

CRVS analyses and evaluations

Monitoring CRVS data quality and progress

This *CRVS summary* is edited from 'A global assessment of civil registration and vital statistics systems: monitoring data quality and progress', a Lancet publication available at thelancet.com/series/counting-births-and-deaths

Key messages

- Global progress with civil registration and vital statistics (CRVS) systems has been very slow despite their importance for health and development.
- Evidence suggests that rapid progress is possible with some key components of a CRVS system.
- Death registration completeness has only modestly improved, but more deaths have been recorded with a reliably assigned cause of death.
- Specific component analysis of CRVS systems suggests that improving completeness of registration, reporting causes of death in more detail, and strengthening death certification practices will have the greatest immediate benefits for CRVS improvement.
- Monitoring improvement activities will benefit from performance index metrics.

A global assessment of civil registration and vital statistics systems: monitoring data quality and progress.

In 2015 the Lancet published a series of papers on civil registration and vital statistics (CRVS) systems as part of the special edition on 'Counting births and deaths', a follow-on from the original series, 'Who counts?' published in 2007.¹

One of the papers in the series conducted a global assessment of CRVS systems, with a focus on monitoring data quality and progress.² This *CRVS summary* will examine their findings and will describe the index they used to compare progress in countries over time.

Monitoring CRVS progress

Vital statistics systems can be a valuable tool to inform government policy and assist development. To be effective it is important that CRVS systems record most births and deaths that occur and provide accurate and timely data about causes of death. While there is recognition of the need for better CRVS systems globally, improvement initiatives have been underfunded and poorly coordinated, with a lack of leadership and a lack of a framework to cost-effectively monitor and assess systems.

There is a need to ensure that CRVS strengthening activities are effective, that is, not only knowing if planned activities have occurred but also whether they have led to sustainable system improvements. To do this, we need to measure core quality indicators of civil registration and to also track progress globally. This summary describes the composite index named the Vital Statistics Performance Index (VSPI), and key results from its application to data from 148 countries and territories around the world in order to assess their CRVS performance.

Measuring CRVS performance

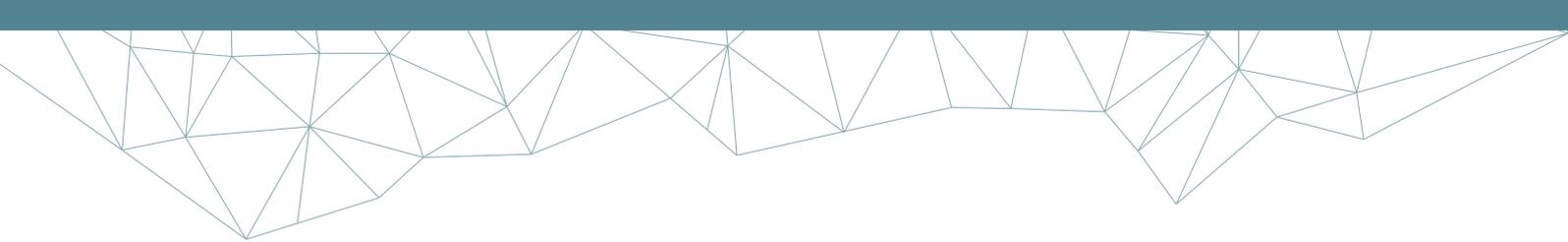
Generally, birth registration levels tend to be higher than death registration, with death registration being much more complex, particularly if it involves correctly recording what the person died from.³ Based on this information, the VSPI uses mortality data to assess the quality and usefulness of a given CRVS system. The VSPI is a composite of six components, each of which are scored individually, empirically weighted and multiplied:

1. **Completeness of death reporting**
2. **Quality of death reporting**
3. **Level of cause-specific detail**
4. **Internal consistency**
5. **Quality of age and sex reporting**
6. **Data availability and timeliness.**

1 Available at <http://www.thelancet.com/series/who-counts>

2 Mikkelsen L, et al. A global assessment of civil registration and vital statistics systems: monitoring data quality and progress. *Lancet* 2015; 386:1395-1406.

3 Murray CJL, et al. What can we conclude from death registration? Improved methods for evaluating completeness. *PLoS Med* 2010; 7: e1000262.



The value of the score ranges from zero to one. Further detail about what aspects are considered for each component is given in **Box 1**.

The data used to compute the scores of each country were taken from the Global Burden of Disease database, which is the most complete collection of mortality data currently available. It consists of publicly available data for every year back to 1980.⁴ The data come from various sources including the United Nations, World Health Organization, and national statistical and research publications.

Box 1: The six components of the vital statistics performance index (VSPI)

1. Completeness of death reporting

This measures the extent to which the CRVS system covers the entire population and registers (births and) deaths. It is generated by a combination of adult and child mortality estimates and the registered number of deaths.

2. Quality of death reporting

This is measured by assessing the proportion of ill-defined deaths.⁵ The VSPI uses the broader concept of so-called garbage coding from the Global Burden of Disease (GBD) lexicon, with further classification of ill-defined codes into entirely meaningless (such as ill-defined causes) or somewhat meaningful (such as malignant neoplasm of unspecified site).^{6,7}

3. Level of cause-specific detail

'The indicator measures the number of separate categories of cause of death reported compared with the Global Burden of Disease 2010 cause list of 192 individual categories'. Better cause-of-death detail leads to higher utility of data for health policy purposes.

4. Internal consistency

This component measures the extent to which the reported causes of death are biologically plausible. This affects the utility of the data.

5. Quality of age and sex reporting

Complete and accurate data in this category makes the data of higher utility.

6. Data availability or timeliness

This component measures how available the data is publicly, and whether this availability is timely as this increases its utility. The algorithm used to measure this gives this component a weighting emphasising consistent and recent data.

4 Lozano R, et al. Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet* 2012; 380: 2095–128.

5 Murray CJL, et al. What can we conclude from death registration? Improved methods for evaluating completeness. *PLoS Med* 2010; 7: e1000262.

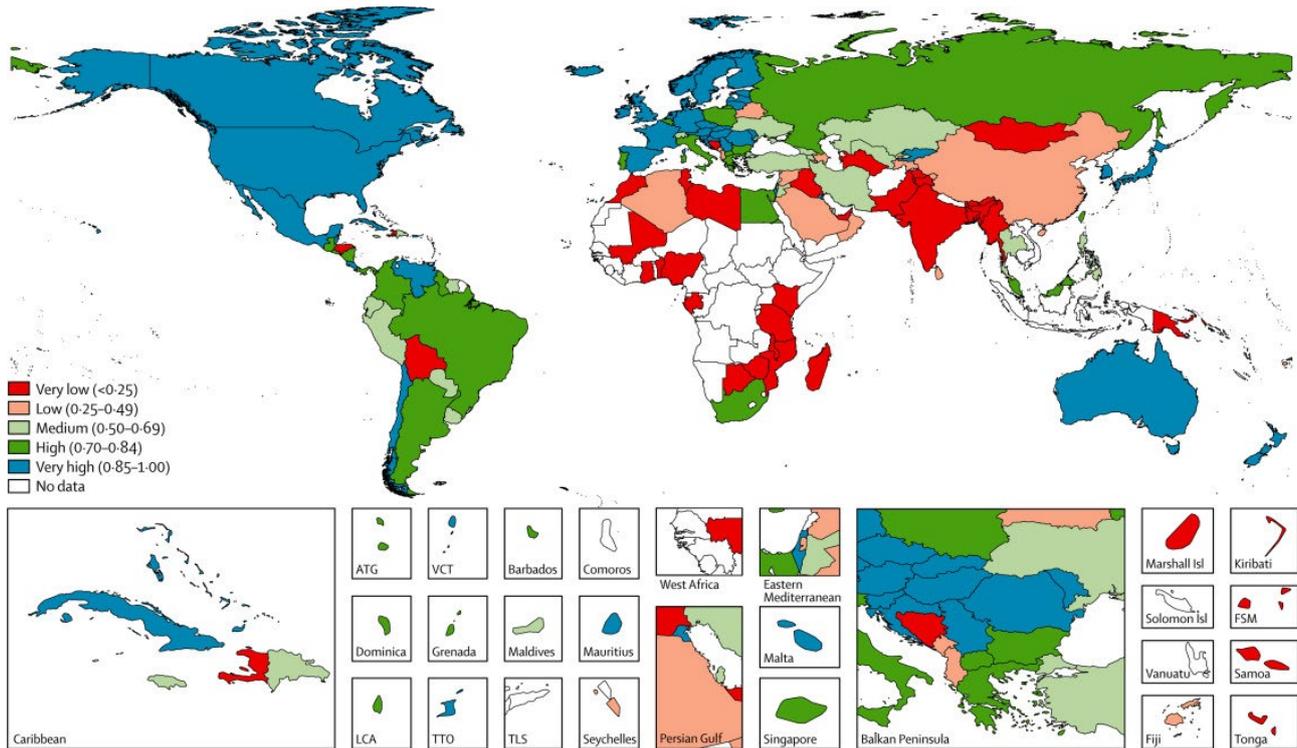
6 Murray CJL, Lopez AD. *The Global Burden of Disease: a comprehensive assessment of mortality and disability from diseases, injuries and risk factors in 1990 and projected to 2020. Global Burden of Disease and Injury Series, vol I.* Cambridge, MA: Harvard University Press on behalf of the World Health Organization and The World Bank, 1996.

7 Naghavi M, et al. Algorithms for enhancing public health utility of national causes-of-death data. *Population Health Metrics* 2010; 8: 9.

CRVS performance from 1880 - 2012

The VSPI was calculated for 148 countries for the period between 1980 and 2012. Data availability ranged from 1 year to 33 years and based on the best score since 2005 countries could be classified into five categories (Figure 1).

Figure 1. Typology of CRVS systems on the basis of vital statistics performance index (VSPI) scores for best available year between 2005 and 2012



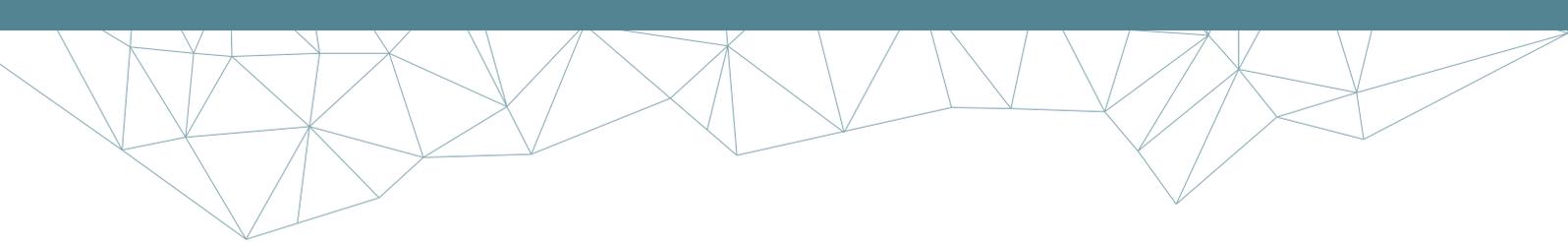
The study also calculated average scores in five-yearly blocks, which, interestingly, showed that great improvement is possible over short periods of time of 10 years or less. This was seen in the scores for countries such as Jordan, Malaysia, Qatar, China and Turkey to name a few. The analysis also found some countries that have failed to make much progress in CRVS improvement since the 1990s including Georgia, Jamaica and the Philippines, and other countries that have shown a decline, such as Azerbaijan, Kazakhstan and Belarus. The original paper includes the data for all the countries studied.²

Data quality and CRVS performance

In addition to looking at the total VSPI score, it is also useful to look at the individual components and how the countries performed in these as this can help identify the major components of change in the overall score.

In the study the authors report that, **'Among countries with poor system performance (VSPI <0.70), three components (registration completeness, cause of death detail, and data quality) account for much of the observed weakness, providing very clear policy guidance about priority interventions'**.

Simple and cost-effective interventions such as training of doctors in correct medical certification and the use of more detailed cause-of-death lists can improve performance in a short period of time. Interventions to improve registration completeness should also be given a high priority and can be helped by information and communication technology (ICT) like mobile phones.



Challenges and opportunities

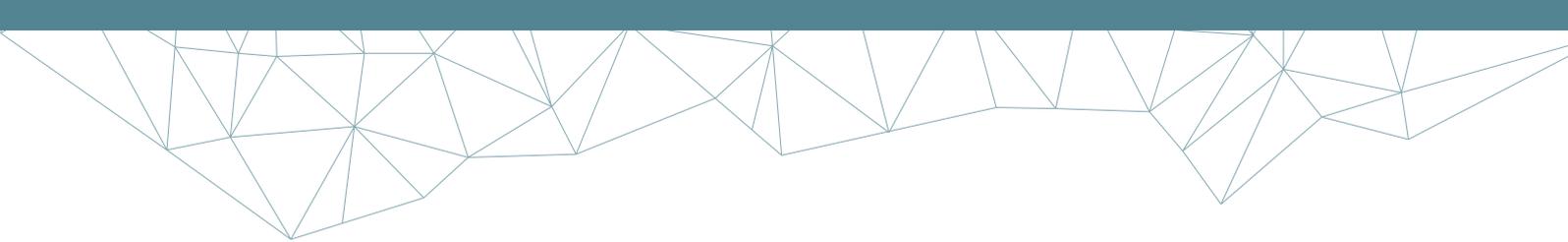
Based on UNICEF's estimates birth registration increased globally from 58 per cent in 2000 to 65 per cent in 2010. Improvements in death registration, according to this study, have been slower, only rising from 36 per cent in the 1980s to 39 per cent in 2005-9.

There are, however, signs that the quality of CRVS systems is improving as more deaths have been registered with better cause of death information. As a method of analysis the **VSPI has several advantages: it is objective, replicable, uses available data and can generate comparable scores over time and between countries.** These characteristics suggest that the VSPI as a proxy for CRVS performance has an important role to play in monitoring national improvement strategies as well as in any global accountability framework.

The findings from this study suggest that rapid progress in improving CRVS systems is possible using a few strategic approaches. These include targeted efforts to improve completeness of registration and cause-of-death certification practices, and awareness campaigns to ensure that those who operate CRVS systems in countries such as doctors, statisticians and analysts, understand the importance of accurate and complete vital statistics.

The authors draw five broad conclusions from the study:

- CRVS systems could be made more useful for policy by improving the quality of cause-of-death information for deaths that are already registered.
- Technical leadership and employing ICT tools to put in place cost-effective methods for birth and death registration and data management would be of great benefit.
- There need to be awareness programs targeting national CRVS-related organisations highlighting the utility of high quality data for public policy.
- More effort should be spent towards ensuring that governments are aware of the value of quality information about births and deaths.
- CRVS improvement strategies should include a cost-effective, objective and sensitive monitoring and accountability strategy.



Summary

In summary, while there is agreement among donors, development agencies and governments that better quality data from CRVS systems are important and necessary, systems improvement strategies suffer from a lack of global and regional leadership. They also must have an appropriate accountability and monitoring framework based on a metric that is objective and mostly costless. To address a part of this, the authors proposed a single metric that can assess CRVS performance by using mortality data as a proxy for the quality and utility of all the data produced by the CRVS system. The vital statistics performance index (VSPI) comprises six components that measure various aspects of coverage and data quality.

Applying this metric to data from various countries around the world shows that CRVS systems around the world can be classified into five categories. The data also showed that great progress is possible in CRVS improvement in a short period of time if strategic interventions are applied, some of which are very cost-effective and efficient. Although progress in coverage of registration is slow globally, there is evidence for improvement in the quality of cause of death notifications, with scope for further improvement with a focus on improving quality of death registration. A lot of these strategies and efforts can be aided by newer ICTs.

These data also show the VSPI to be an objective and replicable metric that can be used with already available data and can generate comparable scores over time and between countries.

The program partners on this initiative include: The University of Melbourne, Australia; CDC Foundation, USA; Vital Strategies, USA; Johns Hopkins Bloomberg School of Public Health, USA; World Health Organization, Switzerland.

Civil Registration and Vital Statistics partners:



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