



# Recording all deaths and causes of death

With the COVID-19 pandemic, the importance of registering deaths and recording causes of death has gained increased visibility. Death registration is fundamental in measuring and mitigating critical health challenges, particularly in calculating excess mortality to monitor the COVID-19 pandemic. Moreover, every death registration should be accompanied by a medically certified cause of death. This information is paramount to produce statistics on mortality and cause of death. However, the significance of death registration and recording causes of deaths goes beyond the production of vital statistics.

The registration of deaths also fulfils a legal and administrative purpose of the State. A death certificate represents a final and permanent record of the fact of death. It is used as primary evidence by courts in ruling inheritance or other related claims in all but one country that responded to the midterm questionnaire. In addition, 22 countries reported requiring a death certificate to issue burial permits and 24 countries said they were providing funeral assistance to at least part of their population after the submission of a death certificate. Finally, death registration and a record of the causes of death are valuable for the family of the deceased. It may be part of the grieving process and the information on the cause of death can also inform descendants of health conditions that may be hereditary.

**Box  
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**CRVS resilience through accessibility and digitization: the example of Armenia and the Republic of Korea in the COVID-19 crisis**

The COVID-19 crisis has brought significant challenge to the delivery of CRVS services. However, it has also shed light on how innovation can increase systems' robustness and even provide help in the mitigation of such a crisis. Indeed, the nature of the situation has forced many countries in the region to limit or stop their in-person public services during part of 2020, including the registration of vital events. This major disruption is problematic both because it prevents people from accessing some of their rights and it impacts a source of information critical to understand and fight the pandemic. In contrast, countries that had previously established online civil registration platforms were able to provide continuous services while the collection of vital statistics data continued.

In Armenia, repeated efforts have been made since 2016 to remove barriers to civil registration. For example, the Ministry of Justice opened a number of unified offices for the provision of public services throughout the country, including in post offices and bank agencies in rural communities. These offices help reduce the distance people need to travel to access civil registration services while also simplifying administrative processes. Cost barriers were addressed by removing some of the state duties, for example for the registration of marriage, while the delays taken for each procedure were also cut short. Recently, on-site birth registration points have been opened in a few hospitals to make services directly available to those who need it. In June 2020, the Ministry of Justice launched an online platform allowing some administrative procedures to be done entirely online, such as receiving proof of marital status or copies of events certification. The number of services available on the platform has progressively expanded and campaigns to increase awareness on the importance of the procedures were conducted. During the COVID-19 pandemic these efforts enabled the continuity of governmental services and provided recourse to the population when some services had to be suspended.

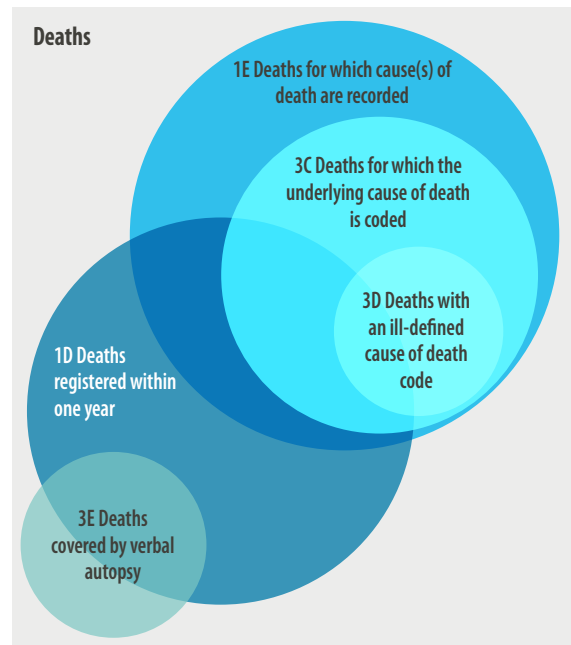
This increased convenience for the public offered by online service delivery is further exemplified in the Republic of Korea. The country has long been involved in e-governance, where it ranks among the best internationally. This involvement has been reflected in CRVS for a long time: digitization of several CRVS-related databases began as part of a more general plan in 1987. Through progressive steps, full computerization and interoperability of the different systems was achieved, significantly simplifying the administrative processes for citizens while also increasing the security of sensitive data. In 2018, online services for citizens included declaration of births and requests of copies of family relationship or marriage certificates. Coupled with the high completeness of the civil registration system, this digitization and the simplification of procedures has shown its value during the COVID-19 crisis. By continuing to provide complete and timely registration data, this system enables the use of vital statistics to monitor aspects of the crisis that are often unaccounted for.



The Regional Action Framework contains six targets on the registration of deaths and the recording of causes of death. Similar to targets 1A and 2A for birth registration, targets 1D and 2B focus on the registration of deaths soon after their occurrence and the issuance of a death certificate thereafter. These targets reflect the importance for families to obtain the death certificate of the deceased early to claim benefits and settle the inheritance and estate. In addition to registering deaths, recording the cause of death is paramount for public health reasons. The Regional Action Framework includes target 1E on deaths captured by the health sector which have a medically certified cause of death recorded using the international form of the death certificate. However, recording a medically certified cause of death is not sufficient for producing vital statistics. The underlying cause of death must also be coded to be analysed. Target 3C concerns the percentage of deaths occurring in health facilities or with the attention of medical practitioners, which have an underlying cause of death code derived from the medical certificate according to the standards defined by the International Statistical Classification of Diseases and Related Health Problems (ICD), latest version as appropriate.<sup>9</sup> The quality of the statistics on causes of death is dependent on the information given on the medical certificate of cause of death and its coding. The Regional Action Framework includes target 3D on the reduction of ill-defined codes, reflecting the importance of improving data quality in addition to the coverage of deaths for which a cause of death was recorded. Finally, in many countries of the region, a large number of deaths are still taking place outside of medical facilities and without the attendance of a medical practitioner, preventing the assignment of a medically certified cause of death. The Regional Action Framework includes target 3E on the use of verbal autopsy to collect information on these populations and understand health

<sup>9</sup> To simplify the reporting by countries, data for target 3C was instead collected on whether countries were using ICD to code deaths rather than on the percentage of deaths occurring in health facilities or with the attention of a medical practitioner which have an underlying cause of death code.

Figure VII: Registration of deaths and recording of causes of deaths



issues affecting them. These targets are used to monitor improvements in death registration and the recording of causes of death in the region (Figure VII).

Figure VIII shows a higher percentage of countries in East and North-East Asia and North and Central Asia have already achieved their targets on death registration and the recording of causes of death. Nevertheless, all subregions have yet to achieve their target on the reduction of ill-defined causes of death.

### Are deaths registered within a year?

Timely registration of deaths is necessary for public health concerns and because the burial or cremation permit should be issued only after the death has been registered. Similar to the registration of births, 42 countries in the region reported having an initial period during which registration is free. However, the period given for registering deaths is usually much shorter, with 15 countries having a limit of six days or less (Figure IX). Countries in East and North-East Asia and North and Central Asia tend to have a shorter legal period to register deaths than countries in the other subregions. For all countries except the Lao People's Democratic Republic and Pakistan the registration is free within the legally specified period.

Figure VIII: Overview of achievement against targets on death registration and the recording of causes of death

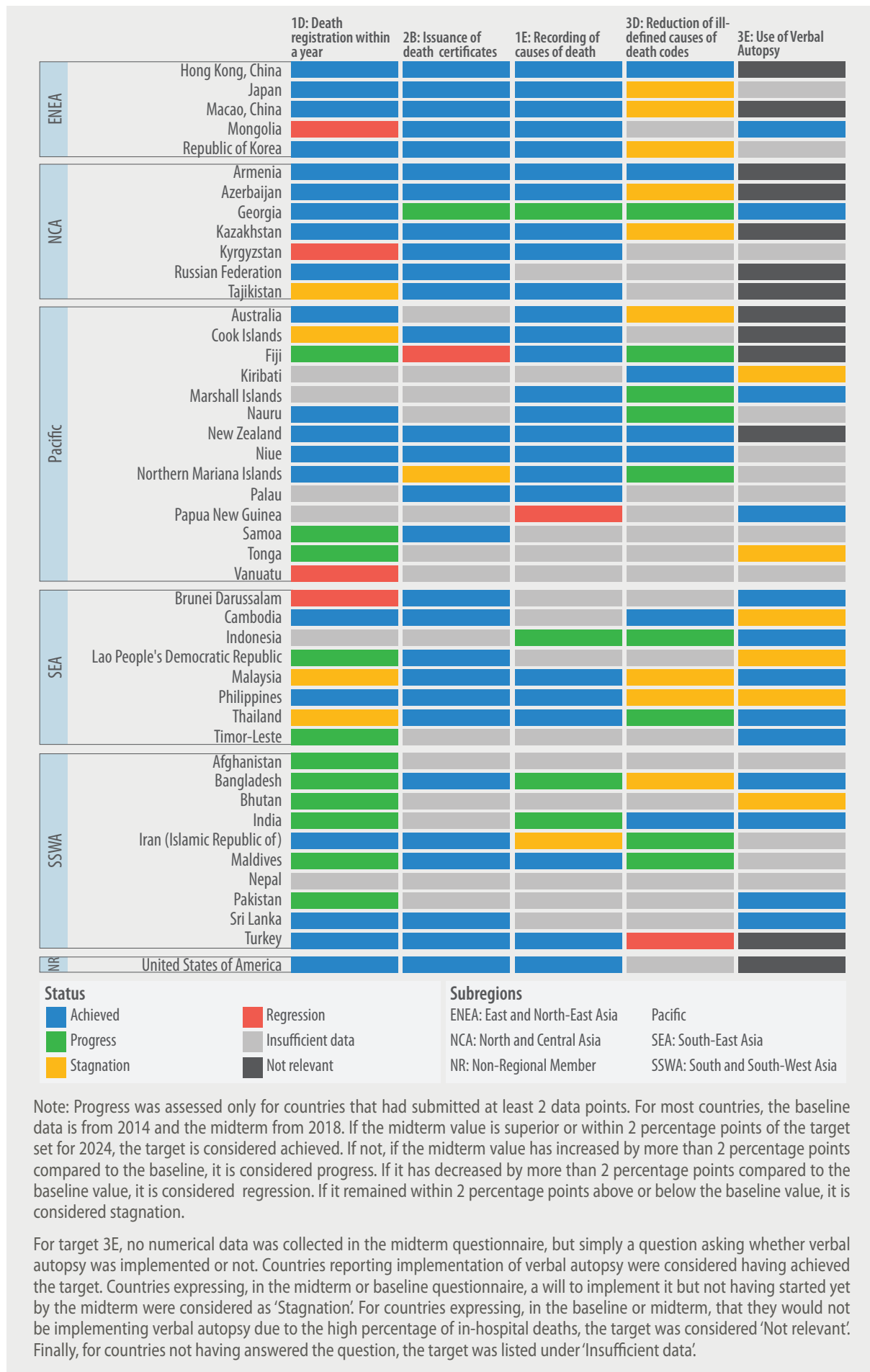
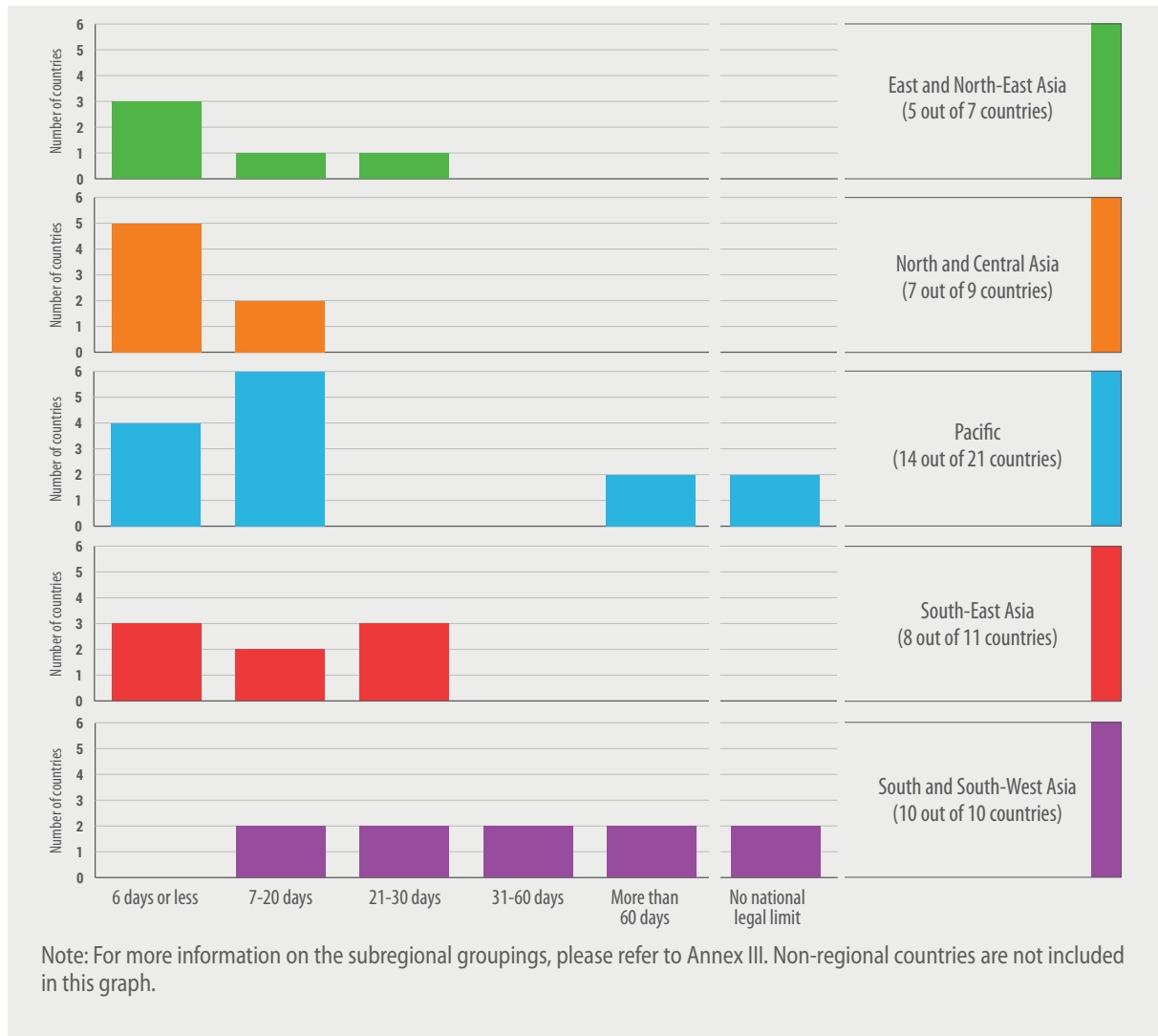


Figure IX: Legally stipulated period for death registration



After this period, about half of the countries charge a fee for late registration, which may discourage the late registration of deaths.

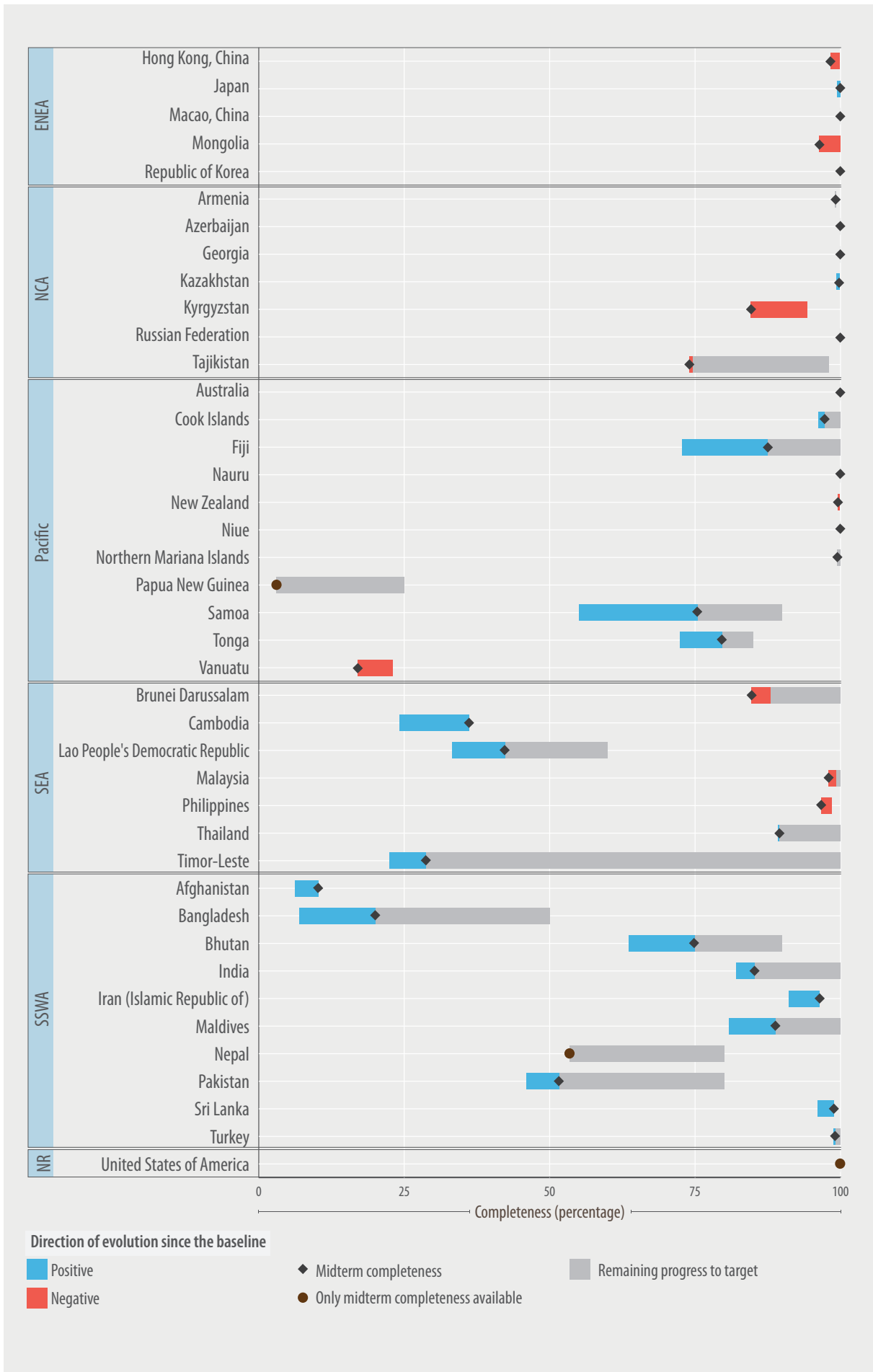
As with birth registration, the completeness of death registration is calculated by comparing deaths which occurred during a certain year and were registered within one year of occurrence to the estimated number of deaths during the same year.<sup>10</sup> The completeness of death registration in Asia and the Pacific is at a lower level than birth registration. The reasons for this include the more limited incentives

<sup>10</sup> Death registration completeness depends on the quality of the estimated number of deaths, which is difficult to estimate. The figures should therefore be interpreted with caution and be understood as a general indicator of the situation rather than an exact representation of the reality. For more information on the calculation of death registration completeness, please consult the technical report. Available at <https://getinthepicture.org/resource/technical-report-crvs-decade-midterm-report>

to register deaths and the fact that many deaths occur outside of health facilities. The gap between the countries with the most and least completeness of death registration is also larger than for birth registration. Eight countries reported registering all deaths within a year, six fewer than the number of countries registering all births.

With a few exceptions, most countries progressed towards their target. However, the current pace of progress may not be sufficient for countries to reach their target by the end of the Decade. Countries which reported death registration completeness close to 100 per cent may wish to conduct a more detailed analysis of death registration with a focus on hard-to-reach and marginalized populations to ensure they have truly achieved universal death registration.

Figure X: Death registration completeness: Progress towards target 1D



Looking at the different subregions, East and North-East Asia and North and Central Asia have high completeness of death registration, with only two countries below 90 per cent. CRVS systems in these regions benefit from well-institutionalized processes. The situation in South-East Asia and South and South-West Asia is very different. Most countries are making progress although only a few have completeness above 90 per cent. Finally, in the Pacific, there seems to be a convergence towards complete death registration among countries that responded to the midterm questionnaire. However, it should be noted that only 11 out of 21 countries in the Pacific subregion submitted data, limiting the strength of the analysis.

### **If a death is registered, is a death certificate then issued?**

A death certificate, like other civil registration documents, should be easily accessible to the appropriate individuals soon if not

directly after the registration of the death. In Asia and the Pacific, 29 countries reported the practice of issuing death certificates on the day of the registration, while 14 reported that it may take longer depending on the case.

Similar to birth certificates, most countries reported issuing death certificates for all registered deaths. Only five countries reported not issuing certificates for all deaths. Northern Mariana Islands reported that death certificates are issued to qualified individuals upon request for a small fee, and death certificates were not always requested after death registration.

The automatic issuance of death certificates following registration in an overwhelming majority of countries that responded to the midterm questionnaire is encouraging as it means the family of the deceased will be able to claim an inheritance or obtain specific support such as funeral assistance.

## **Box 7**

### **COVID-19 and CRVS**

During any epidemic, basic CRVS processes are vital to inform and support both national and global responses to monitor the impact of the emergency and assess the impact of interventions. To better understand the implications of COVID-19 on CRVS functions, the United Nations Legal Identity Task Force launched a global survey (UNLIA survey) in which 56 countries and four states of Australia participated. The survey results revealed that the pandemic had a massive impact on the principles, operations and functions of CRVS.\* Due to the pandemic, many CRVS offices were closed, budgets were refocused toward COVID-19 response. Maintaining the registration process was difficult as staff were shifted toward responding to the pandemic. If no positive actions were taken to compensate, then underreporting, incompleteness and inaccuracy would be among the expected long-term impacts of the pandemic on CRVS systems.

Countries need to focus on improving the notification of deaths and medical death certification and building capacity to routinely measure and monitor excess mortality resulting from the public health emergency. Those actions can help to ensure that their mortality surveillance systems are of maximum benefit for policy. With the unique access of the health sector to the population, a refocus is needed for its clear responsibility in strengthening CRVS systems. During emergencies, countries can consider such measures as drafting business development plans, strengthening multi-sectoral collaboration, deploying online registration platforms and allowing work shift modalities for CRVS staff.\*\*

Notes: \* Impact of the COVID-19 pandemic on Civil registration and vital statistics; UNLIA survey; Global CRVS Group UN Legal Identity Agenda Task Force; <https://unstats.un.org/unsd/demographic-social/meetings/2020/Webinar-crvs-Covid19/docs/Seminar02.pdf>

\*\* WHO CRVS Strategy and Implementation Plan 2021–2025.

Nevertheless, there are still millions of unregistered deaths every year in the region, and no death certificates will be issued for those deaths. As a result, families may not be able to benefit from services or exercise rights that require a death certificate. In addition, death registration and the issuance of a death certificate by the civil registration authority is needed to 'retire' a legal identity (see Box 4). The implementation of an identity management system in countries without universal death registration could therefore lead to failures to retire legal identities.

### Are causes of death recorded?

Assigning causes of death goes beyond the realm of the civil registration authority and is generally under the responsibility of the health sector. Efficient collaboration between the two authorities is crucial to ensure the medically certified cause of death is part of the information recorded by the civil registrar. It requires the medical practitioner attending the death to complete the international form of the medical certificate of cause of death and to send this information to the civil registrar. The registrar will ensure the form is combined with other information needed for statistical purposes. The use of the international form of the medical certificate of cause of death is widespread in the region, with only five countries reporting not using it (the Lao People's Democratic Republic, Nauru, Northern Mariana Islands, Pakistan and Timor-Leste). Nevertheless, three of these countries still reported data on the number of deaths with medically certified cause of death and they are included in the below analysis. However, 17 countries reported not having any regular training on medical certification of cause of death provided to doctors or coroners.

Twenty-two countries declared recording a medically certified cause of death for all deaths taking place in health facilities or with the attention of a medical practitioner. Ten of these countries are effectively recording a cause of death for all deaths. In addition, four record causes of death for 80 per cent to nearly 100 per cent of deaths taking

place in health facilities or with a medical practitioner in attendance, while nine record causes of death for less than 80 per cent of these deaths. Nevertheless, many deaths in Asia and the Pacific are not taking place in a health facility or with the attention of a medical practitioner, and they are not recorded by the health sector. Thus not all deaths have a medically certified cause of death, even in countries with 100 per cent for this target.

A medical certificate of cause of death is a necessary but not sufficient step to produce mortality statistics on causes of death. As shown by Figure XI, the information on a medical certificate of cause of death also needs to be coded. If there is no medical certificate, verbal autopsy can be used to obtain less detailed information on the cause of death, which can be useful at the population level if applied to a representative sample.

### Box 8

#### COVID-19 as a cause of death

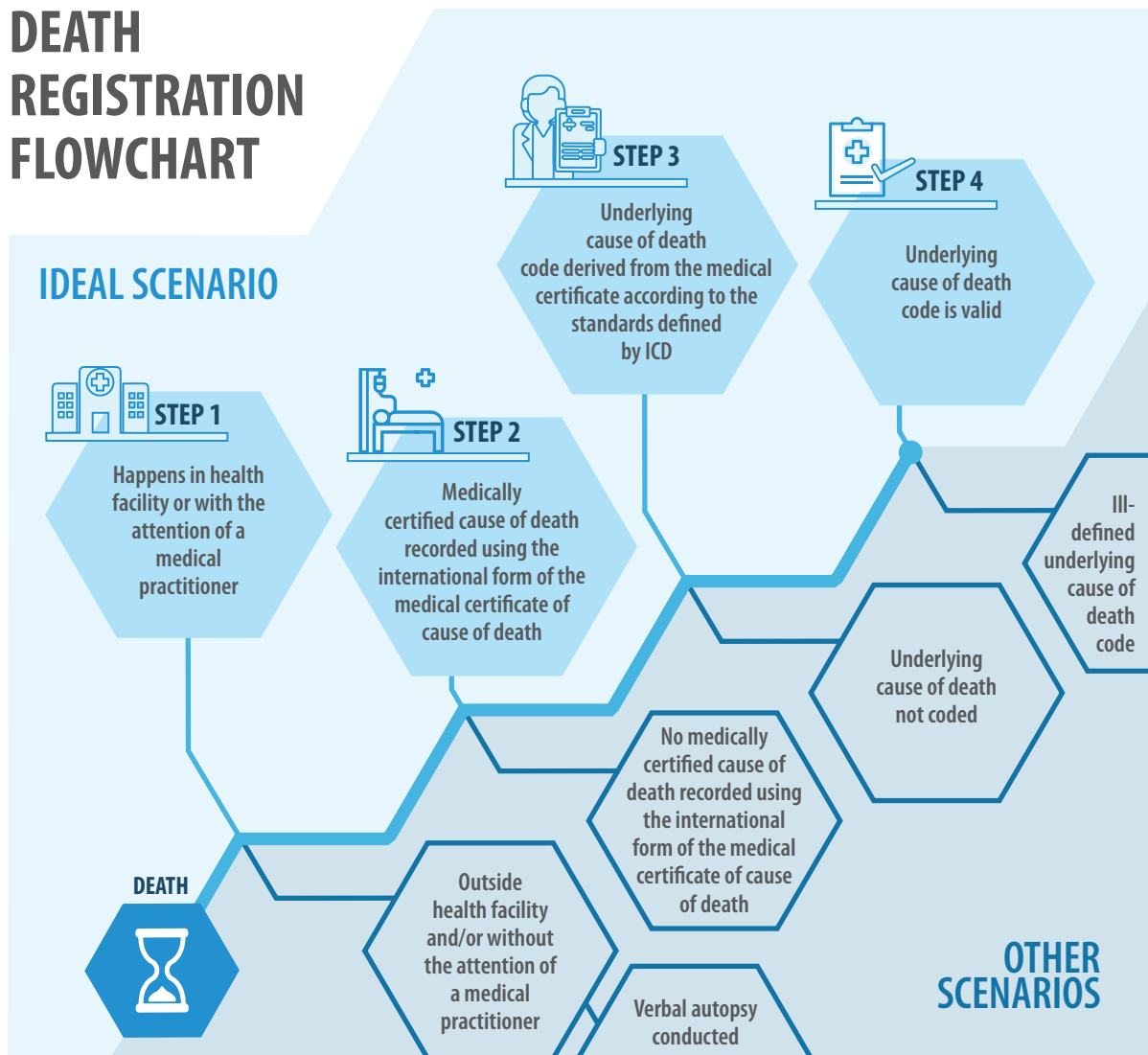
According to the WHO International Guidelines for Certification and Classification of COVID-19 as a cause of death, a death due to COVID-19 is defined as a death resulting from a clinically compatible illness in a probable or confirmed COVID-19 case and counted independently of pre-existing conditions, unless there is a clear alternative cause of death that cannot be related to COVID-19.\*WHO also created a code in the International Statistical Classification of Diseases and Related Health Problems (ICD), Version 10, for COVID-19 (U07), to improve the quality of reporting of the epidemic.\*\*

Notes: \* International guidelines for certification and classification of COVID-19 as a cause of death, World Health Organization. Available at [www.who.int/classifications/icd/Guidelines\\_Cause\\_of\\_Death\\_COVID-19.pdf?ua=1](http://www.who.int/classifications/icd/Guidelines_Cause_of_Death_COVID-19.pdf?ua=1).

\*\* COVID-19 coding in ICD-10; World Health Organization; [www.who.int/classifications/icd/COVID-19-coding-icd10.pdf](http://www.who.int/classifications/icd/COVID-19-coding-icd10.pdf).



Figure XI: Death registration flowchart



### If recorded, are causes of death then coded for the purpose of vital statistics?

The underlying cause of death is used as the basis for mortality statistics. It is defined as the disease or injury that initiated the chain of events leading directly to death or the circumstances of the accident or violence that produced the fatal injury. The information provided on a medical certificate of death cannot be directly used for the purpose of producing vital statistics. The underlying cause of death needs to be coded to a statistical category using the comprehensive classification of morbidity and mortality causes provided by ICD, so that the cause of death can inform public health policies. When doctors fill in the medical certificate of cause of death and identify the underlying disease, injury or accident which led to death, the classification of the underlying condition

in a general taxonomy facilitates analysis and international comparison. Almost all countries reported using ICD, although not necessarily in a systematic manner. Nevertheless, 22 countries reported not having regular training provided to coders, of which nine countries also reported not having ad hoc training.

The ICD includes codes to be used when information is either too limited or not available to accurately classify the cause of death, characterized as “ill-defined codes”. The quality of the information provided on a medical certificate of cause of death is ultimately reflected in the proportion of ill-defined codes. Since the beginning of the Decade many countries managed to lower the proportion of ill-defined codes among causes of death. However, many

## Box 9

### Tools to increase quality and timeliness of coding causes of death in the Philippines

The Philippines Statistical Authority publishes population data from a variety of sources such as censuses, surveys, and a civil registration system with relatively high completeness. Yet the timeliness and quality of data needed some improvement. The lack of human resources to code and analyse data meant that the data were not specific enough to properly guide policies and publication was often delayed, especially for detailed data, such as causes of death.

Human resources and time are needed to record correct and precise underlying conditions and convert that into an accurate code for cause of death. More than 60 per cent of deaths in the country occur outside of hospitals.\* For these deaths, doctors often have very limited information on which to determine cause of death. To help solve those problems, the Bloomberg Philanthropies Data for Health Initiative partnered with the Government of Australia in 2015 to support the implementation of SmartVA (smart verbal autopsy), Iris (automated coding system for cause of death), and ANACONDA (Analysis of Causes of National Deaths for Action). Those tools use the International Statistical Classification of Diseases and Related Health Problems (ICD), Version 10, developed by the World Health Organization.

SmartVA aims to attribute a cause to death occurring outside of health facilities for which there are no medical records or information is insufficient. Using tablets or laptops, a formatted interview between a doctor and the family of the deceased aims to determine a probable cause of death.

The Iris tool automates the mortality coding system. It converts all entries on the medical certificate into an ICD code, and selects the underlying cause of death. This process was previously done manually by coders at the Philippines Statistical Authority. The implementation in the Philippines was guided by the University of Melbourne as a member of the Data for Health Initiative.

The final tool, ANACONDA software, was jointly developed by the University of Melbourne and the Swiss Tropical and Public Health Institute at the University of Basel. It checks the plausibility of mortality levels and quality of causes of death data using information from established epidemiological and demographic patterns. It therefore measures common problems such as lack of detail, improbable sequences and other issues leading to “garbage codes”, which assesses the reliability of the data and reveals areas where training is needed.

Using the training of trainers approach to roll out these tools, a large number of provinces and hospitals were reached quickly while also greatly improving the human resources available locally. Results of these innovations can already be seen, with the Philippines Statistical Authority now able to produce cause of death statistics in less than half the time it took previously when the death certificates were manually coded, while having increased data quality.

Note: \* CRVS Knowledge Gateway, *Philippines: a story of change*. Available at [www.youtube.com/watch?app=desktop&v=p2KAcNPUX9w](http://www.youtube.com/watch?app=desktop&v=p2KAcNPUX9w).



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other countries experienced increases in the proportion of ill-defined codes and four countries reported that ill-defined codes were assigned to more than 20 per cent of underlying causes of death at the time of the midterm questionnaire (see Annex II). As shown in Figure VII, progress of countries against target 3D on the reduction of ill-defined code among causes of death stands out compared to the other targets, highlighting the need for improving the quality of information on causes of death in all countries of the region.

**Is there any information on the causes of the deaths that took place outside of a health facility or without the attention of a medical practitioner?**

Eleven countries in the region reported more than 50 per cent of deaths taking place outside the health sector and therefore not having medically certified causes of death. Verbal autopsy is a structured interview with persons familiar with the deceased to elicit events, signs and symptoms that arose before the death. The information

is then analysed by a medical professional or using automated algorithms to assign a probable cause or causes of death. Verbal autopsy generates useful information at the population level but is less reliable than medical certification for assigning the cause of death of an individual. It does not provide family members with a legal certificate of cause of death. Like sample registration, verbal autopsy can be applied to a representative sample of the population.

Thirteen countries reported using verbal autopsy, and its use varies depending on the country. Bangladesh, India and Indonesia have integrated it in their sample registration system. It is also sometimes used in surveys to investigate specific deaths. At the beginning of the Decade, 14 countries set a target to use verbal autopsy by 2024. However, due to the COVID-19 crisis more countries have recently expressed interest in implementing verbal autopsy.

**What can the region do to improve death registration and the recording of causes of death?**

The COVID-19 pandemic has underlined the lack of timely and accurate data on deaths and their causes in many countries. A universal and well-maintained CRVS system could provide such information. However, as seen in this chapter, many countries have yet to register all deaths and record reliable information on their causes.

Most of the steps to be taken to improve birth registration are also applicable to death registration. However, as there are fewer incentives to register a death, it will probably take longer for countries to achieve universal death registration. Ways to increase the percentage of death registration include revising the legal framework, facilitating the sharing of death-related information between the health sector and the civil registration office, simplifying registration procedures to have a more active system reaching out to the families rather than the other way around, implementing an information and communications technology platform for CRVS and launching

advocacy campaigns. Such improvements are particularly needed for countries embarking on the implementation of a legal identity system based on civil registration as the registration of a death is necessary to retire a legal identity.

Although the region is experiencing notable improvements in death registration, progress on recording causes of death has lagged behind. In many countries, the high percentage of deaths taking place outside of health facilities or without the attendance of a medical practitioner is only slowly diminishing over time. Fortunately, recent progress in the use of verbal autopsy allows countries to gather valuable information on the causes of non-facility deaths. Countries which have a significant percentage of deaths that occur outside health facilities should therefore use verbal autopsy on a representative sample of these deaths. Verbal autopsy can be integrated into the civil registration system or surveys. Nevertheless, the information collected with verbal autopsy is not as reliable as a medical certificate of cause death and it is not recommended to include the individual cause of death generated from verbal autopsy in a death certificate.

As seen before, medically certified causes of death are assigned for most deaths occurring in health facilities or with the attention of a medical practitioner. However, too often this information is of poor quality, resulting in many deaths for which the underlying cause is ill-defined. A greater emphasis on improving the quality of the information provided on medical certificates of cause of death is therefore needed to enhance the understanding of causes of death in the region. To improve quality, it is first important to ensure all hospitals use the international form of the medical certificate of cause of death (see Annex IV) and doctors are trained to complete it. Once completed, these certificates need to be transferred to the authority responsible for their coding. Depending on the country, it could be the National Statistical Office, the Ministry of Health or the Civil Registration Office. The

process to transfer the information needs to be clearly defined so that all health facilities do it within a specific timeframe. Finally, the coding of the causes of death should be done by trained coders using ICD. Of course, these are only some steps that could help improve the recording of causes of death as the exact activities will depend on the situation in the country.

