and residence all require documentation, court orders or other administrative approvals. Such documentation should be retained in case questions arise at a future date. The record itself should contain proper citations of the legal basis for the changes to the record. The civil registration programme is considered to be at a satisfactory performance level when each of these elements is in place as an integral and routine part of the registration services provided to the public, both centrally and at the local registration offices.

359. Some internal registration activities also benefit from the information contained in registration files. The completeness, accuracy and reliability of the information reflect on the performance of the programme units responsible for these components. Deficiencies in these areas can jeopardize the results for other registration activities. In the case of an adoption the original birth record must be registered and the information regarding the biological parents must be accurate and complete. Performance here affects not only the adoptee and adopting parents but also the adoption unit in the registration programme. The performance of the unit would be rated harshly in the case of misplaced, inaccurate or incomplete information.

360. The number of double registrations must be kept to a minimum. A central database containing all registrations of vital events in the country, or a number of linked databases is an

effective means of preventing double registrations (intentional or by mistake). One of the most common uses of civil registration records for assessing performance is matching (infant) deaths to its corresponding birth registration. This has a twofold objective, evaluating completeness of birth registration and marking or flagging the birth record in order to prevent fraudulent use of it.⁸⁸ Other internal activities on which civil registration performance will be rated include the vital events index registers, which affect the capability to search for and retrieve records; record matching for purposes of incorporating amendments and corrections to the original records; and the verification of registered events for legal or administrative purposes. The latter are services provided to other programmes or agencies that may receive requests for health, social or economic benefits. The ability to provide such services is a measure of the quality of the performance of units within the registration programme.

361. Public service functions are primary objectives. The extent of accomplishment of those objectives yields performance indicators of the registration programme. Periodic user satisfaction surveys are a key tool for assessing registration performance, and an excellent source of information on user needs and expectations.

II. Management decision-making and structure

362. The information from registered vital events can support administrative decision making and policy and planning activities within the agency responsible for the registration programme, at national, subnational and local levels. Registration data provide insight about the sources of reporting and possible need for training or other resources. Significant increases in vital events may require a redistribution of staff resources, funding support or the establishment of additional local registration sites. Proposals for legal or procedural changes in registration functions can be initiated through the administrative process. These proposals are based on information received with respect to changes of vital events reporting, changes to reporting period between the occurrence of a specific vital event and the date of registration, or changes in definitions of events or supporting documentation for modifications of records.

363. Outside the registration programme, registration information from local offices can be used for administrative policy and planning at the local level. It can be used to plan with respect to health care needs and resources for specific health facilities, geographic areas or population sub-groups. Administrative decisions in the conduct of such programmes as maternal and child health, family planning, adolescent health, and acute and chronic diseases draw on the registration information to assess the current impact of existing programmes. It can also signal the need for development of new programmes.

364. The requirements for managing an effective registration programme are based, in part, on the information from the programme itself. Administrative decisions determine priority service areas and functions. These priorities in turn require a management structure for performing programme activities to accomplish them. The internal programme structure is heavily dependent

⁸⁸ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, paragraphs 580-582.

on management approaches in addressing specific functions and activities. Each of these functions and activities is identified, along with staff, equipment, resources and relationships with other programmes. When legal changes cause delayed registration or large increases in requests for registration services, or new programmes for public service benefits are implemented that require additional registration documentation the organizational and management structure are seriously affected. Advance information from the registration units responsible for these activities can prepare management to arrange and structure necessary resources to meet these needs.

365. Relationships with other programmes within the agency, but outside the registration programme also have significant implications for management. In order to provide information to these programmes, the types of data and the information network required to support them are the responsibility of management. Drawing on the information from the registration programme relevant to the specific programmes and activities being addressed provides the proper structure for managing data and information requests. Such programmes would benefit from information on vital events registered by type of event, location, volume, reporting source and health care providers. Access to this information from programmes outside the registration system requires a well-managed and well-organized internal structure that can direct the proper resources to meet these needs.

III. Operational workflow

366. Daily registration operational activities rely on information related to record volumes, number of requests for registration services, coding, data entry, validation, record changes and updates. To assign appropriate resources to conduct these activities in an effective and timely manner, information from the different organisational units is essential. The number of records received by type and the processing needed before the records can be shared with other registration units set the framework for all other activities. The initial review, logging, recording and entering of the records is followed by the distribution to other units for their use. The type of record, birth, death, foetal death, marriage or divorce determines the time period required for each unit to complete its function, since the volume and number of data elements contained on the records differ. This affects work flow. Fewer data items require less time for coding or data entry and validation. Birth records, for example, require a greater amount of processing and services than foetal death records. Each of these characteristics helps set the workflow structure among the units.

367. When a well-organized record management system among different units is in place, the information from the system defines the type of records to be processed by which units for a specific time period. The work flow and the processing methods for birth records, for example, determine how soon these records will be available for adoption, legitimation and paternity modifications. The priority level for these areas determines the resource allocation to the initial birth record processing activities. High priority would require more resources to ensure that birth records are available on a timely basis. Low priority would imply that other records, such as deaths, would receive more processing resources. The major factor setting the operational structure to meet established priority needs is the information coming from the registration programme. Without the use of this information, the capability to establish an efficient and

productive programme is minimized. The impact is not limited to the registration programme. It also affects the other programmes in the agency that rely on these records for their activities and functions.

2. Inter-agency applications of civil registration information

368. The extent to which information collected through the civil registration system can serve other government agencies, professional organizations and voluntary health or social groups depends on the data items that vital record and statistical forms contain. Prior determination about the anticipated use of registration information sets the baseline; several of the major areas that rely on registration information are identity management and population registers, health and social services, selected health oriented registers, electoral rolls, passport/visa and citizenship services, and certain legal functions. See Figure 1 and Figure 2 (Chapter I) for a graphic illustration of inter-agency interaction. The objective of the national coordination committee is to study particular challenges, make decisions and take actions to facilitate the use of civil registration information among agencies.

I. Identity management and population registers

369. Building a holistic system that encompasses civil registration, population registers, identity management and vital statistics was elaborated and presented in detail in Chapter V above. The main focus of the present discussion is on essential principles and generic guidelines that should be implemented in building, maintaining and operating this system.

370. In the paradigm of civil registration, population registers, identity management and vital statistics system, **interoperability** needs to be incorporated from the very beginning. Interoperability refers to the capacity of the system to develop interfaces that fully communicate among themselves in the process of operating the system. Civil registration is the building block that must continuously feed information on vital events on the one hand to the identity management system for it to maintain its relevance, and on the other hand to the statistics office in order to produce vital statistics that guide policy formulation. Within the identity management system, a major use of civil registration information relates to issuing passports; see **Box 18** below an example of this interaction.

Box 18

Canada. Civil registration and passport issuance

Passports are issued by the federal government through Passport Canada. In 2011, Passport Canada attended the Annual General Meeting of the Vital Statistics Council for Canada in order to consult the council on proposed changes under consideration for passport issuance. To enhance the security and integrity of Canadian travel documents, Passport Canada suggested limiting what constitutes acceptable proof of citizenship for a general passport application to a copy of the birth certificate issued by a provincial or territorial registrar or a certificate of citizenship. The proposed changes would significantly impact upon the civil registrars given that a substantial number of citizens would now require a copy of their birth certificate in order to apply for a passport.

The Passport Canada presentation highlighted the changes under consideration and registrars were able to provide feedback during the meeting. Passport Canada was then able to incorporate the feedback and forward a discussion paper to the registrars for more formal input. Additional discussions were held with individual jurisdictions to allow for differences in provincial/territorial legislation. One of the main findings was the need for outreach materials for vital registrars to explain the changes to Canadians.

Negotiations between Passport Canada and registrars ensued on the appropriate timing for implementation of the proposed changes. A communications strategy and accompanying outreach materials (press release, posters, etc.) were developed collaboratively. Ultimately, the initiative was successful and there were no significant issues with such substantial changes across thirteen individual jurisdictions.

371. In the case of the civil registration and identity management, interoperability refers to the ability of different registers and databases to communicate with each other, on the basis of a unique identifier, definitions and classifications, subject to restrictions in terms of security and legal protection of confidentiality and privacy of information. These restrictions must be balanced with international agreements about data sharing, particularly where data sharing between agencies may be required to monitor disease outbreaks, which, in the case of certain diseases, ought to be notified to the WHO, according to the International Health Regulations (IHR). For example death notification data received by civil registration or a health agency may be critical to discover, monitor and address a disease outbreak. The inter-agency coordination committee is well placed to study particular challenges and make decisions to facilitate interoperability among agencies.

372. **Universality** of the coverage of civil registration is one of the essential principles as defined in the international standards⁸⁹, and is directly related to the ability to make use of the civil

⁸⁹ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 296.

registration information. It refers to the universal coverage of the occurrence of vital events in the country, irrespective of characteristics of the event and persons involved, such as sex, age, nationality, ethnicity, physical ability, income, legal or migratory status and so forth. The registration and issuance of certificates must be free from any kind of discrimination and truly universal throughout the country, in line with universality of the right of people to be part of the system. Consequently, the same principles must guide the establishment and development of population registers and identity management, so that identity documents are available for the lifetime of each individual in the country, thus enabling access to services in the contemporary societies.

373. Hand in hand with universality is the necessity of making registration of vital events and persons involved **compulsory**⁹⁰. Civil registration is a right, but also a duty, regardless of migration status, nationality and any other characteristic. A country's civil registration system must be compulsory in order to assure its smooth operation and effectiveness. While it is necessary for every country to establish and maintain a law on registration, it must be noted that the existence of such a law is not a sufficient condition for ensuring that the general public reports the occurrence of vital events. Registration as compulsory has to be linked, in addition to the issuance of the first certificate free of charge, to the imposition of some form of penalty on those who fail to comply with registration law, i.e., failure to register the occurrence of a vital event should be punishable by law. Since penalties for failure to comply with registration laws may not always be invoked and penalties may also be a deterrent to registration, it is imperative that there be a legal basis for prosecution to ensure that general compliance with the registration law is practised. Thus, a legal framework for civil registration is fundamental to its sound operation as a coherent, coordinated and technically sound system.

374. In spite of the existing provisions for penalties in a number of countries in cases of non-compliance, the level of completeness of registration remains low. The most important reason for such non-compliance has to do with the lack of incentives for registration. Incentives must be established not only to stimulate but also to encourage compliance with the compulsory registration law. Besides the privileges and rights that are to be enjoyed upon proof of registration, national registration systems, within their own respective sociocultural environments, should offer other incentives which are of practical use, especially at the individual level. Examples of incentives include in-kind goods for new-born care, household goods, as well as cash stipends for health care or burial expenses, among other measures. Some countries owe their high levels of completeness to the existence of a unique identifier for individuals, or personal identification number (PIN), which is the key for the provision of a range of services, both public and private and also enables interoperability.

375. There are no standards for the type of PIN to be used; most European countries use individual information for the first part of the PIN together with a second part comprised by random digits; other countries assign random, sequential or consecutive numbers; others use a combination of letters and digits. There are two important factors to consider regarding the type of PIN to be used: one is security and protection of data; PINs should be difficult to crack; and

⁹⁰ Ibid, para 294.

second, the structure of the PIN must allow for perennial generation of new PINs for new members of the population (i.e. so that the pool of available numbers is not exhausted). See **Box 19** for details on how the PIN is implemented in Chile.

Box 19

Chile. The personal identification number

Since 1942, the functions of civil registration and identity management are integrated in a single government agency. Every individual is assigned a unique identifier (PIN) at the moment of birth registration, or at the moment of immigration registration. This identifier is comprised by a consecutive number given in a sequential order, plus a verifier digit (zero to nine, or the letter K) generated by an algorithm. Individuals carry this number for a lifetime in order to identify themselves in all interactions both with the State and with private entities. Consequently, birth registration plays a fundamental role because it is the gateway to inclusion in the network of subsidies, benefits and health care, both in the public and private spheres. In turn, population are highly motivated to comply with birth registration at their earliest convenience and no penalties for late and delayed birth registration are necessary. It is estimated that only 0.5% of the total births are not registered, and that only 0.5% of population do not have a PIN.

Chile is a centralised State, as such; all public agencies have nationwide authority. The civil registration system and the identity management system are integrated into one agency; the corresponding databases are linked through the PIN. The implementation of the PIN has allowed efficient focalization and control of resources that are linked to social security, health, education and other social services.

Addresses and change of residence are not registered, but every time an individual renews their identity card or passport, they are given the opportunity to provide an address for electoral purposes. Thus, interoperability is established between the electoral authority and the civil registration and identification authority, which serves as the main data supplier when an election takes place.

376. The compulsory dimension needs to be maintained throughout the system of civil registration, population registers and identity management. In practice, this refers to the fact that changes in the civil status or physical location of individuals have to be reported and recorded in the population register and this obligation needs to be stipulated in the relevant legislation. Changes of addresses, in particular, have a substantial importance for a number of reasons, for example, voting lists, and thus have to be reported to the agency that maintains the population register.

377. In the case of identity management, the compulsoriness refers to the fact that acquiring and carrying an identity document has to be mandatory to all individuals in the country. While spelled in the appropriate legislation, it also can be easily enforced by denying services to individuals without the proper identity document – a very strong and unambiguous incentive for all to comply with this requirement.

378. The **continuity and permanence**, another of the basic principles spelled in the international standards, of the registration method require the existence of an agency of sufficient administrative stability whose operation is not limited by the factor of time. Permanence is contingent upon the authority given to the civil registration administration through enactment of a civil registration law. Permanence of the system is a requirement for the continuity of registration and vital statistics data, which is necessary for a meaningful understanding of both current figures as well as trends in vital statistics measures.⁹¹ This is true for the functioning of population registers and identity management as well.

379. **Confidentiality** is yet another major principle spelled out in the international standards.⁹² Namely, through the civil registration method, a variety of information is collected about individuals within the population. While all of the information collected has importance, some data, when identified and linked to a specific individual, may be highly personal and sensitive. In order to promote the provision of full and honest data to the system, which directly impacts the ability to use civil registration information, confidentiality must be protected, i.e., those who provide information must rest assured that it will be used only for the purposes prescribed by law and/or in aggregated form so that individuals are not publicly identifiable.

380. If an agency other than the civil registration authority is responsible for producing vital statistics, such as the national statistical office, this agency should be given access to micro data, i.e. individual level information from the civil registration system. This greatly improves the possibilities of assessing the data quality, including detection of errors, and producing good quality vital statistics. In every case, the national statistics office must guarantee the same or higher level of security is maintained as at the civil registration authority, and that confidentiality is strictly safeguarded. In addition, the formulation of a data protection act and the establishment of a data protection government agency may be helpful to enforce confidentiality and security of individual data, as well as prevention of misuse⁹³.

381. In today's circumstances, compromising the confidentiality of individual data can occur through many different channels, such as breaking into on-line databases or selling them for profit to on-line retailers, for example. These facts exacerbate the importance of assuring the population that the confidentiality of individual information provided to civil registration, population registers and identity management is of paramount concern and that access to such information is strictly underpinned by law and regulations. It also requires developing as robust as possible safeguards that prevent intrusion into the registers; in turn, this demands continuous follow-up on technological development in the field of digital security systems.

⁹¹ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 297.

⁹² *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 298-299.

⁹³ Sweden and Norway have such data protection agencies, The Swedish Data Protection Authority (<http://www.datainspektionen.se/in-english/>) and The Norwegian Data Protection Authority (<https://www.datatilsynet.no/English/>)

382. In practice, a series of routines (physical and electronic) must be established in order to protect information. For example, employees must sign, together with their work contract, that no confidential data will be shared, and that they will be subject to legal prosecution if this is violated. Designating and equipping a zone to securely store data is paramount, as is designating labs where confidential data can be accessed but there is no internet or email connection. If data are moved from the labs to a work zone where there is email and internet, this movement must be registered. So must be the attachment of data files to email messages. This means that a log must be maintained on who accesses, changes and extracts records, in order to be able to track activity. Access to confidential data must be limited to those who need it for work purposes.

383. **Costs** involved with the registration of vital events and issuance of certificates and identity cards have to be set in such a manner to encourage the registration and subsequent issuance of documents. International standards⁹⁴ recommend that when registration of a birth, marriage, divorce, foetal death or death occurs within the time period prescribed by registration law, no fee be charged. In addition, issuance of the first certificate should be provided to the public at no cost. Fees charged should be related to the purpose of issuance, for example, of certified copies of vital records and replacement of identity cards. Fees, reasonable and proportional to the additional work necessary, may apply in cases of delayed registration of vital events as provided in registration legislation. For individuals, fees may be related to the extent of the delay or to the nature of the information, e.g., name changes, legitimations, adoptions and the establishment of filiation. Minor corrections due to clerical errors discovered at the time of registration, burial or cremation should be permitted free of charge.

384. Instruments for holding the system **accountable** have to be put in place as well. Accountability of the system and its operators increases the confidence of the population that it serves their needs and augments the likelihood of, for example, proper and prompt reporting of the occurrence of vital events and the characteristics of persons involved, timely registering changes of addresses in the population registers and acquiring identity cards with biometric⁹⁵ characteristics. The administrative arrangements for ensuring accountability of the system may include instituting the agency's independent general inspector, for example, whose office would have the authority to review all the procedures and actual services delivery by agency's staff, especially in terms of accessing and manipulating individual information. In quite a few countries, civil servants in the agency are required to swear an oath in terms of discharging their responsibilities according to the law and regulations and would be subject to penalties and criminal investigation in case of breach.

I. Health and social services

385. Access to health and social benefits generally requires some sort of documentation, including registration information. For example, social service programmes that provide support for families with a large number of children require birth certificates for each child to verify family

⁹⁴ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 364.

⁹⁵ In general, biometric identifiers are unique and measurable characteristics of each individual person, such as photographs, fingerprints, palm or foot print (used mainly for newborns), iris recognition, among others.

size prior to the allocation of resources. In the case of a single parent requesting support services as a result of the death of the other parent, the agency may require a certified copy of the death record to verify that the death occurred. Services relating to food, immunization, housing, clothing and other personal needs that are provided through either government or voluntary organizations require verification of the individuals involved; hence the importance of official identity cards issued by the identity agency and seed documents, such as birth or death certificates issued by the civil registration authority.

386. Services in the medical and health area are often made available to the public free of charge provided that other eligibility criteria, such as residence and income are met. Problems associated with pregnancy or delivery complications can lead to necessary follow-up for medical and health benefits. The birth record, in addition to hospital and or clinic records, may contain relevant information to verify stated medical and health conditions, and may result in free care for the patient. Selected causes of death on the death record may be used by a family to obtain certain counselling and testing related to possible hereditary communicable disease categories for the surviving spouse and children, depending on the condition. Thus, the content of the vital record forms becomes critical for their use in obtaining particular or targeted services.

II. Disease registers

387. The use of notification and registration data for surveillance purposes and in the development and maintenance of disease registers has been increasing. The International Health Regulations (IHR) are a legal instrument which requires WHO Member States to report diseases of global importance; notification and registration of deaths may form an important part of the process in reporting such diseases. The long established use of the cancer registers in many countries has drawn on death information to identify cases and to update existing cases. This has now resulted in other registers being implemented; these registers are enriched when drawing from civil registration information. Examples include registers for birth defects that obtain the initial information from the birth record. The information in these registers is also used for epidemiological investigations in which environmental or nutritional factors may have caused the defect. Other disease registers, such as tuberculosis, AIDS and Alzheimer's disease use death records information to identify cases not previously reported, and to update current cases. This information is critical for establishing and maintaining effective disease registers that may be used to identify individuals and families in need of health or social support services. Other examples that may benefit from civil registration information are patient registers and registers of medical prescriptions.

388. To manage the critical functions between the civil registration and vital statistics systems and the health systems, it is recommended that a national technical committee be tasked to ensuring that data sharing and linkage arrangements are put in place. This will benefit disease notification and disease registers, and the **continuous** registration of vital events, such as death.

III. Legal uses and activities

389. Throughout this *Handbook*, as well as in the international principles for civil registration and vital statistics, the importance of providing legal tender and identity to each individual has been outlined as one of the most essential and crucial responsibility of the **government**. This is especially related to the fact that in many of the support service areas, there are specific requirements to be met prior to authorizing the release of the information. The identity documents based on civil registration are the legal basis for establishing some of the essential criteria and authorizations to access services. Other areas, such as inheritance, insurance, citizenship, school and military enrolment, and family status, are all based on legal information from the registration and identity management system. Age, date of birth, place of residence, place of occurrence, family name, citizenship and personal identification are significant legal factors that rely heavily on the registration system for verification. These, in turn, affect a wide variety of rights to which, an individual may be entitled. There is usually no other system that provides these basic elements.

390. The legal implications associated with registration information are a significant factor in the design, implementation, operation and management of a registration and identity management programme. These elements have been described in earlier chapters of the *Handbook*, and the use of the information noted in the present section demonstrates the need to ensure a well-developed system. Legal issues often occur many years after the date of occurrence of a vital event. There is a need for record preservation and record accessibility. Events involving issues of adoption, legitimation, paternity and dissolution of legal marriages have legal implications for inheritance, government services, insurance benefits, and social and health outcomes. An adopted child's health might become an issue in later years, depending on medical facts of the biological parents. Such situations can result in legal action to gain access to the original records in order to obtain relevant information for assessing the current medical condition. Civil registration information clearly has a broad spectrum of uses for multiple purposes and under many different conditions for the population, and for administrative, government and legal actions and activities.

IV. Other inter-agency applications

391. Information from the civil registration, population registers and identity management has a valuable role in a number of other programmes at national and sub-national levels. These include maternal and child health, family planning, population patterns, planning and development for health and medical care programmes, surveillance sites, evaluation, government resources allocation, and electoral processes. In the case of **maternal and child health programme**, it identifies families requiring services. Within this programme, a number of sub programmes are funded to supply medical care, nutrition, public housing, prenatal and postnatal counselling, and infant and child health-care services. Reviews can be conducted using both the birth and death records associated with the maternal or infant death under review, combined with other data from the medical care provider and the facility where the event occurred. Based on the findings, the government may promulgate rules and regulations relating to medical practice, health care delivery services at medical facilities or malpractice issues. The records-level information extracted

from the civil registration and population registers is the primary source for initiating and implementing this type of programmes.

392. With the increasing availability of computerized records from both civil registration and censuses, several countries lacking population registers have created a long-term representative sample (a longitudinal panel, or virtual cohort) of their national population by linking a systematic sample of birth records from selected years with other civil registration records in subsequent years (marriage, deaths, etc.), together with census individual records over the following decades. Unlike cross-sectional studies, these virtual cohorts allow the study of many individual outcomes through the life course (e.g., socio-economic inequalities in health, geographic and occupational mobility), without being affected by numerator/denominator bias. France^{96 97 98}, the United Kingdom^{99 100 101} and the United States¹⁰² are among those countries which started some of these largest national cohorts several decades ago, followed in more recent years by New Zealand^{103 104 105} and Switzerland^{106 107} to name a few. Please see **Box 20** for selected examples of this type of endeavour.

393. The linkage of these various sources of information, including tracking individuals from one census to the next, supplemented by civil registration (and eventually other administrative data sources like health records), provides a wealth of information on geographic, occupational, and demographic changes concerning its study population. This type of panel data is invaluable to carry out methodological studies, and to investigate health pathways and complex life trajectories (e.g., education, social and professional mobility, evolution of family composition, etc.) which are difficult if not impossible or too costly to study from a single data source.

394. The ability of the civil registration authority to share information with other governmental agencies must be regulated by the legal framework, which spells out conditions, limits, specify partner agencies, etc. The legal framework for the civil registration system establishes a

⁹⁶ Couet, Christine (2006). L'échantillon démographique permanent de l'Insee-Documentation méthodologique. INSEE. *Courrier des statistiques* n° 117-119, année 2006, pp. 5-14.

⁹⁷ Jugnot, Stéphane (2014). La constitution de l'échantillon démographique permanent de 1968 à 2012. INSEE. *Série des Documents de Travail de la Direction des Statistiques Démographiques et Sociales. Documents de Travail. N° F1406. Septembre 2014.*

⁹⁸ <https://www.insee.fr/fr/metadonnees/source/s1166>

⁹⁹ Boyle, Paul et al. (2009). Cohort Profile: The Scottish Longitudinal Study (SLS). *International Journal of Epidemiology*; 38:385–392.

¹⁰⁰ O'Reilly, Dermot et al. (2012). Cohort description: The Northern Ireland Longitudinal Study (NILS). *International Journal of Epidemiology*; 41:634–641.

¹⁰¹ <https://www.ons.gov.uk/aboutus/whatwedo/paidservices/longitudinalstudies>

¹⁰² National Longitudinal Mortality Study (NLMS - <https://www.census.gov/did/www/nlms/about/>)

¹⁰³ Blakely, T, Woodward, A, & Salmond, C (2000). Anonymous linkage of New Zealand mortality and census data. *Australian and New Zealand Journal of Public Health*, 24 (1): 92-95.

¹⁰⁴ Hill, S, Atkinson, J, & Blakely, T (2002). Anonymous Record Linkage of Census and Mortality Records: 1981, 1986, 1991, 1996 Census Cohorts: NZCMS Technical Report No. 3. Wellington: Department of Public Health, Wellington School of Medicine and Health Sciences, University of Otago.

¹⁰⁵ <http://www.otago.ac.nz/wellington/departments/publichealth/research/hirp/otago020541.html>

¹⁰⁶ Bopp, Matthias et al. (2009). Cohort Profile - The Swiss National Cohort—a longitudinal study of 6.8 million people. *International Journal of Epidemiology* 2009; 38:379–384.

¹⁰⁷ <https://www.swissnationalcohort.ch>

continuous source of information to serve a broad range of activities and programmes. A detailed elaboration on legal framework can be found in [Chapter I, Section D](#).

Box 20

Longitudinal panels by linking civil registration records with census individual records

France started its “Permanent Demographic Sample” (Échantillon Démographique Permanent) with 1% of its 1967 birth cohort and 1968 census. It had grown to 2.7 million people by the end of 2013, with individuals enumerated in the censuses of 1968, 1975, 1982, 1990, and 1999, and annually since 2004. From the beginning, each year, all vital events are tracked for all persons born on the first four days of October. However, the sample size has been quadrupled since 2004 for civil registration and since 2008 for the census, as persons born on January 2, 3, 4 or 5 or the first four days of April or July have been added to be monitored in the panel.

The **British** equivalent is the Longitudinal Study (LS), based on the censuses of 1971, 1981, 1991, 2001 and 2011. Census records are linked with life events data for a 1% sample of the population of England and Wales. More recently, sister studies have been established in Scotland and Northern Ireland. The Scottish Longitudinal Study (SLS) started with 1991 Census data and the Northern Ireland Longitudinal Study (NILS) started with 2001 Census data.

In the **United States**, the National Longitudinal Mortality Study is based on a random sample of the non-institutionalized population, and follows since 1973 one million respondents of the Current Population Surveys, Annual Social and Economic Supplements and a subset of the 1980 Census combined with death certificate information to identify mortality status and cause of death. The study allows to investigate social, economic, demographic and occupational differentials in mortality (total and by cause).

The **New Zealand** Census Mortality Study anonymously and probabilistically links all census (1981, 1986, 1991, 1996, 2001, and 2006) with death registration records during the subsequent three years (for the cohorts of 1981, 1986, 1991 and 1996), or five years for the more recent cohorts (2001 and 2006). This linkage has allowed to study socioeconomic and ethnic inequalities in mortality, and to address issues with numerator-denominator bias for ethnicity reporting in census vis à vis mortality data from death registration.

Switzerland created in 2005 the Swiss National Cohort which is a nationwide anonymized record linkage of census and death registration records that includes all residents enumerated in the national 1990 or 2000 census. Deterministic and probabilistic methods of record linkage were used to link anonymized census records to death or emigration records from 1991 up to 2008.

395. Continuous assessment of the impact and outcomes of national health programmes and identification of population health patterns require access to appropriate health and demographic information. The registration programme can provide this type of information for **planning** new programmes and for **evaluation** of the impact of existing programmes. Whether the issue is maternal and infant health, family planning activities or general health, fertility and mortality patterns of the population, birth and death information is available by health, demographic and geographic characteristics on an individual basis. This information can then be used to profile the impact of current programme activities, and can lead to planning and programme evaluation. The individual record information, supplemented with vital statistics summary data for relevant variables, is an effective mechanism for determining new directions for various programmes.

396. Another component of the use of registration information by different government agencies refers to the allocation of funds, staff, supplies and services. The conduct of such programmes as education, maternal and infant health care, family planning, maintenance of health and disease registers, and population health patterns and status require well-structured decisions and commitments of resources. To do this effectively, a sound, accurate and reliable information- base is needed. In some cases, this can be vital statistics summary data, and in others record-specific individual information. The latter situation draws on the civil registration system to provide data on an individual level. When funds are to be allocated to programmes based on individual events, then the decision-making process needs information at that level – and it is available from the well-designed and operated holistic system of civil registration, population registers and identity management.

C. Applications of vital statistics

397. The registration information described above is primarily for use at the individual level. In addition to these substantive applications, the registration system provides the database, containing microdata (individual level), for the preparation of vital statistics data files covering natality, fertility, mortality, marriage, divorce and selected population profiles. The statistical data have broader uses at the general descriptive or analytical levels. The database serves multi-purpose areas in a quantitative sense, with the capacity to extrapolate, estimate or project selected characteristics based on previous data. This provides for more applications, some of which may relate to conditions outside the registration programme. Several areas of applications within the statistical agency, in conjunction with other agencies and programmes and at the national level, are described below.

1. Intra-agency applications of vital statistics

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

quality of life, such as expectation of life at birth and infant mortality rate.¹⁰⁸ Vital statistics are obtained preferably through a complete civil registration system, as this is the ideal source from which to derive accurate, complete, **timely and continuous** information on vital events. In addition, vital statistics derived from the civil registration system and accompanying population registers can include annual flow statistics from the smallest civil divisions, which no other data-collection system can provide.

399. In the model where civil registration, population registers and identity management components are interlocked in a holistic system, vital statistics activities are usually housed in the national statistical office, taking into consideration that centralizing all statistical work in the country enhances the quality and efficiency of the production of official statistics. This holistic model allows as well for linkages with other sources. Examples of specific indicators and measures computed within the national statistical office include infant mortality rates, crude birth, death, foetal death, marriage and divorce rates, total fertility rates, age-specific rates, fertility rates, mortality and marriage rates, life-tables, life expectancy at- birth and cause-specific death rates. These specific indicators and measures are available not only for the country as a whole and its main divisions but also for small geographic areas. The national statistical office would develop these raw statistics for other programmes and agencies involved in medical, health, housing, social services, education, economic planning, natural disaster risk mapping, among other issues. The demographic data would be directly used for national purposes within that agency.

400. Many of the applications described in the previous section related to registration information at the individual level have similar statistical applications in aggregate form. In the maternal and child health area, vital statistics are used to compute rates for maternal mortality, infant mortality, complications of pregnancy, labour and delivery, malformations and such health services as prenatal care and other related government services. These quantitative measures are then used by programmes to assess the quality of care, medical problems associated with pregnancies or delivery procedures, the utilization of health services and health outcomes.

401. Within an agency with responsibility for the health of the population, such as the Ministry of Health, vital statistics serve multiple purposes. Mortality measures based on demographic information contained on the death record are used to identify specific causes of death for specific population groups. When death rates appear significantly higher for certain groups, studies to obtain more detailed information or epidemiologic investigations may be initiated to determine the factors causing the increases. Geographic data for place of residence or place of occurrence, as well as year of occurrence, can provide additional information on health conditions in specific locations and point in time, and are key elements for the evaluation and monitoring of intervention programmes.

402. To assess disease conditions elevating mortality rates in a certain area, the mortality data must be analysed by both residence of the deceased and the site where the death occurred. Individuals may be infected in one area but travel to another for medical care. This can give a false

¹⁰⁸ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 3.

impression of where the problem exists. The rates in the area of occurrence may have no bearing on the site where the actual disease problem exists. Place of residence and occurrence are two critical variables in the conduct of such analysis.

403. Extensive use is made of mortality data in evaluating health-service facilities and for studying environmental and social factors related to the health system. Death rates for events that occur in a particular hospital, clinic or other type of facility can be compared both with other similar facilities and with national or state averages. These data can give some sense of the quality of services being provided, and may reflect both on the institution and on the person providing care. For example, differences in death rates following surgical procedures for heart disease or cancer when reported on the death record can be used to assess these outcomes for quality of care, availability of resources or severity of illness. Results of these analyses are then brought back to the health facilities and providers for review and evaluation to improve conditions, when applicable.

404. The data can also be used by government survey teams in attempting to determine the allocation of resources and funds for improving health and medical services to the population. In countries where surveys of medical records are conducted for utilization reviews and the quality of care of health providers, mortality outcomes are essential data in the survey process.

405. Generally, there are more data items contained on the birth record than on the death record. This provides the potential for more extensive use. As per international standards, the birth record would contain items relating to the mother, such as demographic characteristics, previous pregnancy history and prenatal care; in some countries, birth records also contain information on services or behavioural factors, such as smoking, alcohol or drug use. In addition, the record often contains conditions associated with pregnancy, methods of delivery and birth outcome. These data form a large pool of health data for review, evaluation and research activities. Data regarding the condition of the infant at time of delivery, APGAR¹⁰⁹ score, birthweight and birth defects provide a substantial database for planning and evaluation purposes, research and the health service needs of the family.

406. The broad and comprehensive nature of the vital statistics data for use in areas of research, analysis and evaluation can be seen in most public health and medical publications of governments, professional organizations and other public and private agencies. Examples of vital statistics and research, particularly if a PIN is available to link across different databases, include: distribution of women by parity (number of live births), including research into childlessness; analysis of fertility by social strata (educational attainment, labour force activity), social inequalities in life expectancy (by occupation and educational attainment), and integration of immigrants by duration of residence in receiving country.

¹⁰⁹ The APGAR score was introduced in the 1950's as a simple and quick method for assessing and summarizing the health of a newborn. It evaluates the newborn on five criteria (skin color, pulse rate, reflex irritability grimace, activity and respiratory effort) on a scale from zero to two and the resulting APGAR score ranges from zero to ten.

2. Inter-agency use and applications of vital statistics

407. Vital statistics are a critical mechanism for supporting good governance, through data driven planning and accountability. They have a significant value and financial function as they are key inputs for planning and resource allocation at national and subnational level. Access to the vital statistics database by other agencies is important to programmes such as public social services organizations, specialization units for independent research, medical facilities, population profiles and education.

408. These programmes draw on natality, fertility and mortality statistics to address current issues, identify trends and project new directions of the events being considered. Social service programmes use natality data to identify geographic or demographic profiles of high fertility that affect benefits and services directed at women and infants. Notably, natality and fertility data are used to inform plans for building or opening new schools. In the same vein, urban planning, in general, is highly connected to vital statistics.

409. Social and health programmes use mortality data to provide support to families in areas having major-difficulties involving epidemics or other health problems where support services are needed. Through the linkage of social service records and vital statistics data, family profiles may be developed for use in the allocation of resources. Allocations can be based on number of children, single parenthood, health problems and availability of medical care in specific geographic locations.

410. Agencies that maintain data on selected health characteristics, such as specific disease categories and health or medical conditions, or are responsible for planning and evaluation activities require access to data and information from the vital statistics system. The number of individuals dying from a particular disease or illness provides relevant input to agencies or programmes directed at these conditions. The most complete and timely data come from the vital statistics database. An agency with the responsibility to build health facilities or relocate clinics or care providers based on health conditions, or to propose new resources to meet current or projected healthcare needs, must have access to vital statistics.

411. Quantitative information is fundamental to the conduct of such programmes. Rates of specific health conditions, the proportion of events occurring in particular locations or at specific facilities and the relative rates of change and trends over time offer valuable indicators for the agency to make decisions and align resources to best use.

412. High rates of low birthweight new-borns, birth defects and infant mortality from the vital statistics database may help define where the next infant health programmes should be located. It can indicate on what conditions the programmes should be focused. High fertility rates for specific age groups may provide information to redirect a family planning programme. High rates of mortality in specific geographic areas, for particular population sub-groups or in health facilities provide data necessary for the health agency to conduct surveys and record reviews to determine causes.

413. Agencies often require quantitative data to sustain support for the programme or agency function. Depending on the area of responsibility of the agency or programme, vital statistics represent an important and unique source of information for preparing descriptive summaries and profiles of particular categories of vital events. These events can be further detailed by geographic areas, demographic profiles, health-care provider types and particular population groups, and can be linked with other data. The data provide integrated information for the programme or function under review.

414. For instance, the demographic dynamic of displaced, stateless persons and refugees may be different from that of the regular population. If the vital statistics on these population groups are sufficiently good, it can be useful for governments and humanitarian actors to analyse their statistical patterns, also in comparison with the overall population in the country. An Expert Group on Refugee and IDP Statistics (EGRIS) has been established by the UN Statistical Commission in 2016 to develop guidelines on refugee statistics and a technical report on IDP statistics¹¹⁰.

415. Measures and indicators for selected vital events can be constructed for use in programme operation, evaluation and impact analysis. The data items to be used depend on the programme objective. Rates, proportions, frequencies and volume of events are common indicators and measures that may be used for agency programmes and functions. For infant immunization programmes, the number of infants in particular area can be obtained from the vital statistics files which helps to define the level of service needed.

416. Programmes for the delivery of health-care services, programme initiatives, impact analysis, evaluation and programme direction, planning and development, and research activities have significant ties to the vital statistics system. Responsibilities for these activities vary among agencies, programmes, and private and voluntary organizations. To be positioned to meet these needs is the vital statistics system perspective. To have this information available is the external user's need. Participation of these groups in the structure of the civil registration programme is essential to accomplish this objective.

417. Utilization can be of a general nature, with focus on overall characteristics of vital events. Birth rates and death rates, the frequency of vital events categorized by selected demographic and geographic variables, the distribution of vital events by type of service provider, and the place of occurrence of the event and residence of the individual give a general statistical overview. These data offer a profile for health outcomes of the population, for geopolitical subdivisions down to the smallest geographic areas, and for facilities used for health care. More detailed uses can also be made of the vital statistics data, using selected outcome variables, such as malformations at birth, the amount of prenatal care by age or socioeconomic group, cause specific information for maternal and infant deaths, complications associated with pregnancies and specific cause of death for various demographic characteristics.

¹¹⁰ Report on the forty-seventh session of the Statistical Commission, document number E/2016/24-E/CN.3/2016/34 available from <https://unstats.un.org/unsd/statcom/47th-session/documents/Report-on-the-47th-session-of-the-statistical-commission-E.pdf>

418. The use of these detailed data may be to monitor particular programme of agency objectives or define areas for medical and health research activities. In either case, the data elements for these applications come through the vital statistics system and reach out in a wide pattern of use and application in the health field.

419. At the international level, vital statistics will be essential for reporting against development frameworks such as the Sustainable Development Goals (SDGs). Out of the 230 indicators, 19 use vital statistics as direct inputs, be it in the numerator or the denominator. Eleven of them belong to the SDG3. Good health and wellbeing, and there is great emphasis on cause of death information. In addition, information on registration completeness of births and deaths is directly needed for two more indicators. Many more indicators use vital statistics as indirect input for computing population estimates, rates, ratios and other figures. Examples of SDG indicators necessitating vital statistics indirectly include indicators on access to certain services, land ownership, malnutrition, school attendance, literacy, gender violence, among others.

a. Vital statistics dissemination

420. **Regular dissemination** of vital statistics is one of the principles of the vital statistics system as per the international standards¹¹¹. The compilation of vital statistics should have as its minimum goal two attainments: (a) the provision of total monthly or quarterly summary counts of vital events on a time schedule prompt enough to provide information for health intervention and population estimation programmes, administrative uses or other needs and (b) the production of detailed annual tabulations of each type of vital event cross-classified by its demographic and socioeconomic characteristics. Such tabulations must be accompanied by metadata, graphs, maps and description that aid to their analysis and comprehension.

421. In the planning of the detailed tabulation programme, it is important to ensure that resources are available for completing it on a regularly established basis and on a time schedule. It is common that countries set a cut-off date for incoming data from the previous year in order to produce the annual vital statistics tabulations. Depending on the country, this date hovers around 1 February and 1 March every year. An established time schedule will contribute to the effective use of the analysis of the interrelationship among demographic, economic and social factors in the planning, operation and evaluation of public programmes and policies, and for the purpose of formulating and evaluating economic and social plans.

422. There are tools that support the design and implementation of the annual dissemination programme of vital statistics compiled from civil registration data. The major references are the UN Principles and Recommendations for a Vital Statistics System, Rev.3, which present recommended tabulations in detail in their Annex II¹¹², and the Guidelines and Template for

¹¹¹ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 38.

¹¹² *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, Annex II

Developing a Vital Statistics Report, developed by Statistics Norway¹¹³. As far as possible, statistics should be comparable within the country, across demographic data sources and on an international basis to permit international analysis. Where particular circumstances within a country require departures from international standards, publication of the data should be accompanied by an explanation of these departures and an indication of how the national presentation can be converted so as to meet or approximate international standards.

423. For national and subnational purposes, an annual programme of tabulation of vital statistics should provide data classified in accordance with the need to study the incidence, patterns, time trends and geographical differentials of the most important characteristics and determinants of fertility, mortality, foetal mortality, nuptiality and divorce, together with the exploration of their interrelationships. Tabulations for small geographical areas need to be included in the dissemination plan, as well as disaggregations by relevant variables. In addition, the programme should include tabulations needed for administrative purposes to evaluate the quality of vital statistics, including the completeness and timeliness of registration and the accuracy of the content of the registration records (or the reporting forms for statistical purposes, as the case may be). The tabulation programme should also seek to meet the requirements of international organizations and, wherever possible, conform to recommendations for achieving international comparability.

424. As far as basic concepts of tabulations are concerned, they refer to:

1. *Universality*. It is stipulated in the legal framework that each vital event occurring within the geographical area concerned must be registered once and only once within the time period. Therefore, statistical tabulations should encompass the entire geographical area and include events for **all** population groups within the area occurring during the specified time period. Tabulation of data for a country should generally relate only to events occurring within its boundaries. Events occurring outside the boundaries need to be included only when they relate to persons included in the population denominator for potential national rates, such as deaths to tourists or the armed forces occurring outside the country. For countries that wish to implement this, provision should be made for international or bilateral exchange of records so that events occurring to residents of other countries can be excluded from occurrence data.
2. *Tabulation by date of occurrence*. Although preliminary tabulations may be presented by date of registration in order to prepare them as quickly as possible, final tabulations for the calendar period should be based on events that actually occurred during the period, regardless of their date of registration.
3. Tabulations by place of occurrence and place of residence. Final annual tabulations should be prepared by place of residence. For tabulations of events for the country as a whole, there is generally relatively little difference between place of occurrence

¹¹³ H Brunborg & V O Nielsen (2017): Guidelines and Template for Developing a Vital Statistics Report. To be published by ECA, ESCAP and Statistics Norway.
<http://www.getinthepicture.org/system/files/event/documents/%5BDRAFT%5D%20Guidelines%20and%20Template%20for%20Developing%20a%20Vital%20Statistics%20Report.pdf> (preliminary link)

and place of residence. Final tabulations for geographical areas smaller than the total national territory, major civil divisions, minor civil divisions and cities should, for analytical purposes, be prepared according to place of usual residence. However, as discussed in paragraphs 356-360, place-of-occurrence tabulations required for administrative purposes or evaluation of registration coverage need to be prepared.

425. A detailed list and specifications for an annual vital statistics tabulation programme are presented in the Appendix II of the *Principles and Recommendations for a Vital Statistics System*¹¹⁴. In addition, countries are encouraged to publish the level of completeness of registration for each of the vital events, at national and subnational levels.

426. **Vital statistics microdata dissemination** refers to developing mechanisms for allowing users access to individual record files maintained for the production of vital statistics. In the model of civil registration, population registers and identity management, the indispensable feature is relying on individual records stored in different databases that can be linked with a unique identifier, preferably the Personal Identification Number (PIN). For the purpose of vital statistics, the extraction from the population register will normally omit data items not relevant for aggregation purposes, such as the name and address, but will retain the unique identifier and location.

427. The guidelines for disseminating microdata by the national statistical service are presented and elaborated in the *Principles and Recommendations for Population and Housing Censuses, Revision 3*.¹¹⁵ The same principles and confidentiality protection protocols apply in the case of vital statistics microdata as well, taking into consideration the substantial value that this dissemination provides for in-depth research of demographic, health and social related phenomena. See **Box 21** for details on how the dissemination of vital statistics microdata is handled in Norway.

¹¹⁴ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014.

¹¹⁵ *Principles and Recommendations for Population and Housing Censuses, Revision 3*, United Nations Publication, Sales No. e.15.XVII.10, United Nations, 2015, paras.3.373-3.388.

Box 21

Norway. Vital statistics microdata for research

Requests on access to the data of the Central Population Register (CPR) in Norway are handled by the owner agency, the National Tax Administration. The Tax Administration distributes data directly and daily to a few large users, including Statistics Norway, the Norwegian Labour and Welfare Administration, the Directorate of Immigration and the Norwegian Mapping Authority. Other users (more than 2,200) receive the information through a private company according to an agreement with the Tax Administration. Users may only receive data after an application that explains the reasons for needing the data. The users only receive the data in the CPR that they are entitled to, according to the law.

On the other hand, Statistics Norway handles requests for microdata for research projects, relating to persons, establishments and enterprises (<http://www.ssb.no/en/omssb/tjenester-og-verktoy/data-til-forskning>). Researchers from approved research institutions in Norway have to apply to the Data Protection Authority or one of the Regional Ethical Committees for permission to use microdata, while paying for the costs of producing the data files. Transfer of personal data outside the country's borders is not allowed according to the Statistics Act. There have not been any very serious cases of misuse of data from the CPR, but it has been revealed that in a handful of cases, conditions for receiving microdata were violated, such as sharing the data with other researchers or exporting data to other countries.

The micro data are anonymized before being released, which means that variables that can be used to directly identify an individual are removed from the file, such as name and PIN. Since it may be possible to use other variables, such as address, full date of birth, etc., to indirectly identify individuals, users need to sign a non-disclosure declaration. Furthermore, microdata are released for a specific project and must be eradicated when such a research project is finished. Micro data that may be released for research include data from administrative registers, population censuses and sample surveys, and cover labor market, population, social security, income, wealth, educational activity and attainment, health and establishments and enterprises.

According to the new Population Register Act, which is expected to enter into force in 2017, public authorities and enterprises will be able to obtain non-confidential information from the CPR through lists based on personal identification numbers. Private businesses and actors will be able to obtain non-confidential information from the CPR about named identifiable individuals. The principle of confidentiality will not apply for information elements such as name, date and place of birth, gender, personal identification number, citizenship, marital status and date of death. The confidential items will include among other address, parents, spouse, children and adoption.

428. The United Nations Fundamental Principles of Official Statistics¹¹⁶ provide unambiguous guidance in administering official statistics at national and international levels. A particular emphasis of these principles is on confidentiality of information collected for statistical purposes. In the context, the sixth principle, governing international statistical activities, states: “Individual data collected by statistical agencies for statistical compilation, whether or not they refer to natural or legal persons are to be strictly confidential and used exclusively for statistical purposes.”¹¹⁷ The following four principles should be considered for ensuring the confidentiality of microdata:

1. *Appropriate use of microdata.* It is appropriate for microdata collected for official statistical purposes to be used for statistical analysis to support research as long as confidentiality is protected.
2. *Microdata should only be made available for statistical purposes.* A distinction has to be made between statistical or analytical uses and administrative uses. In the case of statistical or analytical use, the aim is to derive statistics that refer to a group (be it of persons or legal entities). In the case of administrative use, the aim is to derive information about a particular person or legal entity to make a decision that may bring benefit or harm to the individual. If the use of the microdata is incompatible with statistical or analytical purposes, then microdata access should not be provided.
3. *Provision of microdata should be consistent with legal and other necessary arrangements that ensure that confidentiality of the released microdata is protected.* Legal arrangements to protect confidentiality should be in place before any microdata are released. However, the legal arrangements have to be complemented with administrative and technical measures to regulate the access to microdata and to ensure that individual data cannot be disclosed.
4. *The procedures for researcher access to microdata, as well as the uses and users of microdata, should be transparent and publicly available.* This principle is important to increase public confidence that microdata are being used appropriately and to show that decisions about microdata release are taken on an objective basis.

b. Demographic applications

429. The use of vital statistics in the area of demographic analysis is very dependent on the quality and completeness of the data. Accuracy and timeliness of data are significant factors for demographic use in mortality, natality, fertility, nuptiality and population analysis.

¹¹⁶ Presented at the United Nations Statistics Division website at: <http://unstats.un.org/unsd/dnss/gp/fundprinciples.aspx>.

¹¹⁷ Ibid.

430. Demographic analysis related to natality and fertility also requires specific variables, many of which are included in the vital statistics files. Characteristics that are important in the measurement and analysis of fertility for population purposes include the age and marital status of the mother, parity, birth order and residence. Other factors that may affect the levels of fertility are also essential data elements, such as race/ethnicity, age of parents, marital status, socio-economic status and educational level. These data can provide basic information that can affect the fertility of population sub-groups and population growth.

431. Measures for demographic analysis include age specific fertility rates, fertility rates within marriage cohorts, probabilities of birth based on age of the mother, and various subcategories for birth and fertility rates. The use of these data from the vital statistics system requires in many instances linkage to census data or other survey data. This makes the data effective for demographic analyses related to natural growth and change of the population. Vital statistics are often used to evaluate the quality of population censuses, by comparing the total number of births and/or deaths in both sources.

432. Mortality data from the vital statistics system can provide indications of variations in the characteristics of the deceased and the cause of death. These are important variables in the demographic analysis of mortality. Two of the most critical variables associated with demographic analysis related to mortality are the age and the sex of the decedent. The relationship between the risk and cause- of death and age and sex makes them important factors in the demographic analysis of mortality. The fact that mortality varies by gender, geographical area, marital status, socio-economic conditions and availability of health-care resources makes these characteristics essential in the analysis of mortality. Many of these variables are part of the vital statistics database derived from the registration programme. For those items not collected through registration, options to obtain the data may be initiated. For example, conducting surveys that use the vital records as the framework for identifying and locating individuals for the sample. Another option is to access other administrative databases that contain the data.

433. Mortality data from the vital statistics system are also used in the development of life-tables for the measurement of mortality. The basic life-table provides data on mortality, life expectancy and survivorship. Other applications include population projections, natural population growth and length of life for selected subcategories. Essential to the construction of the life-table are the death data. The applications for life-tables and the mortality, natality and fertility data from the vital statistics system are described in detail in a number of publications.^{118 119}

434. Vital statistics can provide some of the essential data elements in the preparation of population estimates and projections. The basic process uses the numbers of births and deaths and a migration measure. The migration measure may be obtained from other sources unless a population register is available. These data can be used to update a previously conducted population census. Natural increase in the population based on birth and death information

¹¹⁸ Tom Moultrie, Rob Dorrington, Allan Hill, Kenneth Hill, Ian Timaeus and Basia Zaba, *Tool for Demographic Estimation*, at: <http://demographicestimation.iussp.org/>.

¹¹⁹ *Handbook on the Collection of Fertility and Mortality Data*, United Nations publication sales no. E.03.XVII.11, 2004

combined with net migration can be used to update an earlier census count. Another approach, the vital rates method, uses birth rates and death rates for selected geographic areas, and, combined with a previous census count produces an intercensal estimate of the total resident population.

435. Various methodologies exist in preparing population estimates and projections for the total country or for selected geographic areas. For these purposes, many include vital statistics data when it is determined that the registration programme has provided adequate reporting (see **Box 22** for an example on how census results and vital statistics are used jointly to aid the production of population estimates at the subnational level). When the registration programme has not provided adequate levels of completeness or accuracy and timeliness of reporting, other sources of data are used, but the methods become more complex and less reliable.

Box 22

Tunisia. Allocation of births at the subnational level for the production of population estimates, implemented by the National Institute of Statistics

The Tunisian Registration Law requires that both births and deaths be registered in the nearest municipality or civil registration center to where the event occurred. However, not all governorates (major civil division) have hospitals or clinics, which forces women residing in those governorates to deliver and register their babies in a governorate different to their usual residence. Given that place of usual residence is not collected, this leads to a problem when producing population estimates at the governorate level. The National Institute of Statistics solves this problem by using the geographical distribution of children under one year of age observed in the population census, and applies it to the total number of births from the civil registration system.

VII. Digitizing civil registration and vital statistics

A. Introduction

436. The rapid developments and increased availability in information technology have facilitated the transformation of civil registration and vital statistics processes from paper-based to electronic. However, such a transformation requires a careful and deliberate design and implementation process to ensure success. The topics covered in the present chapter are concerned with the technical details of the digitization of a civil registration and vital statistics systems, or specific components. Based on the *Step-by-Step Guide to Digitising Civil Registration and Vital Statistics Processes in Low Resource Settings*, this chapter presents the preparation, analysis, design, and implementation considerations and processes for an effective digitization of a civil registration and vital statistics system.

437. As mentioned in previous chapters, vital statistics and civil registration are separate entities, but it is crucial that they be established, maintained and exploited as components of a coordinated and coherent system for registering and producing vital statistics. In addition, the emergence of the interconnectedness between civil registration and identity management systems adds yet one more dimension to the structure of the civil registration and vital statistics system. A graphic representation of these relationships and functioning is presented in figure 1 (Chapter 1). Civil registration is defined as the **continuous/permanent, compulsory, universal** recording of the occurrence and characteristics of vital events pertaining to the population, as provided through decree or regulation in accordance with the legal requirements in each country. It is important to highlight the quality of universal in relation to the people's right towards the registration of vital facts. Established in the 1948 Declaration of Human Rights and supported through other global accords, every person has the right to an identity as bestowed through civil registration. In this regard, laws, policies, rules and regulations must not be a hindrance to the realisation of this right. Civil registration is carried out primarily for the purpose of registering vital events and establishing documents as per national law. The usefulness of these records as the best source of vital statistics is well established. The procedures for recording vital events are equally important for civil registration in legal terms and for vital statistics in the context of source of statistics; hence, the work of civil registrars and that of statisticians are interdependent.¹²⁰

B. General overview

438. Digitizing administrative processes is a sine qua non of contemporary approaches to government functions. In its essential meaning, "digitizing" would refer to generating a series of numbers that represent a document, signal and so forth. This term is also commonly used in the case where a piece of information is converted in single binary code. In theory, digital information

¹²⁰ *Principles and Recommendations for a Vital Statistics System, Revision 3*, United Nations publication, Sales no. E.13.XVII.10, New York, 2014, para 274.

is not subject to damage or degradation over time, as it consists of strings of numbers recorded and stored in an appropriate device. As digitizing a certain process or information is not possible without using information technology, the meaning of the term also encompasses computerization of these processes and information – that is, the use of automation by way of computers and software.

439. In the context of the civil registration, vital statistics, population registers and identity management, digitization refers to developing an enterprise information system – that is, an information system that provides a technology platform that enables all components to integrate and coordinate business processes on a robust foundation.¹²¹ A functional system needs to be in place for it to be transformed and digitised successfully. Further, even if a system is functioning smoothly without automation, digitisation needs to be conducted carefully, without rushing too quickly into technology and guided by international standards, in particular the *Principles and Recommendations for a Vital Statistics System*.

440. Taking into consideration that information systems tend to be fairly complex and multi-layered, recent developments include the introduction of a separate discipline – governance of enterprise information technology (GEIT) – concerned primarily with organizing the resources of an enterprise or organisation for the purpose of satisfying stakeholders. GEIT is meant to bring alignment between high-level strategic objectives with operational level activities and work outcomes.¹²² It allows for developing precise blueprints enabling all stakeholders to understand the business processes even if they lack the full understanding of information technology.

441. In this context business process is defined as¹²³ a self-contained, logical set of activities performed by humans or machines that are executed to accomplish a specific business objective. Triggered by specific events, a business process has one or more outcomes that may result in the termination of the process, or a handoff to another process. It is often presented in the form of a figure or map, and is composed of a collection of interrelated tasks or activities that solve a particular issue. A business process comprises end-to-end work that delivers value to customers (or users) and may involve crossing functional boundaries.

442. The first step in applying these contemporary mechanisms and their operational logic is to develop clear understanding of the current and ideal business processes and their actors. Chapter II and III of this Handbook elaborate on these issues, and the integration of civil registration, vital statistics, population register and identity management functions and components is presented in Chapter V. Consequently, this chapter will focus in more technical details on the implementation of the enterprise information system paradigm and the features of the governance of enterprise information technology adapted for civil registration and vital statistics, which then leads to

¹²¹ Chapter V of this Handbook elaborates on operational integration for civil registration, vital statistics and identity management.

¹²² *Getting Started with Governance of Enterprise Information Technology*, ISACA, as presented at: http://www.isaca.org/Knowledge-Center/Research/Documents/Getting-Started-With-GEIT_whp_Eng_0314.pdf?regnum=353307.

¹²³ A Step-by-Step Guide to Digitising Civil Registration and Vital Statistics Processes in Low Resource Settings, APAI-CRVS

feeding population registers and identity management systems. More and more countries are introducing identity cards and ID managements systems with biometric markers. Such systems have a great potential for improving vital statics but this is often not utilized. Some of these ID systems are closely linked to the civil registration system whereas others have little or no connection. A database including all ID numbers with particulars about the persons can be developed into a population register if it is regularly updated with births, deaths and migrations. This transition is particularly smooth if ID numbers are assigned at birth, rather than when a person reaches a required age to obtain an ID card.

443. The major reference here refers to the CRVS Digitization Handbook: A Step-by-Step Guide to Digitising Civil Registration and Vital Statistics Processes in Low Resource Settings¹²⁴, developed for the purpose of supporting the Africa Programme for Accelerating Improvement of Civil Registration and Vital Statistics (APAI CRVS), a regional programme developed following the political commitment and policy directives of the ministers in charge of civil registration to reform and improve CRVS systems on the continent.¹²⁵

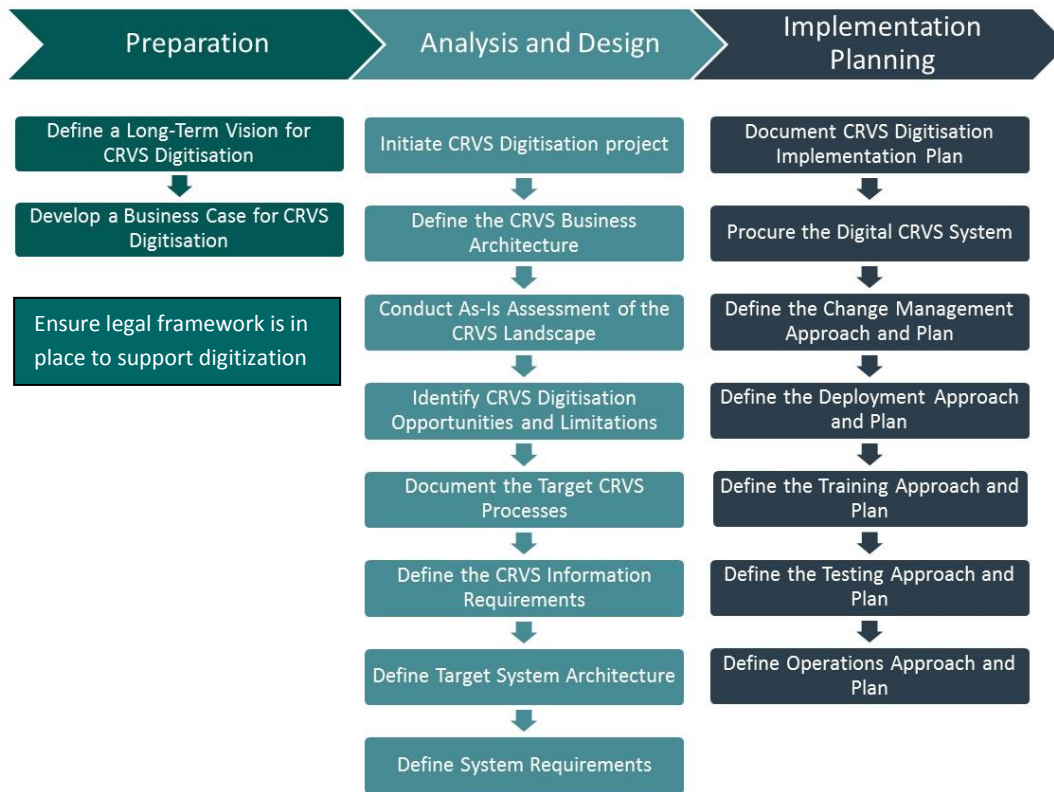
C. Developing blueprints

444. Out of the general framework for implementing an efficient enterprise information system, it is necessary to adapt it to the process of conducting civil registration of all various vital events, collecting the necessary information, ensuring the production of comprehensive vital statistics and generating input for population registers. The graph below presents the digitization lifecycle for civil registration and vital statistics.

¹²⁴ Available at: <http://www.crvs-dgb.org/en/>.

¹²⁵ For more information, please see: <http://www.apai-crvs.org/>.

Figure 13. Digitization project lifecycle for civil registration and vital statistics



Source: CRVS Digitisation Guidebook, available from <http://www.crvs-dgb.org/en/> (Adaptation)

445. Each of the phases and recommended activities is presented below in a prescribed sequence that may or not be accomplished- in its entirety or in a step-wise fashion- depending on the system, stakeholders, and resources in place.

446. **Preparation phase.** The activities of the preparation phase need to be completed prior to commencing a CRVS digitization project. This phase includes alignment with a country's broader CRVS strengthening programme and lays the foundations for a business case for digitized civil registration and vital statistics.

1. **Define a long-term vision for digitization.** The long-term vision for digitization sets out a desired future state for civil registration and vital statistics that can specifically be achieved through the use of digital technologies. Aligned with a Strategic Plan for Civil Registration and Vital Statistics, the long-term vision will be based on high-level needs and will set the direction for the digitization project.
2. **Develop a Business Case for digitization.** The Business Case elaborates on how technology can be a cost-effective means to improve civil registration and vital statistics systems and processes. The document should be used to indicate the expected benefits of digitization, to generate support from key stakeholders, to justify the technology investment costs and to raise funds for project implementation. The Business Case is developed in two parts. The initial Business

Case, developed in this activity, outlines the actual costs of the Analysis and Design Phase and indicative costs for full implementation. This Business Case will be revisited and updated at the beginning of the Implementation Phase to more accurately reflect the findings of the Analysis and Design Phase, including an accurate representation of the defined digital civil registration and vital statistics system and the benefits and costs associated with implementing it.

- 3. Ensure legal framework is in place to support digitization.** Develop and/or reform an appropriate legal framework for a national civil registration system that highlights its statistical function and takes into account the identity management system, in the context of e-government. Identify the gaps of the current legal framework and elaborate a plan to align it to the needs of a digitised system.

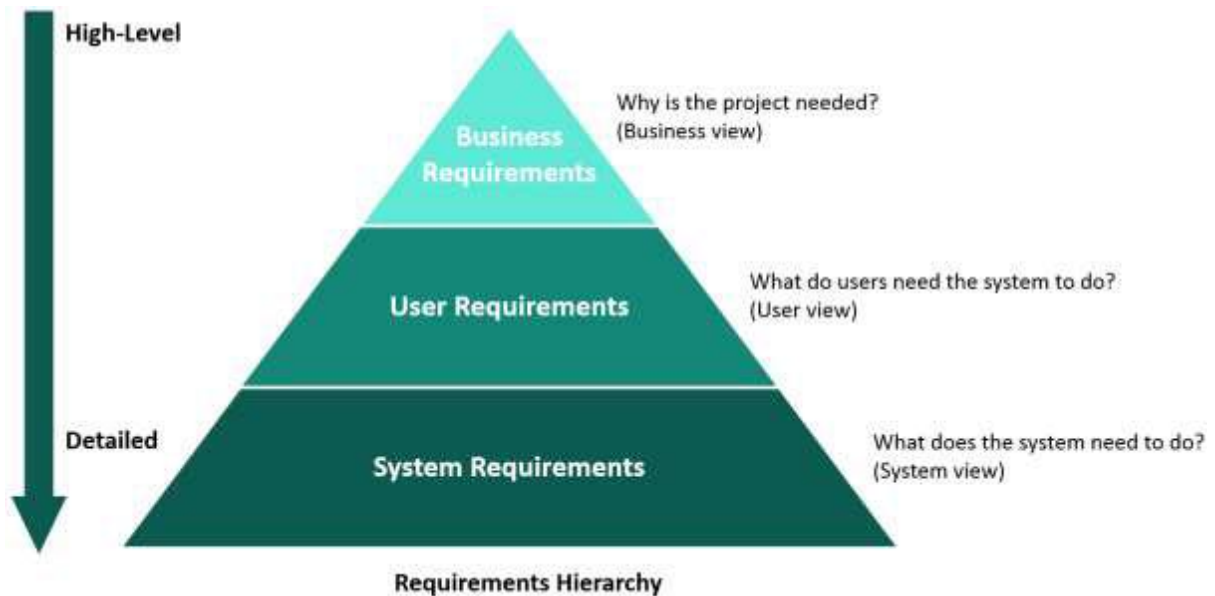
447. **Analysis and Design Phase.** The activities outlined in the analysis and design phase must provide step-by-step guidance of how to align information and communication technology with the civil registration and vital statistics business need. Following the activities in a sequential manner will ensure that the relevant country context is fully analysed and traceable from the civil registration and vital statistics business requirements through to the detailed requirements for an enabling civil registration and vital statistics system.

- 1. Initiate Digitization Project.** In order to execute a successful Digitization Project, it is critical to initiate the project in a structured manner, clearly defining expectations and standards to all relevant actors and stakeholders. To do this, a Project Initiation Document (PID) should be created, formally documenting the purpose, approach, standards and timelines of the analysis and design phase. The PID should be shared with all relevant parties so that the scope of work and their roles and responsibilities are acknowledged and accepted before formal work begins. In subsequent activities, this advanced project planning will help guide project decision-making and management and will be updated to reflect the change in focus of activities at the beginning of the Implementation Phase.
- 2. Define the Civil Registration and Vital Statistics Business Architecture.** The purpose of defining a Business Architecture is to build a common understanding of the organisation's purpose, functions and needs in order to guide and manage organisational activities and change. In this context, the organisation comprises those authorities responsible for civil registration and vital statistics. Subsequent steps in the digitization process must align with the organisational foundations defined in the Business Architecture e.g. target digitised systems and processes must meet the business requirements.
- 3. Conduct an As-Is Assessment of the CRVS Landscape.** In order to identify appropriate technologies to support civil registration and vital statistics, an "As-Is" assessment must be conducted to understand the strengths and weaknesses of the existing landscape, including several components documented in the Business Architecture e.g. civil registration and vital statistics business processes. Basing subsequent technology decisions on these findings will ensure that technology interventions directly address identified weaknesses¹²⁶.

¹²⁶ If a Rapid or Comprehensive Assessment has been conducted this should be used as an input.

- 4. Identify digitization opportunities and limitations.** In order to identify appropriate technologies that are feasible in the current context, it is important to understand what opportunities and limitations exist in the country to support a digital civil registration and vital statistics system. These opportunities will later be used to inform the definition of the target digital civil registration and vital statistics system and processes.
- 5. Document the target civil registration and vital statistics processes.** Target civil registration and vital statistics processes are re-defined processes that respond directly to the weaknesses identified in the As-Is Assessment and the opportunities identified in the previous activity. The target processes should simplify and streamline existing processes i.e. reducing bureaucracy, facilitating the decentralization of civil registration, addressing bottle necks and improving service provision to citizens. The target processes will be supported by the Target System Architecture which enables simplification and automation.
- 6. Define the information requirements.** Before being able to define what systems are required to support the business needs of civil registration and vital statistics, it is necessary to understand what information requirements exist i.e. what data is collected, stored and put to use within the existing system. At the highest level this means understanding what logical entities exist within the business domain and the relationships between them. Together with the Data Dictionary, they form the basis of the data architecture which, when detailed at the lowest level, will later define the database design for civil registration, vital statistics and population registers, as well as interactions with identity management systems.
- 7. Define the target system architecture.** The target system architecture is a holistic, interoperable model of the applications and computer programmes required to fulfil business needs and support target processes.
- 8. Define system requirements.** System requirements are clearly articulated statements of what a system must be able to do in order to satisfy stakeholder needs, and are derived from business requirements and user requirements, as per the Requirements Hierarchy figure below. They should be defined in two clear categories, functional and non-functional. Functional requirements describe the required behaviour and functions of the system. Non-functional requirements describe specific criteria that can be used to judge the operation of a system e.g. performance, security, availability.

Figure14. Requirements hierarchy



Source: CRVS Digitisation Guidebook, available from <http://www.crvs-dgb.org/en/>

448. **Implementation planning phase.** The activities of the implementation phase will support the creation of a comprehensive work plan for the digitization project, from the selection of software vendors through the testing and deployment of information and communication technology solutions in the field and subsequent scaling-up.

- 1. Documenting the digitization implementation plan.** On completion of all activities in the Analysis and Design phase, it is important to carefully plan the next phase of activities, from system procurement to the beginning of full system deployment. Conducting a comprehensive planning exercise mitigates the risk of schedule and cost overruns and a well-defined implementation plan provides a structured framework for ongoing project monitoring and reporting. This should be done within the context of the wider strategic plan to ensure that the project is not operating in isolation and any interdependencies are clearly acknowledged by all parties. The shift from analysis and design to implementation will necessitate returning to the Project Initiation Document and adjust the project team and governance to support the changing nature of the activities. There is also a need to update the Business Case template to complete the costing sections related to Systems Development, Testing and Implementation.
- 2. Procuring the digital system for civil registration and vital statistics.** Conducting a rigorous procurement process will ensure a strong contractual position for the government and mitigate delivery risk in the provision of software and services. Central to this is a Request for Proposals (RFP) that clearly defines the system, requirements, deliverables and delivery timeframes. The procurement of this system should follow the regular government-issued procurement guidelines and regulations.

- 3. Defining the change management approach and plan.** Change management refers to the management of transformative activities within an organisation in such a way as to ensure that the changes that occur are fully accepted and integrated into daily routine. An effective change management approach is crucial to facilitate the acceptance and use of the digital system and processes across the organisation and should be done in alignment with wider strengthening activities. Clear and targeted communications through a variety of different channels should be used to explain what changes are happening, when, and how they will affect each stakeholder.
- 4. Defining deployment approach and plan.** Deployment is the act of introducing a new technical solution/platform and services to an organisation in a coordinated manner. A successful deployment relies on forward planning, adequate resourcing, on-going monitoring and evaluation and strong communication.
- 5. Defining the training approach and plan.** Training staff and users in the use of the digitized civil registration and vital statistics system and processes will ensure that the system is used effectively and will mitigate the risk of business rejection and safeguard against improper use.
- 6. Defining the testing approach and plan.** Testing the newly developed digital system rigorously is essential to ensure that the system is fit for purpose when it is deployed. Testing should be done sequentially and traced directly back to system requirements defined in the Analysis and Design Phase.
- 7. Defining the operations approach and plan.** During the Operations & Maintenance phase, the fully tested and accepted system is released into the full-scale production environment for sustained use with operational and maintenance support. This activity focuses on planning for the transition from the implementation phase to normal operational use and handover to the Operations and Maintenance Team. The Operations and Maintenance Plan should define the tasks, activities, and parties responsible for carrying them out, to ensure that the live system is fully functional and is performing as expected.

449. The following examples from the Philippines, Mongolia, and Ghana demonstrate the varying ways in which system digitization can be designed and implemented. The Philippines embarked on the project of digitising their civil registration and vital statistics system through a public-private partnership. Please see [Box 23](#) for some details and outcomes of this model.

450. Another example is Mongolia, where an electronic system for data capture has been introduced recently, which has had a positive impact on the completeness of birth and death registration. See [Box 24](#) for details.

451. A third example, the case of the digitization plan of the entire CRVS system in Ghana, is described in [Box 25](#).

Box 23

The Philippines. Public-Private Partnership for digitization of the CRVS system

The Philippines has a model of a public-private partnership on CRVS. The Philippine Statistics Authority (PSA), which is both the national statistics office and also the civil registration authority, entered into a Build-Transfer-Operate contractual arrangement with a private entity, known as the Civil Registry System Information Technology Project (CRS-ITP2). This is a successor project to the CRS-ITP implemented since 2000 through which digitisation of civil registration documents was achieved and provision of frontline civil registration services was implemented. With the CRS-ITP, service times were reduced from 7 to 10 working days to within the day, and customer satisfaction increased from 18% to 82%.

Under the CRS-ITP2, the contractor builds the facility on a turnkey basis, assuming cost overruns, delays and specified performance risks. Supervision is performed by the Public-Private Partnership (PPP) Center following PPP law. Once the facility is commissioned satisfactorily, the title is transferred to the PSA. The private entity will operate and maintain the IT system on behalf of the PSA under an agreement, while the PSA will operate the CRS Service Facility. The CRS-ITP2 is a concession period of 12 years (starting 2016) inclusive of a 2-year development phase and a 10-year operations and maintenance period. Revenue sharing is based on the bid of the private partner.

The CRS-ITP2 will involve further computerization of the civil registration operations of the PSA and is designed to collect, access, store, maintain and manage civil registration documents and specimen signatures of all city and municipal registrars using imaging technology. It will also include faster production of vital statistics and will make available civil registration services nationwide through the CRS outlets and other authorized partners. It will develop a new CRS application based on modern architecture that will support the central and end user computing for system management, system performance and security. Other access channels to CRS services such as the use of the web, mobile and kiosk devices, integration of services with other government agencies and partners will also be established, as well as the establishment and site preparation for 40 additional outlets nationwide.

Among the objectives of the CRS-ITP2 is to provide enhanced frontline civil registration services through copy issuance of birth, death, and marriage certificates, authentication, Certificate of No Marriage and new services such as Certificate of No Death. Key performance indicators have been set as follows (only basic services are shown):

Service	Former PPP (2000-2016)	New PPP (2016-2028)
Copy issuance	2 hours	1 hour
Authentication	2 hours	1 hour
Certificate of No Marriage	5 days	1 day
Certificate of No Death	N/A	1 day

Finally, the CRS-ITP2 will establish a geographically separate disaster recovery environment in an undisclosed location within The Philippines.

Box 24

Mongolia. Improved processes through digitization of the CRVS system

Mongolia has achieved very high birth and death registration in recent years. An important factor in this is that they have introduced an electronic system for data capture. Digital data which have been collected from the local registration units are transmitted through the online system to the central database where possible. However, as the greater part of the districts (soums) is not yet able to have direct access to the online system for civil registration, an offline program has been introduced in these offices.

The registrar at the district level enters a vital event using the offline program. This program includes checks and controls and ensures that the forms are entirely filled out and in line with nationally standardized questions. If one information item is missing, a warning is shown by the registration program and no further processing is accepted. Once the registration is complete, the local civil registrar prints the official registration form including a QR code where information has been saved in a machine-readable format.

The registrar and the informant sign the registration form, which is sealed by the registrar. The registration form (which contains also digital information in the QR code) is then delivered to the province (aimag) registration unit where a superior registrar verifies the information on the registration form, as well as other attached documents (such as the birth notification form issued by the health facility, copies of the IDs of parents, and acknowledgement of parentage). If everything is in order, the information will be scanned through the QR code and entered into the online registration system. If not, a correction procedure will be required and the registration form will be returned to the district registrar. At registration centres without access to Internet, information about vital events is also computerised. The computers are used to print a QR code with all relevant information on a copy of the certificate, which is then forwarded to the higher-level civil registration centre, where the QR code is scanned and this information is entered online into the national database.

Before the offline system was introduced, inaccurate information on vital events due to unintentional mistakes often occurred. Since the offline program has been in place, the mistakes caused by manual errors have almost disappeared. Also, significant time is saved as data only have to be entered once and many errors are avoided due to automatic checks.

Box 25

Ghana. CRVS digitization strategy as a result of the comprehensive assessment

Ghana conducted a comprehensive assessment of its Civil Registration and Vital Statistics System and prepared a national CRVS Strategic Plan in line with Regional and International requirements for developing an efficient system. The comprehensive assessment exercise revealed among others that interoperability of stakeholder databases was virtually non-existent, many parallel databases of individual identifications were being operated by various government institutions at great cost to the country, stakeholders shared data on an ad hoc and infrequent basis and the paper-based nature of the system was a major barrier to improving the CRVS system.

The current national medium term development policy framework- the Ghana Shared Growth and Development Agenda 2014-2017 also identified under-development and under – utilization of the civil registration information systems, lack of awareness and non-compliance with civil registration regulations as further drawbacks.

Thus, the CRVS strategic plan proposed the digitization of the entire system to improve its efficiency and provide reliable and timely statistics to monitor and evaluate national goals and SDG goals at all levels of governance. In line with this, stakeholder institutions were tasked to design a CRVS ICT strategy and develop a business case for its implementation. A team of consultants conducted a needs assessment of the IT systems of stakeholder institutions after which selected participants were trained on the use of the CRVS digitization guidebook (published by ECA) to cover the first phase of the CRVS digitization programme.

In the phase 2 of the programme, participants met in a workshop to critically review the first draft of the 'as-is' CRVS business process maps, and to identify any bottleneck of the proposed processes in registering births, deaths, marriages and divorces. System analyses were also done to confirm the current processes and identify missing steps. Participants at the end of the workshop proposed the expansion of service delivery points for the registration of all the vital events considered under the programme.

A number of initiatives in the CRVS strategic plan recommends the automation and digitization of the system and processes so as to extend registration coverage, standardize and streamline civil registration and vital statistics processes, integrate data from multiple systems and securely store data at scale all in a cost effective manner. If properly employed, ICTs can make a significant contribution towards achieving universal registration of vital events, providing legal documentation of civil registration as necessary to claim identity, civil status and ensuing rights, and producing accurate, complete and timely vital statistics.

D. Key considerations

452. Developing and deploying digitized system for civil registration, vital statistics, population registers and identity management using the governing enterprise information technology approach described in Section B. above is also subject to several key considerations that are outlined below.

453. The **system's foundation** must be well established with a strong design, stakeholder engagement, and a supportive legal framework.

1. **Business Process Map.** Gather key stakeholders involved in the system under consideration to map out the current business process (as-is) and proposed business process (ideal). Each map should include participants, processes, time periods, outputs, and bottlenecks. This activity will elicit discussion among key stakeholders and ensure a common understanding of the current and proposed systems. The map of the proposed system should be used to guide digitization activities.
2. **Conduct a legal review.** Ensure laws and regulations are in place to support the proposed digitized system. Compare the laws with the Business Process Map of the proposed system to ensure that the role of participants, processes, and outputs are in line with the legal framework. Initiate the process of revising laws prior to the implementation of any system changes.

454. Digitisation needs to be guided by **international standards**, in particular the *Principles and Recommendations for a Vital Statistics System*.

455. **Selecting technology.** Integrate the selection of hardware and software to ensure compatibility, keeping in mind the need to update hardware periodically. The technology for the holistic system for civil registration, vital statistics and identity management has to be developed in the framework of contemporary solutions for computer networking and use of internet. In addition, the fact that collecting biometric characteristics will, at some point, be part of the system, entails adapting the system to accommodate this type of information, primarily storage and retrieval. The selection of technology must be based on an objective assessment of needs and a comparative analysis of the cost-efficiency ratio of available technology options. An option for technology selection and maintenance is the implementation of public-private partnerships, with the well spelled out accountability and ownership terms of reference.

1. **Hardware.** While it is well documented that hardware become obsolete in a relatively short period of time, which, in turn, translates into the incentive to acquire the latest and most modern solutions – and thus the most expensive, it is also well documented that basic maintenance of the population and civil registers and related data processing does not require the most advanced technological features available.
Consider hardware that meets system specifications but is compatible with the environment (battery power, durability) and is user friendly (screen size, durability, weight).

2. **Software.** Consider developed platforms rather than ‘homegrown’ solutions. Technical staff supporting software solutions require less historical training if a developed platform is used. The disadvantage of using a developed platform is that it might not meet all system specifications. The pros and cons need to be carefully considered to ensure that the software meets system needs, but can be maintained within the system architecture, regardless of the maintenance team. The software solution has to be user friendly, too. With the advent of personal portable digital devices and the accompanying shift in communication behaviour, users will expect to have the necessary access to service provided by the system handy and as interactive as possible. System architecture needs to incorporate those interfaces in a manner to meet most, if not all, expectations.

456. **Data safety** considerations need to take the process and the people into account.

1. **Transmission.** Digitisation of the civil registration and vital statistics system may result in the change of hard copy form into electronic forms shared through electronic transmissions. To limit a data breach in which transmitted data is intercepted, encryption should be considered and applied to the necessary level of the system- file, application, database, etc.
2. **Storage.** Digitisation of the civil registration and vital statistics system, including population register and identity management system may also entail scanning **old records** and entering their data. This does not mean that those paper records can be abandoned, but they need to be carefully maintained and stored, with restricted access and regulated handling, as some of these documents might be centuries old. For an example on the importance of preserving historic records, see **Box 13** in **Chapter III**.
3. **Retention.** Related to storage, retention of electronic records necessitates a clear policy. Server space may become an issue for long standing programmes such as civil registration and vital statistics. Thus, the information management strategy of the relevant agencies must clearly state whether, when and how digitised and electronic records may be destroyed.
4. **Authenticity.** Civil registration systems that provide online birth and death certificates need to carefully consider methods to ensure authenticity to minimise identity theft and child trafficking using stolen certificates. See an example of the checks and safeguards in the production of certified copies, implemented by the Civil Registration and Identification Service of Chile in **Box 6** in **Chapter II**.

457. **Confidentiality** of the individual information is one of the basic principles of the civil registration and vital statistics. Ensuring the safety of the individual information stored in the digitized system requires robust security setups and multi-layered protection against breaking into the system and retrieving the records. The potential misuse and abuse of individual information does not necessarily have to always come from outside the system. Hence the need to carefully limit the access to the register to only the necessary officials. Even then, a hierarchy for allowing different levels of access to the records and their manipulation has to be established. In addition, physical security has also a role to play; for example, work stations should not be equipped with interfaces for portable memory cards, preventing the downloading of the records.

458. Debate on **digital identity** is well under way at present¹²⁷. While the definition of digital identity is not universally adopted, it refers to unique and constant identity – a virtual Identification Card – assigned to an individual that authenticates him/her to all portable digital devices, but also in the digital world, such as online banking, commerce and even in the physical world whenever such identification may be required. It involves biometrics, such as fingerprints or iris scanning, which is increasingly available on contemporary portable digital devices. The fact that it is not yet universally implemented is due to a number of issues, such as that it has to be platform- and device-independent¹²⁸. As it can be expected that the concept of digital identity will take hold more and more, if for nothing else than to move away from the (userid+password) model, the digitized civil registration, vital statistics, population registers and identity management systems need to take this development under consideration and perhaps provide such an additional service to its users. See **Box 26** on the potential use of blockchain technology in this context.

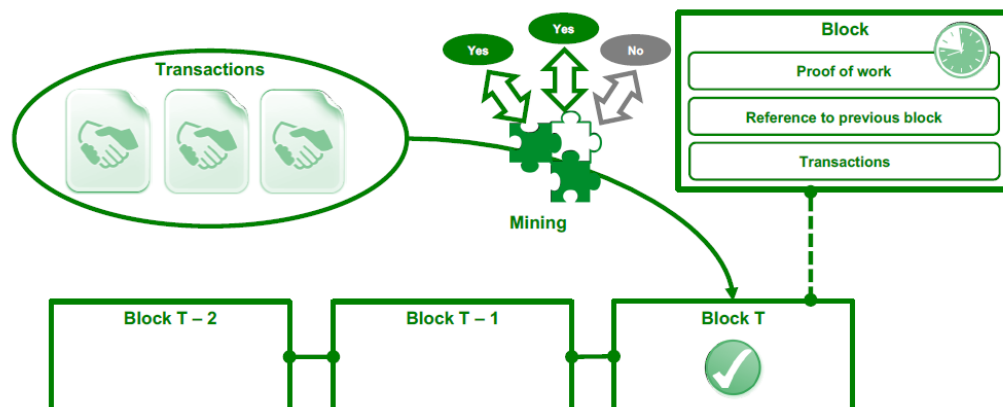
¹²⁷ January 2017.

¹²⁸ *The Digital Identity Dilemma*, Bob O'Donell, at: <http://www.recode.net/2016/8/10/12413592/digital-identity-virtual-id-card-fido-web-api>.

Box 26

Blockchain and CRVS

The recent increased interest in the Blockchain (also known as distributed ledger technology) and cryptocurrency technologies have brought the attention of many governments, United Nations agencies and civil society to potential applications in civil registration and identity (ID) management. Just as its name implies, a blockchain is a chain of blocks; each block contains records of information and is connected by hash pointers (mathematical functions) and secured using cryptography. A blockchain can be seen as a decentralized network which has the objective of maintaining synchronized copies of a digital ledger distributed among the members of the network. In the world of blockchain, each participant keeps one ledger, which registers all events occurring in the platform. Once a piece of new information pertaining to a participant is announced, it will be verified by the miners (a term used to call the verifiers), then it will be added and reflected in the ledger of each participant. By design, blockchains are inherently resistant to modification of data. Once an information entry is created and verified, it is saved permanently, as the information is verified and saved by consensus, which makes modification extremely hard. Therefore, falsification is expensive. This is the reason why blockchain technology is potentially suitable to applications related to record management, such as civil registration and ID management.

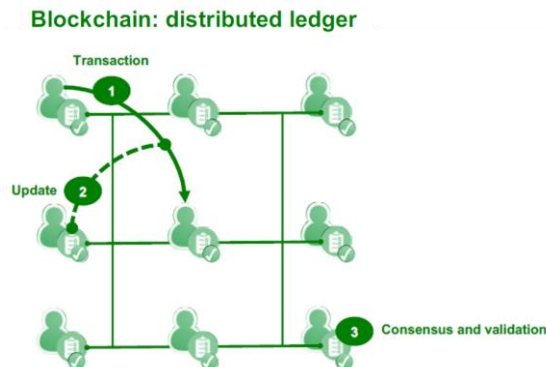


Source: Presentation of Blockchain for Identity Management by IBM Corporation in November 2016 Seoul, available from <https://www.slideshare.net/eburon/blockchain-for-identity-management-ibm-part-1-of-3>

In the simplest and most practical case of implementation of blockchain in civil registration, everything in the system would appear unchanged to the public as well as civil registrars. People would go to the civil registration office and provide requested information; local registrars would enter the required information to the system. The differences only lie in the background. That is, the technology embedded in the system for data input, storage and update changes. No single local registrar would be able to alter any information in the system without being verified by others and there are audit trails whenever information is edited.

Box 26 (continued)

Blockchain and CRVS (continued)



Source: Presentation of Blockchain for Identity Management by IBM Corporation in November 2016 Seoul, available from <https://www.slideshare.net/eburon/blockchain-for-identity-management-ibm-part-1-of-3>

In addition to applying blockchain technology in the usual model, application of blockchain may potentially solve many current challenges in civil registration and ID management. Hypothetically, the public could register all vital events from any point with an internet connection by accessing the blockchain network. For example, to notify a birth, parents could enter the data themselves identifying themselves using their own ID, or if the web application allows for it, even just upload a link to a digitally-signed video or photo to the blockchain, stating the baby's full name, date and location of birth and other data items. Miners would record the new birth and associate it irrevocably to the claiming parents and then all ledgers would be updated. To validate the process further, parents could also add their testimony and/or a third party's testimony, as well as additional proof such as the medical birth certificate from the hospital.

As all data are stored digitally and cannot be erased or modified, so are personal identities, no matter if the person moves. Therefore, loss of identity documents would no longer be a concern and the dilemma of proving one's identity would be eased. In fact, people may not need to carry and show any physical ID documents anymore as long as they can connect online and present information they know e.g. a password or biometric information such as a retina scan or fingerprint to identify themselves. This would be particularly meaningful for refugees and displaced persons who may not be able to carry their identity documents when fleeing their usual place of residence.

Despite the excitement about the potential revolution of civil registration and ID management brought by blockchain technology, applications are still at the stage of exploration, only a few small pilot projects have been carried out, let alone large scale implementation. At this point of time (Fall 2017) it is more of a conceptual exploration as there is a need for further elaboration of the use of this technology from the point of view of ensuring proper and comprehensive input of relevant information into the statistical function as well.

Appendix 1

Medical certification of cause of death form recommended by the World Health Assembly

INTERNATIONAL FORM OF MEDICAL CERTIFICATE OF CAUSE OF DEATH

Cause of death		Approximate interval between onset and death
I Disease or condition directly leading to death*	(a)
	due to (or as a consequence of)	
	Antecedent causes Morbid conditions, if any, giving rise to the above cause, stating the underlying condition last	(b)
	due to (or as a consequence of)
	(c)
	due to (or as a consequence of)	
	(d)
<hr/>		
II Other significant conditions contributing to the death, but not related to the disease or condition causing it

*This does not mean the mode of dying, e.g. heart failure, respiratory failure. It means the disease, injury, or complication that caused death.		

Appendix 2

Computer software for selection and coding of underlying cause of death

Manual coding is a laborious process requiring understanding and skill in applying ICD rules and principles for correct coding and selection of the underlying cause of death. Since the 1960s automated coding systems have been developed to streamline the coding process and improve uniformity in the application of coding rules and principles for the selection of the underlying cause of death. Automated systems do not replace trained coders. In fact, trained coders are still required to support automated coding systems for death certificates rejected by the system and to perform quality control of automatically coded records, especially when changes are made to the automated systems. Currently, the Mortality Medical Data System and Iris are the two most commonly used automated coding systems globally. Both systems require deaths reported as per World Health Organization death certificate recommendations.

The Mortality Medical Data System (MMDS) is a software package developed by the US National Center for Health Statistics in the 1960s. It includes components to conduct various coding data management processes: data entry, cause of death coding, selection of the underlying cause of death, and data translation for statistical analysis. Mortality Medical Indexing Classification and

Retrieval (MICAR) is the component that codes using ICD rules and principles for multiple cause coding. MICAR codes the causes of death entered in text format, a process that is language dependent. It has been used in the US, UK, and Australia. The Automated Classification of Medical Entities (ACME) is the component that determines the underlying cause of death from the codes selected in MICAR. Since the data are in numeric format, ACME is language independent. Sweden, Brazil, and France have used ACME but it does not perform as well without MICAR due to very specific coding instructions. Currently, the US National Center for Health Statistics maintains the MMDS and is its primary user.

In the 2000s, five countries collaborated to develop a language independent automated coding system. Initially based on MICAR and ACME, Iris was developed as a free, closed-source software with a language-independent component. Similar to MMDS, Iris conducts multiple cause coding and selects the underlying cause of death. Iris can be used in two modes: code entry or text entry. For code entry, Iris selects the underlying cause of death from the codes entered directly into the system. This mode can be used once Iris is installed and data are prepared in the required data entry format. For text entry, causes of death are entered in text format and coded using ICD rules and principles for the selection of the underlying cause of death. The text entry mode requires the development and maintenance of a local dictionary, allowing application in any language. Dictionary development and maintenance is a substantial investment but can be facilitated with the modification of an existing dictionary, e.g., French dictionary used for the development of the Moroccan French dictionary.

Iris is currently used or in the process of implementation in many countries worldwide: Czech Republic, France, Luxembourg, Sweden, Brazil, Philippines, Fiji, South Africa, Mexico, Canada, Australia, and others. The Iris Institute, established within the German Institute of Medical Documentation and Information and supported by partner countries, maintains Iris through its Core Group to meet ICD rules and principles; issues software updates; and organizes annual training meetings.