THE UNIVERSITY OF MELBOURNE

Bloomberg Philanthropies

DATA FOR HEALTH INITIATIVE

CRVS COUNTRY PERSPECTIVES

Fellowship profile:
Improving the quality of birth and death data in Brazil

January 2019

Applying country experiences and knowledge

Resources available from the University of Melbourne, Bloomberg Philanthropies Data for Health Initiative

CRVS development series

Concise and easily accessible, the CRVS development series form a lasting archive of synthesised evidence and knowledge on strengthening CRVS systems as generated through the Initiative. The content of this series is based on a combination of technical knowledge, country experiences, as well as the scientific literature. The series is intended to stimulate debate and ideas for in-country CRVS policy, planning and capacity building, and promote the adoption of best practice to strengthen CRVS systems world-wide.

CRVS technical outcome series

This series focuses on filling a range of scientific knowledge gaps offering new tools, methods, findings and approaches for CRVS systems and data improvement. The series has a strong empirical focus, reporting on works in progress, particularly for large or complex technical initiatives, or on specific components of projects that may be of more immediate relevance to stakeholders.

CRVS resources and tools

Capacity-building resources and tools are designed to influence and align CRVS processes with established international or best-practice standards and to help countries improve their systems. These resources, which are used extensively in the Initiative's training courses, aim to change practice and ensure countries benefit from such changes by developing critical CRVS capacity among technical officers and ministries.

CRVS country perspectives

CRVS country perspectives describe the capacity-building experiences and successes of strengthening CRVS systems in partner countries, including fellowship reports. The series describes the state of CRVS systems improvement in partner countries and lessons learnt, and provides a baseline for comparison over time and between countries.

CRVS action guides and summaries

Many papers from the development and technical outcome series have accompanying action guides or summaries, which provide a succinct overview of key points and, in the case of action guides, a suggested way forward for countries.

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Melbourne School of Population and Global Health
Building 379
207 Bouverie Street
Carlton
VIC 3053, Australia

+61 3 9035 6560
CRVS-info@unimelb.edu.au
www.mspgh.unimelb.edu.au/dataforhealth

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Fellowship profile: Improving the quality of birth and death data in Brazil

Between September and November 2018, Luiz Fernando, from the Brazil Institute of Geography and Statistics (IBGE), came to the University of Melbourne to work on completeness of births and deaths as well as record linkage. This fellowship profile documents Luiz's experiences whilst at Melbourne, including what he worked on, what he learned, and what impact this might have on improving the quality of vital statistics in Brazil.

Country context

The North and Northeast regions have some of the worst health outcomes.

In collaboration with the Bloomberg Philanthropies Data for Health (D4H) Initiative, Brazil is engaged in efforts to improve the country's civil registration and vital statistics (CRVS) system. CRVS system-strengthening is crucial for generating reliable and timely vital statistics which can be used to guide health policy and planning. The Government of Brazil is committed to CRVS-strengthening activities to make sure that its population of 207.7 million[1] is counted and included in policy and planning.

According to the *United Nations Human Development Report 2016*,[2] Brazil's Human Development Index (HDI) was classified as 'high' in 2015, with a life expectancy of 76 years.[1] Brazil is an upper-middle income country divided into five administrative regions, twenty-six states, and a Federal District **(Figure 1)**. Most of the population lives in urban areas, with São Paulo, Rio de Janeiro, and Salvador constituting Brazil's major cities. Of the five regions, the North and Northeast are the poorest and least developed in the country, with the lowest HDI. The South and Southeast regions are the wealthiest and have the best health indicators in the country, and the Center-West region has intermediate health indicators.[3]

1 The World Bank Group. Brazil country data. 2018. Available at https://data.worldbank.org/country/brazil

2 United Nations. Human Development Report 2016: Human Development for Everyone. 2016. Available at http://hdr.undp.org/sites/default/files/HDR2016_EN_Overview_Web.pdf

3 Vasconcelos A, França E. Measuring adult mortality in Brazil: improving quality of cause of death data. 2011.

Figure 1 Map of Brazil (States indicated)

Source: Maps of the World, available at https://www.mapsofworld.com/brazil/brazil-political-map.html

The CRVS system of Brazil

All deaths in Brazil must be medically certified by a physician and coded to the ICD-10.

Key stakeholders in the Brazil CRVS system include the Civil Registrar (CR) and the Ministry of Health (MoH). The MoH is the principal agency responsible for capturing and publishing cause of death data. All deaths in the country are legally required to have medical certification of cause of death **(Box 1)** by a physician using the International Form of Medical Certificate of Cause of Death, mortality coding is in accordance with the International Classification of Diseases and Related Health Problems, 10th revision (ICD-10),[4] and nearly 100 per cent of deaths captured by the MoH information system have a medically certified cause of death.

Box 1: What is medical certification of cause of death

When a patient dies in a hospital or health facility, a medical certificate of cause of death (COD) should be completed.[5] The medical death certificate is usually completed by a physician who attended to the patient or a physician who is familiar enough with the patient's medical history to confidently ascertain the COD.[6] To certify a death, the physician must first identify the disease or injury leading directly to death, and then trace back the sequence of events to determine the underlying COD.

4 World Health Organization. International Statistical Classification of Diseases and Related Health Problems, 10th revision, vol. 2, 10th edn. Geneva, Switzerland: WHO; 2016.

5 The University of Melbourne. *Strategies for improving the quality of cause of death data in hospitals.* CRVS development series. Melbourne, Australia: Bloomberg Philanthropies Data for Health Initiative, Civil Registration and Vital Statistics Improvement, The University of Melbourne; 2017.

6 Lomas HD, Berman JD. Diagnosing for administrative purposes: some ethical problems. *Social Science and Medicine* 1983; 17:241-244.

In 2015 (based on data from 2012), an international study concluded that Brazil's Vital Statistics Performance Index (VSPI) was "high" and that Brazil produces good quality but not excellent mortality data;[7] with substantial disparities in completeness and quality of data at the sub-national level. In 2013, deaths with an unusable or ill-defined cause collectively represented 34 per cent of all deaths **(Box 2)**.[8]

A garbage code has no use in informing public health policy.

Box 2: How do garbage codes affect mortality data?

The use of ill-defined and unusable (often referred to as 'garbage') codes to classify causes of death can threaten the utility of mortality data. A garbage code has no use in informing public health policy, as the related underlying cause of death is too vague or simply impossible for the specific age and sex group of the deceased. Garbage codes include any code that:

- cannot, or should not, represent an underlying cause of death – for example, septicaemia, senility, or headache
- represents a symptom or condition that belongs in some other part of the sequence of events leading to death
- insufficiently specifies a cause of death.

Garbage codes bias the true pattern of mortality in a country, given that they are unlikely to be proportionally distributed across the disease categories used in analysing cause of death data. As such, the data will not represent the true health status of the population.[9]

Addressing garbage codes

The Ministry of Health has an 'active' system for recording deaths.

The MoH maintains two information systems parallel to those of the CR to capture births and deaths: the Live Birth Information System (SINASC) for births, with three million live births reported annually, and the Mortality Information System (SIM) for deaths, with approximately 1.2 million deaths reported annually. These information systems generally capture more births and deaths than the CR system, due to a number of 'active' processes, such as searches of records from illegal cemeteries, notary registry offices, health centres, and Brazil's Family Health Program to improve under-reporting of deaths. Record linkages between health information systems also improve completeness and quality of mortality data.

Completeness of both births and deaths **(Box 3)** registered by the CR is very high (above 95 percent).[10] Although national completeness estimates are high, completeness varies by region, with the North and Northeast regions reporting the lowest levels. Deficiencies in the quality of mortality data are due to a variety of factors: a quarter of deaths in Brazil occur outside of health facilities (where it is difficult to ascertain the most probable underlying cause of death), geographic barriers to certification for rural populations that do not have access to physicians, and poor medical certification in some areas.

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

8 França E, et al. Ill-defined causes of death in Brazil: a redistribution method based on the investigation of such causes. Public Health Practice 2014; 48(4):671-681.

9 Mikkelsen L, Richards N, Lopez AD. Redefining 'garbage codes' for public health policy: Report on the expert group meeting, 27 –28 February 2017. CRVS technical outcome series. Melbourne, Australia: Bloomberg Philanthropies Data for Health Initiative, Civil Registration and Vital Statistics Improvement, University of Melbourne; 2018.

10 Ministry of Health. *Brazil Ministry of Health: Bloomberg Philanthropies Data for Health Initiative Work Plan*. Unpublished; 2016.

Box 3: What is registration completeness and why is it important?

Without reliable vital statistics, completeness estimates are impossible to know where to focus improvement measures and potential CRVS interventions. A complete CRVS system is the best and most cost-effective source of routine, timely and detailed data on births, deaths and COD. 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.[11]

The completeness of registration is defined as the percentage of actual births or deaths in a population that are registered. It is the number of registered births or deaths divided by the actual number of births or deaths in a population.

$$\text{Completeness of birth registration (\%)} = \frac{\text{number of registered births}}{\text{actual number of births}} \times 100$$

The Government hopes to build on its strengths by increasing registration completeness 100 percent.

The MoH considers the improvement of completeness of vital event registration – to 100 percent – as one of its top priorities. A number of measures have been taken to improve registration of vital events including making registration and the issuance of first certificates free of charge.

The fellowship project

The Brazilian Institute of Geography and Statistics (IBGE) is a key stakeholder of the CRVS system. Luiz is responsible for supervising the process of CR data collection at the national level with the help of local supervisors in every State. This national supervision role involves generating reports aiming to improve data quality during the period of data collection. These reports then help State supervisors to address potential CR issues.

The focus of Luiz's fellowship in Melbourne was around completeness of births and deaths as well as record linkage. **The main purpose of this fellowship was to assess completeness of vital statistics for specific demographic groups, such as infants, or women of reproductive age.**

Reflections: take-home lessons

New completeness methods

During Luiz's fellowship, he was able to learn and apply new methods of estimating the completeness of births and deaths – namely an empirical method as well as a specific model for estimating completeness. Throughout his fellowship, Luiz became comfortable using these methods, and was able to successfully apply them to estimate completeness in Brazil. Luiz was pleased to find that the methods indicated a high level of completeness for his country.

Luiz was surprised at how efficient the methods of estimating completeness were.

Challenges and surprises

Luiz commented on how the fellowship was both challenging and rewarding. Learning new techniques and developing a project in another language was difficult at times, he remarked. The end-product, however, was worth it – Luiz was able to find the results using a method for

11 The University of Melbourne. *The importance of routinely measuring birth and death registration completeness. CRVS summaries*. Melbourne, Australia: Bloomberg Philanthropies Data for Health Initiative, Civil Registration and Vital Statistics Improvement, The University of Melbourne; 2018.

The fellowship allowed fellows from other countries working in Statistical Offices to share their knowledge.

estimating completeness of death that he commented was incredibly efficient.

Learning from other country experiences

Luiz remarked that this fellowship was a chance to share knowledge and experiences from the other fellows who were in Melbourne at the time. During his fellowship, Luiz was able to meet fellows from the Philippines and Ecuador, and each were able to discuss their respective country's experiences with CRVS improvement. Moreover, given that all three fellows at the time worked at Statistical Offices, they were able to have discussions specific to their roles.

Benefits for CRVS system development in Brazil

Luiz plans to share all of the knowledge developed during the fellowship with his Brazilian colleagues. Doing so is important so that Brazilian stakeholders have access to a better enumeration of vital events, and in turn can calculate demographic statistics, measure the population health status, and identify priorities for CRVS strengthening. When IBGE and MoH are able to identify problems with coverage, Luiz commented, they can use specific policies to ensure that Brazilians have access to the healthcare system, and on a broader scale, to safeguard Brazilians' rights as citizens to being counted in the civil registry.

Related resources and products

University of Melbourne, D4H Initiative, CRVS Knowledge Gateway: Library

https://crvsgateway.info/library

A new method for estimating the completeness of death registration. CRVS summaries.

CRVS country overview: Brazil. CRVS summaries.

Fellowship profile: Estimating the completeness of birth and death registration in Ecuador. CRVS development series.

Fellowship profile: Investigating garbage codes to improve mortality statistics in Brazil. CRVS development series.

The importance of routinely measuring registration completeness. CRVS summaries.

University of Melbourne, D4H Initiative, CRVS Knowledge Gateway: Learning Centre

https://crvsgateway.info/learningcentre

Topic 5: Improving quality and presentation of vital statistics – Completeness.

University of Melbourne, D4H Initiative, CRVS Knowledge Gateway: Courses

https://crvsgateway.info/courses

Estimating the completeness of birth and death registration.

Further reading

Adair T & Lopez AD. Estimating the completeness of death registration: An empirical method. *PLoS ONE* 2018; 13(5): e0197047.

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For more information contact:

CRVS-info@unimelb.edu.au
crvsgateway.info

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