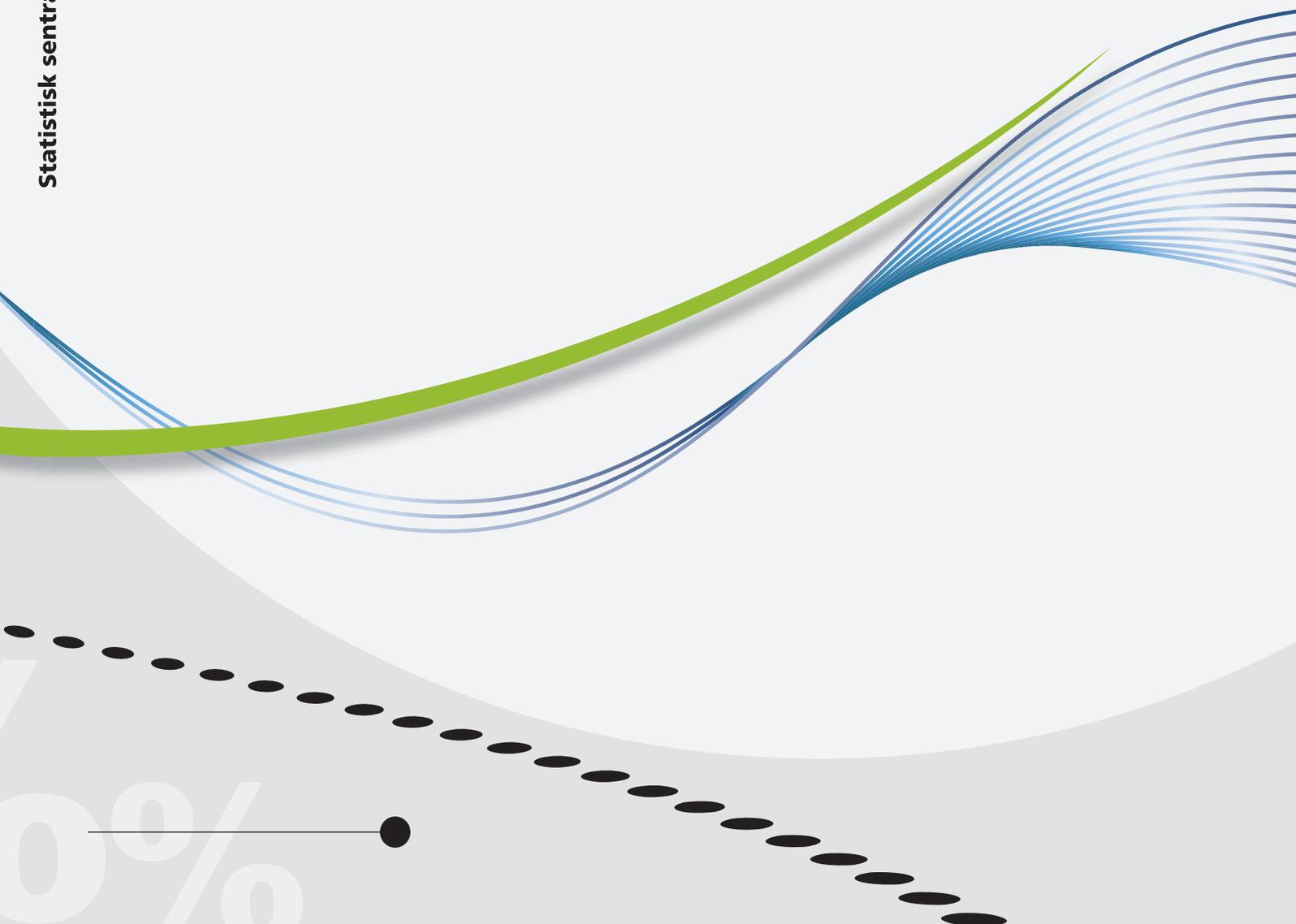


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Status Analysis on Civil Registration and Vital Statistics (CRVS)



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Preface

Statistics Norway (SN) has been asked by the Norwegian Agency for Development cooperation (Norad) to do an analysis of the current status of civil registration and vital statistics (CRVS), with an emphasis on developing countries: what is currently the state of registration systems around the world, what is and can be done to improve it, and who should take the initiative and responsibility. The report consists of four main chapters:

- Current situation of CRVS
- Selected country studies
- How can registration coverage be improved?
- Good quality vital statistics

The first chapter gives an introduction to the current state of play of CRVS systems: what it is, why it is important to develop it, who is presently involved in this work, and what needs to be done to build a good CRVS system.

The second chapter gives a description of how the CRVS system works in Norway and a few other countries where SN staff have been involved. It is intended to provide ideas and suggestions for how CRVS can be implemented and improved in countries where the CRVS system is still weak.

Chapters three and four are picking up on some of the topics mentioned earlier in the report and discuss them more in detail.

The status analysis is also meant to serve as an introduction and background for how SN best can contribute to the international CRVS development. These suggestions are attached in a separate appendix to this report. In this section we suggest to concentrate our support on vital statistics development, in addition to advising on how registration of vital events can be improved and how the registered data may be organized. The suggestions can be divided into the following seven areas of support:

1. Access to data
2. Structuring data
3. Linking data
4. Data analysis
5. Dissemination of data
6. System wide approach
7. Explaining the Norwegian system

We would like to thank the Global Health section in Norad for funding this report, for travel support and for useful input. Thanks also to colleagues in UNECA, UNESCAP, UNSD and WHO, who have been very good discussion partners and who have provided useful comments on the first draft of this report.

Statistisk sentralbyrå, 19. november 2014

Olav Ljones

Abstract

The Civil Registration and Vital Statistics (CRVS) agenda has a wide scope. It covers the registration of vital events, like births, marriages and deaths, and the use of this to produce statistics. The registration often has immediate benefits for the persons who are registered, by giving them an identity and the right to public services. It is also useful for the government as a basis for evidence-based policy and planning and, when sufficiently good, CRVS is a means to keeping track of inhabitants, such as potential tax payers.

Registration of vital events provides a powerful source for producing statistics, as the collected data can give more detailed evidence on sub-national areas than it is possible to obtain from sample surveys, and more frequently than population censuses can do. This is crucial for national policy-making, like identifying the needs for investments in infrastructure, setting priorities in the education and health sectors, and for ownership of land.

The registration and use of vital events may be conducted at different levels of complexity and with increasing levels of ambition, resource use and benefits to government and individuals. Additional levels of complexity include registration of non-traditional vital events (marriages, internal and external migration), computerizing the CR data in a data base, introducing personal identification numbers, and establishing a comprehensive population register. Even the most advanced solutions have become more feasible with the development of modern technology such as computers, smart mobile phones and internet.

Developing CRVS requires cooperation of a wide range of stakeholders. To achieve this, it is necessary to have the political will to establish a uniform system. Furthermore, practical challenges such as to increase the coverage, digitise the registers and link the systems, have to be addressed. The full value of CRVS first becomes apparent when registers are used for public administration and contribute to planning.

Countries have different motives for engaging in CRVS, such as security concerns, increasing tax revenue, modernise banking, improving public services to the residents (health, education, pensions, etc.), and strengthening human rights by providing birth certificates to everybody with name, date of birth, citizenship, etc. Thus, CRVS may serve many purposes and is often seen as an important part in building a modern society.

The point of entry of this document is to learn from what has already been done in many countries in the world, including Norway, Albania, Kazakhstan and Mozambique, and to present and discuss good practices to facilitate the process for countries embarking on a CRVS development process. The population of a country needs to know how to register vital events and appreciate the benefits from doing it.

It is essential that CRVS systems respect data confidentiality and human rights and that legislation is developed to avoid misuse of data on individuals and groups.

The report also describes the specific role that potentially can be played by national statistical offices in CRVS development, both in building and maintaining registers as well as producing and disseminating data from the system.

The document ends by suggesting how Statistics Norway can contribute to the development of CRVS internationally and in individual countries. The core of this is to build on practical experiences from the development of CRVS in Norway and other countries, to create a basis for sustainable practices in developing countries.

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List of abbreviations

| | |
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| APAI-CRVS | Africa Program on Accelerated Improvement on CRVS |
| ARKS | Agency of the Republic of Kazakhstan on Statistics |
| ASSD | African Symposium on Statistical Development |
| CoIA | Commission on Information and Accountability |
| CRVS | Civil registration and vital statistics |
| CPR | Central Population Register |
| CSO | Civil status office (Albania) |
| DHS | Demography and Health Survey |
| EMRO | Eastern Mediterranean Regional Office of the WHO |
| ESCAP | United Nations Economic and Social Commission for Asia and the Pacific |
| EU | European Union |
| GDCS | General Directorate of Civil Status (Albania) |
| HPR | Historical Population Register |
| ICD | International Classification of Diseases |
| INE | Instituto Nacional de Estatística (Mozambique) |
| INSTAT | Institute of Statistics (Albania) |
| MICS | Multi Indicator Cluster Survey |
| MoI | Ministry of Interior |
| MLGD | Ministry of Local Government and Decentralisation |
| NGO | Non-Governmental Organisation |
| NMFA | Norwegian Ministry of Foreign Affairs |
| NSDS | National Strategy for Development of Statistics |
| NSS | National Statistical System |
| NSO | National Statistical Office |
| NTA | Norwegian Tax Administration |
| OSCE | Organisation for Security and Co-operation in Europe |
| PIN | Personal Identification Number |
| QVS | UNSD Questionnaire on Vital Statistics |
| SN | Statistics Norway |
| UNECA | United Nations Economic and Social Commission for Africa |
| UNICEF | United Nations Children's Fund |
| UNSD | United Nations Statistical Division |
| WHO | World Health Organisation |

1. Introduction

1.1. What is CRVS?

Civil registration (CR) and vital statistics (VS) are often mentioned together as CRVS. Both are important for a well-functioning system of keeping count of and having an overview of population trends in a country.

According to the UN, civil registration involves the “continuous, permanent, compulsory and universal recording of the occurrence and characteristics of vital events (live births, deaths, marriages and divorces) and other civil status events pertaining to the population as provided by decree, law or regulation, in accordance with the legal requirements of each country” (UNSD 2014).

“Vital statistics constitute the collection of statistics on vital events in a lifetime of a person as well as relevant characteristics of the events themselves and of the person and persons concerned. Vital statistics provide crucial and critical information on the population in a country.” “Vital statistics and their subsequent analysis and interpretation are essential for setting targets and evaluating social and economic plans, including the monitoring of health and population intervention programmes, and the measurement of important demographic indicators of levels of living or quality of life, such as expectation of life at birth and the infant mortality rate.” (UNSD 2014).

“Vital statistics are obtained preferably through a civil registration system, as this is the ideal source from which to derive accurate, complete, timely and continuous information on vital events. In addition, vital statistics derived from the civil registration system (and the population registers) can include annual flow statistics from the smallest civil divisions, which no other data-collection system can provide.” (UNSD 2014).

If there is substantial underreporting of births and other vital events, vital statistics measures such as crude birth and death rates need to be estimated from other sources, primarily censuses and sample surveys. However, both of these sources have serious drawbacks in this respect: Censuses are infrequent, expensive, take a long time to process and publish, and are not well designed for measuring flow data. Survey results have sample errors, may be biased, and can usually not provide reliable data for small areas and populations, neither on flows nor on stocks.

As a minimum, civil registration covers the registration of births and deaths, but in many countries this also includes the registration of marriages, divorces and other important life events. Internal and external migrations have traditionally not been considered vital events, but are included in several countries because they are important in themselves and also for making population estimates. In addition to births and deaths the health sector often registers the cause of death. For consistency and practical use of data for administration, statistics and planning, inclusion of migration should also be a long term goal. However, although we in the following will touch upon most of the vital events mentioned here, our focus will be on the registration of births and deaths.

Thus, improvement of CRVS consists of two major parts:

- CR: Improving (or establishing) the registration of births and deaths, etc. Usually carried out by a civil registration office or system.
- VS: Improving (or establishing) the production and publication of vital statistics. Data are usually processed by a national statistical office.

In some countries a substantial number of vital events are registered but there is nevertheless little or no dissemination of vital statistics, for several reasons

(resource constraints, statistical system not implemented and/or unwillingness of institutions to share data, etc.).

The registration and use of vital events may be conducted at different levels of complexity and with increasing levels of ambition and usefulness. In the following we have focused on the different levels of complexity of civil registration (CR). The level and detail of vital statistics (VS) will depend on this and is also mentioned below. The different levels have been given names for easy reference in later chapters.

1. *Basic CR*: Registration of births and deaths only, with limited recording of information. Registration is done by issuing a birth (or death) certificate and recording the information on paper (often in a book) or in a computer. Aggregate values of registered births and deaths can provide essential VS data for administration and planning if the coverage is sufficiently high and if there is a system for aggregating and transferring the data to a local or national statistics-producing office. As some persons may move after registration, combining birth and death information with the most recent census will give a better picture of the current population. Many countries in the world have a system of this kind but the coverage is too low in most developing countries. WHO estimates that about one third of all births and two-thirds of all deaths globally are not registered in a national system. For these countries the main challenge is to improve the coverage and the quality of the existing registration and for a few countries to establish a system.
2. *Computerized register of births and deaths*: Establishing a computerised register of births and deaths at local or preferably national level. With this system, there will be much easier access to micro data on births and deaths, which may greatly expand the feasibility of producing important vital statistics. Some examples are indicators like crude birth and death rates, total fertility rate (TFR), infant mortality rate (IMR) and under five mortality rate (U5MR), both for the whole country and for small geographical areas. This assumes, however, that the CR coverage is sufficiently high, that micro data are transferred to a national statistical office for analysis and publication, and that there is a recent population census that can be combined with data on births and deaths to provide updated estimates of the size and composition of the population (by age, sex and region).
3. *Computerized register of all vital events*: Expanding registration of vital events to include marriages and divorces and also internal and external migration. The addition of migration data would allow better population estimates and consequently more detailed and exact vital statistics on the population. It is, however, more challenging to develop a system that registers migrations than other events.
4. *Civil Registration with PIN*: Assigning a unique personal identification number (PIN) to each new born child. This number should be entered into the birth register and be used when issuing birth certificates and other documents. The same number, if available, should be used when registering deaths and immigrants. This would be an important – and essential - preparatory step for establishing a population register. With the linked birth and death data, more correct and updated vital statistics can be produced.
5. *Comprehensive population register*: Establishing a comprehensive central population register (CPR), with registration of all vital events as well as the total population with full name, date of birth, a universal unique identification number, and address. Only a few countries have such a comprehensive system (among others the Nordic countries, Netherlands, Belgium, Austria and Slovenia). The statistical use of such registers varies, however. In some countries, particularly the Nordic, there are close links between the population registers and the national statistical office, as well as with many other registers and government institutions. In such countries the population register is widely

used for administrative and statistical purposes. In the Nordic countries the CPR was established on the basis of a population census, in other countries, such as Albania, the CPR was established from an existing manual paper-based register.

6. *System of registers*: Establishing a system of registers, with links between registers of persons (CPR), properties (including land titles) and companies. Norway and a few other countries have developed such a comprehensive system.

For most countries the challenge is to first establish a basic functioning system for birth and death registration. If all births are registered, over time a birth register would gradually be built up. In “only” about one hundred years the total population would be included (except for new immigrants). This would not be a population register, however, unless the register is also updated with deaths, immigrations and emigrations. It is usually more complicated to record losses from a population than additions. We do not recommend this gradual approach, as it would take an exceedingly long time to build up such a register to cover the whole population. Moreover, it would not provide a good representation of the current population unless deaths and migrations are also registered.

Instead, we recommend a gradual development towards either a basic computerized CR system or a population register, depending on the economic development and the state of infrastructure in the country. For many developing countries the first step would be to improve and expand the registration of births, deaths and possibly other vital events, and to enter information about these into a central database. This simple register can be used to make statistics and gradually be used for various administrative purposes. A logical and not too complicated further improvement would be to introduce personal ID numbers (PINs) at the same time.

The PIN number will be most effective if it is not just part of the register/database, but is used in the interaction between government and individuals as identification in line with name and other personal identity information. Another factor that might improve the use of the number and make linkage between different data sources much easier is that the same PIN number is used as personal ID in all registers instead of different codes in each system. We will come back to details about how the PIN number should be generated and organised in later chapters.

Registration of births, deaths and other events needs to be based on a solid legal platform, to ensure that it is done properly, and particularly to reduce the risk of misuse. It is particularly important that sensitive information about individuals is confidential and that access to such data is restricted. There should also be restrictions on sharing within the government and institutions that follow up on violations need to be in place. In Norway the full Personal Identification Number (PIN) is considered sensitive information and should not be published, not even on the outside of an envelope with a letter to the concerned person. The date of birth is not protected, however.

Institutions and persons that have a legitimate reason for needing the full PIN for selected individuals or the whole population may apply for this, if permitted by the law. In Norway this is done through The Data Protection Authority. Institutions having a legitimate need for PINs include both public and private health and educational institutions, police, army, banks and insurance companies.

Thus, there is a need for laws and regulations that protect sensitive information about individuals. These have to be developed in such a way that they also open up for exchange of data between different government institutions without compromising on data confidentiality. This should be an important part of the planning process to improve the CRVS system in a country.

The improvement of CRVS should take advantage of the technological development in recent years, particularly with regard to inexpensive computers, mobile telephones and access to Internet. This technology was non-existent when the Nordic countries introduced central population registers in the 1960s. Developing countries therefore have a technological advantage compared to the Nordic countries when the system was introduced there, but may nevertheless learn from the Nordic experience.

Even the simplest CRVS involves many Government bodies either through direct implementation or through specific interests. As mentioned earlier, it is organised differently in different countries. The core usually consists of a registration office (i.e. a *registry*) with local branches, supervised by the Ministry of Interior, Justice or other. It is common, however, for registration offices to be supervised by local or regional governments, with the central government only having legal and technical responsibility for registration, such as standardizing documents. In addition there is a national statistical office (NSO) in most countries, which may receive vital statistics data from the registry and process and publish them. In some countries the registry or unit within the ministry processes and publishes the data themselves. This often leads to duplication of work.

In countries where a good and updated statistical law exists all data that “enter” the NSO are treated confidentially. In these countries national statistical offices (NSO) should have a special role: Since all data are handled confidentially, the NSO has extended rights to receive confidential data for statistical purposes. This implies that a NSO has the right to receive confidential register data, but it also restricts the NSO’s possibility of sharing data on individual level with others. The population can therefore trust that personal and linked data are not distributed and misused, and that only the vital statistical information is available for public use.

Ideally vital statistics data should be published regularly, timely and be of wide coverage and good quality, meaning that vital statistics should be:

Processed and published by an independent statistical body to ensure good quality information.

Transferred to the statistics producer on micro data level to enable quality control and the possibility to publish a wide range of cross tabulations.

Confidential – it should not be possible to identify individuals in the published data
Published in a user-friendly and accessible manner and for sub-groups of the population, f. ex. by age, sex and region.

In many countries the health sector plays an important role for the registration of vital events, because it is usually involved when births and deaths occur. The health sector also has a great interest in the data that come out of the CRVS as population data are necessary for planning the health services. Close cooperation between the registration office and the health sector, both on central and local level, may therefore be advantageous. Other stakeholders and contributors will be mentioned throughout the report where relevant.

1.2. Why CRVS?

There are many good reasons for establishing a CRVS system. The registration of births and deaths and other vital events may be beneficial for individuals, national and local government and private companies, for different reasons. The benefits are particularly pronounced if the CR data are integrated into a Central Population Register (CPR) which is updated regularly, as mentioned above.

Although the benefits for the residents of a country are the most important goal, we will first present some of the benefits for government, as this also affects the residents and how they can gain from a well-functioning CRVS system. This is easier understood and appreciated by the population if the gains of the government are clearly stated.

Naturally, CRVS is most advanced in developed countries. Only a few developing countries have a good CRVS system. This is mainly a result of limited resources and poor infrastructure. There is no doubt, however, that developing countries will benefit from better CRVS systems, both for statistics, administration and planning, and not the least for the people themselves. The lack of identification documents is often a problem, for example.

Civil registration data as a basis for fact-based decision making

Many parts of public administration would benefit from a good CRVS system. The level of benefits is related to the complexity of the system. Even a basic CR system, where only births and deaths are registered and without a PIN-code, can improve planning, be cost-saving and improve the efficiency of the government. If the registration coverage is sufficiently high and the data are compared with census data to adjust for migration, it can be used for the following examples:

- Rough estimates of the size and composition of the population, at both local and national level. This will make it easier the planning of a number of government activities.
- The estimate of the population size can, for example, be used to estimate the per capita income (GDP) of a country, as well as a number of indicators where population size is needed as the denominator.

A computerized register of births and deaths will make it easier to produce more advanced indicators based on vital statistics data, such as:

- Crude birth and death rates, total fertility rate (TFR), infant mortality rate (IMR) and under five mortality rate (U5MR), both for the whole country and for small geographical areas

A population register with inclusion of migration, and where everybody is given a PIN, can provide valuable information for public administration and planning:

- Based on information in the register it is possible to construct lists based on different criteria:
 - Voters eligible to participate in local and national elections, based on citizenship, years of residence, age, etc.
 - Persons residing within the borders of a country. This may be important from a national security point of view.
 - Children eligible for enrolling at school and of people in need of specific health services on sub-national level.
 - Conscription lists for military service.
- It can serve to ensure more efficient public services, such as for issuing passports, driving licenses and legal documents on ownership of land.
- Be the base for a tax register with an updated list of persons who are eligible for paying taxes.

A more advanced system that includes the same unique personal ID in several registers, which makes it possible to link the population register with other registers, can provide better information on the issues listed above. In addition,

other information may be available and more services can be provided. The most relevant registers to link information with are registers on addresses, educational activity and attainment, legal units, income and labour. A number of other registers may also be linked, which is the case in the Nordic countries. When different registers are linked, much additional information can be obtained, this opens up for a range of possibilities and could for instance:

- allow for a broader and more secure basis for taxation and hence a more efficient system for collecting taxes.
- make it easier and faster to establish the correct identity of an individual, including age, gender, citizenship and address (essential for ambulances in emergencies, e.g.). If the law allows, this may also be used to investigate crimes, and for applications for jobs and enrolment in schools and universities.
- allow commercial banks to use publicly available information to check identity and personal history of its customers and hence secure a more efficient banking system.
- allow a secure license and register system for firms which can be used to better monitor the economy and collect taxes.
- lead to a data base of interlinked statistical data that are useful for Government planning.

Benefits for individuals

In order for a civil registration system to work, the individuals need good reasons and incentives to register. Many of these are linked with the governmental benefits, but it is nevertheless important to emphasize the individual-level benefits as well:

- Being registered in a civil register and having a proof of this (ID card or birth certificate) may serve as an official proof of membership in a society, including citizenship and place of birth.
- A birth certificate is proof of name and age and may be used to avoid child marriage, child labour, and other exploitation.
- More targeted public services as the decision makers have better information and know where different services are needed (with basic CR system).
- Easier access to public services on individual level (with an advanced population register). This will be even more efficient when registers are harmonised between different public institutions to avoid double registration. Many countries strive to achieve a one-entry data system, reducing the response burden for the population, where personal information is registered only once and then utilised by different areas of the public sector. This can include utilising a civil register and an ID number as a basis for issuing passports, identity cards, driving licenses, etc.
- More easily getting health and vaccination cards.
- Easier application to enter schools and universities.
- In some countries there are substantial costs for registering and for receiving various certificates (on births, death, marriage, divorce, residence, etc.). A comprehensive registration system may reduce the costs and needs for this.

Benefits for private companies

Private companies and institutions may benefit from a population register which has information about all residents, especially their name, address and ID number. Examples include banks, insurance companies, banks, telephone companies and survey organisations. In Norway the CPR has many users within the private sector, which on specific terms are granted access to parts of the register and can utilise the register for commercial purposes.

It would be particularly useful for utility companies, such as for water, electricity, gas and telephones, to have a register with official ID numbers, to be used when registering new clients and billing them. This is a problem in many countries, where it may be almost impossible to trace clients not paying their bills.

We have listed many possible gains for some of the major parts of a society above. A few of the topics deserve more attention and we will discuss them a little more below.

Better vital statistics – better planning tool

As mentioned above, there are substantial gains from civil registration even with a simple system. With a CR system in place and a high level of registration of births, death and possibly internal and external moves, decision makers will have access to data on the size and distribution of the population. This can be achieved by updating the population size from the most recent population census with the recorded annual numbers for the factors affecting the growth (and composition) of the population, i.e., births, deaths, in- and out- migrations. This means that it will be known how many children will enrol in school in coming years, how many people live in one area and what the age distribution is. A strong benefit of vital statistics derived from civil registration is that it can be localized, which will make it possible for local authorities to make population statistics at low geographical levels. Such local information makes it easier to plan and decide where to build new health stations and schools, etc.

The population size is used as a denominator in many different settings. It is used to say something about the gross domestic product (GDP) per capita, vaccination coverage, share of children over five, share of elderly, and the death rate for different ages. Without correct population counts (denominator) such figures are uncertain. Population censuses give the answer to many of these questions, but they are usually carried out only every ten years and quickly become outdated, especially for populations that are changing rapidly. Surveys may provide useful data, but not on the population size. For other variables, such as the vaccination rate, the uncertainty is usually high, depending on the sample size. Generally, national surveys are in most cases not useable on local level.

With good vital statistics in place that are published in a user-friendly and timely manner, the population can also use the information to hold the government accountable for decisions and needs in the country, for example with regard to health and education services.

Human rights

Registration of births is very important from a human rights perspective. For children in particular it is important to be able to prove age, name, parents and country of birth. The Convention of the Rights of Children (CRC) specifically states that every child has the right to have a name, identity and acquire a nationality (Article 7). Birth registration is a protection right of children and is related to a number of issues dealing with children, such as child labour, juvenile justice, under-age marriage, health, human trafficking and child prostitution. It is also important in relation to education, voting rights and nationality, with the latter being a right enshrined in Article 15 of the Universal Declaration of Human Rights. Birth registration is seen as a tool in combating these injustices and providing children with rights and freedom that children in many other countries enjoy. An accurate knowledge of children's ages ensured through a birth registration system provides a means of establishing age and, as a result, providing protection to children. Linking birth registration to immunization programs and other child health services may be beneficial for these programs as well as improve the coverage of birth registration.

The United Nations Commission on Human Rights Special Rapporteur on the Right to Education has expressed special concern about the lack of information about children who should be in school, pointing out that registration of children at birth is often not put into practice. By knowing a child's age, the Government is in a better position to ensure that a child receives an education, even if it is only

through the non-formal education program, and presents the child with an opportunity to commence the move out of poverty.

When it comes to human rights and where registration documents are linked to access and services, it is important that registration covers the whole population as those not being registered will not have the same access. Typically, the hard-to-reach and vulnerable parts of the population such as refugees, minority groups and remote populations, are usually registered last. Making sure that they are included is therefore of great importance. If they are registered their status will in most cases be clearer than in a country where registration is not well developed.

With all these advantages, why is not a proper civil registration system established in all countries? The answer to this is quite complex and we will touch upon many of the things that need to be in place in the next chapter. Some important reasons are, however, that any CVRS system needs a substantial initial investment in terms of financial, technical and manpower resources before yielding improved public services and this is often not available, particularly not in poor countries. Also, there are many different interests involved in CRVS and cooperation has often proved difficult, including that a number of public and private agencies have established their own separate registration systems. It has, therefore, often been a challenge to ensure the necessary broad base for cooperation across sectors and agencies. Even with this in place, the necessary incentives or pressures on the population to register are not always sufficiently in place. Another important reason is that there is widespread opposition in some countries against having a register with individual information about all residents, based on concerns about privacy (“big brother is watching you”) and possibilities for misuse. This is the case in countries like United States, France. In Germany and Italy there are population registers at regional levels, but these registers are not centralised. In United Kingdom there are local registries that only record births, marriages and deaths.

1.3. What is important for CRVS development?

Civil registration and production of vital statistics requires the involvement of many different government institutions at national and local level, including registration offices. Therefore, cooperation between involved agencies and a high commitment of the government is of great importance for achieving a well-functioning CRVS system. This is, however, usually not sufficient as the population also needs to have an incentive or a reason to register births, deaths and other events, as discussed above.

Government commitment and leadership

In order to succeed in developing CRVS, it is of vital importance that the national government takes the lead. Without a government that is committed to the improvement and development of a CRVS system, the probability of failing is very high. The commitment should be specified through specific outputs and outcomes and include a worked-through implementation plan.

Ideally, there should be a presence of citizens and/or organizations that follow the development and makes the government accountable if it does not follow up on its own commitments. This is, however, often not the case as the citizens and opposition in many countries have very limited influence on the government and where public participation is rather low. Also, even where there is an opposition, other issues such as poverty and violence will often have a higher priority in countries with serious social differences and problems.

If the government sees the use and need for a CRVS system, for example because it gets a better overview over the population, this might be sufficient to implement changes. Also, international pressure over time and competition with neighbouring countries might have a positive effect.

In many countries, although there is a central push for CRVS development, this may be slowed down on regional/lower administrative levels or by lack of cooperation between different government institutions. In the Nordic countries we have seen that cooperation between different government institutions have been instrumental in developing a well-functioning CRVS system.

It is challenging for government and public authorities to work together on this and put aside their own special interests, which we will discuss in more detail below. Also, once the system is ready, the government needs to take the lead and create incentives for the population to actually see the advantages of registering. Some of the incentives that can be used to promote registration are presented towards the end of this chapter.

Holistic approach

Even with good goals and intentions in place, it is crucial that a system is planned and developed that plans for full scale implementation from the beginning and takes different interests and needs into account. A problem often seen in earlier attempts is that pilot programs have started without a plan for full scale implementation. The pilots often go very well, but when scaled up, it often shows that what worked in one region is not possible on a broader or national level. Having said this, starting implementation with pilots in parts of the country to test the system usually is a good approach.

Another aspect of this is the need for a long term commitment. When a pilot project is implemented there needs to be a plan for full scale implementation in a second stage. Here international organizations often have part of the blame as they start implementation without planning, both regarding funding and reality, for scaling up at a later stage, and for not involving the relevant government institutions sufficiently.

When planning the improvement of CRVS in a country, one should study already existing systems and build on what is available, if feasible. If this is the case it can reduce the cost of training people that know the already implemented systems.

As there are many different parts of a society that may benefit from a good CRVS system, one should also include a group of representatives for these different interests in the planning. The advantage of this approach is that the different parties feel included and that it reduces the chance of competing systems evolving. With more involved partners there is probably higher awareness of/interest in the implementation, which can lead to information spreading faster to the population. Too many involved parties might, however, also lead to too much discussion and perhaps disagreement and a system that never evolves from planning to implementation. An assessment therefore needs to be made of whom to involve in the planning phase and how and when to move on to implementation.

Cooperation

Since CRVS involves many different agencies, cooperation between the stakeholders is often a challenge to the development of the system. Agencies often have ownership of their part of the system, but are not able or willing to cooperate with other agencies to make the system work as a whole. There are many examples of institutions being unwilling or reluctant to share the data they “own” with other institutions, sometimes because they are afraid of losing power or income potentials. Here again, there is a need for a high-level committee that includes involved agencies, and a strong government commitment and ownership.

Some agencies are more important in the process than others. A two-level approach might therefore be efficient. On both the planning and implementation level the civil registration office, the vital statistics producer and ministries in charge of these agencies should be included. In cases where the health sector or others play

an important role in implementation, representatives from these agencies/ministries could also participate. Other agencies could be involved through a reference group. Examples of institutions that should participate in such a group are Ministry of Finance, Ministry of Planning, Ministry of Health, Ministry of Education, Ministry of Immigration, Ministry of Local Government (or Interior), Ministry of Justice, police, army, tax authority, passport office, driving license office, citizenship office, utility companies, banking and insurance sector, mapping authorities, different national NGOs such as human rights groups, and representatives for international organizations.

A practical measure that can be taken to increase the willingness to collaborate is to identify how each agency can benefit from working with the others and make these benefits visible and understandable. Strengthening ties between agencies to make them more dependent on one another might also help development. One solution that has many other positive implications is to harmonize standards and registration forms across agencies and regions. With all partners using the same language, classifications and systems, cooperation and interoperability are much easier to achieve. Another is to actively share examples and best practices of cooperation between institutions.

A practical example of inter-linkage is data exchange between the registration office and the vital statistics producer. Registration offices are often reluctant to hand over data to the vital statistics producer. If they can be convinced to share it once as a test, the agency responsible for producing (vital) statistics should commit to reporting back to the registration agency both on national and regional level on level of coverage, data quality and core vital statistics. The registration office might then see the added value of sharing data and also realize that the data they produce are needed and may increase efforts to improve the system further as well as sharing data.

One important issue is that production of statistics also serves as a check of the data. The statistical agency will often detect duplicates, missing data, impossible values (such as 32th of February, year of birth less than 1900, mother being 7 years old, etc.). These errors can be reported back on a general level to the civil registration agency and used to improve their data and routines.

The sharing of data is, however, a challenge in itself as data need to be handled securely in order to ensure confidentiality. When information is available on paper only, the security requirements are more limited than for computerized data, as is now the case in most countries. Handling and exchanging data therefore needs to be carried out with strict security regulations and stored at a central server where access to the files is limited to the relevant persons. Development of technical standards and agreements about use of data, including confidentiality, as well as agreement on funding and development of CRVS, is important for achieving practical cooperation in this area.

Also, collaboration between civil registration authorities and the health sector can be very effective if carried out in the right way. One way of cooperating is at health facility level where there may be a registration office. In countries where many people are not using health facilities, other solutions such as using local health workers or linking registration with vaccination and antenatal care could be considered. As the Global Investment Plan (WB 2014, p.29) shows, vaccination and antenatal care coverage levels are much higher than registration rates in many countries. In Uganda f. ex. the antenatal care covers 95 percent of the population while only 30 per cent of births are registered. Using new methods and tools in cooperation with the health sector might, therefore, be very helpful for registration if done in the right way.

Private actors can also be useful partners in CRVS development. Experience from Uganda and Senegal shows, for example, that mobile operators have taken initiatives and developed systems for birth registration which have proven quite successful so far (GSMA Mobile Identity Team 2013).

If good inter-agency cooperation can be achieved, this will reduce duplication of work, which in many cases may reduce costs and resource use.

Demand for CRVS

We have often seen that although there is a need and a will to improve the coverage of civil registration in a country, it is often failing due to legal and organisational challenges. A good law is a prerequisite in itself. If national laws are not amended to actually allow CRVS development, improvement will not happen. When and where the laws have been amended to allow up-to-date registration procedures, implementation projects still often do not get going or are stopped because of lack of interest from important stakeholders at national level. In other words, there may be too little *demand* for the benefits of the system, such as better information about a country's residents and therewith more informed decision making.

With increased international focus on CRVS development (see the next chapter), the international demand for better data, such as the Millennium Development Goals, has had an impact on national efforts to improve CRVS systems. In many countries high level committees have been established to assess the current system and have asked for advice on improvements and development of strategic development plans. In some cases national governments have also committed to development plans and secured a substantial part of *funding* for the planned changes. A more comprehensive overview of country commitment and actions taken can be found in annex 6 in the World Bank Global Civil Registration and Vital Statistics Scaling up Investment Plan 2015–2024 (WB 2014).

As the development and attainment of a high-quality CRVS system is a rather lengthy process, it is important that results are made available along the way. This includes statistics on registration coverage. It may also be useful to publish stories about individuals who have registered and have benefited from it. In this way, the chance of keeping the “demand side” interested and committed is much higher. This includes government decision makers, development partners, research institutions, NGOs, and the population in general. With a committed government, there is a much better chance of achieving a well-functioning CRVS system with a high coverage.

The expanded and improved registration of vital events may initially be targeted at some segments of the population, for example, the urban population, and may gradually be expanded to the total population of a country. In this way each goal may seem more achievable and it may therefore be easier to get started. With this approach the first regions to be covered can also serve as good examples and provide lessons learned. There should, however, be a plan for full country implementation to ensure that the project does not stop half way. In many countries we have seen examples of regional efforts that have been carried out without the necessary resources to scale up the system to national level.

Creating incentives for the population to register

The aim is to make registration of vital events as something people normally do. The CRVS system can, however, not improve if many families do *not* register their births and deaths. Most people will not register vital events unless they think that there are some advantages for them to do so. The government should spread information about the benefits to the public and also introduce new incentives - and perhaps also disincentives for not registering. Below is a summary list of such incentives and disincentives, based on the previous paragraphs:

- Providing a birth certificate with name, date of birth, place of birth, names of parents and citizenship, and preferably also a unique personal identification number (PIN).
- The birth certificate should be required for getting an ID card, if introduced.
- Removing legal barriers, such as the need to be given a name before the birth certificate is issued. (In Mozambique this has been done.)
- Removing all monetary costs of registering a birth and a death. This is in line with the standard advocated by the Committee on the Rights of the Child: «Ensuring that all children are registered at birth can be achieved through a universal, well-managed registration system that is accessible to all and free of charge». In countries where it is common that registration officers ask for additional service fees and bribes, efforts should be made to remove this practice.
- Create awareness of the benefits of registering, for example, through campaigns that stress the importance of registering. Before launching campaigns to promote registration of deaths as well, cultural factors should be taken into account.
 - Make the place of registration as easily accessible as possible.
 - If the law allows, one option is to make it possible to register a birth or a death at the health facility where it occurred and immediately or soon after this. If immediate registration is difficult, notifications can be sent from the place where the event happened to the closest registration point. Ideally, information obtained from a health clinic or hospital can be used as the foundation for a birth certificate or equivalent in order to secure that there is a correspondence between the medical institution birth records and the civil registration system.
 - Opening up more registration offices or introduce mobile registration offices to make it easier to register for people who live in remote areas.
 - Open up for the use of modern tools such as registration with mobile phones or on Internet.
- Reducing bottlenecks to registration. A Civil Registration meeting in Africa (EU/UNICEF 2013) identified many of the bottlenecks that need to be removed or improved in order to ease registration procedures. Among others the systems should not be too complex and the barriers not too high. Barriers can take many forms, but distance, infrastructure and long queues due to too low staffing are important issues that need to be taken care of.

A good example of successful country efforts on public awareness and creating easier access is the Philippines where they have introduced February each year as the national registration month when there is free registration and different activities related to registration. In order to reach the population with difficult access, mobile registration has been set up and is coordinated with expert agencies and NGOs. Also, the Philippine Statistics Authority, which has the technical oversight of CRVS, has a weekly radio show where people can ask questions about registration (Philippines 2014).

Promotion, easier access and lowering registration barriers are, however, often not enough and many countries therefore link registration with rights to public services. In countries where simple system exists, obtaining a birth or death certificate may be sufficient. Where a PIN is introduced and printed on the birth certificate or an ID card, this could be made a requirement for receiving different public services and legal documents. Examples of these are:

- Health and/or vaccination card.
- Access to health services. Since some births may not have been registered, for various reasons, there should be exemptions from the PIN requirement, however, at least for emergency health care.
- Enrolment in school and higher institutions of learning.
- Social services and economic transfers, like old age pensions.

- Being *employed*, at least in the public sector.
- Obtaining a driver's licence and a passport.
- Getting utilities like water, electricity and gas.
- Buying a mobile telephone.
- Opening a bank account and purchasing insurance.
- Buying a car.
- Buying and selling property.
- Getting certificates of marriage, divorce, residence and migration, if required.
- Voting in local and national elections.
- Right to public burial ground.
- Legal handover of land and other inheritance after death.
- etc.

Since there are some legal and social concerns on compulsory registration for vulnerable groups, it might not be a good idea to deny services to those who have not registered. A softer line might be sought instead where access to services and documents would still be possible, but it would be more difficult and time consuming. Positive incentives for registration should be sought, whereas punishment for not registering should be avoided or minimized.

Competition

Another approach that also might be effective is to give incentives to the registration officers and registrars to improve the number and quality of registrations. Here more easily accessible systems, either on paper or by using technology such as mobile or online registration, are important measures that can be taken. This does not have to be very expensive as open-source solutions are becoming more and more available. As we mentioned earlier, feedback and forwarding vital statistics to the regional and local offices that collect and deliver the data, is another action which may increase both coverage and quality of data. The work load of each registration office is another issue. With more employees the task may become more manageable for each of them, which may lead to higher coverage and quality. Competition is also a possible incentive: by letting each of the registries know how they do compared to others in the region, and award a prize or a bonus to the best performers.

1.4. International focus on CRVS

Over the last years the international focus on registration of vital events has increased substantially. The international activity has been driven by many sectors, but the regional organizations and the health and child protection sectors are probably the main driving forces. Many other agencies have also made important contributions to CRVS development and have provided practical support to specific countries. There are, however, also quite a few areas where CRVS could be very useful which have so far not received much attention from international organisations. In the following we will give a short overview over some of the main current international efforts.

The accountability agenda and health related initiatives

Birth and death registration, including cause of death, are important tools for the health sector to monitor and provide efficient support to the health needs of the population in a country. The World Health Organisation (WHO) has civil registration on its agenda for some time. The Health Metrics Network (HMN) was established in 2005 to improve the health information systems. As part of this work, improvement of the civil registration system has been promoted.

This has later been followed up by the Commission on Information and Accountability (CoIA), which arose from the "Every woman, every child" initiative that was led by the UN Secretary General's office. The Commission was

co-chaired by the Prime Minister of Canada and the President of Tanzania, but Norway also played a very active role in this work both politically and in terms of funding. The first recommendation and action point in the report was for countries to build and improve their CRVS systems. This includes registration of births, deaths and cause of death, as well as production and dissemination of vital statistics. The World Health Organisation (WHO) has been the main driver and is assisting countries in following up the recommendations. Up until May 2014 as many as 51 countries have conducted an assessment of their CRVS systems. 25 countries also have a multi-sector plan and a high-level steering committee, and several have developed long-term investment plans. CoIA has gained much attention and the political momentum for CRVS is growing in many countries. This is also supported by the UN Regional Commissions and other partners. This will be discussed in further detail in the following sub-chapters.

One concrete action that has been taken in many countries is the so-called rapid assessment of the registration system (WHO 2010). This includes eleven focus areas:

1. Legal framework for CRVS
2. Registration infrastructure and resources
3. Organization and function of the vital statistics system
4. Completeness of birth and death records
5. Registration data storage and transmission
6. ICD-compliant practices and certification within and outside hospitals
7. Practices affecting the quality of cause-of-death data
8. ICD coding practices
9. Coder qualification and training and quality of coding
10. Data quality and plausibility checks
11. Data access, dissemination and use

For each of these a rate of completeness is estimated and summed up (table 1), which gives an indication of the state of a country's vital registration. As this initiative has a health focus, it includes births, deaths and cause of death only. Other vital events such as marriages, divorces and movements/migrations (usually not considered vital events) are not included. The tool is very helpful for assessing the level and quality of registration of births and deaths and is in general helpful for other sectors than the health sector, as it covers many important aspects. Since cause of death is often considered a second step, it might be useful to assess the system based on only a selected number of focus areas and not follow the rating in the table below.

Table 1. Rating of national civil registration and vital statistics systems according to overall Rapid Assessment score and broad actions required

| Score (%) | Rating | Actions required |
|-----------|---------------------------|---|
| <34 | Dysfunctional | System requires substantial improvement in all areas |
| 35–64 | Weak | Many aspects of the system do not function well, and multiple issues require attention |
| 65–84 | Functional but inadequate | System works but some elements function poorly and require attention; specific weaknesses of the system should be identified by completing the comprehensive review |
| 85–100 | Satisfactory | Minor adjustments may be required in an otherwise well-functioning system |

Source: WHO

The rapid assessment is often followed by a more comprehensive assessment that gives a more detailed picture of the situation. Both assessments are described in "Improving the quality and use of birth, death, and cause-of-death information: guidance for a standards based review of country practices", developed by the WHO and Health Information Systems Knowledge Hub at the University of Queensland (WHO 2012). The comprehensive assessment also links up with the recommendations for vital statistics developed by the UN Statistical Division (UNSD 2013)

In general WHO seeks to involve the national health sector in the CRVS development, emphasizing that the health sector can be an important partner both in data collection and in increasing the demand for vital statistics. When it comes to data collection, the health sector already collects much data on the population. Children born in health facilities are usually registered in the health system and they are also registered in the same system when receiving vaccinations. Deaths occurring at hospitals are also registered there. In addition, many health workers at community level have a good overview of the population in their area. In most countries this information is kept at the health facilities and not forwarded to a national CR system. Substantial gains both in increased registration numbers and in efficiency can be made by connecting health information and CR closer together.

With increasing national cooperation between the registration authorities and the health sector, a larger share of the population can be reached. New approaches can be taken and, for example, lead to establishment of registration offices at health facilities to allow for official registration including issuance of official birth or death certificates. As we will see below this has already started in many countries.

Child protection initiatives

According to the UN Convention on the Right of the Child, article 7: “The child shall be registered immediately after birth...”. This was reconfirmed and extended at the 19th session of the UN Human Rights Council. Article 29 states: “Urges all States to intensify their efforts to comply with their obligations under the Convention on the Rights of the Child to preserve the child’s identity, including nationality, name and family relations, as recognized by law, to provide for the registration of the child immediately after birth, irrespective of his/her status, to ensure that registration procedures are simple, expeditious and effective and provided free of charge, and to raise awareness of the importance of birth registration at the national, regional and local levels;”

Also, improving the registration of pre-school children 0- 5 years is one of the proposed post 2015 Sustainable Development Goal (SDG) indicators. Another initiative has been to increase birth registration. This approach has been taken by organisations that work to improve the life of children. The two most involved international agencies have been UNICEF and Plan International.

UNICEF has promoted birth registration for many years with positive and promising results in many countries. In Bangladesh a program for registration was launched together with the Bangladesh Government in 2006 and today a large share of the population is registered. UNICEF’s approach has been to carry out and fund awareness campaigns in villages and has also played a role in linking registration to immunization of children (UNICEF 2014). In Uganda UNICEF has supported innovative work on using mobile technology devices for transmitting birth notifications. Another project has been to support development of a computerized, Internet-enabled registration system which has currently been introduced in more than 130 hospitals across Uganda. Support on amendments to law and high-level political commitment is also provided in many countries.

A Non-Governmental Organisation (NGO) that has been very active in birth registration is Plan International. Their “Counting every child program” is using different angles to increase the coverage: They are working directly with children so that they can help influence parents in registering younger family members; they are raising awareness in the communities on why birth registration is important; they promote and support mobile registration units that travel and can reach remote areas; they have developed a digital birth registration system using mobile phones for notification; and they work with Governments on advocacy, technical support and partnerships. As the program states, the need for reaching every child is important as vulnerable groups otherwise can lose even more when a CRVS system is established if they are not registered (Plan International 2014).

One of the critiques of the child registration initiatives is that they have not taken other parts of the civil registration into account. With birth registration only, many of the potential advantages of the CRVS system are lost. There can for example be no good estimate of the population size or need for health and education services if not also deaths, and if possible migrations, are also registered.

Although an important issue, it should also be pointed out that many of the initiatives on birth registration, such as better reporting tools and easier access to registration, will improve the CRVS. Improved birth registration can be seen as the most important first step. If this is functioning well it will be much easier to move ahead with other parts of the registration system.

The child protection initiatives have worked closely with the health sector in many countries. Mobile registration teams have been present at child immunization campaigns and have visited health facilities on immunization days. An example of this is a pilot project in Nigeria (UNICEF 2013). These efforts have resulted in substantially increased birth registration coverage of children less than 5 years old.

A problem with many of the child registration initiatives, however, is that they often finish after the pilot period and therefore only lead to a short-term improvement in registration. A more holistic approach and cooperation with other partners interested in CRVS are important here. Many of the newer initiatives also take this approach, which is a good sign for further development.

Regional initiatives

In many ways, the efforts that have been made at regional level have been important for the recent interest in CRVS at the global and national level.

The Africa Program on Accelerated Improvement of CRVS (APAI-CRVS) emerged from the need for merging different CRVS initiatives in Africa into one framework and has been embraced by the African ministers responsible for CRVS. A Mid-Term Plan for the period 2010-2015 was developed by the United Nations Economic and Social Commission for Africa (UNECA) and the African Development Bank (AfDB) and was endorsed by the Ministers in 2010. The Mid-Term plan is expected to serve as a guiding tool for countries, regional and international organizations; in managing interventions and monitoring achievements in CRVS systems in Africa (UNECA 2012).

Since the plan for 2010-2015 was launched many countries in the region are about to or have already carried out assessments and developed implementation plans. For example, at least 10 of the 25 countries who have completed the comprehensive assessments are in Africa. Many have also done substantial work to improve the levels of registration. In addition, the ministerial conference is now a permanent body under the African Union and meetings take place every second year. The next ministerial meeting will take place in the Ivory Coast in October 2014. This is an excellent way for countries to exchange ideas and learn from each other. To some extent it also makes the ministers accountable for the work they do and puts pressure on achievements.

The region is also active in improving guidelines and tools. For example, the United Nations Economic Commission for Africa (UNECA), with funding from the African Development Bank, has started a project to see how modern technology can contribute to the improvement of civil registration in African countries. The goal is to update the UNSD guidelines on computerization.

In Asia and the Pacific there has been an active regional initiative driven by the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), UNICEF, UNDP, UNFPA, UNHCR, WHO, the Asian Development Bank and Plan International. A regional strategic plan was developed in 2012

(UNESCAP 2012) and many meetings and conferences at regional and country level have taken place. Most of the countries in the region have carried out assessments of their CRVS systems and many have already started detailed planning of how to move forward.

In November 2014 the first ministerial conference in the Asia and Pacific region on CRVS will take place in Bangkok. It will be held under the theme “Get everyone in the picture” and aims to forge high-level political commitment on CRVS and launch an “Asian and Pacific CRVS Decade” for 2015-2024. The outcome will be a monitored and time-bound Regional Action Framework that enables countries to set targets for 2024 in areas of civil registration coverage, provision of legal documentation and production of vital statistics.

Regional development banks have been active partners in among the regional implementing organisations in Asia, Africa and South and Middle America. They have been involved in and supported many projects and efforts on CRVS development. The African Development Bank has, for instance, been an active partner in the APAI-CRVS and is also funding specific development projects and guidelines related to CRVS. The Inter-American Development Bank (IDB) has funded projects to promote the registration of birth by strengthening the civil registry institutions, and has also conducted research to qualify and quantify under-reporting and lack of documentation. Emerging issues relevant to the modernization of the registries are the need to update and strengthen the legal framework, strengthen the institutional capacity and the incorporation of new technologies.

Statistical support

The statistical community has seen the need for administrative sources for statistical production for a long time. Vital statistics are among the core data of a statistical office. Although vital statistics can also be collected from censuses and surveys, the data from civil registration are a much better source when the coverage, quality and timeliness are sufficiently high. The statistical community is, therefore, a very active partner in the ongoing work:

- Many national statistical offices with well-working systems (including Statistics Norway) are providing support to partners bilaterally.
- Regional UN organization statistical experts in, for example, UNECA and UNESCAP have played an important role for regional development, as described earlier.
- At the international level UN Statistical Division (UNSD), the UN Statistical Commission and Paris21 also support these efforts.

The UN Statistical Division (UNSD) has a good database with tools and guidelines related to CRVS. In 2013 the Principles and Recommendations for a Vital Statistics System were renewed (UNSD 2013). UNSD is also currently leading the global group on CRVS (see below). Paris21 is responsible for developing guidelines for the National Strategy for Development of Statistics (NSDS) that is used in many countries to improve planning within the National Statistical System (NSS). In the revised version of these guidelines that was published earlier this year, the CRVS agenda was more prominent than in the former version. In addition, CRVS was on the agenda of the UN Statistical Commission in 2014 and will probably receive more attention at this forum in the coming years.

In the African region, the African Symposium on Statistical Development (ASSD) has in the past organized three annual symposia focusing on CRVS. It has brought together civil registration and statistical authorities from the countries under one platform to discuss various issues related to CR and VS. This has helped ensuring improved coordination between the two agencies. In Asia, there have also been several meetings and exchange of information and experiences both among statistical agencies and between statistics and civil registration offices.

Investments in CRVS

Canada is one of the donor countries that has contributed to put CRVS on the development agenda. As one of the main drivers of the CoIA recommendations, Canada has been pushing CRVS development. In May 2014 it hosted a high-level summit on maternal, new born and child health in Toronto. The summit provided experts and global leaders with the opportunity to build consensus on future international efforts in maternal, new born and child health, with a special focus on strengthening health systems and building civil registration and vital statistics systems.

In advance of this meeting the World Bank came on board with experts in many different fields that, together with other partners, developed an investment plan for scaling up global CRVS (World Bank 2014). It covers activities over a 10-year period from 2015 to 2024, with a goal of universal civil registration of births, deaths, marriages, and other vital events, including cause of death, and access to legal proof of registration, for all individuals by 2030.

Canada and other partners are now working for the establishment of a global fund for CRVS development. How the fund will be organised is not yet decided, but different options, as described in the WB investment plan, are being discussed. The implementation will, however, be divided into different country groups where countries that have a comprehensive assessment incorporating all elements of CRVS and a national plan, will be prioritized first, currently including around 25 countries. This is an important point, since the premise is that the full system gives the greatest sustained benefit to the countries and the international community.

A few country-specific investment plans have already been developed, including for Bangladesh, Ethiopia, Mozambique and Philippines¹. A template for other countries to follow these examples will soon be available.

As stated above, the regional development banks (AfDB, ADB and IADB) have been important partners on the regional level and supported efforts for some time already. They are committed to further support to achieve a better system for CRVS.

Global Civil Registration and Vital Statistics Group

Out of these different international efforts, a Global CRVS Group has recently been established. It consists of international and regional inter-governmental organizations committed to the advancement of CRVS programs. It is aiming at enhancing the effectiveness and sustainability of the support that is provided to countries. With growing recognition of the value of CRVS for human rights, good governance, development planning, monitoring and evaluation, there has been renewed interest in strengthening national CRVS systems. CRVS is also emerging as an essential underpinning of the post-2015 development agenda, and considered as an essential element of National Strategies on the Development of Statistics (NSDS).

Hopefully, this global group will lead to a more holistic approach of CRVS implementation by the international community and lead to more cooperation both nationally and internationally. A part of this is to secure long-term funding for full scale implementation.

1.5. Country-specific coverage at present and uncertainty of coverage levels

As shown above there are many initiatives to help improving register quality and coverage in countries. Nevertheless, the tools that measure coverage and quality

¹ See http://www.who.int/healthinfo/civil_registration/TechnicalConsultation_April2014/en/.

are not perfect. However, data on coverage are important for baseline assessments and for targeting how to prioritize and where to put efforts to improve the system.

In order to get a better understanding of how the CRVS system functions in general in a country, rapid and comprehensive assessments are very useful. They are now carried out in many countries and do not only measure coverage, but also quality. Laws, use of data for statistical purposes, and level of ICD coding, all play a part when assessing a country's CRVS system. There is, however, little focus on the registration of other vital events than births, deaths and cause of death. Even with this in mind, they are the best baseline data source as they are based on the countries' own assessments and are carried out at about the time when changes to the system are planned. However, most of the assessments are not publicly available at present. This might change over time as investment plans usually demand a baseline description, but in the meantime many international partners will have to rely on internationally available data.

At the global level UN frequently publishes data on the coverage of birth (children under 5) and death registration:

- UNSD annually publishes information on the percentage of live births and deaths that are registered, based on the UNSD Questionnaire on Vital Statistics, with surveys such as MICS, DHS and similar as secondary sources.
- UNICEF publishes data on birth registration based on survey information only.
- WHO collects data from the two sources mentioned above. The database on births does not add value in itself, but provides the most updated data from the two other sources. WHO does, however, collect data from countries for registered deaths and cause of death, and bases its coverage estimates on these data.

As there are more data available on birth registration, we will in the following focus on births. Many of the points made are however valid for death registration as well.

The data on birth registration are in general in line with one another, but due to the fact that household surveys usually are conducted only every 5th year and that the UNSD Questionnaire on Vital Statistics (QVS) is very irregular, the data are often outdated.

The data from the QVS seem to be particularly outdated as many of the observations are 10 years or older and therefore not a very good baseline indication, as much can have happened in recent years. Another drawback with this questionnaire is that very wide categories are used, such as "Under 50 per cent". This is too broad to monitor progress. In general, these data should be used with caution at present. With renewed focus on CRVS there might be a greater incentive to collect data more often, which would provide more updated data. Since many of the assessment tools for the countries are not published, collecting new data through the UNSD questionnaire might be a good alternative.

The information from household surveys such as Demographic and Health Survey (DHS) and Multi Indicator Cluster Survey (MICS) are in general more updated. Since older surveys are easy accessible, it is possible to get a picture of the development of registration rates over time. With this information one can get a better understanding of whether changes in the data are part of a long-term development or can be attributed to external changes to the CRVS system. Confidence intervals and multiple observations may also help in obtaining a clearer picture of the uncertainty in the data.

Another good feature of the household surveys is that the collected information contains information that makes it possible to say something about the parts of the population which are more likely to register. The general picture in the data published by UNICEF is that there is no gender bias in birth registration. It is quite clear though that people living in urban areas and who are relatively well off, register their births to a greater extent, particularly in countries where the general

level of registration is below 90 %. The differences in registration for different sub-groups are shown for a few randomly selected countries with a total birth registration below 90 % at the time the survey was carried out.

Table 2. Level of birth registration in selected countries. Information from MICS and DHS

| Country or territory | Total | Gender | | Place of residence | | Wealth Index Quintile | | | | | Source |
|--------------------------|-------|--------|--------|--------------------|-------|-----------------------|--------|--------|--------|---------|--------------|
| | | Male | Female | Urban | Rural | Poorest | Second | Middle | Fourth | Richest | |
| Afghanistan | 37,4 | 38,3 | 36,5 | 60 | 33,1 | 31,4 | 33,6 | 30,1 | 37,4 | 58,1 | MICS 2010-11 |
| Bangladesh | 9,8 | 10,1 | 9,6 | 12,8 | 8,8 | 6,1 | 6,8 | 8,8 | 11,7 | 18,6 | MICS 2006 |
| Cambodia | 62,1 | 62 | 62,1 | 74,4 | 59,9 | 48,1 | 60,2 | 64,5 | 67,7 | 78,2 | DHS 2010 |
| Cameroon | 70,1 | 71,1 | 69,1 | 85,7 | 57,6 | 51 | 61,1 | 71,8 | 84,6 | 90,6 | MICS 2006 |
| Central African Republic | 61 | 60,6 | 61,5 | 78,4 | 51,6 | 46,3 | 50,8 | 59 | 71,2 | 84,7 | MICS 2010* |
| Chad | 15,7 | 16,1 | 15,2 | 42,2 | 8,7 | 5 | 7,6 | 9,6 | 14 | 46 | MICS 2010 |
| Côte d'Ivoire | 54,9 | 53,6 | 56,3 | 79,3 | 40,5 | 28,3 | 41,5 | 55,7 | 77 | 89,4 | MICS 2006 |
| Lao PDR | 71,5 | 72,2 | 70,8 | 83,9 | 68,4 | 62 | 65,9 | 74,9 | 83,9 | 84,7 | MICS 2006 |
| Mali | 80,8 | 81,4 | 80,2 | 92,4 | 77,1 | 64,8 | 74,4 | 80,8 | 92,1 | 96,2 | MICS 2010* |
| Mozambique | 30,8 | 31 | 30,7 | 38,6 | 27,8 | 19,5 | 23,7 | 31,6 | 37,6 | 47,7 | MICS 2008 |
| Namibia | 67,1 | 65,7 | 68,5 | 82,5 | 59,3 | 46,2 | 61,1 | 67,5 | 82 | 91,5 | DHS 2006-07 |
| Senegal | 74,6 | 75 | 74,2 | 89,3 | 65,9 | 50,4 | 71,7 | 79,7 | 87,5 | 93,5 | DHS 2010-11 |
| Sierra Leone | 78 | 77,7 | 78,3 | 77,6 | 78,2 | 74 | 73,8 | 77,5 | 80,7 | 87,5 | MICS 2010 |
| Sudan | 59,3 | 61,3 | 57,2 | 84,5 | 49,7 | 26 | 41,9 | 65,2 | 86,8 | 98 | SHHS-2 2010* |
| Uganda | 29,9 | 29,9 | 29,9 | 38 | 28,7 | 27,2 | 25,7 | 26,9 | 27,8 | 44 | DHS 2011 |
| Zimbabwe | 48,8 | 48,3 | 49,3 | 65,2 | 42,7 | 35,4 | 41,1 | 47,4 | 54,8 | 74,9 | DHS 2010-11 |

Source: UNICEF ChildInfo. http://www.childinfo.org/birth_registration_tables.php

One general drawback of these surveys is that they only provide information about the recent level of birth registration (children under 5), with little information on how many adults are registered and how the system functions in general.

Another drawback of using data from international surveys is that their estimates usually differ from the national figures that are estimated in the national assessments. The Eastern Mediterranean Regional Office (EMRO) of the WHO has done a comparative analysis of the different quality levels identified by rapid assessments in the countries in their region (WHO EMRO 2013, unpublished). Twelve of the 23 countries in the region have figures both from the rapid assessment and UNICEF's database on the coverage of birth registration. On average, the rapid assessments show 9 percentage points lower coverage than the surveys reported through the UNICEF database (ChildInfo). In some countries the differences are huge, such as in Djibouti with a difference of 59 percentage points.

More generally: Of the 23 countries in the EMRO region, 22 had carried out rapid assessments and several have developed action plans for CRVS improvement. The rapid assessments show that about half of the countries in the region had a quality level that was weak or dysfunctional. This gives a good picture of how and where to start working on improvements. It would, therefore, be an advantage if countries made their assessments publicly available. Another argument for this is that it might trigger countries to work for better systems as it is very visible who does well and who does not.

Even if publication of the assessments is not something the countries would like, data from the assessments are in most cases the most updated and comprehensive information available. Countries should, therefore, establish their baselines based on the assessments. If they have not already carried them out, this would be a good incentive to do so. As long as data are not publicly available, international partners should continue using survey and census information, but the first priority should be data from assessments. Survey information can, however, be a good tool for validating levels and changes over time. In countries where register data are compared with census and survey data this might also help to obtain a clearer picture of the parts of the population that are poorly represented in the register and therewith help targeting such groups.

2. Selected country studies

Using the experience of countries that have already developed registration systems that work can be helpful when discussing how improving CRVS could succeed in other countries.

Norway has one of the most advanced CRVS systems in the world and Statistics Norway (SN) has given input to and helped develop systems in several other countries. The Norwegian case is presented below. We are also discussing a few other countries where SN has first-hand experience.

2.1. Case study of Norway

Many countries and organisations have expressed interest in how the Norwegian system developed and how it functions today. In the following we will provide an overall presentation that hopefully will be useful for others when considering different options for improvements in their CRVS systems. The information will also help explain SN's expertise in CRVS and what kind of support we can provide to other countries.

Development of the Central Population Register (CPR)

In Norway, civil registration of vital events was started by the church in the 17th century. The church in each parish registered baptisms, marriages and funerals in a special book. At that time most of the population lived in rural areas, with more than 90 per cent being Lutherans adhering to traditions. To be a member of the church the children had to be baptised and later confirmed. Otherwise they could not be buried in the cemeteries, called "Christian soil". Almost everybody baptised their children, and were married and buried by the church. The coverage was close to 100 per cent of the corresponding vital events, i.e. births, marriages and deaths (Thorvaldsen 1996).

The first national law on population registration was introduced in Norway shortly after independence from Sweden in 1905 and local population registration offices were established in some municipalities, the first in Oslo in 1906. Slowly more and more municipalities were included and by 1940, 91 out of a total 750 municipalities, covering 38 percent of the population, had established a local population register. The registers were used for administrative and statistical purposes.

After the Second World War population register offices were established in all municipalities based on the act of Population registration that came into force in 1946. The registers were based on manual procedures and cards which were sent by mail to the new municipality. The new population register also included addresses and the law stated that a citizen had to report the new address to the register when moving.

During the 1950s and 1960s several municipalities and governmental bodies started to operate computerised registers and this was done by all municipalities in 1991. In 1964 a computerised central population register (CPR) covering the total population was established on the basis of the population census in 1960. The register is continuously updated with data on births, deaths, marital changes, migrations, etc. When a person emigrates or dies the record is not removed from the register but the type and date of exit is recorded with special codes.

From 1985 the register was centralized in one database, while all transactions and registrations were gradually fully computerized. Until around 1990 most of them were still updated manually, but from 1994 all vital events were registered online from the local population registers. This means that the former manually updated local registers were changed to an on-line connection to the central database. The system has since then been further centralized and from 2005 there are 97 local

registries with responsibility for registrations for several municipalities in each county.

Statistics Norway (SN) was responsible for the Central Office of Population Registration from the beginning in 1946. Between 1964 and 1990 the CPR was located within Statistics Norway and run jointly by the National Tax Administration (NTA) and SN. This was because the NTA had a local office that could be used for registration in each municipality (or groups of small municipalities). However, as the registration of individual information was considered increasingly important for taxation and for a series of legal rights and obligations, such as taxation, military service, voting and receiving an old-age pension, running the register was considered to be so different from the key responsibilities of a national statistical office that the CPR was transferred to the NTA in 1991. It is important to be aware of the fact that the CPR is an administrative register of legal status and transactions and that it was not created for statistical purposes.

The CPR was the state of the art solution at the time of establishment in 1964 with only modest modernizations over time. In 2010 NTA started planning a program for modernization of the CPR. Subject to funding, the program will start off in 2015 and should yield the first results in 2018. The program will have four goals: more secure management of PIN-codes and other information on physical persons, better quality of information in the CPR, more efficient proceedings, better user friendliness and 24/7 service. One of the improvements will be the introduction of a new PIN-code, possibly without information on the person's gender and date of birth. In addition, the Ministry of Finance is preparing a new law for the CPR.

The legal foundation for the CPR is the Population Registration Act of 1970 (with several amendments up to now). It states when and where a person shall be registered, when a change of address has to be reported, and how a civil registration decision is reflected in the register. Consequently, statistical needs have only a minor influence on the content and definitions of the register, which is occasionally a problem. It is, however, difficult to keep a high level of quality of registers established only for statistical purposes.

The PIN code - a common identifier

When the CPR was established an 11-digit personal identification number (PIN) was introduced for all residents in Norway, regardless of citizenship. The numbers are permanent and unique for each person. The PIN-code is issued immediately after the tax authorities receive a notification of birth from the hospital. The a PIN-code is also issued to persons who have immigrated and have the intention to stay in the country for six months or more, and who have the legal right to live in Norway. (Asylum seekers, e.g., are only assigned a PIN after their applications have been approved.)

The first six digits of the PIN show the date of birth, the next three is a serial number which includes information about the sex of the person and the century of birth, whereas the last two digits are control digits introduced to detect wrong or fake person numbers. The PINs are only changed when there is an error or change of the date of birth or sex, and for adopted persons and a few others for whom it is important to hide the previous identity.

Nobody "leaves" the CPR, but the variable for register status is changed for persons who die, disappear or emigrate. The PIN-code is not changed for such reasons, however. An emigrant who re-immigrates to Norway can continue to use his or her "old" PIN. All relevant information is kept in the historical archives. SN also has a copy of the CPR which is regularly updated. Experience shows that SN keeps more historical information about the population than the CPR.

The modern thinking is that the ID number should be free of information as this reduces the need to change the number and protects against misuse. For example, information about place of birth or residence may be used to discriminate persons.

For most persons in the CPR there is information about the PIN of the parents and about the spouse. This can be used to link families and relatives. This is used for many purposes, ranging from estimation of taxes and old age benefits to doing research on hereditary diseases. The PIN-code is needed in order to register that a person is living in Norway, and is required to open a bank account, establish a telephone subscription or buy a cell phone, to obtain a tax card for work and to become a member of the National Health Insurance, as well as for a range of other purposes. In short, it is an integral part of living in Norway.

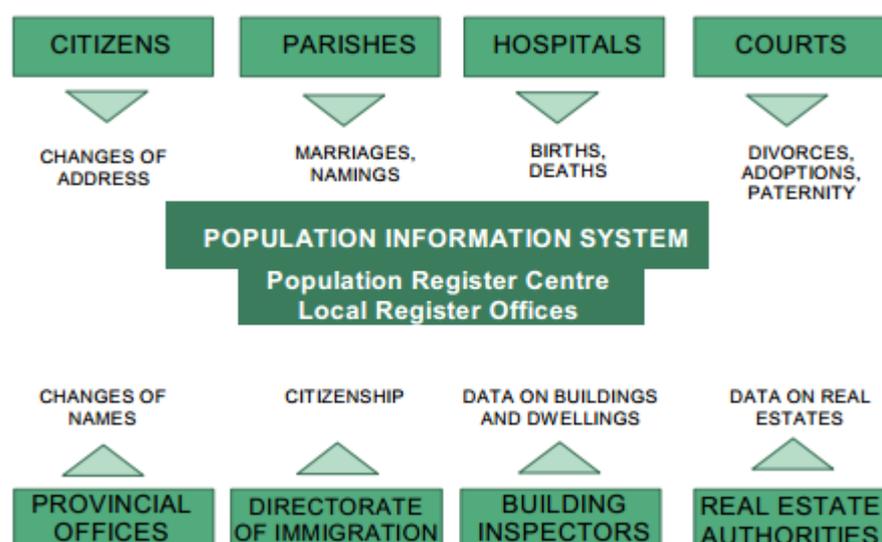
Similarly, having a PIN may be an important part of the incentives for people to register in other countries. The CPR is, for example, also used to establish a list of voters before each Norwegian municipal and parliamentary election. This simplifies and significantly reduces the costs of conducting elections, as well as avoiding accusations about cheating or rigging elections.

When a person is born a birth certificate with the PIN is issued. This can be used to obtain identification documents such as drivers' licenses and passports, both including the PIN (see also chapter 3.3). Norway has not had an official ID card, however, but the needs for this have been discussed and the government has recently decided to introduce such cards. The increasing globalization, with many immigrants as well as Norway's association with the EU, particularly the Schengen agreement, has made it more imperative to have a national ID card.

Updating of the CPR

The CPR gets its data from a combination of self-reporting and data from other administrative registers. For example, birth notification forms are sent by the hospital or the maternity clinic or by the midwife if the birth is given at home, to the population registry in the mother's municipality of residence. The NTA then assigns the PIN number to the child. When the child has been assigned a national ID number the NTA sends a request to the mother to choose a name for the child. The child's national ID number is stated on this request. After the child's name has been registered the NTA sends a birth certificate to the parents.

Figure 1. Responsibilities for updating the Finnish population information system



Source: UNECE 2007

Deaths are reported by the probate court or the local police in the deceased's municipality of residence, after having received a death notification form normally

provided by the relatives of the deceased who is responsible for providing a death certificate issued by the hospital or a medical doctor.

Domestic migrations are in general based on forms completed and sent by the individuals concerned to the local population registries. This also goes for emigration, but these are supplemented by “administrative deregistration”. This practice was established by the Norwegian Tax Administration (NTA) as a consequence of the increasing number of emigrants who do not report when they move from Norway. And based on a set of procedures ‘inactive’ persons are assigned an emigration from Norway. Updating of the CPR is done online by the local population registry offices and partly centrally by the NTA. The PIN-code is only issued by the NTA. A similar set up is used in Finland (see figure 1).

A person who stays in Norway for less than six months will not be given an ordinary PIN-code, but instead a number called the D-number. This is an ID number which is given to all foreigners living in Norway for less than six months, or who have economic interests in Norway, such as property, without qualifying to be registered as residents. The D-number is used to apply for a tax card. The D-number was originally given to seamen working on Norwegian ships (the name stems from the Directorate of sailors). However, in recent years the D-number has been assigned to persons coming on temporary work permits to Norway, i.e., permits valid for less than six months. The D-number population is also a part of the CPR, but is not counted as regular residents. SN produces a limited range of statistics based on the D-number, for example statistics on short term labour in Norway.

From registers to statistics

From 1967 all official statistics on vital events in Norway have been based on data from the CPR. In order to achieve this there are some important conditions that have to be met. First and foremost is access to the data and in Norway this relies on a strong statistics act. According to this SN has the right to use nationwide administrative data registers. Furthermore, SN shall be informed of the establishing and changing of such systems in advance, and may also make proposals for statistical development.

In connection with the Statistics Act, SN has prepared and signed agreements with relevant ministries and institutions to secure the flows of administrative records needed for statistical purposes. To secure a proper updating of the statistical population register, an agreement has been made with the NTA. In addition, there is close contact between the employees maintaining the two registers.

An administrative register is not directly suitable for compiling statistics. Special routines and organization of data are needed. Among these is a routine to create a “situation file” as per a certain date, i.e. taking into consideration only events that occurred up to this date, regardless of when the events were reported. Besides this, a good system of quality control of data is required.

SN receives transaction files with notification of changes from the CPR continuously. From 1985 and onwards, these data are used to update a separate population database in SN kept for statistical purposes, including only variables of relevance for the production of statistics. This database is basically a copy of the CPR and forms the basis of all current register-based population statistics, statistics on stocks as well as on flows. The creation of this separate database was necessary in order to facilitate an appropriate preparation of statistics as SN has other needs than the NTA since the data have to be organized in different ways, depending on the use. On the other hand, the statistical use of the CPR contributes significantly to detecting errors and shortcomings on the CPR.

SN’s data base is upgraded continuously with data on new transactions, which are transferred from the CPR every night, five days a week. The transactions include

information about new vital events and migrations, name and address changes, etc., and also corrections of errors in the CPR. All transactions include one or more dates, e.g. the date of birth of a person and also the date of registering the birth in the CPR. Analyses have shown that there is practically no difference between the CPR and the statistical database, even after several years of updating and running the two registers separately.

SN reports back to the NTA on errors or shortcomings detected during the compilation of statistics. The same definitions are used in both registers and routines for updating correspond closely. All vital events (births, deaths, marriages, national and international migration, etc.) and demographic characteristics like age, marital status, citizenship, number of children, place of birth, national background (including parental country of birth), and year of first immigration, are registered in the CPR, totally around 75 variables. In addition to this, SN generates a number of variables for statistical use, such as, for instance, children ever born for each woman (and man) and variables describing the immigration background of a person. In total there are around 400 variables in the statistical database.

Linkage with other sources

Because every citizen has a unique PIN and this is used in almost all administrative registers, both private and public, SN can obtain data for the same individuals by linking data from different registers via the PIN-code. This is done for statistics, analysis and research. Examples include fertility by education, mortality by occupation and school grades by education of parents and immigration status.

The linking of data from different registers reduces the response burden of the population since they only need to report information once or not at all. Special care has to be taken to protect confidentiality. This is also done in connections with sample surveys, where many questions on many variables do not need to be included in the questionnaire since they can be collected from administrative registers. Examples of such items include age and sex, address, marital status, number of children and when they were born, income, wealth, educational attainment, labour market status and information about spouse and children.

However, the collection of administrative data to supplement sample surveys need to be approved by the respondents, according to the law. Individuals who are selected to participate in a sample survey receive a letter from SN, which includes a list of administrative registers that additional data about the respondents may be collected from. Respondents who are against this have to inform SN. Respondents who do not actively protest are assumed to tacitly approve the collection and use of register data.

After the CPR was established in 1964 the 1970 census was used to obtain additional information and to check the information in the CPR, including marital status, and the PINs of parents, based on a special 1970 census law. The 1980 and 1990 censuses were not used to obtain additional data but the opposite was done: the census data were supplemented with data from the CPR, such as marital status, number of children, educational attainment and income, thus saving costs in the data collection. The 2001 census was used to collect additional information about housing and addresses. This census was, in fact, the last regular census using forms to collect data. Later censuses, such as the 2011 “census”, are entirely based on data from administrative registers. Not only was this development positive in terms of a lessened response burden for the public, but the cost savings for the government were also substantial.

The road towards a register based census – links from population and housing censuses to CPR

As described above, the Norwegian CPR was established in 1964 based on the 1960 census. In the following years the population censuses were used to improve

the registers. The 1970 census was used directly to correct the CPR. Name, address and some few core variables were pre-printed on the census form, and the respondents were asked to check and possibly correct this information. They were informed that the revised data would be used to correct the CPR. The legal basis for collection of this information was the Personal Data Act, not the Statistics Act, as was the case for the rest of the census form.

In 1980 and 1990 the quality of the information in the CPR was considered to be adequate and the censuses were not used to obtain additional data but vice versa: the census data were supplemented with CPR data, such as marital status, number of children, educational attainment and income, thus saving costs in data collection. The census forms were sent out (and returned) by mail. The questions were limited to variables which at that time could not be found in administrative registers.

Before the 2001 census a number was introduced for all dwellings to obtain a more precise place of residence than the street address alone. The collection of the dwelling number of each resident in the census had a legal basis other than the Statistics Act. The dwelling numbers of residents collected in the census were later transferred from SN to the CPR in the NTA for entry. The linking key was the PIN-code. For confidentiality reasons a special number series that could be used on envelopes in the mail was created.

By basing its statistics on administrative data, SN is saving substantial amounts of public expenditure. The Population and Housing Census 2011 was estimated to cost less than 0.5 USD per capita. This is around 10 per cent of the cost of the 2001 census, even though this was also largely based on administrative data. By way of comparison, the USA, which conducted a traditional census in 2010, spends almost 80 times as much per capita. The population also saves time by not having to fill in a census questionnaire. Completing a questionnaire every 10 years is perhaps not a huge burden, but many people probably consider it unnecessary to provide information that they know is already held by the authorities.

The CPR and PIN solutions chosen by Norway, as well as the other Nordic Countries, show how registers and censuses may strengthen each other. Subsequently, population statistics have benefited greatly from this approach. The improved CPR is now the only source for all vital events and population statistics, both stocks and flows, i.e. both the size and composition of a population at a given time and data on new births, deaths, migrations, etc. in a given year, or for a shorter period of time.

SN produces annually detailed statistics for among others: births, deaths, migrations, marriages, divorces, naturalizations and adoptions as well as statistics on quarterly population changes. For more information about the wide range of population statistics, both on stocks and on flows that can be produced from the data of this system see <http://www.ssb.no/en/befolkning/nokkeltall>.

The establishment of a high-quality CPR in Norway has taken many years and a lot of resources but the benefits have been enormous and have reduced costs in many areas, both for the government, for the individuals (example: tax forms), and for private business. Some of the factors contributing to the success are:

- Institutional cooperation
- A solid legal foundation
- A long history of local data collection and registers.
- Low level of corruption and trust in government institutions
- A relatively small and homogeneous country with no serious internal conflict
- A good economy

Not all of these are, however, necessary in order to achieve well-functioning and high quality registers.

Historical Population Register

A recently started project, the Historical Population Register (HPR), is intending to link data on all individuals recorded in censuses and church books (parish registers) and other sources since 1801 until today, including linking 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:

1. Scanning of the original source documents.
2. Transcribing the data from paper, i.e. digitizing the data to make them machine readable.
3. Linking the records, using name, date and place of birth and other available information.

The most costly part is the second, since it is usually not possible to automate the transcription of handwritten text, but several methodological developments have been made which will reduce the transcription costs significantly, such as splitting a census form into virtual cells. This would, e.g., make it legally possible to let persons outside Statistics Norway and The National Archives do the transcription, without breaking the confidentiality rules.

Several of the source documents have already been scanned and transcribed, such as the 1801, 1910 and 1960 censuses, but six censuses (about 15 million records) and about 18 million baptisms, burials and weddings remain.

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.

The HPR is a collaborative project between the Norwegian Historical Data Centre at the University of Tromsø, the National Archives, Statistics Norway, The Norwegian Institute of Public Health, the Norwegian Computing Centre, and several research institutes. The Research Council of Norway is funding a substantial part of the project.

The HPR may provide useful experience to developing countries on how to transcribe and link data from different paper-based data sources.

2.2. Albania

In the period from 2001-2011, Statistics Norway initialised and played an important role in the modernisation of the civil registration system in Albania. This work has been described in more detail by Skiri et al. (2012), but for the purpose of this report, we are summarising some main ideas and findings here.

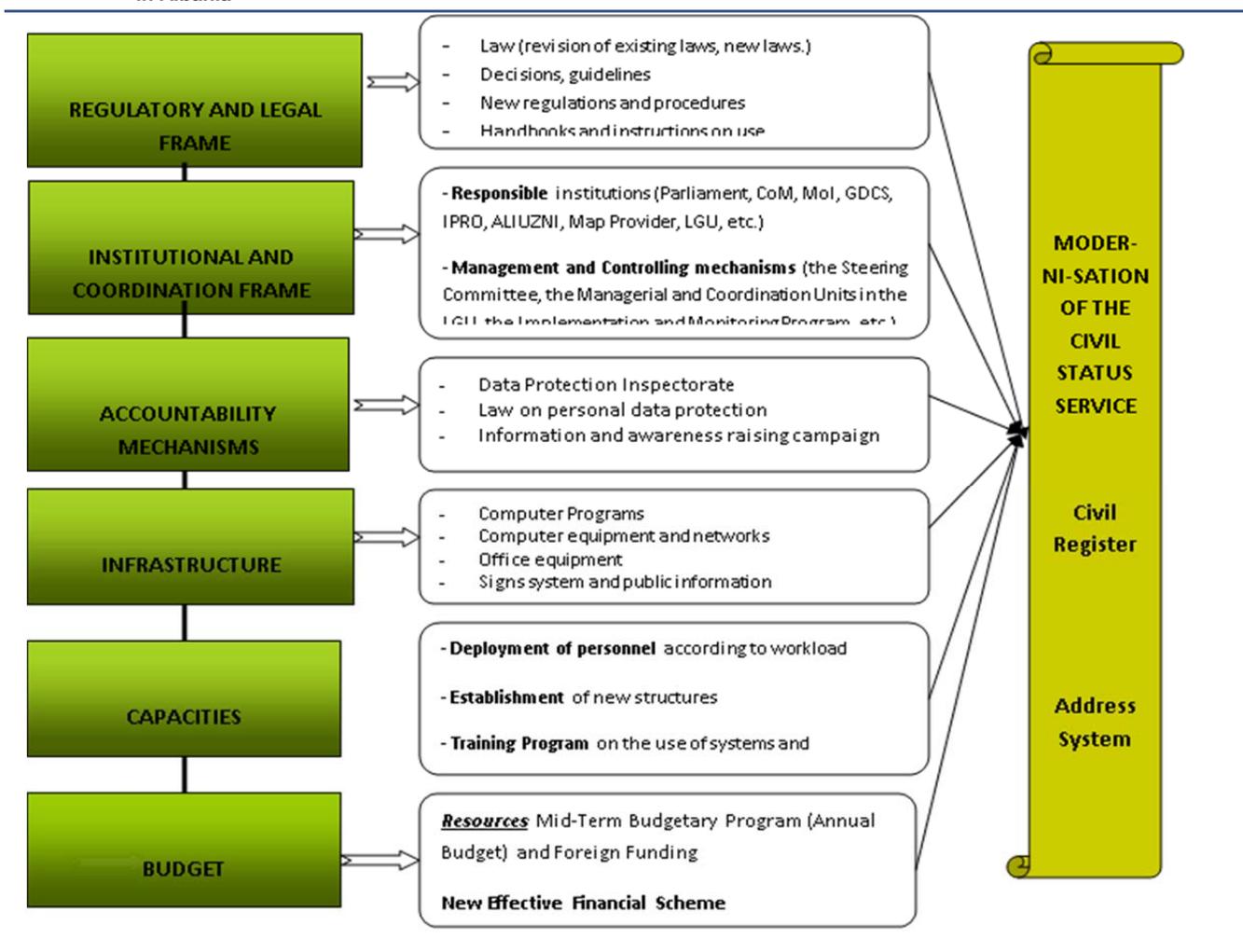
Albania had established a system for registration already in the 1930s. This system was based on hand-written books in more than 400 local offices with information about births, marriages, movements and deaths of all people in the local population. The data were entered and updated on family pages, which often made it difficult to retrieve the information. This worked quite well in the totalitarian communist period, but with a more mobile population and less government control after 1990, it became increasingly difficult to keep the registers updated. Increasing population mobility to urban areas and other countries added to the problems. As the registers were the basis for voter lists and for handing out certificates to the residents, needed to enrol in school, receive medical attention, driving licences and passports, it was important that the information was up to date and accurate.

It was decided to digitise the civil status books and establish a system for updating these. SN, with funding from the Norwegian Ministry of Foreign Affairs (NMFA), made an agreement with the Albanian Ministry of Local Government and Decentralization (MLGD) to test such a solution in a selected number of pilot local registration offices. If successful and additional funding could be secured, it would be further developed to incorporate the whole country.

The project started with thorough preparations and important aspects were:

- Organisational
 - Develop an overall plan or strategy
 - Budget and investment plan
 - Coordination with national and international partners
 - Build ownership and decide on actual owner of the register
- Legal
 - Go through existing laws and propose amendments if relevant
 - Suggest and develop new laws
- Technical
 - Design the system; which variables will be included, what is needed?
 - Design the IT system
 - Plan for data exchange
 - Plan for training of employees.

Figure 2. A conceptual map of the project for modernization of the civil status service drafted by the Ministry of Interior (Moi) in Albania



Source: Skiri et al (2012).

The project experienced that there was not full clarity about the responsibility for the civil registration system, but this was solved by the Albanian Government by establishing the General directorate of civil status (GDCS). However, even with this in place, the project found that approvals of major changes had to be approved by several Ministries, which was very time-consuming.

The plans were to be tested in a pilot in a few selected local civil status offices (CSO), later it was followed by a bigger test in two districts that had experienced an increase in population because of migration. Although in general successful, the project experienced that it was a challenge to explain to the Albanian Government that tests and pilots were necessary before full scale implementation. The pressure to move ahead quickly, especially because of the need for updated voter lists, was high. Also the understanding for the need for planning and how to carry this out was to some degree lacking. The project therefore also spent time providing training in these tools.

Based on the good experience from Norway, personal or individual ID numbers were proposed as a part of the plan from the beginning and a plan for the introduction of these was also developed. Except for those with international passports, the population did not have ID cards and they had to visit their local CSOs every time they needed documentation of identity. Development and distribution of a personal ID card for every citizen was therefore an important goal of the project.

In order to provide the legal basis for the changes, laws had to be established or amended. In Albania, this was an amendment to the Law on civil status which among others contained a liberalisation of events' recording procedures which would provide better assistance to the residents. In addition a Law on ID number and a Law on ID card were established.

Another challenge was the reorganisation of the Civil Status Service and computerisation of it. Both the newly established directorate and all the civil status offices in the regions had almost no access to computers and power was often unavailable during the working day. Purchasing computers, printers, software and power generators therefore became an unavoidable task for the project. Training of the staff in the use of computers and the newly developed program for registration also needed to be done and a training centre at the GDCS was established with this purpose.

The data entry in the pilot was organised in such a way that every record was punched by two different people to check the quality. It turned out that almost 90 percent of the records differed and had to be corrected. This was time consuming as one had to return to the books and find the relevant records. This was therefore changed in the full scale recording; the corrections were done as part of the second data entry.

In addition, the files had to be checked for duplicates as there had earlier been no or little communication between registration offices and citizens that had moved therefore often were registered more than one place. This was partly done automatically with a program, but as there were errors, many records also had to be checked manually.

One topic that came up during the work was the lack of a well-functioning address system. This was something that international partners (EU and OSCE) took in their hands and developed. They also provided substantial support and funds to the project on modernising the Albanian Civil Registration System in general. Without this it would have been much more difficult for SN and partners to implement our part of the project successfully. For SN this was a very positive experience when it

comes to cooperation and ownership both at national level and between international partners.

One issue remained however and that was the access to individual register information by among others, the national statistical office (NSO), INSTAT. Access to the database would have allowed INSTAT to work more efficiently, produce high quality statistics and reduce the response burden for the CSOs and population in general. As the task of developing the IT system for the register had been outsourced and the contract had not specified code sharing, the developers demanded payment for the needed amendments. Luckily this was resolved over time.

When the new register had been established, SN agreed to help scanning old books so that the history of each person, including the dead, also would be available. This proved to be very useful for, among others, the determination of property rights.

2.3. Kazakhstan

The Agency of the Republic of Kazakhstan on Statistics (ARKS) and SN started cooperating in 2006. In this period SN provided input to the establishment of a Statistical Population Register (SPR) situated at ARKS.

The database ARKS has developed is for persons and has many of the same features as the statistical database for persons in SN. The core of the statistical databases in ARKS and SN is very similar to the administrative Norwegian CPR. Some of the features are: a unique PIN code, frequent updates, storing of historical information, and extension of the database with statistical information from other individual based sources. With this database ARKS is well equipped for register-based demographic and social statistics, including CRVS. Through this effort ARKS is well under way to organize the first register-based population census in Kazakhstan.

ARKS has also linked the most recent census with the newly established SPR with support from SN. The census did not include any unique identifier and the linkage of data was therefore based on

- Surname
- Name
- Patronymic name
- Birth date
- Place of birth
- Sex

SN recommended checking both the census and SPR for duplicates and removing them before linking the files. During the linking the first step was to use all the above variables for verification. Based on this, the records that matched completely were taken aside. In the next step, comparison was made for all variables except place of birth. In the following step, place of birth was taken back in, but date of birth was dropped.

For the remaining unmatched files after the first three steps had been carried out, subsets of data (blocks) for regions and sex were created. For these data a method that calculates weights for a match to be true or not was used. The higher a weight is the greater the chance is that the match is true. This method is described in a Data Integration Manual (Statistics New Zealand 2006), chapters 5 and 6.

Using the SAS software, matches were created on regional level and weights calculated. The approach that was used was that when 3 out of the 4 variables matched and no duplicates were found, it was assumed that the true matches had been found. In general additional investigation might be useful in some cases: The

lower the limit for the composite weight is set to define true matches the less manual work will be needed. However, this increases the risk of false matches. A balance between the risk of wrong matches and the manual work needed for matching had to be decided.

Two other approaches were also considered. One was to create new columns for names by dividing each of the names into three new variables with one third of the name in each. Then these new variables were given probabilities and weights. In the second a check for the percentage of the names which were spelled the same way was carried out. If for instance a name is 10 positions long and 9 out of 10 of this positions are equal when the names are compared, that would give a 90% match. The problem with this approach is when a character is added in the beginning of one of the names. Then the comparison will get a low match percentage even if the names are almost equal.

An issue that created additional trouble in Kazakhstan was that names could have been written both in Kazakh and Russian. Names were, for example, written in Russian in the population register and in Kazakh in the Census (or vice versa). Creating matches with this in mind is time consuming, but might be considered at least for common names or names that are more likely to be spelled in two different ways. It could also be considered to create a standardised way to write the most common names, and, based on that, create new variables which can be used for matching.

The Government of Kazakhstan has later developed this system further, and has, among others, carried out seamless linkages with the ministries of health and justice. ARKS is currently looking into the possibilities of carrying out the Population and Housing Census for the 2020 round using administrative data.

In general, linkage of this type is quite time consuming and may provide a lot of wrong linkages. This method should therefore be used for statistical purposes only where it has no consequences for the individuals. On the other hand, it may provide a much better data base and improve the quality and create a greater variety of available statistics. It may also reduce the response burden and costs of carrying out surveys, etc.

2.4. Mozambique²

Mozambique has a long tradition of civil registration and identity cards. The Portuguese colonial government introduced several forms of identification documents and registration of the population. After independence in 1975 there was initially some political resentment against these systems but most of the systems were kept, with some changes.

People in Mozambique need to identify themselves on many occasions in transactions with both public and private institutions. The documents used for personal identification are the birth certificate and the identity card. Moreover, people who work in the formal sector need a special card issued by the Ministry of Labour. Until 1993 people were also obliged to have a residence card. Children have health cards for recording of vaccinations, etc.

The two major registration and identification systems in Mozambique today are: Direccção Nacional dos Registos e Notariado (Registo Civil, RC) under the Ministry of Justice, which registers and issues certificates of births, deaths, marriages, "emancipations" and the "personal history document".

² This section is based on Brunborg and Aurbakken (1997) and Brunborg (2011), which provide more information about the CRVS system in Mozambique.

Direcção de Identificação Civil (DIC) under the Ministry of Interior, which issues the identity card.

However, registration of events such as births and deaths and the use of identification documents are limited, especially in rural areas. There is a lack of statistics in many areas, in particular demographic statistics. This makes administration and planning difficult.

In recent years there have been many positive developments, including:

- A birth registration campaign has been conducted since 2005.
- A pilot project is about to start to register births directly at a few local registration offices.
- The Government has decided to introduce a unique national identification number to be assigned at registration of birth and to be used on the ID card and a number of other documents, such as health records, driving licenses and passports.
- New laminated ID cards with a chip containing information about the owner of the card are being issued.
- New laminated personal history cards (Cédula pessoal) cards with a magnetic stripe containing information about the owner are being issued.
- The national Statistical Institute INE is planning to begin receiving data from the National Civil Registry (DNRN) and to analyze, tabulate and disseminate statistics on this.

Improvements to death registration: In 2006, the Ministry of Health formally adopted the decision to use ICD-10. In 2008, mortality registers were introduced. There were further reforms initiated in the mortality system through the revision of the death certificate, introduced nationwide in 2009, and the introduction of SIS-ROH (Sistema de Informação de Saude – Registo Obitois Hospitalares), software designed to enable individual-based data management, including demographic data and data on hospitalization and cause of death (World Bank 2014).

Mozambique was one of the first countries to carry out the comprehensive assessment and is also one of four countries that were picked by WHO and WB to develop one of the first CRVS investment plans in 2014. This is an indication of commitment to CRVS development in the country. An operational plan for strengthening CRVS in Mozambique was launched in July 2014.

3. How can we improve coverage and data quality?

In the previous two chapters we have shown that there are many initiatives and many ways of organizing CRVS. In the end it does, however, end in the same question: How can we improve the coverage and quality of the registration data? The answer may come from assessing CRVS systems and identifying bottlenecks to be removed. Registering civil events should be made part of what people normally do. In the following chapters we will go more into detail on some of the factors that need more detailed explanations and might be important to improve the CRVS systems and therewith the coverage. Where relevant, we will also discuss what one should be aware of in order not to violate law or create wrong incentives.

In general, it should be mentioned that the investment plan (World Bank 2014) has set up targets well-functioning CRVS systems. Those are related to the improvement of coverage and the investment and planning needs to show how the activities in the projects link to improving coverage – or achieving the outcome of good quality registers and statistics. This is related to the demand side, but there are other factors that can be important and helpful too.

3.1. Building structures to enhance birth and death registration

We have already touched upon incentives for increasing registration in chapter 1.3, but will return to some important points here.

The level of registration of births and deaths in most developing countries is quite low. Besides poorly - or lacking - functioning administrative routines, many births and deaths are not registered because the affected family members do not see the benefits of registering. It may be a burden doing this, for some travelling long distances, waiting in lines, and in some cases having to pay a fee (or bribe) for receiving a certificate of birth and death. There is a need to remove or reduce such obstacles to registering and instead make it advantageous to do so.

Ideally, the registration of births and deaths should be done at and by the health institution where the birth or death occurred, as the institution usually has the most accurate and timely information. There are some problems with this, however:

- In many developing countries a substantial part of births and deaths do not take place at health institutions.
- It is normally a civil registration office that is in charge of registration of vital events and of issuing birth and death certificates.
- Hospitals rarely have the resources such as trained personnel to do the registration. Health personnel are trained to do other things and usually have little time for statistical activities, which are not given priority over health services. A solution could be to employ a person who is trained to do registration (and who does not need to be a health person) or the civil registration office could establish a satellite office in the largest health institutions.

Thus, in some countries it may be more feasible that all registrations of vital events are done at a civil registration office, in spite of the fact that the proportion, timeliness and quality of registration are usually lower if it is done by the concerned individuals themselves.

On the other hand, it is not always possible to establish registration offices in all parts of the country and registration services are often very far from the families. It is therefore often more effective to find solutions where mobility of registration officers or use of mobile reporting play a role in order to improve accessibility. Experience has in many countries also shown that the solution in many cases is not to open registration networks but look for other existing networks formal and informal. Examples of this are networks such as community health workers, community chiefs, faith leaders, local administration etc.

Another way of increasing birth and death registration is to make it beneficial having a birth or death certificate and disadvantageous not having one. Some of the measures that could be introduced are:

- A birth certificate with the PIN code may be made a requirement for receiving health services.
- The PIN code could be printed on the health and vaccination cards, where such cards are used. This does not imply, however, that emergency health care should not be given to people who do not have a birth certificate.
- The same requirement could be made for school and university enrolment, as well as for receiving other public services, such as drivers' licenses and passports.
- Private commercial institutions could also be asked to make it a requirement to have the clients' PINs for services such as opening a bank account or taking insurance.

An example of introduction of incentives to increase birth registration is Bangladesh, where a person with a birth certificate gets access to 16 essential services including school admission, marriage recognition and passport for foreign travel.³

To increase the registration of deaths, it could be made a requirement that a birth certificate or an ID card is a requirement for burial by religious institutions, undertaker, or getting a permission or land to bury a person. A death certificate with PIN number of the deceased may also be made a requirement for inheriting property.

3.2. Use of modern technology for data collection

The technological development has been substantial in recent years, especially when it comes to mobile tools that can be used for non-centralized data collection. Naturally, there has been a strong focus on how technical tools can help to improve data collection and therewith also increase the coverage of civil registration. It will not be the focus of this report to go into detail on all possible solutions, but we will provide some examples of what we believe is necessary in order for new tools and systems to be helpful in improving civil registration. More detailed information can be found in a guideline on computerization (UNSD 1998), although the document is somewhat outdated. APAI-CRVS is currently working to update it to include current options.

Civil registration is a rather comprehensive system. Before applying technology and innovations, there should therefore be a sound institutional basis for civil registration (legal framework, capacity, clear delineation of responsibilities, business processes etc.). Also, the tools to be used in civil registration should cover all the different aspects needed for full-scale implementation. Often initiatives have started on a pilot level and without a plan for later national implementation. This has led to many projects that initially have had promising results, but afterwards turn out not to be scalable or which do not achieve sufficient government support. At present, partly due to a stronger national and international focus on this, there are more initiatives that have a national implementation plan, with more countries assessing the whole plan before allowing implementation on a smaller level.

Another aspect that needs attention is what the system developers actually offer. Many private companies offer a basic version only and demand additional funds for updates and changes to the system. This is not a good long-term solution, especially not in poor countries. Governments and partners should therefore try to use free-ware where possible and read terms and agreements carefully before signing any contract. Alternatively, the government should secure the right to the source code and the right to change it for free if the software development has been done by a commercial company. There should also be clear laws on data ownership making sure that private companies do not sell the data for advertising or other commercial purposes.

This being said, there are many good initiatives from the private sector that can be beneficial for all parties. One example are mobile companies that help develop solutions for village chiefs and similar to report vital events by SMS or internet.

New technology can be used in many parts of the CRVS system:

- Flexible registration based on computer systems or mobile solutions and devices, preferably through internet based on secure connections or offline with the possibility for later uploading when connections are available.
- Registration by authorized personnel or possible self-registration.
- Actual registration of a person at this person's place of residence.

³ Source: http://www.unicef.org/bangladesh/media_8870.htm

- Registration at a local administration office or health facility.
- Sending and sharing data within the registration system and with relevant partners.

Different systems and tools are needed for these tasks, but it is important that the systems are programmed in such a way that they can communicate with one another. Another requirement is that sensitive information is protected confidentiality is secured so that only authorized persons get access.

Any modern and scalable database system that has a safe and reliable support of transactions, including free (open source) variants, can be used as a basis in order to create a system for data management. Such a system can preferably be based on a generic data model with a flexible setup of data elements, data entry forms, validation rules and reports. Any new development should base the technical implementation on secure internet connection to the database system. Exchange of data with other parties should be based on system-to-system connections, e.g. based on web services and possibly some sort of business integration solution.

To ensure a stable and well-functioning system, there are some obvious prerequisites:

- Sufficient human resources with skills in relevant technology, such as web servers and database systems.
- Reliable backup of the system, including safe storage at a remote server.
- Use of encryption to keep private information like passwords secure.
- Monitoring of server resources and application performance.
- Stable Internet connectivity (if necessary).
- Sufficient power supply including a backup power solution.
- Secure server environment to avoid unauthorized access, misuse, theft and fire.
- Sufficient server hardware with potential for expansion as the use is expanding.

One of the sectors that have been very active in the use of mobile tools for collection of vital information is the health sector. It might, therefore, be a good idea for the civil registry to look more into their solutions and establish cooperation where feasible.

3.3. Implications of introducing and using PIN numbers

As we have already mentioned in the last chapter, the use of a unique personal identity number (PIN) has many positive aspects. One of them is that the incentive for registering might increase because having a PIN-code makes the contact with the Government easier.

The introduction of a PIN might be especially useful in a society where many people have identical or similar names, but often with different spelling practices, and where the date of birth and other information is frequently wrong, imprecise or missing from official records:

- A unique number makes it easier for an individual and for the society to ensure that the identity of a particular person is not mixed up with other people's identities.
- Detection and elimination of duplicate entries of records for the same person is greatly facilitated.
- Detection of fraudulent birth certificates is made easier.
- A unique ID number is a requirement for establishing and updating a population register, whether local or central.
- Comparing and matching personal records from different sources becomes much simpler, for example, the linking of births and deaths. This is of great importance for administrative purposes, for producing statistics, and for doing analysis and research.

- A unique ID number would play an important role if national identity cards are introduced; both to avoid issuing several ID cards to the same person and as an essential item of information on the card.

Thus, it would be highly advantageous if a PIN could be assigned to everybody whose birth is registered. Furthermore, the PIN should be recorded on the birth certificate and on other identification documents. Finally, if a birth register is established the PIN should be entered together with name, date of birth, names and PINs of parents, address or locality, etc.,

Implications of introducing and using PIN numbers

The introduction of PIN numbers should be done with a clear message that it is advantageous for the people to use it. There should be incentives for using it, such as easier access to health services and schooling.

Using PIN numbers makes it easier to accurately identify a person, even in cases where date of birth and name etc may be identical or similar. This is an important benefit both for the concerned individuals and for local and central administration. The PIN number can be used as the identification number for many uses and institutions, such as social security, employers, health institutions (health card), schools and universities, drivers' licence, passport, electoral registers and cards, banks and insurance companies, etc.

Introduction of PIN numbers requires laws, regulations and good practices against misuse. Access to the CPR and the PIN numbers should be restricted and monitored. When legally permitted and professionally justified, PIN numbers makes it easy to combine data from different registers for statistics and research.

Combining data from different administrative registers can also benefit individuals, as it reduces the burden of collecting data from different sources, for example, when completing income tax forms. For most residents of Norway this is now done by the Norwegian Tax Administration based on information from the CPR and other registers (on address and period of residence in Norway, spouse and number of children), companies (on income and taxes), banks (deposits, loans and interest), register of properties (on ownership), etc.

Structure of the ID number

As we have explained in the Norwegian case study (chapter 2.1.), the PIN can either be a sequential number or a number containing information such as date of birth, sex and region of birth or first registration. This is the case in the Nordic countries, Albania, the countries of the former Yugoslavia and several others. The disadvantage of this is, however, that the number has to be changed if it is found that the date of birth, for example, is wrong. Information about place of birth or residence may be also used as criteria for discriminating persons from certain regions. On the other hand, numbers containing information are easier to remember and errors may be more easily detected.

Another disadvantage of PINs with information is that they demand more digits and take more space. In Norway, for example, the 11-digit number will be too small to include new residents in 20-30 years. Due to technological development space required to store ID numbers is no longer a problem.

The modern thinking is that the ID number should be a sequential or random number that is free of information about the person it has been assigned to, such as date of birth and gender. This would also reduce the need to change the number and protect against misuse.

Both types of PINs should include one or two check digits to check if a number is valid. This would also protect better against misuse, although misuse can never be totally ruled out. The check digit can be used to check if an ID number is correctly

constructed, to detect typos, errors and fraud, etc. Most countries with unique ID numbers include one check digit (Denmark, Sweden and countries of the former Yugoslavia) or two check digits (Norway). Different algorithms exist for this, for example, modulus 11.⁴

We recommend that information-free PINs are used. In any case, the number used in the computer system should be stable, if possible, and need not be the same as the PIN used by the residents.

3.4. Linkage of different data sources

When information about a citizen exists in different parts of the Government system, coverage and quality of the core civil registration system might be improved by linking it to other data sources. Although the main goal for improved register coverage would be for the people themselves, linking different data sources is a good way to make the civil register data more interesting and useful – which again can lead to more interest and actual improved registration.

Data linkage can be done both at the administrative and statistical level. Although the technical approach is about the same, there are many more considerations that should be made when linking data for administrative purposes as it has greater implications for the population if an incorrect linkage is carried out.

One of the things that need to be decided is which data can be shared and publicly available, and which information is confidential. Here the statistical offices are in a special position as they usually, as statistics producers, have the right to receive even confidential data for statistical data, but because of confidentiality and trust usually should not share even data that in general are publicly accessible.

In any case, the relevant laws and regulations need to allow linking data. Good examples of what should be thought through before actually linking data can be found in Statistics New Zealand's data integration manual (Statistics New Zealand, 2006)

- Once the required changes have been made of laws and regulations, there are many different data sources that can be linked to the population register to improve coverage. Some examples are:
 - population censuses
 - other administrative registers such as;
 - health registries: vaccination, child and maternal health, births and deaths
 - education registries: school enrolment, educational attainment, examination grades
 - voting lists; name, date of birth, age, gender and place
 - Other databases and registers that are privately held

Given that the prerequisites for linking data are in place, the data linkage might give the vital registration system a flying start and greater incentive to improve registration. It may also serve as a tool for quality assessments of the register. If not coordinated, linkage with the health data on births and deaths will, for example, give a good indication of how good the records are and how complete the coverage in the civil register is.

⁴ The modulus 11 check digit is computed as follows: Each of the first digits is multiplied by a given number, the sum of the products is divided by 11, and the remainder is subtracted from 11, which yields the check digit. According to the Modulus 11 algorithm used in Denmark, for example, the first nine digits of the PIN are multiplied with weights 4, 3, 2, 7, 6, 5, 4, 3 and 2, respectively. For a PIN with first nine digits 030636117, the sum of products is $0*4 + 3*3 + 0*2 + 6*6 + 3*6 + 6*5 + 1*4 + 1*3 + 7*2 = 120$. $120/11 = 10$ with a remainder of 10. The check digit is found by subtracting the remainder from 11, i.e., $11-10 = 1$. Thus, the full PIN is 0306361171. Source: Lunde (1980:54).

When linking data for statistical purposes, laws and regulations also need to support the action that is planned. The arguments for statistical linkage are however a little different than for administrative linkage; in addition to improved coverage, linking data will usually reduce the response burden of the population and give the statistical office new possibilities in terms of statistical products.

Linkage is easiest if a unique identifier or PIN exists. If both records that are to be linked contain the PIN, the linking can be done easily in a short time with statistical programs such as SAS, SPSS, R or Stata.

Many countries that need to improve the coverage of their population registers do however not have PIN-codes, and if they have, they might not be used in all data sources. As the case study of Kazakhstan (chapter 2.3.) shows, however, linkage of data can be done with good results even if there is no PIN available.

If a population register is going to use data from a population census, the census law needs to provide for this, as census laws normally do not allow for this. This was done for the 2001 census for Albania, where the census law permitted the use of “personal identifiers” (name, date of birth, etc) for administrative reasons such as creating a population register. However, the population register was later established from existing paper-based information in the civil register offices.

3.5. Are there any parameters that affect the coverage?

There are many different variables that affect the level of coverage and it is probably different from country to country and related to the present level of coverage. For a country to be able to target the right parts of the population, this is important information.

A main challenge and reason why people don't register seems to be lack of knowledge, but some groups are more vulnerable to this than others. For example, the data from UNICEF's Childinfo (see chapter 1.5.) show that poverty has substantial effect on whether people register or not. Poverty can be linked with many other variables such as education and access to information and special focus on these groups might therefore be useful.

The UNICEF data do not give clear indications of differences in gender, but some countries, where registration is fairly high, report that gender plays a role. We have also earlier touched upon the issue of reaching the remote population and this is a challenge many places. New technology and cooperation between sectors and agencies seems to have an effect on this.

Other parameters that have been mentioned are

- Cultural reasons such as late name giving for birth registration or burial traditions for death registration.
- Level of development, that a country does not have the infrastructure and similar in place
- Conflict, in regions or countries where the level of conflict is high, access and focus on registration is much more difficult. Other approaches are needed in these cases.

But the question about coverage can also be asked in another way: Are there specific parts of the populations that are more important to reach in order to boost registration in the rest of the country? Will reaching the urban population influence the level of registration in rural areas as well? Could it be the other way around? Should efforts be targeted at the poor only since one could assume that the richer parts will register more anyway?

There are probably many different approaches to this. One approach that seems to have some support, however, is to start with specific regions of a country. This is a natural approach as pilots are recommended, but it can also be used to develop competition among regions and registration offices based on their performance. Governments can support this by providing incentives to the good performers, such as bonuses, etc. In this case it is important to make sure that the registration carried out is based on actual events.

So far there are not many studies on the issues we have mentioned here, but some are emerging and many regions and organisations are currently working to increase the analysis and research around this and other topics related to CRVS.

3.6. Publish data with low coverage and quality?

In many countries the coverage of the civil registration data is much lower than 100 percent and the quality of records low. In these cases other data sources such as censuses and household surveys may be preferred. However, data from civil registration might add additional information even if incomplete or of poor quality.

Publishing data from the civil registration system might also increase awareness of why such a system is needed. If possible, incomplete data should therefore also be published. When data are published, there should, however, be clear and accessible information on limitations and adjustments made to the raw data.

A lower limit of coverage level might be considered in order not to base the published data too much on data adjustments. As an example, the WHO uses a criterion of 85 percent completeness of death registration in order for it to be used to calculate maternal mortality (WHO 2010-b).

Many different methods for assessing the quality of a register exist (UNSD 2013). One approach has already been mentioned in chapter 3.4: matching the civil registration data with other administrative data sources to see how well the data fit. Other options are to check the register against results from sample surveys that include questions on whether a birth has been registered or measuring trends between censuses.

One can use this information to assess whether the coverage is sufficiently high to publish it and if yes, whether adjustments or similar need to be made in advance. Publishing information based on linked data or data from selected areas where coverage is relatively high compared to the rest of the country, is also a possible way of achieving attention and interest for civil registration.

The bias that may be introduced with incomplete registration coverage is perhaps more important to investigate than the percentage of coverage itself. This is generally the case for proportional statistics: A register may have a low coverage, but represent the population well and so the bias will be minimal. On the other hand, if the coverage is relatively high (e.g. 90 percent) but not representative (e.g. if the rural population are excluded from the register), then the statistics produced may be strongly biased. However, measuring the bias or representativeness of the register is usually more difficult than reporting a coverage rate.

In order to publish incomplete data from civil registration, it might be useful first to carry out an analysis on the data material, and if relevant, adjust for biases. There are a number of ways to deal with registers that do not cover all of the population. What is the best approach will most likely depend on the reasons for under-coverage and on what resources and information is available. For example, if a register has low coverage because it has only recently been introduced in a part of the country it will require a different approach to a register that only has low coverage in rural areas.

Possibly the most common (but not most ideal) approach is to limit the target population for statistics. For example, if there is a birth register that only includes those covered by the national health system for which only citizens of the country are entitled to, then statistics may be created for the population of national citizens. This is an easy solution but can be quite misleading, particularly for those outside the setting who do not have a full understanding of the system.

A better approach may be to investigate the use of weighting or calibration techniques with auxiliary information (e.g. rural/urban areas) in the calculation of statistics. In this case, registers that have a known bias may be used after some adjustments. There is also a great potential in this area for integrating survey and register data to create the desired statistics for the population. Imputation of missing data in registers may also be a way for adjusting for known biases in certain circumstances.

At present many countries do not have the information and knowledge needed in order to carry out analyses and publish incomplete data. Although there is much research on how incomplete data could be treated and what needs to be taken care of before publishing the information, there is not much information available related to register data. More analyses and training in use of this information has been demanded by countries

4. Good quality vital statistics

We have touched upon vital statistics throughout the report, but there are some issues that should be highlighted separately. This is especially related to the role, needs and contribution of the vital statistics producer, in most cases the National statistical office (NSO), to the CRVS agenda. Many of the issues we discuss in this chapter are discussed more in detail in the Recommendations and Guidelines of the UNSD (2013).

Standardizing data

The NSO, even if they are not the vital statistics producer, should be part of the planning of data collection activities to make sure that data are standardized and can be used across agencies and countries. This is an area where the NSOs usually have much experience. The standardization can make cooperation easier and also lead forms and documents that are more understandable for the population. This again can lead to improved coverage. Typical examples of products that should be standardized with the involvement of NSOs are:

- Designing forms: using forms that are easy to understand and reduce the possibilities of errors when filling in
- Meta data: defining which data are needed and develop descriptions of these so that all have a common understanding of what each variable entails. In this work the NSO can also make sure that the data are as much adapted to statistical needs as possible
- Collection strategies: identify how data should be collected and how (ex: field collection exercises)

Access to data

In order for the vital statistics producer to provide good quality data that are disaggregated by different variables such as gender, region and wealth, it is important that they get access to micro data. In order to get access, there are a few things that need to be in place:

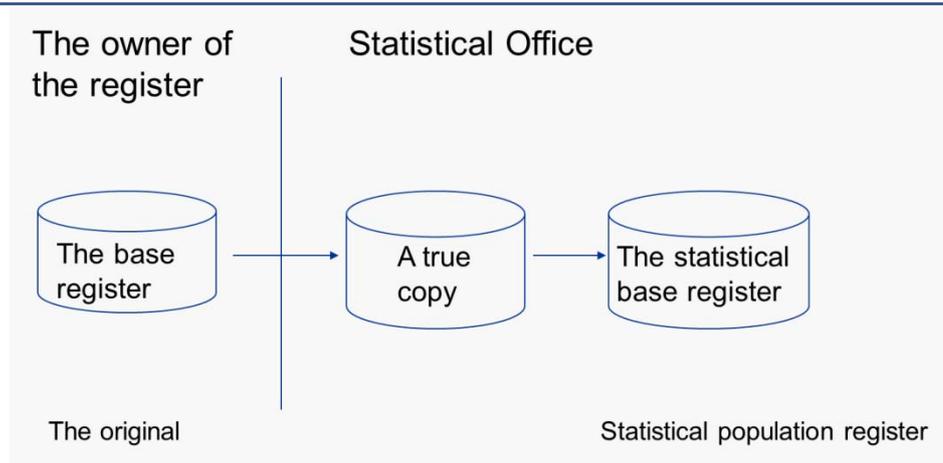
- The statistics producer need to be able to prove that data reception and handling is carried out securely so that only authorized personnel get access
- A statistical law that gives the vital statistics producer the right to receive handle and publish the data.

- That data are treated so that only confidential data are published, intentionally or not.
- Rules for how data are shared with others and standards in terms of data release.

In the Norwegian case study (chapter 2.1.), it is described how SN receives and handles data. Other countries have however other ways of organising and receiving micro data. Some important aspects that should be thought about and handled are:

- Coverage, content and quality
- Check of completeness and consistency of files
- Document files – meta data
- Creation of situational file as a basis for publication of statistics of stock population

Figure 3. From the base register to the statistical register in Norway



Source: Hendriks et al (2010)

Data processing

In most countries the NSO, or the national statistical system (NSS), have the most qualified staff to process and structure data. It is therefore usually a good idea to let these institutions do the data processing. This involves checks and controls of data, cleaning data, aggregate data into meaningful entities and preparing tables and graphs that describe the vital events.

Also, as described in chapter 3.6., it is often very useful to link data from different data sources. The NSO has data from different sources and when good linking keys, such as PIN number, are used, linkage is easy and can lead to much interesting information.

Since statistical laws and regulations demand a high level of confidentiality, data that can be recognised and linked to individuals should not be published. Also, the NSOs will in general not share individual data with other organisations. This is because it is important that the population trusts that the NSO keeps the information that they collect to themselves.

Vital statistics and beyond

A good CRVS system would be a very important improvement for every country which does not have credible vital statistics. We have discussed many of these advantages in earlier chapters. However, in order to produce good statistics on the number of persons (stock) there is a major demographic component generally missing in CRVS. This component is statistical information on in and out migration.

To estimate the number of persons in a country, one needs the number of persons at a specific point in time. In most cases this will be the number of persons from a

national census. Once the number of persons at a specific point in time is established, the number of births, deaths, immigrations and emigrations is needed to update the estimate of the number of persons at the next point in time. The most basic method of calculating numerical population change over time is the “balancing equation”, shown below.

$$P2 = P1 + (B - D) + (I - E),$$

where P2 is the population at the later date and P1 is the population at the earlier date, B is births D is deaths, I is immigrations and E is emigrations between the two dates (Haupt et al 2011). Since CRVS covers births and deaths, but normally not migration, only the natural increase (surplus or deficit) can be calculated. Therefore the next step would be to establish statistics on immigration, emigration and preferably on internal migration as well. Once the balancing equation is established, a nation can describe and understand the causes of population change.

Dissemination

As we have discussed in earlier chapters, dissemination of data that are easy accessible will probably lead to increased use by decision makers and the public. Also return summary regional information to registration authorities at local level could be very useful so that they see how the data are used. The vital statistics producer should be trained in and encouraged to this. If the NSO is in charge, they will often already have experience and knowledge in at least some of this work, but they may also need training. If vital statistics production is not part of the NSO, cooperation between the agencies should be encouraged.

5. Conclusions

There are many aspects of a CRVS system and it is a huge task to establish a good system. It is therefore important that governments and countries starting this work are strongly committed to long-term CRVS development. Since it is a comprehensive task that involves many parties, it is also important that there is close collaboration between all stakeholders and that the tasks and responsibilities are clearly identified and divided.

Improving CRVS has both a demand and supply side. On the supply side, the different stakeholders need to make sure that the registration system is something that is accessible and useful for the population. With accessible we mean that it is easy to register where people live or where vital events happen and that registration procedures are free of charge and easy to understand and conduct. With useful we mean that the population understands that registration can lead to better and more easily accessible services and improved legal rights. If this is in place, the demand for registration will probably increase automatically.

The government is also on the demand side of CRVS as understandable and reliable data are a good tool for providing services. This can be seen as an output or gain of CRVS. Financially, better planning leads to fewer funds spent where they are not needed. One example is that vital statistics may show that although there has been high pressure on a school in one area, people have fewer children or are moving away from the area so that expansion of the school will not be needed. Or the other way around, the new school may be too small already before it is built. With good population statistics this might happen more seldom.

Other gains are that there is less need to carry out expensive field work for surveys if a good register is in place. In the most developed systems even censuses can be based on administrative registers. Better cooperation between agencies is also a gain in itself, both when it comes to data collection and providing services.

On the other hand, there are also risks related to CRVS development. As it demands a lot of efforts, the commitment and funding may not last sufficiently long to make the system work. Many countries have experienced this in the past and it may happen again. Also, cooperation has failed in many places when it comes to implementation. On the other hand, it looks like the commitment to CRVS on national, regional and international level is much greater than it has ever been before. We will also argue that the gains from a good CRVS system are sufficiently high to take the risk of failing.

One should, however, be very careful when planning and implementing a CRVS system as there are many pitfalls. One crucial issue is to make sure that the levels of data protection regarding security and confidentiality are sufficiently high. In the most severe cases, the data may be misused by governments or individuals for the wrong purposes, for example to locate enemies and discriminate certain population groups. There are, however, other tools for this as well, so this may not be used as an argument against CRVS in general, but rather to design the system in such a way that only authorized personnel have access to confidential information.

The countries that are now in the process of developing their CRVS systems need support to achieve their goals. Countries will need additional funding and help in the planning and practical implementation. In addition, research and analysis on CRVS in general are needed. Examples of this are how to reach the whole population, what tools to use, and how to treat incomplete data. The international support, including regional and national bodies, are presently committing to this. Many organizations and governments have already allocated substantial funds and efforts to CRVS development. Birth registration has been suggested as one of the goals in the post-millennium development goals. It is also important, however, that international and regional organizations and countries have a long-term commitment to improve CRVS and that they cooperate to achieve this.

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Appendix A: Project proposal: How can SN best support the global development of CRVS systems?

Statistics Norway (SN) has a long tradition of producing population statistics based on administrative registers and has for many years been in the forefront of CRVS development both nationally and internationally. The Norwegian CRVS system consists of local population registries and the Central Population Register. The CPR was originally established by SN in 1964 based on data from the population census in 1960. Since then the responsibility for maintaining the system has been moved to the tax authorities, but SN still receives a daily copy of the transaction files and produces official population statistics based on these data.

SN has provided support to several countries on the establishment, improvement and use of CRVS. Over the years SN has gained substantial expertise in this field and there are several areas where we can contribute to CRVS strengthening in other countries. As a statistical office we believe that our best contribution will be to advise on the production of vital and other population statistics, such as access to data, checking and improving of data quality and publishing vital statistics.

SN has worked with a number of countries, starting with Palestine in the mid-1990s, to assist in establishing a central population register system and how to utilize this for better governance, including production of improved statistics. Our primary experience is that a precondition for success in this area is strong political support and commitment at ministerial level, and that the minister in charge needs to secure the full support at cabinet or president level.

We may propose how to best build the system in steps, but the main principle in any country should be the country's own priorities. A system may start in several different ways, such as with birth registration linked to child vaccination, with vital registration in general including birth, vital events such as marriages and death registration, with preparations for a register which may serve as a voters' register, with a system of personal IDs for the formal sector, or with a system of population censuses.

From the work on the status analysis of this report, participation at international CRVS meetings, and discussions with other stakeholders in this area, SN sees the following topics as possible areas where we can support CRVS strengthening both in developing and in other countries and regions:

1. Access to data: Support the body responsible for compiling vital statistics in getting access to data. This can involve legal, organisational, technical and financial support as well as standardization of forms and collection methods.
2. Structuring data: organising the civil registration data in a database.
3. Linking data: use of different data sources to link data with or without PIN codes
4. Data analysis: As the coverage is substantially below 100 % in many countries, there is a need for support on how to analyse and use the data. This will include work on selection bias and non-response.
5. Dissemination of data: Develop publications and user-friendly web pages that are easily accessible for the government and the public to increase the interest in and understanding of the need for good CR data. This also includes information on baselines and coverage improvement.

This support can, however, only be provided in an environment where there is willingness to carry out changes. Government commitment needs to be in place and be carried out in practice. SN therefore also proposes:

6. A system-wide approach: That the Norwegian Government engages several Norwegian agencies to support the same country to work together on CRVS related issues. Examples of such institutions besides SN include the National

Tax Authority, the Data Inspectorate, the Register of Properties (matrikkel), the Norwegian Mapping Authority, the National Archives, the Health Information Systems Program at the University of Oslo, and the Institute of Public Health.

Although this would cost resources in coordination, etc., this might be more effective than having advice from only one single institution, as different agencies in the receiving country would be involved simultaneously. This system-wide approach is elaborated below.

In the report we have given an introduction to the Norwegian CRVS system. We have also shown how the Norwegian experience can be translated into technical support for CRVS development in some selected countries. We believe that many of the topics and experiences are also relevant for other countries and might therefore be explained more in detail and serve as good practice examples. With this in mind, we propose to:

Develop a detailed description of the Norwegian register system, that can serve as a basis for countries improving their CRVS systems

A generic description with practical examples of how SN can contribute to the international CRVS development is given in the suggestions listed below. For some countries only a few of the examples might be relevant, whereas for others all of them could be considered. In order to follow up on these suggestions a more detailed, country specific plan has to be developed with a detailed project description including timelines and goals.

1. Access to data

As mentioned, the producer of vital statistics, usually the national statistical office (NSO), often does not have access to civil registration data. If they get access it is often only on the aggregate level. There are many reasons for this, such as registration offices not willing to share data because they are scared of losing power or of exhibiting poor data quality. In some cases the definitions and standards differ and are therefore difficult to assess and use. Security concerns are often also a barrier. Moreover, in many countries the NSO is poorly equipped and does not have a sufficiently good system for protecting confidentiality, neither in practice nor as expressed in their legislation on statistics.

SN therefore proposes to work along three lines in this proposal:

- **Develop a sufficient level of security:** Help the NSO (or similar agency) to improve their IT-systems so that data can be securely transferred and stored. Introduction of safe areas and security codes for access is also part of this. This can, e.g., be accomplished by establishing secure zones with limited access for users within the internal network structure. Access to data should be strictly based on a need to know principle. If the law and practice around handling data and confidentiality is not taken sufficiently care of, SN can provide support in this area as well.
- **Provide support in the standardization of data, forms and methods,** to make data more easily transferrable from one organization to another.
- **Legal and actual access:** Work together with the NSO and other partners to convince the Government and registration authority that the NSO has everything in place and is entitled to receive the data for production of vital statistics. If the statistical and registration laws do not clearly state the right to access, working on changing the law will be important. This work will be easier in countries where Norway is an active donor, having the advantage of knowing the country and the system. Also, as our sixth proposal states, this kind of work is easier when the Government is supported in many different areas simultaneously.

Activities

- Assess the current IT system, standards, laws and regulations
- Where necessary provide support on
 - IT-systems to ensure safe transfer, handling and storage of data
 - Standardization
 - Changes of statistics law and related documents needed to ensure that data protection and confidentiality is taken care of.
 - Provide support when discussing data access with data owners
- If relevant, develop guidelines on the needs.

Input

- IT/register experts to develop an efficient and secure system
- Methodology experts for standardization
- Law experts to ensure confidentiality and legal access to data
- IT equipment, software and hardware

Output

The NSO (or similar agency) should have automatic and direct access to CR data on individuals. With this access they will have good opportunities for publishing timely and good vital statistics.

Risks

That the NSO does not have access to individual data with the efforts that have been made.

2. Structuring data

For the vital statistics producer there is a need for a good database where the civil registration data are securely stored and handled. Often it might be useful for the civil registration office and the vital statistics producer to have similar or related systems to secure interoperability and easy exchange of data. If the civil registration office does not have a good system for handling data themselves, it might be a good investment to support them in developing a good database solution, and then provide a similar solution to the vital statistics producer. Supporting the civil registration office might also lead to easier access for the statistical agency both in terms of goodwill and technical possibilities.

SN envisages that a semi-generic solution for this can be developed. By this we mean that the parts of the system that typically are the same in all countries will be developed as a standard solution. The system will, however, need national adjustments based on data specifics and national laws. Such a system will be most relevant in countries where databases are not yet developed or are working very poorly.

The system will probably be developed in such a way that there is a basic version that contains the parts which are crucial in a database of this type. The system should, however, also be sufficiently flexible so that more complex solutions can be added when the country is ready for it.

If countries already have databases with CR data, we can, if requested, carry out an analysis of the current system. This would show the potentials and limitations of the current system. If coding and access is open, SN can support countries in improving the system.

Activities

- Carry out an assessment of a current system for handling and storing data.
- Develop a semi-generic database for handling and storing civil registration data – primarily for use at a statistical office or similar, but this may also be relevant for civil registration offices.

- Provide support/training in using and maintaining the database.
- Provide support in improving existing solutions.

Input

- Register and IT experts for assessment and training, as well as for developing a semi-generic database solution.
- IT developers for developing the database solution (on tender if required).
- IT experts for installing the database.

Output

A well-functioning database is established that ensures secure handling and storing of data.

Risks

It might turn out that the differences among countries are too large to develop a generic solution. Also, there may exist good solutions already. SN will, therefore, look more into existing systems and, if appropriate, promote these instead of developing a new system.

3. Linking data

As described in chapter 3.4 record linkage can be carried out both for administrative and statistical purposes. SN has historically been involved in both and can therefore provide support both to the civil registration office and the vital statistics producer. As described in New Zealand (2006) there is much that should be thought through and in place before actual linkage can be done. This includes making sure that laws and regulations support such activities, checking security and confidentiality, checking data for comparability, and deciding how the linking should be done. SN can provide support to this work as well as to the actual linking process.

Possible linkages SN could contribute to are:

- Linkage between CRVS data and census/survey data, given that there are no legal restrictions. Such linkages could be carried out on at the individual level, paving the way for substantial quality improvement of registers. We have, for example, experience from using the 1970 population and housing census for Norway to correct and update the information in the CPR using pre-printed forms, which were based on CPR information as the basis for the enumeration.
- Transcribing and linking of data from paper-based data sources to an electronic register – as we have shown in the work with the Historical Population Register in Norway.
- Use of aggregate data from censuses/surveys to improve data quality of registers.
- Use of health data such as vaccination and health cards could be an interesting entry point, but this can only be done in countries where legislation allows it.
- Use of data from electoral registers or passport registers – if legislation allows it.
- Introduction of a unique personal identification number (PIN), or other methods to improve consistency and linkage between different registers. If it is not possible to introduce a PIN, a random number should be introduced and linked to the records. This would facilitate linking and the introduction of a PIN at a later stage.

If relevant, a generic solution, or at least a package with standard tools and suggestions, may be developed. This should be based on or using existing tools where good solutions have already been developed. This would include programmes (code) developed in a statistical package for linking data.

If we focus our efforts on the vital statistics producer, the national statistical offices (NSO) have in many countries not been sufficiently involved in the CRVS process, although they could play an important role in dissemination and verification of CRVS data. SN could contribute to developing generic systems/packages to make it easier for the NSOs to be involved.

Activities

Provide support in the preparatory phase before linkage can take place.
Assist in linking data with or without a PIN code.
Develop guidelines and tools for implementation.

Input

Experts that have experience in linking different data sources

Output

A higher coverage and quality of the vital register data.

Risks

There may be so many errors/differences in the databases that only a small share of the data can be linked.

4. Data analysis

The actual coverage of a CRVS system in a country is often difficult to assess correctly, as is the quality of the data. Another issue is whether the coverage is representative of the population in the country.

For example, some countries have temporary campaigns to increase registration, where persons of all ages are registered and given birth certificates and not only the newly born. This may lead to high registration figures in the year of campaign compared to years before and after. This leads to a distribution that does not reflect demographic patterns and trends in the country.

Many countries have information from surveys such as MICS and DHS on which parts of a population that are more likely to register. Furthermore, it is possible to compare register data with census information in order to show areas where coverage and quality need to be improved.

This is an area, where data is available, but underutilised and SN has substantial experience and expertise in how to analyse such data. For example, the relationship between coverage and representativity can be seen as a similar problem to that of non-response in surveys, for which there is considerable research and expertise at SN. An SN assessment could include the following

- How do we measure coverage?
- How do we assess the quality of the data collected?
- Are there ways of using the data although coverage is not complete?

Said another way, we need to find ways to use incomplete and biased civil registration data to publish vital statistics and for establishing baselines and measuring coverage.

This area might be even more relevant if CRVS coverage is made part of the post MDG agenda. Such a goal will probably be related to a certain level of coverage. It is, therefore, important that the coverage is measured correctly. This could become the responsibility of the NSOs.

Activities

- Analysis of data and information presently available.
- Research that suggests new ways of utilizing CR data.

Input

We envisage that the analysis of CR data would require a person with methodological expertise. We suggest that a PhD is done on this topic. A more detailed project description will be developed if relevant.

Output

A method for producing reliable statistics from incomplete civil registration data.

Risks

Not finding a method that works sufficiently well.

5. Dissemination of data

The goal of this suggestion is to contribute to production and dissemination of high-quality publications that are accessible and of interest for government policy makers, development partners and the population in general. SN is one of the world's leading statistical offices when it comes to publishing information for all levels of the population. The different products range from short statistical bulletins, including tables and graphs, an updated statistical bank where users can themselves design relevant tables to more analytical reports. We also have various publications directed at different target groups. Most of our statisticians are also trained in how to make the data interesting and understandable to the public: How statistics can be used to tell interesting stories.

Publishing skills is an area that many statistical producers could improve substantially. In addition to country support, guidelines and tools for vital statistics specific issues could be developed. This includes providing information at low regional levels and for different subgroups of the population.

Another part of dissemination is reports and updates on how well the CR system performs. This includes baseline assessments and information on progress made both at national and local level. Although the target group might be different, these data should also be published systematically and timely for different subgroups and regional/government levels.

Dissemination is related to many of the topics presented above, especially to data quality, and should be linked to those where possible.

Activities

- Provide training in dissemination of data.
- Support the development of publications
- Develop packages that can be used for national and regional training.

Input

Experts that can provide training on how to produce good and easily understandable publications directed at different parts of the population and government.

Output

- Regular publication on CRVS data that are timely, relevant and easily accessible.
- Disaggregated data that can be further used by local registration offices.
- Measures of progress in CRVS development.

Risks

Lack of interest even for good publications as the traditional publications have become less important

6. System-wide support to one country

We propose that the Norwegian government engages several different Norwegian agencies to work together on related issues in the same country. Although this would cost coordination efforts etc., it might be effective as different agencies would be affected simultaneously. To build administrative registers that can be used for statistics is a slow process and relies on a concerted effort by many actors. We believe that in countries where Norway is already heavily involved as a donor and as an aid partner, it should be explored how one could work closer with other Norwegian development partners in order to support CRVS capacity.

What we have seen from our efforts to support the statistical agency in Malawi is that support in only one or two subject matter areas is difficult as gains in one area relies on increased support to other areas. Within the fields of National Accounts (NA), for example, we have observed that isolated support was of little effect if the input data to the NA were not of good quality and timely produced. Equally, we have supported the user side to do macroeconomic modelling based on NA data, - as a strong user can utilise the data as well as make new demands, which is crucial for the quality of the data. The chain from basic data to expert use is important to secure good quality data. This chain of events and data exchange could be transferred to the CRVS field.

In most countries the NSO does not have enough political and legal influence to lead the process of building a CRVS system. The statistical office can be a key actor in securing quality and disseminating statistics, but can probably not play the role as the owner of the basic population register, although there are some historical examples of this. Therefore, simultaneous support to the other actors in the CRVS system would be beneficial. In this area Norway has a broad range of key experts in different areas such as system design, register maintenance, quality control. This includes the National Tax Authorities, Tax for Development, the Brønnøysund register centre, the Norwegian Mapping Authority, the Norwegian Institute of Public Health (FHI), and also the Health Information Systems Programme (HISP) at the University of Oslo, which has experience in the implementation of reporting systems for health data in several countries, including Myanmar.

Norway is a major donor in many countries, especially in Africa, but also in Asia. Support is given to areas such as good governance, health and education, in addition to support to multilateral organizations who often focus on the same topics, all areas that rely heavily on the use of better data to provide better services to the population and to assess the effects of different programmes, to create a baseline, etc. We suggest that Norway, in areas where we already are heavily involved, sets up a comprehensive system of support. The different experts could support different elements of the CRVS and related systems and together build a well-functioning CRVS system.

If the approach is holistic and includes the best of elements from each of the actors the chances of actual improvement of the system will increase significantly. So far, as some of the examples in this report have shown, many of the initiatives within the CRVS field have been targeting one or two isolated areas. In our opinion the way to support the creation of a well-functioning system is to give broad support to a country and through that create a chain of events and actors that share data.

If Norway is involved at an early stage in the development of such an integrated and broad approach there are possibilities of generating synergy effects. Even though this proposal concerns mainly CRVS, many countries might be interested in developing other administrative registers, e.g. for legal units and land properties. Rather than developing separate systems, one can develop an integrated system, as discussed in Part 1 of this document (System of registers, section 1.1). There are many benefits with an integrated approach. Examples are a common IT-

infrastructure, standardisation of key variables (PIN, numerical address etc) which allows exchange of basic data, a common policy and other solutions for data protection, and a common legal base. An integrated approach will facilitate the development of other administrative registers, capitalising on the same underlying structure. In addition to births and deaths, legal units, land properties and property rights could be registered in administrative registers. Estonia is an interesting example which may be an inspiration for other countries.⁵

Activities

- Work with other Norwegian partners to increase sufficient momentum to support CRVS development.
- Work with the NSO to benefit from joint efforts.

Input

Experts linked to one or more of above topics.

Output

A system-wide CRVS system.

Risks

It can be challenging to implement cooperation between multiple institutions, both in partner countries and in Norway.

7. Explaining the Norwegian system

In chapter 2, we gave an introduction to how the CRVS system in Norway works. Although it contains many different aspects, few have been explained in detail. A more detailed description would, however, probably be more relevant to countries and international partners when working to strengthen CRVS in other countries. SN therefore suggests updating and translating relevant documentation on the Norwegian system, including the work with the historical records and IT decisions. This could include a detailed practical description of the IT production system, how it historically was developed and how it is run today. This may be useful for many countries, as a source of information and lessons learned on different elements of the development and use of a CRVS system.

Activities

Develop a document that explains the Norwegian system in sufficient detail.

Input

SN and partner register experts.

Output

Documentation of experiences that can be used for improving CRVS in other countries.

Risks

The Norwegian documentation may not be sufficiently relevant for other countries. We have, however, already received requests for such documents.

⁵ "e-Estonia" is the term commonly used to describe Estonia's emergence as one of the most advanced e-societies in the world with regard to administrative registers (??) – an incredible success story that grew out of the partnership between a forward-thinking government, a pro-active ICT sector, and a technologically advanced population. Source: <http://estonia.eu/about-estonia/economy-a-it/e-estonia.html>

Conclusion and way forward

SN has experience and competence in all the seven areas mentioned above. As we have shown above, we think it would be an advantage to work on all of these interrelated areas as. Also, the burden on SN experts would be more spread, as the support would come from different areas within the SN organisation and it would be easier to find sufficient staff for all the tasks. If it is decided to go for an option like this, SNs work should probably be focused on a few selected countries.

An alternative strategy could be to choose a few of the seven areas and focus only on these. In this case, SN would be able to support more countries and probably also to a greater extent build standard packages for the work needed. This would, however, be a heavier burden on the involved experts and additional internal training in SN might be needed.

SN wishes to discuss the different proposals with Norad and other partners in global CRVS development. We have already to some extent started this work. On the global level this would include UNSD who is an important partner in statistics and who currently leads the Global CRVS Group and therefore have an overview of all the on-going efforts. Efforts will also be coordinated with Paris21. Since the CRVS project is related to work SN has done for WHO, and WHO is an active player in putting CRVS on the world agenda, WHO is also going to be an important partner. Regionally, UN organisations such as UNESCAP and UNECA and their statistical experts are relevant partners. Also direct discussions with countries will be fruitful.

Bilaterally we will discuss possible contributions and division of tasks with other statistical offices that want to contribute to CRVS development. At present we see Statistics Sweden, Statistics Canada and the Australian Bureau of Statistics as potential partners in this effort.

We will also discuss these matters with other Norwegian CRVS stakeholders. Tax for Development at the Norwegian Tax Administration would be a very relevant partner as the Tax Administration is the owner of the population register in Norway. Other possible partners are the Norwegian Institute for Public Health and the Health Information Systems Program, which are both contributing to the CoIA agenda.

The countries SN should be engaged in will mainly be up to development partners and should be linked with the agreed priorities. The global investment plan (World Bank 2014) argues that countries that have carried out comprehensive assessments and otherwise shown commitment should be prioritized. SN wishes to follow such recommendations. We would, however, suggest carrying out at least some of the work in countries and regions where we have prior experience or are currently active. This could include African countries such as Malawi, Mozambique, Zambia, Uganda and Sudan. Asian countries where SN has established contact with the statistical office or other data-producing institutions are Bangladesh, Cambodia and Nepal, as well as countries in the former Soviet Union (mainly Armenia, Kyrgyzstan and Tajikistan).

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