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DATA FOR HEALTH INITIATIVE

CRVS COUNTRY PERSPECTIVES

Fellowship profile:
Assessing the impact of death certification interventions in Perú

December 2018

Applying country experiences and knowledge

Resources available from the University of Melbourne, 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.

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

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CRVS country perspectives describe the capacity building experiences and successes of strengthening CRVS systems in partner countries, including fellowship reports. The series serves to describe the state of CRVS systems improvement in partner countries, lessons learnt, and provide 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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Fellowship profile: Assessing the impact of death certification interventions in Perú

Between November 2017 and January 2018, Janet Miki from the Ministry of Health in Perú, came to the University of Melbourne to receive support in conducting a study assessing the impact of two death certification interventions to improve cause of death data in Perú. This fellowship profile documents Janet's experiences whilst at Melbourne, including what she worked on, what she learned, and what impact this might have on improving the quality of mortality data in Perú.

Country context

Janet is from Perú, a country that has showed impressive political commitment towards engaging in civil registration and vital statistics (CRVS) system-strengthening activities in order to generate reliable vital statistics for health policy and planning. In collaboration with the Bloomberg Philanthropies Data for Health (D4H) Initiative, among others, Perú is working towards ensuring that its population of about 31 million – about 78 per cent of which live in urban areas – are counted in the country's civil registration system.[1]

Perú's geography can make it difficult for some people to access services.

Perú is an upper-middle income country, and one of South America's fastest growing economies.[1,2] The country experiences large amounts of internal migration, with roughly one-third of the population now living in the capital, and largest city, of Lima.[3] According to the U*nited Nations Human Development Report 2016*,[4] Perú's Human Development Index (HDI) was classified as 'high' in 2015. This fact is particularly impressive given that Perú's distinct geographic regions (for example, the Andes Mountains and the Amazon region's jungles) can create barriers to service provision (**Figure 1**).[2]

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

2 The University of Melbourne. *Perú: An exceptional example of CRVS system advancement,* CRVS country perspectives. Melbourne, Australia: Bloomberg Philanthropies Data for Health Initiative, Civil Registration and Vital Statistics Improvement, The University of Melbourne; 2017.

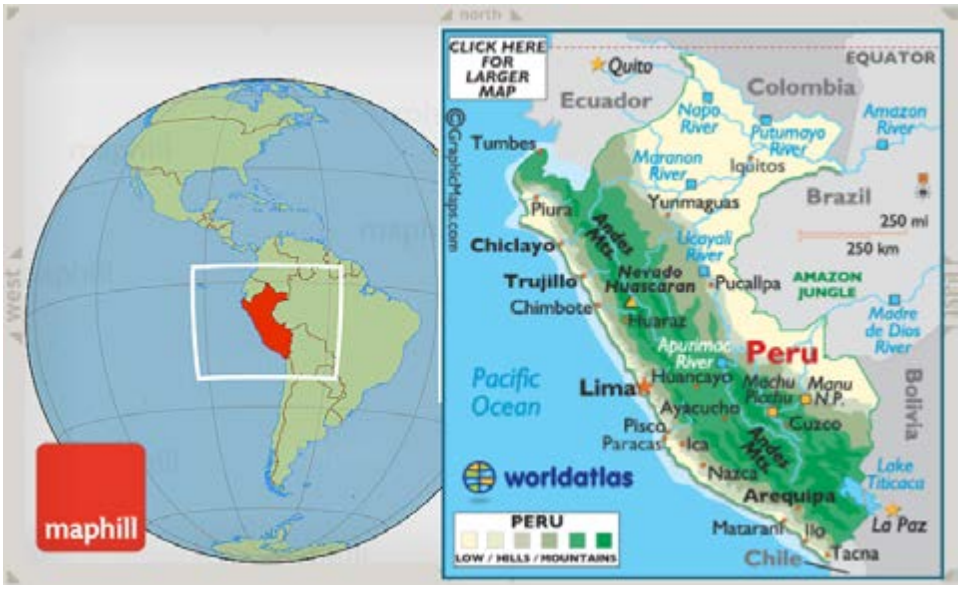
3 Perú Ministerio de Salud and Insituto Nacional Estadística e Informática. *Perú: Bloomberg Philanthropies Data for Health Initiative Work Plan*. Unpublished; 2016.

4 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

Peru's regions differ greatly in terms of their epidemiological profiles.

As a result of these regions' distinct geographical, epidemiological, and socioeconomic characteristics, Perú's regions vary greatly in terms of their birth, death, disease and injury profiles.[2] In response to these differing health needs and priorities, in early 2017 the President of Perú committed to increase public health financing to nearly six per cent of gross domestic product (GDP) by 2021.[2,5] A key focus of this investment in health is on CRVS system strengthening, which will be crucial for developing informed, effective policy and planning initiatives.[2]

Figure 1 Map of Perú



Source: adapted from World Atlas, available at www.worldatlas.com/webimage/countrys/samerica/pe.htm, and Maphill, available at www.maphill.com/peru/detailed-maps/detailed-satellite-map/

The CRVS system of Perú

MINSA, RENIEC, and INEI are the three main government agencies responsible for CRVS.

Whilst there is no permanent coordinating body for the CRVS system, a tri-partite framework agreement between three principal stakeholders has existed since 2001.[6] The agreement designates three government agencies responsible for maintaining Perú's CRVS system: the Ministry of Health (MINSA), the National Registry of Identity and Civil Status (RENIEC) which oversees civil registration, and the National Institute of Statistics and Information Technology (INEI) which serves as the national statistics office.[2,6] With reference to death certification (**Box 1**) and generation of national mortality data, the agreement specifies that MINSA is responsible for medically certifying deaths, RENIEC for legally certifying the death, and INEI for performing national mortality data calculations and providing official birth and death figures.[2]

5 Pan American Health Organization / World Health Organization. *President of Perú and PAHO Director analyze major health challenges* (Lima, 14 March 2017). PAHO. Available at: http://www.paho.org/hq/index.php?option=com_content&view=article&id=13065%3Apresidente-peru-recibe-directora-ops-analizar-retos-salud-hacia-2021&catid=1443%3Awebbulletins&Itemid=135&lang=en

6 The University of Melbourne. *Perú*, CRVS country overview. Melbourne, Australia: Bloomberg Philanthropies Data for Health Initiative, Civil Registration and Vital Statistics Improvement, The University of Melbourne; 2018.

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.[7] 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.[8] 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.[8]

The CNV is a web application that allows health staff to complete online birth certificates. It has improved capture of births.

MINSA maintains two information systems parallel to those of the civil registry for capturing birth and death information, and whilst these systems generally capture less information than the civil registration system, capture of births has improved since the introduction of the Certificado de Nacido Vivo (CNV).[3] The CNV is a web application allowing physicians and obstetricians in health facilities with internet connections to complete birth certificates online immediately following a birth. The physician can then print out a copy of the birth certificate and give this to the parents, who then present the certificate to their local municipal civil registry office and receive an official/legal birth certificate document. This document provides the proof necessary for access to the national identity card, which in turns allows the child access to education, health and social services later in life.[2] Today, the online CNV has reached a tremendous 85 per cent coverage of all births.[2]

Improving information on deaths

Death registration completeness is now a top priority.

Given that the MINSA mortality database only captured about 57 per cent of expected deaths in 2013,[3] the Government of Perú has turned its attention to improving death registration completeness (**Box 2**). Perú has low coverage of deaths with a cause of death (54 per cent)[9] as well as data quality limitations for those deaths that are medically certified. Perú – along with Oman, Egypt, and Georgia, and others – has a high proportion of deaths assigned to garbage codes, meaning that the causes are ill-defined or not helpful for informing public policy. In response, the MoH continuously monitors cause of death data and employs several strategies to improve data quality. Coding of death certificates is done manually as well as using an automated coding system designed specifically for Brazil. In cases where the two methods yield different causes of death, a specialist committee determines the appropriate underlying cause. Deaths that are assigned a 'garbage code' are investigated by the MoH using a combination of autopsy, medical records reviews, and physician-certified verbal autopsy (PCVA) (**Box 2**). In line with their commitment to improving mortality statistics, the MoH has set a target of reducing garbage codes to 10 per cent by 2020, initially focusing on those codes related to causes of death with the highest potential to impact policy and allocation of resources.[10]

7 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, University of Melbourne; 2017

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

9 Vargas-Herrera J, Ruiz KP, Nuñez GG et al. Resultados preliminares del fortalecimiento del sistema informático nacional de defunciones [Preliminary results of the strengthening of the national death registry information system]. *Rev Peru Med Exp Salud Publica* 2018;35(3):505-14.

10 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.

The Ministry continuously monitors cause of death data and investigates deaths with a garbage code.

Box 2: What is registration completeness?

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.[11]

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

Moreover, a study evaluating the CRVS system performance of 148 countries classified Perú as having a Vital Statistics Performance Index (VSPI) of 'medium' (**Box 3**), a score that can be attributed to areas of low coverage, under-registration of deaths, poor death certification practices, and the lack of a formal coding system like the use of the International Classification of Diseases (ICD).[12] The study concluded that the quality and level of detail of Perú's mortality data lack utility for policymaking purposes, indicating the need for improving the quality of Perú's mortality and COD data.

Box 3: The Vital Statistics Performance Index

The Vital Statistics Performance Index (VSPI) is a summary measure of the performance of vital statistics systems in generating reliable mortality data. VSPI scores range from 1 (excellent) to 0 (very poor). It includes six dimensions of system performance as measured through:

- Quality of cause of death reporting
- Quality of age and sex reporting
- Internal consistency
- Completeness of death reporting
- Level of cause-specific detail
- Data availability/timeliness.[13]

One reason for the poor quality of COD data in Perú is the lack of education and training on medical certification. Peruvian universities do not focus on medical certification of cause of death in the undergraduate medical curricula, and many physicians are unaware of the importance of death certificate information for generating accurate national mortality statistics. In terms of certification practices, physicians are not well-trained in standard guidelines and procedures for filling out death certificates.[14,15,16]

11 The 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, The University of Melbourne; 2018.

12 Mikkelsen, Lene et al. A global assessment of civil registration and vital statistics systems: monitoring data quality and progress. *The Lancet* 2015; 386(10001): 1395-1406.

13 Phillips DE, Lozano R, Naghavi M, et al. A composite metric for assessing data on mortality and causes of death: the vital statistics performance index. *Population Health Metrics* 2014; 12:14.

14 Soto-Caceres V. Calidad del llenado de los certificados de defunción en un Hospital Púbico de Chiclayo, Perú 2006 [Quality of the filling of death certificates in a Public Hospital in Chiclayo, Perú 2006]. *Rev Peru Med Exp Salud Publica* 2008;25(3):330-32.

15 Loreto Nuñez MGIM. Calidad de las estadísticas de mortalidad en Chile, 1997-2003 [Quality of mortality statistics in Chile, 1997-2003]. *Rev Med Chil* 2006;134:1191-6.

16 Valdez WG, C.; Siura, G. Análisis de la calidad de la certificación de defunciones en la región Ica, 2007 [Analysis of the quality of the certification of deaths in the Ica región, 2007]. *Revista Perúana de Epidemiologia* 2013;17(1).

Two of Perú's main interventions focus on improving death registration completeness and quality of COD data.

Seeking to address these issues, MINSA has worked with D4H to introduce two interventions for improving the completeness of death registration and the quality of COD data. MINSA together with RENIEC drew upon the lessons learned from CNV implementation in order to develop the National Death Registry Information System (SINADEF).[9] SINADEF is an online death notification and certification system allowing physicians to complete death certificates in real-time, immediately after verifying that a death has occurred.[9] D4H has supported Perú in implementing SINADEF, including developing standards and promoting its use, as well as identifying barriers to certification and registration and deaths and incentives for removing these barriers.

To complement the implementation of SINADEF, MINSA introduced a second intervention: a training programme for physicians on medical certification. To support this intervention, the D4H Initiative trained physicians from main hospitals in the country on how to complete the International Form of Medical Certificate of Cause of Death[17] correctly, trained a group of statisticians in ICD-10 coding, and developed tools for automated COD coding.[9]

The fellowship project

Janet's fellowship involved assessing the impact of two training interventions on accuracy of death certificates.

At MINSA in Perú, Janet is responsible for the efforts to improve the quality of mortality data. Her main duties include medical certification training, ICD-10 training, mortality data analysis and supervising a pilot phase of verbal autopsy roll-out. As such, the focus of Janet's fellowship in Melbourne was around assessing the impact of the two interventions introduced to improve COD data in Perú. During her fellowship, Janet assessed the quality of death certificates using the assessment tool developed by the University of Melbourne.[18] The aim of the study was to evaluate the quality of COD data in Perú – data that relies on accurate completion of medical certificates filled out by physicians.

The study found that both interventions were effective at reducing errors in death certificates.

The study examined the frequency of common errors in death certificates prior to the two interventions ('pre-intervention'), death certificates entered in SINADEF by physicians ('online intervention'), and death certificates entered in SINADEF by physicians who had also received medical certification training ('online and training intervention'). The study found that both interventions were effective at reducing errors in death certificates: the average error score declined by 38 per cent due to the online training intervention, and by a further 26 per cent due to the training intervention.

Countries looking to implement online systems of notification and/or certification can thus draw upon the lessons learned from Perú's implementation of SINADEF. Physicians and health facility administrators in particular can use the results of this study to assess the current state of medical certification practices and identify areas that need further training. These results will also prove useful to MINSA in tailoring its medical certification training programme to address specific areas.

17 World Health Organization. *International Statistical Classification of Diseases and Related Health Problems*. 10th revision, vol. 2, 10th ed. Geneva: World Health Organization; 2016.

18 University of Melbourne. *Assessing the quality of death certificates:* Guidance for the rapid tool. CRVS resources and tools. Melbourne, Australia: Civil Registration and Vital Statistics Improvement, Bloomberg Philanthropies Data for Health Initiative, University of Melbourne; 2018.

Reflections: take-home lessons

New data analysis skills

Janet commented that she learned new skills in data analysis, namely how to use statistics software like Stata. Whilst she found Stata difficult to use in the beginning – given it was her first experience with the software – the support from her colleagues at the University of Melbourne helped her throughout the process, and Janet was able to use Stata to interpret the results of her study.

New data analysis skills

Janet noted that her fellowship also taught her different ways of using information. Even when the results are not as expected, Janet explained, they can be interpreted and used in a meaningful way. For example, Janet had expected that the medical certification trainings in the study would yield greater improvements in death certification. The results, however, highlighted the ways in which the training materials used could be modified. Thus, Janet and her colleagues were able to use these results to pinpoint the common errors – and causes of death – that physicians continued to struggle with even after the introduction of online and training interventions.

Benefits for CRVS development in Perú

After returning to Perú, Janet and her colleagues have presented the results of the study to the Head of Statistics from every region in the country, many of whom will draw upon the study to guide future COD data improvement activities. The results of this study will shape the education and training priorities for physicians and health professors in Perú going forward, particularly as CRVS stakeholders look to improve online death certification using SINADEF. Janet's study demonstrated the utility of SINADEF for improving death certification and simultaneously underscored the areas in need of improvement, and Janet hopes to have MCCOD training teams work in every region of Perú to continue collecting data and providing feedback on death certification practices to physicians. As death certification practices improve, Perú will benefit from reliable, timely COD data for years to come.

The full results of Janet's study have been published in 'Saving lives through certifying deaths: Assessing the impact of two interventions to improve cause of death data in Perú', available in *BMC Public Health*, and also through the CRVS Knowledge Gateway Library https://crvsgateway.info/Library~23

Related resources and products

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

https://crvsgateway.info/library

Assessing the quality of death certification: Guidance for the rapid tool. CRVS resources and tools.

CRVS country overview: Peru. CRVS summaries.

Handbook for physicians on cause of death certification. CRVS resources and tools.

Intervention: Medical certification of cause of death. CRVS summaries.

Intervention: Mortality coding. CRVS summaries.

Medical certification of cause of death: Quick reference guide. CRVS summaries.

Redefining 'garbage codes' for public health policy: Report on the expert group meeting, 27-28 February 2017. CRVS technical outcome series.

Strategies for improving the quality of cause of death data in hospitals. CRVS development series.

Training and education on medical certification of cause of death: Effective strategies and approaches. CRVS development series.

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

https://crvsgateway.info/learningcentre

Topic 4: Cause of death in CRVS.

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

https://crvsgateway.info/courses

Medical certification of cause of death.

Further reading

Hernandez B, Ramirez-Villalobos D, Romero M, Gomez S, Atkinson C, Lozano R. Assessing quality of medical death certification: Concordance between gold standard diagnosis and underlying cause of death in selected Mexican hospitals. *Population Health Metrics* 2011; 9.

AbouZahr C, De Savigny D, Mikkelsen L, Setel PW, Lozano R, Nichols E, et al. Civil registration and vital statistics: progress in the data revolution for counting and accountability. *Lancet* 2015; 386(10001):1373-85.

Mikkelsen L, Phillips DE, AbouZahr C, Setel PW, de Savigny D, Lozano R, et al. A global assessment of civil registration and vital statistics systems: monitoring data quality and progress. *Lancet* 2015; 386(10001):1395-406.

Soto-Caceres V. Calidad del llenado de los certificados de defunción en un Hospital Público de Chiclayo, Perú 2006 [Quality of the filing of death certificates in a Public Hospital of Chiclayo, Perú 2006]. *Rev Perú Med Exp Salud Publica* 2008; 25(3):330-32.

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