

The importance of routinely measuring birth and death registration completeness

This *CRVS summary* is edited from the module 'Completeness' from Topic 5 of the CRVS Learning Centre, available at <https://crvsgateway.info/learningcentre>

Why does data from CRVS systems matter?

In many countries of the world, civil registration and vital statistics (CRVS) systems are non-existent or provide incomplete data. This problem has come about due to several factors, including outdated and incomplete birth and death registration laws, lack of coordination among poorly-linked government ministries responsible for CRVS, and insufficient incentives for families to register births and deaths.

However, those populations whose vital events are not registered will be left behind when it comes to health and development efforts, completely counter to the 2030 Sustainable Development Goal (SDG) Target 16.9, *By 2030, provide legal identity for all, including birth registration*.¹ Indeed, measuring and monitoring most of the targets in SDG 3, *Ensure healthy lives and promote wellbeing for all at all ages*, will depend on timely and reliable mortality data (**Box 1**).²

What is registration completeness?

A complete civil registration and vital statistics system is the best and most cost-effective source of routine, timely and detailed data on births, deaths and causes of death. However, globally, around one-third of births and one-half of deaths are not registered. In CRVS systems where not all births and deaths are registered, the accurate measurement of registration completeness should be a core function (**Box 2**).



Box 1: Examples of SDG 3 targets that require mortality data

- 3.1 By 2030, reduce the global maternal mortality ratio to less than 70 per 100 000 live births
- 3.2 By 2030, end preventable deaths of newborns and children younger than 5 years, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1000 live births and under-5 mortality to at least as low as 25 per 1000 live births
- 3.3 By 2030, end the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases, and combat hepatitis, waterborne diseases and other communicable diseases
- 3.4 By 2030, reduce by one-third premature mortality from noncommunicable diseases through prevention and treatment, and promote mental health and wellbeing

¹ Dahan M, Gelb A. The identity target in the post-2015 development agenda. The World Bank; 2015.

² Sankoh O, Byass P. New INDEPTH strategy for the SDGs using robust population data. *The Lancet Global Health* 2017; 5:e657-e648.

Box 2: Registration completeness

The completeness of registration is defined as the percentage of actual births or deaths in a population that are registered. Put another way, it is the number of registered births or deaths divided by the actual number of births or deaths in a population.

Completeness of birth registration (%)

$$= \frac{\text{Number of registered births}}{\text{Actual number of births}} * 100$$

Completeness of death registration (%)

$$= \frac{\text{Number of registered deaths}}{\text{Actual number of deaths}} * 100$$

Why is completeness important?

Registration completeness can be used to monitor the performance of the CRVS system. Timely information of the extent of under-registration, including by geographic areas or demographic groups, can be used to then target CRVS technical and other interventions, or measure their effectiveness, to improve registration completeness. For example, if a country introduces a novel system to notify and register deaths in rural areas, then reliable measurement of completeness enables quantification of the effectiveness of these investments.

In particular, completeness of registration matters from a health equity perspective. If all births and deaths cannot be registered within a country, then policy-makers are basing their policy and planning decisions on data derived from biased birth and death statistics. This means the health outcomes (and subsequent needs) of whole communities can remain invisible because health decisions are being made on the basis of fertility, mortality and cause of death patterns and levels among sectors of the population whose births and deaths are more likely to be registered.³ It is often the poorest sectors within a population, and persons in rural and remote locations, who fall through the policy cracks in countries with incomplete CRVS systems. Yet, it is these same sectors that are hit the hardest by disease outbreaks and natural disasters, and share the greatest burden of largely preventable diseases.

If the completeness of birth and death registration is known, data from incomplete CRVS systems can still be used. Fertility and mortality statistics can be derived and adjusted so that policy-makers can make informed decisions for health policy and planning. This will be important in the global push to achieve the health-related targets under the Sendai Framework for Disaster Risk Reduction 2015–2030.⁴ **Boxes 3** and **4**, and **Table 1** summarise the importance of fertility and mortality statistics for countries and their partners.

Box 3: Important measures of fertility

Crude birth rate (the number of births per 1000 population)

Age-specific fertility rates (the number of births per 1000 women in each age group)

Teenage fertility rate (the number of births per 1000 women aged 15–19)

Total fertility rate (total number of children born or likely to be born to a woman in her life time if she were subject to the prevailing rate of age-specific fertility in the population)

Box 4: Important measures of mortality

Life expectancy (the average number of years a baby is expected to live, given current age-specific death rates)

Maternal mortality ratio (the annual number of mothers who die per 100 000 live births)

Under-5 mortality rate (the number of deaths in children under age 5, per 1000 live births)

Adult mortality rate (the probability of dying between ages 15 and 60, per 1000 population)

Age-specific death rates: the number of deaths occurring in a given age group divided by the population in that age group, per 100 000

³ Setel PW, Macfarlane SB, Szreter S et al, on behalf of the Monitoring of Vital Events (MoVE) Writing Group. A scandal of invisibility: making everyone count by counting everyone. *The Lancet* 2007; 370:1569-1577.

⁴ UN General Assembly. Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction, *Note by the Secretary-General*. A/71/644. 1 December 2016.

How is completeness measured?

It is vital that countries have the capacity to apply methods to routinely estimate the completeness of registration.⁵ Human, technological and financial capacity will all be critical to improve performance of CRVS systems and to maximise the utility of the data they collect.

Measuring completeness is generally complex and will require countries to invest in upskilling personnel; however, new, simple and accurate techniques can easily be applied to measure completeness

Several techniques can be applied to estimate the completeness of birth and death registration. Existing methods to measure completeness of death registration can be broadly classified into four groups:

- Death distribution methods, also known as indirect methods.
- Capture–recapture methods, also known as direct methods.
- Comparing registered deaths to total deaths estimated using a range of data sources and methods, i.e. by the Global Burden of Disease or United Nations.
- A new empirical method to estimate the completeness of death registration using limited data.⁶

These scientific methods, particularly capture-recapture and death distribution methods, are generally not straightforward, and their appropriateness for use by countries will depend on the characteristics of each country’s population and CRVS system.

A new empirical method developed under the BD4H Initiative to estimate completeness reliably is now available and easily applied by country CRVS technical personnel with relatively limited training. Importantly, the new empirical method can estimate completeness for both national and sub-national areas using up-to-date data, and so is an effective monitoring tool for CRVS managers.

How can completeness be improved?

The legal and regulatory environment will play a key role in facilitating registration completeness: legislation helps to ensure the completeness of registration and to improve the accuracy of information held in the civil record. Making registration activities subject to the law, and establishing procedural rules and regulations, is essential for the efficient management, operation and maintenance of a CRVS system.

This should extend to the legal and regulatory environment surrounding public and private hospitals, legislation on birth and death notification, certification for the disposal of bodies, and coronial (or similar) laws for certifying and registering non-natural deaths.

Other important ways countries can improve registration completeness include:

- Removing disincentives (such as registration fees).
- Making registration more accessible (by, for example, adding more sites or sending registrars out into the community).
- Improving CRVS system functioning through better coordination among government agencies and other stakeholders.

The appointment of a national CRVS committee is another key way to enhance coordination, and centralise and monitor CRVS planning.

⁵ As part of the BD4H Initiative, the University of Melbourne offers a course on estimating the completeness of birth and death registration. For more information, see <https://crvsgateway.info/courses>

⁶ University of Melbourne. *A new method for estimating the completeness of death registration*. CRVS summaries. Melbourne, Australia: Bloomberg Philanthropies Data for Health Initiative, Civil Registration and Vital Statistics Improvement, University of Melbourne; 2018.

Table 1 The role of vital statistics in policy and planning

Importance of reliable fertility statistics	Importance of reliable mortality statistics
<ul style="list-style-type: none">■ Fertility statistics are the primary determinant of population size and age structure■ They are a key component of population growth projections, which are used to<ul style="list-style-type: none">– plan for infrastructure and services, such as adequate health and educational services– predict changes in the population age structure and the implications for fiscal projections – which are heavily influenced by the size of the working population compared with the retired population■ Timely fertility statistics help countries monitor important indicators such as teenage fertility rates and the effectiveness of family planning programs	<ul style="list-style-type: none">■ Reliable mortality statistics are vital for government health planning, program delivery and program monitoring■ Summary mortality measures disaggregated by sex, socioeconomic characteristics and/or geography provide evidence of differentials in population health and thus can inform targeted interventions■ Age and sex-specific death rates are also key components of population projections■ Achieving many of the Sustainable Development Goals and global targets under the Sendai Framework for Disaster Risk Reduction 2015–2030 depends on reliable mortality data

Summary

Regular monitoring of the completeness of registration, especially at the sub-national level, can inform strategies to improve the CRVS system and the quality and policy utility of vital statistics. Knowledge about registration completeness removes bias in statistics used by policy-makers, and facilitates health equity and country achievement of the health and other Sustainable Development Goals.

Improving the capacity of CRVS staff to measure completeness is critical for its routine measurement. Additionally, a strong legal and regulatory environment is necessary to ensure all vital events are registered.

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