



# Asia-Pacific CRVS Research Forum

3–4 April 2023 | Bangkok, Thailand

## Streamlining the Mortality Inquest System in Sri Lanka

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## Abstract

### Introduction

Civil Registration and Vital Statistics (CRVS) System in Sri Lanka records major vital events including births and deaths. The CRVS system captures more than 98% of births and deaths in Sri Lanka. Out of all deaths, around 48% of deaths occur in the health care facilities and the rest happens in the community. Deaths occur in a hospital or in the community which are subjected to inquest will be certified by Inquirer's into Sudden Death (ISD) using the format B18 Inquirer's certificate of death. The format B18 was updated recently which was a milestone in CRVS development in Sri Lanka. The Cause of Death (CoD) as per the international standard recommended by the World Health Organization (WHO) has not been practiced with the old format. Lack of standard format of CoD information in B18 in the past lead to production of low quality national mortality statistics.

### Objective:

To implement an updated B18 form with WHO standards on cause of death certification was the main objective of the amendment.

### Methods:

A Technical Working Group consisting of all relevant stakeholders was appointed by the National Steering Committee on Data for Public Health Policy coordinated by the Ministry of Health. Following a series of consultation meetings, the new B18 form was drafted with WHO standards of CoD certification. The new form was pre-tested on ten ISDs following convenient sampling method, and they were asked to fill the new B18 form according to pre-determined 6 case scenarios. B18 forms filled by ISDs were assessed by a board of experts using a quality assessment tool based on ten common errors. An interview was conducted and recorded by the board of experts on the ISDs feedback on the new form.

### Results:

The mean error count of the death certificates filled was recorded as 3.48 (SD=2.671). Based on the comments made by ISDs during the interviews, few suggestions were identified to improve the usability of this new form. The draft B18 was further modified to increase the usability by the ISD as per their suggestions recorded during the interviews.

### Conclusion:

The new B18 form was approved, and a Gazette notification was issued by the Government of Sri Lanka enabling the implementation of this form. An In-service training was conducted to all ISDs in the island to train them based on the errors.



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## Introduction

Data derived from the Civil Registration and Vital Statistics (CRVS) system is vital to practice evidence-based policy making, not only for health sector, but also for other stakeholder sectors as well. Without good quality vital statistics, country's planning will be in a vacuum and sustainable development cannot be achieved.

Sri Lanka has a well-functioning CRVS system which was established far back in 1864<sup>1</sup>. CRVS system of Sri Lanka records major vital events which are births, deaths, marriages, divorces and adoptions. Despite very high reporting of registration of both births (97%) and deaths (100%) in the country<sup>2</sup>, quality of mortality data produced by the CRVS system remains unsatisfactory with low (0.25–0.49) Vital Statistics Performance Index (VSPI)<sup>3</sup> which is a composite index to assess the quality and progress of vital statistics. Further, assessment studies of the quality of Causes of Deaths in Sri Lanka have demonstrated a high proportion of unusable and unspecified causes, even among the leading causes of deaths in the country<sup>4</sup>.

Similarly, as seen in most of the countries, CRVS system of Sri Lanka has a multisectoral engagement with Registrar General Department, Department of Census and Statistics, Ministry of Justice and Ministry of Health. Increased complexity of multisectoral involvement and lack of coordinated action had led to unsatisfactory status of CRVS improvement of the country, in the past.

However, CRVS system of Sri Lanka is strengthened with strong foundation of legislation. Births and Deaths Registration Act (BDRA) of 1951, which is the main component of legislation, has defined the governance structure of the CRVS system in detail<sup>5</sup>. According to the law, all sudden deaths and unnatural deaths are subjected to the stipulated procedure of the Inquest System. Irrespective of the place of occurrence, whether in a health facility or community, deaths are subjected to inquest if required, as per the Code of Criminal Procedure Act No.15 Of 1979. Accordingly, approximately 50% of all deaths are channeled through to the Inquest System in Sri Lanka by referral<sup>6</sup>.

The business process map of the Inquest System of Sri Lanka is shown in **Figure 1**. All deaths referred for inquests are reviewed by the Inquirer into Sudden Death or a Magistrate. The Inquirer into Sudden Death / Magistrate conducts the inquest and decides on whether a postmortem is required. It is compulsory to refer all maternal deaths, accidents, suicides, deaths caused by shooting and deaths due to unknown reasons for postmortem examination. When a postmortem is being done by a Judicial Medical Officer (JMO), the cause of death will be notified to the Inquirer into Sudden Death. If the Inquirer into Sudden Death is competent on giving the

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cause of death based on the evidence and medical records, he/she can proceed without a postmortem. With or without a postmortem, the Inquirer into Sudden Death can issue the cause of death certificate using the B18 Inquirer’s Certificate of Death and it is the form that triggers the death registration process at the local death registrar level.

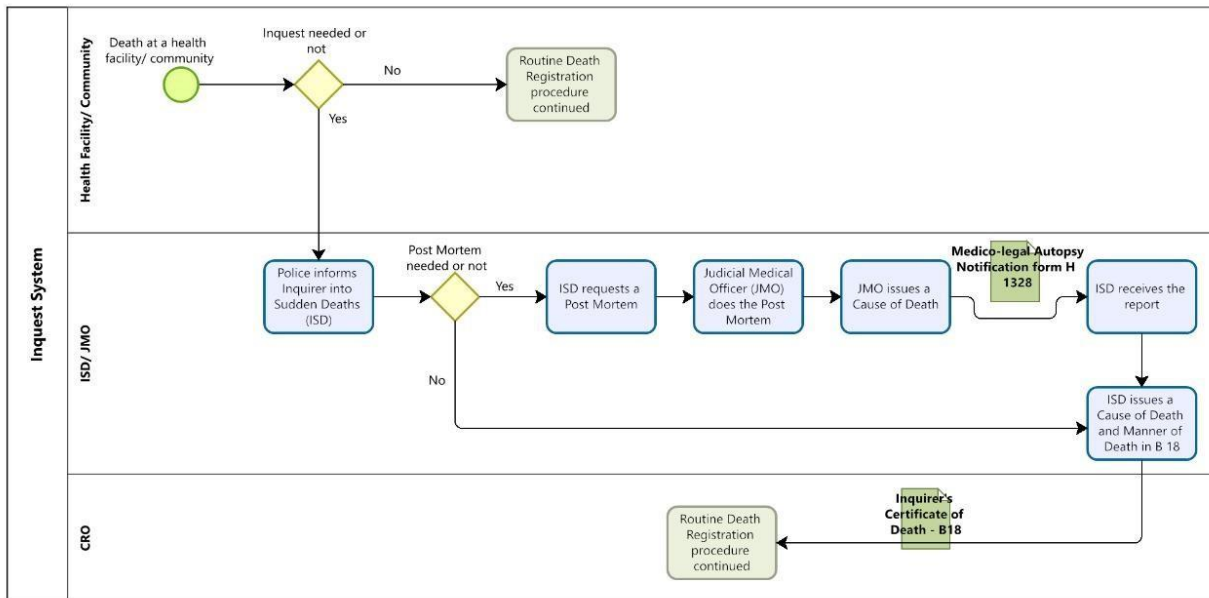


Figure 1 Business Process Map (BPM) of the Inquest System of Sri Lanka

Inquest system of Sri Lanka covers both hospital and community deaths in the country including the deaths referred for postmortems conducted by the Judicial Medical Officers (JMO). Sri Lanka has a good system of producing consultant JMOs through an organized undergraduate and postgraduate training process. These well-trained human resources and infrastructure at the hospitals are utilized to conduct postmortem examinations for required cases. The cause of death given by the JMOs following a postmortem has been considered as the most accurate cause of death. The gold standard cause of death information gathered following the costly procedure of postmortem described above, is forwarded to National Mortality data through B18 Inquirer’s Certificate of Death.

The standard international form for cause of death was updated and introduced in 2016 by the World Health Organization (WHO) and it provides standard guidelines to be adhered across the world<sup>7</sup>. The previously used B18 Inquirer’s Certificate of Death was introduced in 1954 and the



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form was not compatible with the internationally accepted form of medical certificate of cause of death. Cause of death section of the previously used B18 Inquirer's Certificate of Death was not compatible with the frame A of the international death certificate. It is vital that the information on Manner of Death is captured following an inquest and in the standard form of Medical Certificate, the fields related to Manner of Death are included in Frame B. But the formerly used B18 Inquirer's Certificate of Death is lacking the fields for collection of data related to Manner of death. Due to these two main deficiencies, valuable cause of death information generated following a postmortem and inquest has not been transferred to the national level for generation of mortality statistics. For the deaths due to external causes such as accidents, homicides, suicides, poisoning, burns, it is important to report the manner of death and also the details of the circumstance of death<sup>8</sup>. These details are crucial for ICD coding of deaths due to external causes at the central level. Lack of proper cause of death information in the previously used B18 Inquirer's Certificate of Death had led to production of low-quality mortality data and wasting of resources used for inquest and postmortem procedures as well.

## Methods

With the objective of establishing a governance mechanism to coordinate CRVS improvement in Sri Lanka, a National Steering Committee on CRVS was established in 2019. This higher-level National Steering Committee consists of the heads and responsible officials from all stakeholder organizations including the Registrar Generals Department, Department of Census and Statistics, Ministry of Health, and Ministry of Justice. With the establishment of the inter-ministerial coordinating mechanism, all coordinated actions on CRVS improvement have been streamlined. Innovative interventions were approved, coordinated, and implemented across the country, under the supervision of the National Steering Committee.

The CRVS National Steering Committee identified the deficiency of information flow of mortality data caused by the previously used B18 Inquirer's Certificate of Death in Sri Lanka. A Technical Working Group (TWG) consisting of officials from the Ministry of Health, Ministry of Justice, Registrar General Department and Department of Census and Statistics was appointed with the objective of bringing amendments to the B18 Inquirer's Certificate of Death.

The TWG had series of consultative meetings to amend the previously used B18 Inquirer's Certificate of Death. TWG looked into the legal aspect of the Inquest Process in Sri Lanka by reviewing the legislation relevant including Birth and Death Registration Act of 1954 and Code of Criminal Procedure Act No. 15 of 1979. Chapter 39 of the Birth and Death Registration Act



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describes the inquest procedure and the act itself has defined the B18 Inquirer's Certificate of Death. The basic data fields defined for B18 Inquirer's Certificate of Death in the act includes the cause of death and it clearly defines the role of providing the manner of death following an inquest. Accordingly, TWG decided to include data fields related to frame A – Cause of Death and Frame B- Manner of Death, on the international cause of death certificate.

Following the development of a draft amendment of the new B18 Inquirer's Certificate of Death, TWG decided to pre-test the draft updated form. The main objective of the pre-test was to understand the competence of the Inquirers into Sudden Death on using the new form. Accordingly, 10 Inquirers into Sudden Deaths were selected based on convenient sampling method as nominated by the Ministry of Justice. The 10 Inquirers into Sudden Deaths have been selected from 10 different areas of the island. TWG developed 6 case scenarios on deaths subjected to inquest. These case scenarios were developed covering 3 main types of Inquests, encountered by the Inquirers into Sudden Deaths as given below assigning two cases for each situation,

1. Hospital deaths subjected to postmortems.
2. Hospital deaths not subjected to postmortems.
3. Community deaths.

The selected 10 Inquirers into Sudden Deaths were invited to participate for this study voluntarily after getting the informed written consent. 6 case scenarios were given to the participants, and they were asked to fill the updated B18 Inquirer's Certificate of Death. Certificates filled by the Inquirers into Sudden Deaths at the pre-test were assessed by a panel of experts appointed by the TWG. The panel assessed the filled B18 Inquirer's Certificate of Deaths based on 10 types of common errors. 10 errors are listed below,

1. Illegible handwriting.
2. Not correctly marked circumstance of death.
3. Not adequately described circumstance of death.
4. Not correctly marked details of the cause of death.
5. Multiple causes of deaths written per line.
6. Missing time intervals.
7. Use of abbreviations.
8. Clinically improbable sequences of cause of death.
9. Ill-defined conditions.

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## 10. Not duly filled other sections excluding cause and circumstance of death.

The method of analysis of results was performed using a Quantitative Research Analysis and SPSS Version 24.0 was used as the Statistical Software.

Following the pre-test, a discussion was conducted with the participants and their comments on the usability of the new form were recorded. Further an education session on the international guideline on cause of death certification and the quality assessment of cause of death was conducted to all participants.

Since the old format was updated with additional parameters and standard declaration as per the WHO guidelines, a descriptive instruction sheet for proper filling of the new format was also developed in order to enhance compliance and feasibility.

## Results

Inquirers into Sudden Deaths are conducting inquests in hospitals as well as in the community. The case scenarios were developed based on real cases of deaths. Adhering to the international guidelines on cause of death certification by the participants was thoroughly assessed.

	Error	Yes	No	Total
1.	Illegible handwriting.	0 (0%)	60 (100%)	60 (100%)
2.	Not correctly marked circumstance of death.	10 (16.7%)	50 (83.3%)	60 (100%)
3.	Not adequately described circumstance of death.	15 (25%)	45 (75%)	60 (100%)
4.	Not correctly marked details of the cause of death.	15 (25%)	45 (75%)	60 (100%)
5.	Multiple causes of deaths written per line.	31 (51.7%)	29 (48.3%)	60 (100%)
6.	Missing time intervals.	40 (66.7%)	20 (33.3%)	60 (100%)
7.	Use of abbreviations.	21 (35%)	39 (65%)	60 (100%)
8.	Clinically improbable sequences of cause of death.	26 (43.3%)	34 (56.7%)	60 (100%)

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9.	Ill-defined conditions.	25 (41.7%)	35 (58.3%)	60 (100%)
10.	Not duly filled other sections excluding cause and circumstance of death.	26 (43.3%)	34 (56.7%)	60 (100%)

Table 1 Distribution of error type

**Table 1** shows the percentage of errors identified at the pre-test. Zero errors were identified for illegibility of handwriting and the most common error identified was the missing time interval when certifying cause of death (n=40, 66.7%). Also, 43.3% (n=26) of certification of deaths was found to be with clinically improbable sequence of cause of death and errors made in other sections excluding cause and circumstance of death bares the same percentage.

Figure 2 illustrates percentage of different types of errors identified during the pre-test more elaborately.

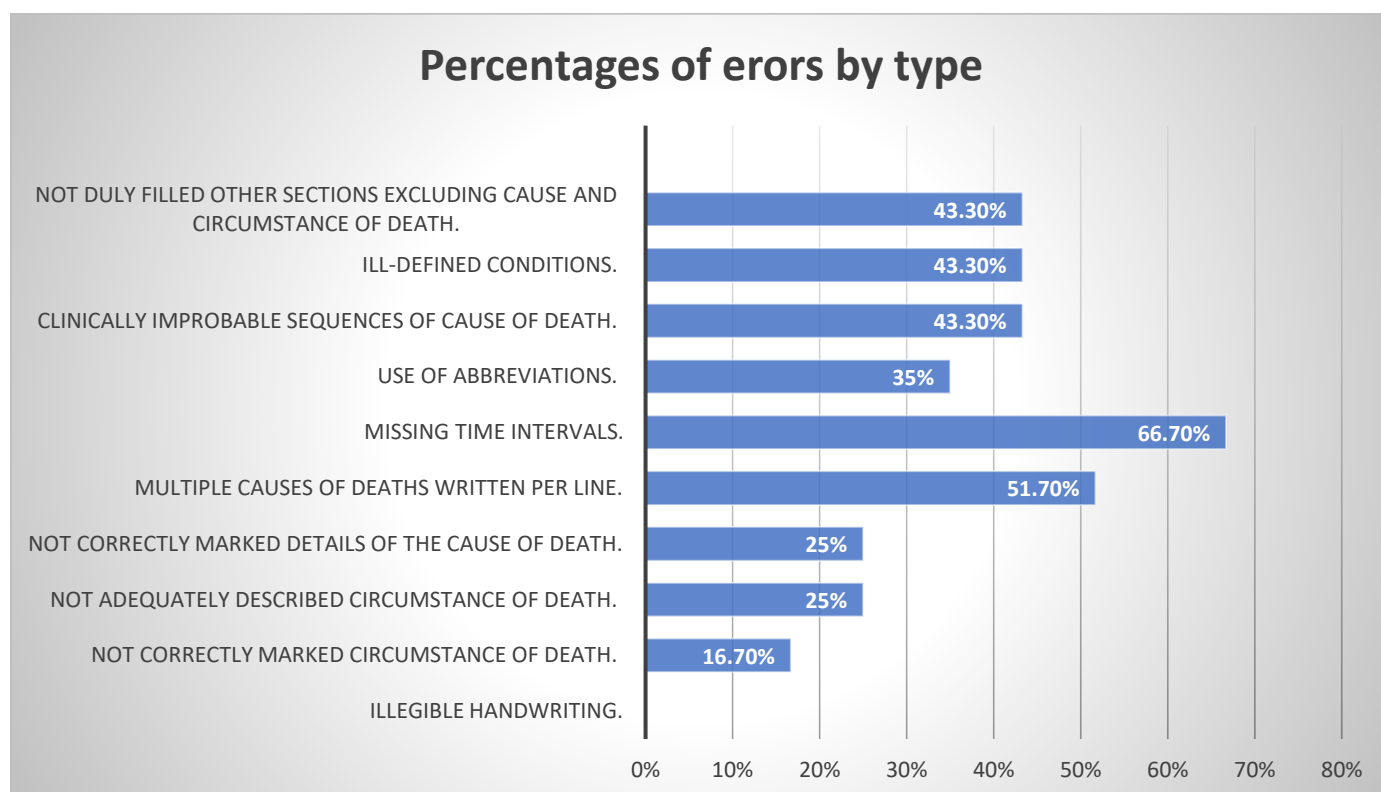


Figure 2 illustrates percentage of different types of errors made at the pre-test



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Table 2 summarizes the distribution of certification by error count.

Number of Errors	Frequency	Percentage
Zero errors	9	15.0 %
Single errors	10	16.7%
One error	8	13.3%
Two errors	7	11.7%
Three errors	2	3.3%
Four errors	4	6.7%
Five errors	10	16.7%
Six errors	7	11.7%
Seven errors	2	3.3%
Eight errors	1	1.7%
Nine errors	9	15.0%
All ten errors	0	0%

*Table 2 Summary of the error count identified during pre-test.*

Error counts showed that only 15.0 % (n=9) of the death certificate are filled without any errors and the mean error count was 3.48 (SD=2.671).

From the discussions conducted with the participants few more deficiencies were found. The issues raised by Inquirers into Sudden Death when filling the updated form are,

- Space given to write the Full name of the deceased is not adequate.
- Space given to write the permanent address of the deceased is not adequate.
- Space given to describe the place of death is not adequate.
- A field should be included to enter Funeral arrangements.

## Discussion

All the death certificates filled during the pre-test were legible. Most probably due to the fact that the pre-test was conducted in a different setting than their routine workplace in hospital or in the community. During the routine practice we might not get the same results of complete legibility.



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The most common error made by the Inquirers into Sudden Deaths is the missing time interval in the cause of section of the death certificate. It is introduced with the new format which was not included in the format they have been using for consecutive years since year 1954. It is a millstone that Sri Lanka will commence certification of deaths as per the international standard endorsed by World Health Organization for deaths subjected to inquest.

Inquiries into Sudden Deaths are not medical professional, and they have minimal knowledge on the pathophysiology of diseases. Therefore, it was not surprising to see a higher proportion of death certificates with clinically improbable sequence of cause of death. Also, a considerably higher percentage of ill-defined conditions (N=25, 1.7%) in the cause of death section was seen probably due to the fact that they are not trained on the subject, and they have learnt from the routine practice of the existing system without a formal induction training.

Inquiries into Sudden Deaths are appointed by the Ministry of Justice based on their educational qualifications. A proper pre-service or in-service training was not given to the Inquiries into Sudden Deaths officially by the Ministry of Justice. They are trained by the senior officers and there are no competency assessments of their performance. Still, they are performing the important task of conducting inquest without format supervision or quality assessments.

## Conclusion/Recommendations

Following the pre-test, the usability of the new B18 Inquirer's Certificate of Death was improved with the input from the participants for changes in formatting including increasing adequate space for certain parameters.

The final draft of the updated B18 Inquirer's Certificate of Death was forwarded to the relevant Ministry under which the purview of Registrar Generals Department falls through the National Steering Committee on CRVS to follow the government procedure. Since the procedure is related to changing of the existing law, a Gazette notification was issued bearing the gazette number 2236 dated 9<sup>th</sup> July 2023 by the government of Sri Lanka enabling implementation of the new B18 Inquirer's Certificate of Death.

It was emphasized that the accurate cause of death information submitted by the Judicial Medical Officers following a postmortem examination is being transferred to National Mortality data through the B18 Inquirer's Certificate of Death. Accordingly, a direction was given to all Inquirers into Sudden Death by the Ministry of Justice, to transfer the correct cause of death given by the Judicial Medical Officers based on postmortem to the stipulated format, in order to ensure the



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proper channeling of the important and accurate cause of death information to national mortality database.

It was identified that the lack of Pre-service and In-service training to Inquiries into Sudden Deaths was a major deficiency in the system and quality of cause of death information given through the B18 Inquirer's Certificate of Death can be improved by a proper training. An In-Service training for Inquirers into Sudden Death was launched in April 2022 as a collaborative activity between Ministry of Health and Ministry of Justice coordinated through CRVS National Steering Committee. The main objective of this capacity building programme was to train all Inquiries into Sudden Deaths on proper cause of death certification which would improve the quality of cause of death for all deaths subjected to an inquest. Five sessions have been completed in the country and 482 Inquiries into Sudden Deaths have been trained covering all 25 districts in Sri Lanka. According to the Ministry of Justice, 98% ISDs in the country had participated in this training. The training will ensure proper implementation of the new format and the instruction sheet annexed to the format will also be a contributory factor to enhance the quality and feasibility. Following the In-service training, a certificate of competency was awarded for participation and the Ministry of Justice will consider the certificate as a valid competency for their promotions and increments. Further, it was decided to incorporate proper pre-service training to Inquirers into Sudden Deaths at their recruitment and also to continue the In-service training periodically.

## Acknowledgements

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