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CRVS Fellowship profile

Assessing the quality of mortality data in the Maldives

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

CRVS course prospectuses

These resources outline the context, training approach, course content and course objectives for the suite of CRVS trainings delivered through the Bloomberg Philanthropies Data for Health Initiative. Each course focuses on a specific CRVS intervention or concept, and is designed to support countries to strengthen their CRVS systems and data.

CRVS Fellowship reports and profiles

The CRVS Fellowship Program aims to build technical capacity in both individuals and institutions to enhance the quality, sustainability and health policy utility of CRVS systems in Fellows' home countries. *Fellowship reports* are written by Fellows as a component of the program, and document, in detail, the research outcomes of their Fellowship. *Fellowship profiles* provide a summary of Fellows' country context in relation to CRVS, an overview of the Fellowship experiences, the research topic and the projected impact of findings.

CRVS analyses and evaluations

These analytical and evaluative resources, generated through the Initiative, form a concise and accessible knowledge-base of outcomes and lessons learnt from CRVS initiatives and interventions. They report on works in progress, particularly for large or complex technical initiatives, and on specific components of projects that may be of more immediate relevance to stakeholders. These resources have a strong empirical focus, and are intended to provide evidence to assist planning and monitoring of in-country CRVS technical initiatives and other projects

CRVS best-practice and advocacy

Generated through the Initiative, CRVS best-practice and advocacy resources are based on a combination of technical knowledge, country experiences and scientific literature. These resources are 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 worldwide.

CRVS country reports

CRVS country reports describe the capacity-building experiences and successes of strengthening CRVS systems in partner countries. These resources describe the state of CRVS systems-improvement and lessons learnt, and provide a baseline for comparison over time and between countries.

CRVS technical guides

Specific, technical and instructive resources in the form of *quick reference guides*, *user guides* and *action guides*. These guides provide a succinct overview and/or instructions for the implementation or operation of a specific CRVS-related intervention or tool.

CRVS tools

Interactive and practical resources designed 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 change practice and ensure countries benefit from such changes by developing critical CRVS capacity among technical officers and ministries.

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

CRVS-info@unimelb.edu.au
www.mspgh.unimelb.edu.au/dataforhealth

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Author

Sofoora Usman, Ministry of Health, Maldives.



Fellowship profile: Assessing the quality of mortality data in the Maldives

From September to November 2019, Sofoora Kawsar Usman from the Ministry of Health (MOH) in the Maldives undertook a Civil Registration and Vital Statistics (CRVS) Fellowship at the University of Melbourne (UoM), assessing the quality of mortality data in the Maldives. This profile provides an overview of country context in relation to CRVS, and documents Sofoora's personal experiences and outcomes and the broader impact her Fellowship might have on strengthening CRVS in the Maldives.

Country context

The CRVS system of the Maldives

Improving mortality data

The CRVS Fellowship project

Reflections: take-home lessons

Understanding local context is key for identifying CRVS priorities

ANACONDA can be used to reveal CRVS weaknesses

The importance of sharing country experiences

Benefits for CRVS system development in the Maldives

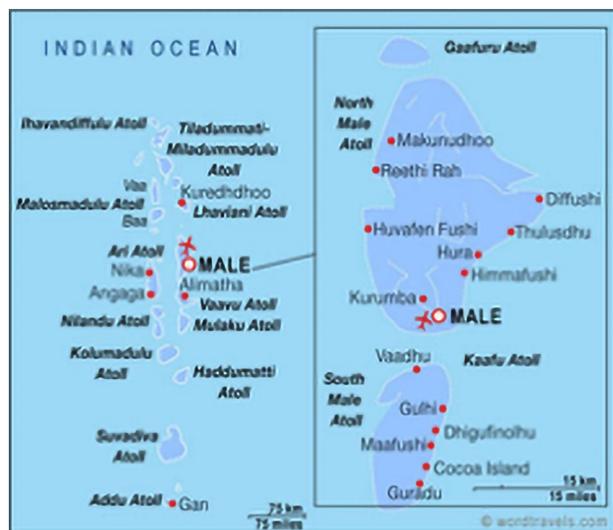
Country context

In collaboration with the Bloomberg Philanthropies Data for Health (D4H) Initiative, the Maldives have demonstrated their commitment to improving the country's civil registration and vital statistics (CRVS) system. A strong CRVS system is the best source of data on births, deaths, and causes of death (CODs), and these data are crucial for decision-makers seeking to develop effective health policy and programs.^{1,2} By engaging in CRVS-strengthening efforts, Maldives aims to ensure that everyone is counted in the civil registration system so that the vital statistics generated will reflect the health outcomes and needs of communities across the country.³

Located in the Indian Ocean, Maldives have a population of 344,023 dispersed across more than 1190 islands which includes 187 inhabited islands.^{4,5} Grouped into 20 administrative atolls, these islands spread across about 90,000 square kilometres, meaning that Maldives are composed of more territorial sea than land.⁶ The country has, however, drawn upon its natural resources in order to drive economic development and improve the wellbeing of its citizens.⁷ Maldives' abundant marine resources allowed the nation to construct a nature-based tourism sector and propel the country into middle-income status, providing a foundation upon which Maldives can continue to build.⁷

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- 1 Cobos Muñoz, D., Sant Fruchtmann, C., Renggli, S., deSavigny, D. CRVS innovations: Assessing the performance of CRVS systems. CRVS technical outcome series. Melbourne, Australia: Bloomberg Philanthropies Data for Health Initiative, Civil Registration and Vital Statistics Improvement, University of Melbourne; 2019.
 - 2 Mukut MAA. Fellowship report: Evaluation of the 'Kaliganj Model' for proactive birth and death notification and registration. CRVS Fellowship reports and profiles. Melbourne, Australia: Bloomberg Philanthropies Data for Health Initiative, Civil Registration and Vital Statistics Improvement, University of Melbourne; 2019.
 - 3 Setel, P., Macfarlane, S., 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 The World Bank. Maldives country data. The World Bank Group; 2019. Available from <https://www.worldbank.org/en/country/maldives/overview>
 - 5 Usman, S. Evaluation of CRVS in the Maldives: the Application of the Electronic Assessment Tool ANACONDA. CRVS Fellowship reports and profile. Melbourne, Australia: Civil Registration and Vital Statistics Improvement, The University of Melbourne, Bloomberg Philanthropies Data for Health Initiative; 2020
 - 6 The World Bank. Maldives Country Snapshot 2016. The World Bank Group; 2016. Available from <http://documents.worldbank.org/curated/en/54760147672013083/pdf/109250-WP-MaldivesCountrySnapshots-HighRes-PUBLIC.pdf>
 - 7 Maldives Ministry of Health. National Health Accounts 2015-17. Ministry of Health; 2019. Available from [http://www.health.gov.mv/Uploads/Downloads/Publications/Publication\(82\).pdf](http://www.health.gov.mv/Uploads/Downloads/Publications/Publication(82).pdf)

Figure 1. Map of the Maldives



Source: WordTravels; Maldives Country Map. Available from <http://www.wordtravels.com/Travelguide/Countries/Maldives/Map>

The CRVS system of the Maldives

The Maldives have utilised a routine birth and death registration system since the 1960s.^{7,8} Whilst this system originally entailed aggregated reporting of births and deaths, since 2003, the country has reported both births through a *foolhuma* form and deaths through a *maru* form.⁷ Once a birth or death occurs, several copies of the respective forms are circulated – the first original copy is sent to the parent or guardian, a second copy to the island administrations (in the case of the capital of Malé, to the Malé Municipality (now city council)), and a third copy through island or city council to atoll/city councils, and then from atoll councils to the Department of National Registration (DNR).⁷ The DNR then enters data from the form into the national Vital Registration System (VRS) database, and in the case of deaths, the entered form is passed to the Ministry of Health (MOH) for mortality coding and returned upon completion.⁷

Improving mortality data

In 1992, Maldives introduced a Birth and Death Registration Law in order to improve the completeness of its vital event registration (**Box 1**).⁷

Box 1: What is registration completeness and why is it important?

Unregistered deaths may have a different COD profile than registered deaths, so registration completeness is important for governments to make planning and policy decisions with confidence, based on the knowledge that vital registration data are unbiased and complete.^{9,10}

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.¹¹

$$\text{Completeness of death registration (\%)} = (\text{Number of registered deaths}) / (\text{Actual number of deaths}) \times 100$$

8 Maldives National Bureau of Statistics. Statistical Yearbook of Maldives 2018. In National Bureau of Statistics; 2019. Available from <http://statistics.maldives.gov.mv/yearbook/2018/>

9 The University of Melbourne. The importance of routinely measuring birth and death registration completeness. CRVS best-practice and advocacy. Melbourne, Australia: Bloomberg Philanthropies Data for Health Initiative, Civil Registration and Vital Statistics Improvement, The University of Melbourne; 2018.

10 Andrade J. Estimating the completeness of birth and death registration in Ecuador. CRVS Fellowship reports and profiles. Melbourne, Australia: Bloomberg Philanthropies Data for Health Initiative, Civil Registration and Vital Statistics Improvement, the University of Melbourne, and National Institute of Statistics and Census, Ecuador; 2018.

11 University of Melbourne. Challenges associated with automated VA training and rollout. CRVS best-practice and advocacy. Melbourne, Australia: Bloomberg Philanthropies Data for Health Initiative, Civil Registration and Vital Statistics Improvement, The University of Melbourne; 2018.



The law mandated that a deceased person cannot be buried without a completed death certificate including a medically certified cause of death (COD) (**Box 2**). The COD must be certified by a medical practitioner, and these death certificates – completed to World Health Organization standards – are the Maldives’ main source of mortality data.⁷

Box 2: What is medical certification of cause of death (MCCOD)?

When a patient dies in a hospital or health facility, a medical certificate of COD should be completed.¹² 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.¹³ 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.

The CRVS Fellowship project

As the Assistant Director, Health Information & Research Section of Policy Planning and International Health Division at the Maldives MOH, Sofoora works intensively with health statistics in the ministry. The staff she supervises are responsible for coding all the deaths recorded in the Maldives, and given that the country has 192 health facilities (including 2 private facilities) that certify deaths, each staff member is responsible for coding deaths from a certain number of facilities. As such, Sofoora plays an important role in both managing and publishing national health statistics, and a large part of this role involves checking that coding is consistent between her staff, and by examining how – and why – coding issues may arise.

As part of her Fellowship project at UoM, Sofoora aimed to conduct a comprehensive assessment of the accuracy and completeness of the Maldives’ mortality and COD data. To do this, Sofoora compiled data on mortality and underlying COD for the years 2010-2017, and learned to use electronic tools like ANACONDA – Analysis of Causes of National Deaths for Action – to analyse the quality of mortality and COD data (**Box 3**). She also learned how to use a standardised medical certification of cause of death (MCCOD) assessment tool to assess the quality of death certification practices in the Maldives.

Box 3: What is ANACONDA?

ANACONDA is an easy-to-use electronic tool designed to help users analyse the quality of routine mortality datasets to understand if the data are fit for purpose.¹⁴

In order to evaluate the data, ANACONDA first overviews the input data and applies some simple checks to the mortality data. Then, it assesses the quality of COD data and computes an overall index of mortality data quality, the VSPI(Q). All the computational steps are automated and straightforward.¹⁵

By regularly applying this assessment tool and carefully interpreting the outputs, country governments can better understand:

- How reliable the input data from their routine CRVS systems are;
- What the probable biases or errors are;
- Progress in improving the quality of mortality and cause of death data;
- Where and what kind of interventions are most urgently needed to further strengthen their existing systems.¹⁶

12 The University of Melbourne. Strategies for improving the quality of cause of death data in hospitals, CRVS best-practice and advocacy. Melbourne, Australia: Bloomberg Philanthropies Data for Health Initiative, Civil Registration and Vital Statistics Improvement, University of Melbourne; 2017.

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

14 Medeiros de Souza, AC. Fellowship profile: Customising ANACONDA and strengthening the quality of mortality data in Brazil. CRVS Fellowship reports and profiles. Melbourne, Australia: Bloomberg Philanthropies Data for Health Initiative, Civil Registration and Vital Statistics Improvement, the University of Melbourne; 2019.

15 Villaver, M. Fellowship profile: Assessing the quality of vital statistics in the Philippines. CRVS Fellowship reports and profiles. Melbourne, Australia: Bloomberg Philanthropies Data for Health Initiative, Civil Registration and Vital Statistics Improvement, University of Melbourne; 2018.

16 The University of Melbourne. A new method for estimating the completeness of death registration. CRVS best-practice and advocacy. Melbourne, Australia: Bloomberg Philanthropies Data for Health Initiative, Civil Registration and Vital Statistics Improvement, The University of Melbourne; 2018.



Reflections: take-home lessons

Understanding local context is key for identifying CRVS priorities

Before proceeding with her ANACONDA and MCCOD analyses, Sofoora first took a step back and mapped the entire Maldives CRVS system. To do this, she used the business process mapping approach¹⁷ to evaluate how information flows from one point to another. Knowing from her own personal experience that time was often a challenge for CRVS data flows in the Maldives, Sofoora decided to add information regarding how long it could take for data to travel from one point to another. Sofoora was thus able to highlight critical weaknesses in the CRVS system – it could take more than a year for data from a single death certificate to reach the MOH, for example – and distinguish a number of priorities for CRVS improvement.

ANACONDA can be used to reveal CRVS weaknesses

After learning about how to use ANACONDA, Sofoora found that one of the main coding issues Maldives had was due to poor quality COD data from death certificates. To find the data quality issues, Sofoora fed 8 years (2010-2017) of COD data into ANACONDA. A major finding was the weak quality of COD reporting. To investigate this issue further, she used the death certificate assessment tool¹⁸ to pinpoint these quality issues. She fed 200 death certificates from 2017 into the tool to see which areas of the certificates were causing problems, and through her analysis, Sofoora found that physicians often did not include key information in death certificates (like time intervals), which she hopes that further MCCOD training and monitoring can address.

The importance of sharing country experiences

Sofoora remarked that her Fellowship presented a number of challenges as well as opportunities for learning. On one hand, the process of reading and synthesising academic literature was a difficult one, as Sofoora had to draft an academic paper for the first time in six years. On the other hand, her time in Melbourne allowed her to speak with other Fellows regarding how their countries tackled their own CRVS challenges. The Fellowship emphasised for Sofoora the importance of open dialogue across all groups of CRVS stakeholders, given that stakeholder coordination forms the backbone of all CRVS improvement efforts.

Benefits for CRVS system development in the Maldives

Going forward, Sofoora plans to publish national-level statistical data, and will rely on the utility and efficiency of ANACONDA and MCCOD tool to help her publish Maldives' mortality statistics. The assessment and monitoring of the Maldives' mortality data will allow the country to identify areas of weakness, like poor quality COD data, and to implement measures to address the causes of these weaknesses – by, for example, providing training and education on MCCOD to all medical practitioners. By bringing together all those involved in CRVS improvement, the Maldives can continue to build on its strengths in the years to come.

¹⁷ de Savigny D, Cobos Muñoz D. Understanding CRVS systems: The importance of process mapping. CRVS best-practice and advocacy. Melbourne, Australia: Bloomberg Philanthropies Data for Health Initiative, Civil Registration and Vital Statistics Improvement, the University of Melbourne; 2018.

¹⁸ Available at <https://crvsgateway.info/file/13475/3634>

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:



For more information contact:

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

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