



# Summary: Developing a mobile app for doctors to improve the recording of cause of death in Sri Lanka

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## Improving Sri Lanka's mortality statistics

Reliable mortality data, which are drawn from quality cause of death (COD) information, are essential for the government and their partners to:

- monitor the health of the population
- study disease distribution and emerging or neglected health problems
- address health inequities
- develop evidence-based health policy initiatives
- implement cost-effective public health programs.

Although Sri Lanka has achieved almost 100 per cent death registration, the quality of COD data remains questionable. Approximately half of all deaths take place in hospitals and are certified by doctors using the official Death Declaration Form (B33). While national mortality statistics produced by the routine civil registration and vital statistics (CRVS) system are based on the underlying cause of death derived from the B33, the lack of training for doctors in correct medical certification contributes to a high proportion of unusable and poorly specified causes (also referred to as 'garbage codes') in the leading causes of death in Sri Lanka.

Garbage codes have no use in informing public health policy, as the related underlying cause of death is too vague, or simply impossible.<sup>1</sup> Garbage codes bias the true pattern of mortality in a country, as it is unlikely they would be equally or proportionally distributed across the disease categories used in analysing cause of death data. Hence, the data will not represent the true health status of the population.

Previous research has also found that most doctors working in health facilities have not been trained in proper medical certification of cause of death. Induction training is often only conducted in some large hospitals for newly appointed intern doctors, despite the fact that interns are often delegated to complete the B33 forms from more senior doctors and consultants. Further, there is no current continuing medical education (CME) program in Sri Lanka on medical certification of COD.

<sup>1</sup> 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.

## Innovative approaches to medical education and training

### Developing the app

Improving the accuracy of medical certification in Sri Lanka is challenged by the large number of practicing doctors, their extensive geographical spread, and the resulting cost and resources required for traditional face-to-face training. As such, alternatives to face-to-face training are required to achieve sustainable, long-term improvements in medical certification and national mortality statistics.

In response to this, an interactive, educational mobile application (app), 'Guide to CoD Certification' was developed by the Ministry of Health, Nutrition & Indigenous Medicine, Sri Lanka, with technical advice from the University of Melbourne and Health Informatics Society of Sri Lanka, logistical support from Vital Strategies (Figure 1).

**Figure 1 Home screen and main navigation pages of the app**



The app was developed to be compatible with all Android devices and supported to deliver dynamic content, without the need for users to be connected to a local network or the Internet. The app covers a comprehensive range of topics and 'how-to' guides including:

- introduction to the Death Declaration Form (B33)
- instructions on how to complete each section
- case scenarios with correctly completed B33s
- explanations and guidelines on specific conditions
- important information on the legal obligations of doctors and when to order an inquest into a death (Figure 2).

**Figure 2 Detailed topics and information within the app**



The app also has an interactive learning component, the 'CoD Tutor', where users are presented with case scenarios and asked to correctly complete the B33 (Figure 3). Feedback is immediately provided to the user.

**Figure 3 Cause of death tutor with case scenario and user feedback**



### Testing the app

The app was tested by 125 doctors from 25 hospitals. A pre-test was done to assess the quality of causes of death written by the participants using three standard case scenarios.<sup>2</sup>

After the app was introduced, a post-test was conducted using the same case scenarios and results were assessed using the rapid assessment tool developed by The University of Melbourne.<sup>3</sup> Ten questions specifically assessed the usability of the app, including questions on synchronization after installation, navigation, image pop-ups, zooming, subject matter, and interactivity of the COD tutor.

### Evaluating the impact

For the three case scenarios used, the pre-test COD had a mean error count of 3.24 and the post-test COD had a mean error count of 1.06 with a significant ( $P < 0.05$ ) improvement in the quality of medical certification as written by the participants. Further, 13 per cent of participants rated the app as 'excellent' and another 36 per cent rated it as 'above average'.

### Moving forward: Next steps

Given the wide use of smartphones among doctors and their conversance of using mobile apps, the Guide to CoD Certification app is a simple and user-friendly tool that doctors can refer to when certifying deaths. The app is currently provided free-of-charge from the Ministry of Health's website, with plans to make it available from the Google App store in the future.

The app has the potential to improve the quality of medical certification of COD in Sri Lanka, and offers an innovative and largely costless way of providing training and education on correct certification practices. Initial results have shown great promise, with a reduction in the number of errors made by doctors during certification, and a general acceptance of the app as a useful educational tool.

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<sup>2</sup> University of Melbourne. Handbook for doctors on cause of death certification. CRVS resources and tools. Melbourne, Australia: Bloomberg Philanthropies Data for Health Initiative, Civil Registration and Vital Statistics Improvement, University of Melbourne; 2018.  
<sup>3</sup> Rampatige R, et al. Assessing the quality of death certificates: Guidance for the rapid tool. CRVS resources and tools. Melbourne, Australia: Bloomberg Philanthropies Data for Health Initiative, Civil Registration and Vital Statistics Improvement, University of Melbourne; 2018.



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