CRVS technical guide
Death Certificate Assessment Tool (Excel version): User guide

January 2020

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.

Death Certificate Assessment Tool (Excel version): User guide

This user guide describes how to use the *Death Certificate Assessment Tool (Excel version).* This guide is intended to be used alongside the tool, which can be found on the CRVS Gateway: **crvsgateway.info/resources**

This Excel version of the "Death Certificate Assessment Tool" consists of the following 11 worksheets in a single Microsoft Excel file:
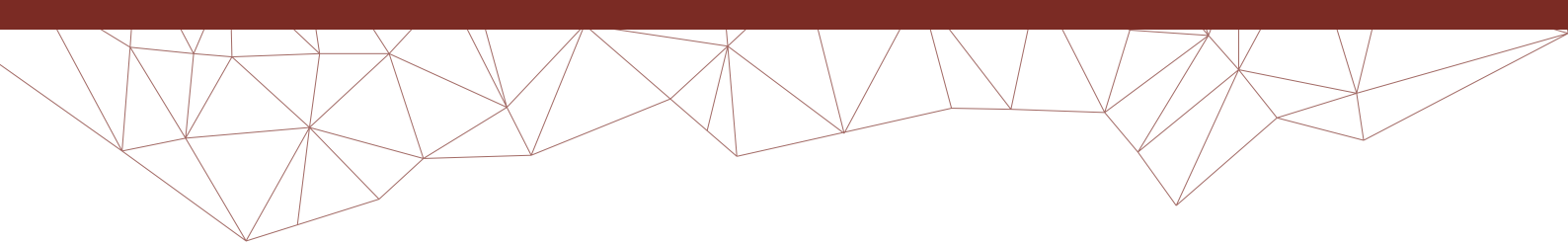
Worksheet	Name
1	Infographics
2	User Guide
3	Tool
4	Optional
5	Enter data
6	Frequency of errors
7	Analysis Q1-6
8	Analysis Q7
9	Analysis Q8
10	Print preview
11	A hidden intermediate worksheet

By clicking on the name of a worksheet it can be opened and viewed (**Figure 1**). Details of each worksheet are given in the following sections.

Figure 1: Worksheets of the template

Worksheet 1: "Infographics"

Purpose	Features
Serves as a quick reference guide to the assessment of the cause-of-death section of the death certificate	The content is expanded and is completely visible when double-clicked and scrolled down over the window.

Worksheet 2: "User-Guide"

Purpose	Features
Provides guidance in using the excel-based tool in assessment of the medical certificate of cause of death.	The content is expanded and is completely visible when double-clicked and scrolled down over the window.

Worksheet 3: "Tool"

Purpose	Features
Provides a glimpse of the tool used for the assessment of death certificates, meant to give an input of the scope of the tool for the data-entry operator.	■ Questions are divided into three sub-components: 1. Questions on general aspects; 2. Questions on deaths due to external causes; 3. Questions on deaths due to neoplasms. ■ Each component is given a unique colour; ■ Each response is given a unique colour-code which remains the same throughout all worksheets (**Figure 2**).

Figure 2: Colour-coding system as mentioned in Worksheet 3

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Worksheet 4: "Optional"

Purpose	Features
This enables optional inputs for subsequent stratified analysis.	■ When you enter values into these columns, they automatically fill the "option list" of the respective columns in the next worksheet (Worksheet 5). It is not necessary to manually enter repeat values, you can select from a list (or copy/paste) (**Figure 3**); ■ Later in the analysis sections, all analyses can be re-done with whatever options you keep.

Figure 3: Option to enter the comparison groups

Worksheet 5: "Enter Data"

Purpose	Features
This sheet is used to enter the assessment responses into the template.	■ When you click on each question number, the full wording of that question appears (**Figure 4**);
	■ If an incorrect digit or letter is accidentally entered (i.e. outside the range from 1-3), the system gives an automatic warning (**Figure 5**);
	■ Depending on the response entered, automatic colouring of the cells occurs (**Figure 6**);
	■ When the response to questions 7a or 8a is "yes", these cells are automatically coloured pink, indicating that an answer is expected for the subsequent column. When the response is either "no" or "not assessed", the subsequent column is automatically coloured black, indicating that no answer is expected. If a value is entered (incorrectly) within a black coloured cell, the value will be visible in a faint-white colour for easy detection. This value can then be manually deleted (**Figure 7**);
	■ The total error score for each category is automatically calculated and displayed;
	■ Optionally, a weight-coefficient can be added if required. This allows calculations to be done automatically based on adjusted values (**Figure 9**);
	■ Enter the age to the nearest completed year. When the age at death is less than 1 year, enter it as "0" (i.e. zero). For deaths with 0 completed years (i.e. deaths of infants), a category (i.e. early-neonatal, late-neonatal or post-neonatal) can be selected in the next column. For deaths with 1 or more completed years, the next column will be automatically coloured in black.

Figure 4: Appearance of full wording

Figure 5: Appearance of warning messages
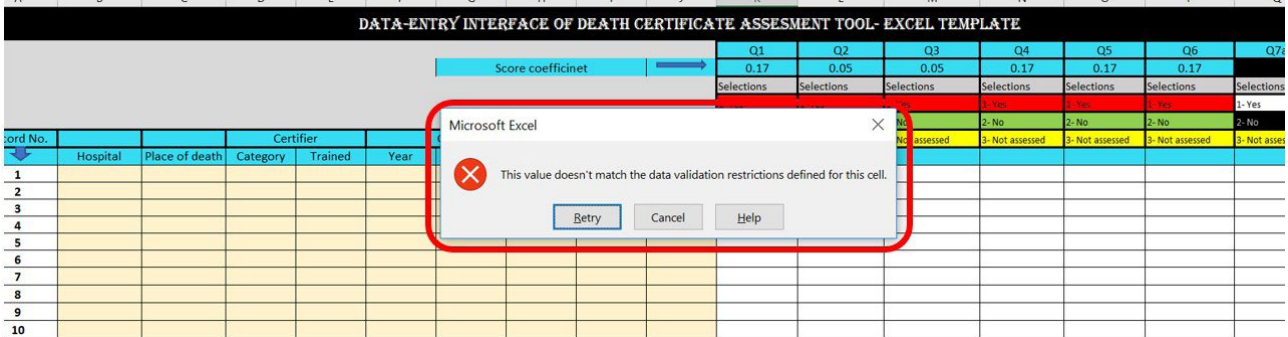
Figure 6: Automatic colouring of cells

Figure 7: Automatic colouring of cells in black when an answer is not expected

Figure 8: Automatic calculation of total error score and the error category

NT TOOL- EXCEL TEMPLATE

Q1	Q2	Q3	Q4	Q5	Q6	Q7a	Q7b	Q8a	Q8b		Score	Category
0.17	0.05	0.05	0.17	0.17	0.17		0.17		0.05			
Selections	Selections	Selections	Selections	Selections	Selections	Selections	Selections	Selections	Selections			
1- Yes	1- Yes	1- Yes	1- Yes	1- Yes	1- Yes	1- Yes	1- Yes	1- Yes	1- Yes			
2- No	2- No	2- No	2- No	2- No	2- No	2- No	2- No	2- No	2- No			
3- Not assessed	3- Not assessed	3- Not assessed	3- Not assessed	3- Not assessed	3- Not assessed	3- Not assessed	Not relevant	3- Not assessed	Not relevant			
1	3	1	3	1	3	1	1	3			0.56	Poor
2	2	2	2	2	2	2		2			0.00	Excellent
3	1	3	1	3	1	3		1	1		0.44	Poor
1	3	1	3	1	3			3			0.39	Poor
2	2	2	2	2	2	2		2			0.00	Excellent
3	1	3	1	3	1	3			1		0.44	Poor
1	2	2	2	2	2		1				0.17	Poor
1	1	2	2	2	2	2		2			0.22	Poor
1	1	1	2	2	2	3		3			0.27	Poor
1	1	1	1	2	2		1		1		0.61	Poor
1	1	1	1	1	2						0.61	Poor
1	1	1	1	1	1						0.78	Poor
1	1	1	1	1	1		1				0.95	Poor
1	1	1	1	1	1				1		1.00	Poor

Figure 9: Option to enter auto-adjustable weight co-efficient

ATE ASSESMENT TOOL- EXCEL TEMPLATE

	Q1	Q2	Q3	Q4	Q5	Q6	Q7a	Q7b	Q8a	Q8b		Score	Category
	0.17	0.05	0.05	0.17	0.17	0.17		0.17		0.05			
	Selections	Selections	Selections	Selections	Selections	Selections	Selections	Selections	Selections	Selections		Score	Category
	1- Yes	1- Yes	1- Yes	1- Yes	1- Yes	1- Yes	1- Yes	1- Yes	1- Yes	1- Yes			
	2- No	2- No	2- No	2- No	2- No	2- No	2- No	2- No	2- No	2- No			
of deceased	3- Not assessed	3- Not assessed	3- Not assessed	3- Not assessed	3- Not assessed	3- Not assessed	3- Not assessed	Not relevant	3- Not assessed	Not relevant			
For infants only													
	1	3	1	3	1	3	2	1	3			0.56	Poor
	2	2	2	2	2	2	2		2			0.00	Excellent
	3	1	3	1	3	1	3		1	1		0.44	Poor
	1	3	1	3	1	3	2		3			0.39	Poor
	2	2	2	2	2	2	2		2			0.00	Excellent
	3	1	3	1	3	1	3			1		0.44	Poor

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Worksheet 6: "Frequency of errors"

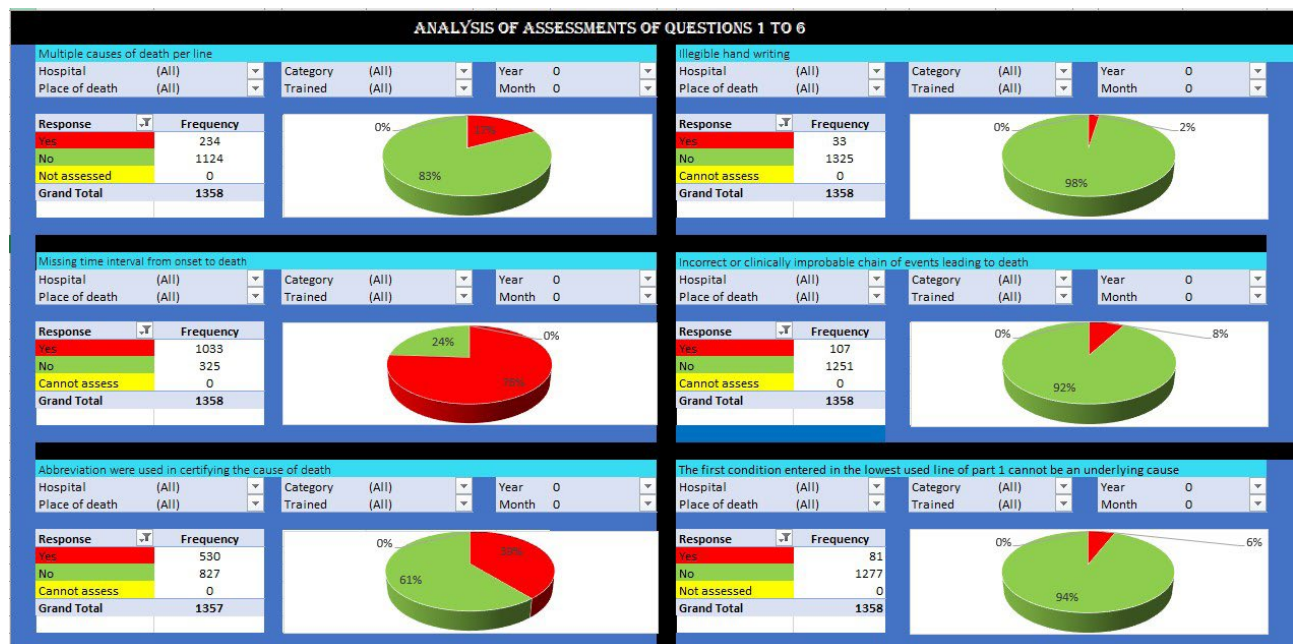| Purpose	Features
This worksheet gives the distribution of the number of errors found in the set of death certificates.	■ A frequency table is automatically generated from the values entered in Worksheet 2 (**Figure 10**); ■ A pie chart is generated for the error distribution (i.e. 0 errors, 1 error and "2 or more" errors (**Figure 10)**; ■ A bar diagram is automatically generated for the score categories (i.e. excellent, good, poor) from the values entered in Worksheet 2 (**Figure 10**); ■ A histogram is displayed for the distribution of total scores (**Figure 10**); ■ Automatic updating of all tables and charts will happen with a single click on the "Refresh all" button under the "Data" option of the menu.

Figure 10: Automatically generated tables and figures in Worksheet 6

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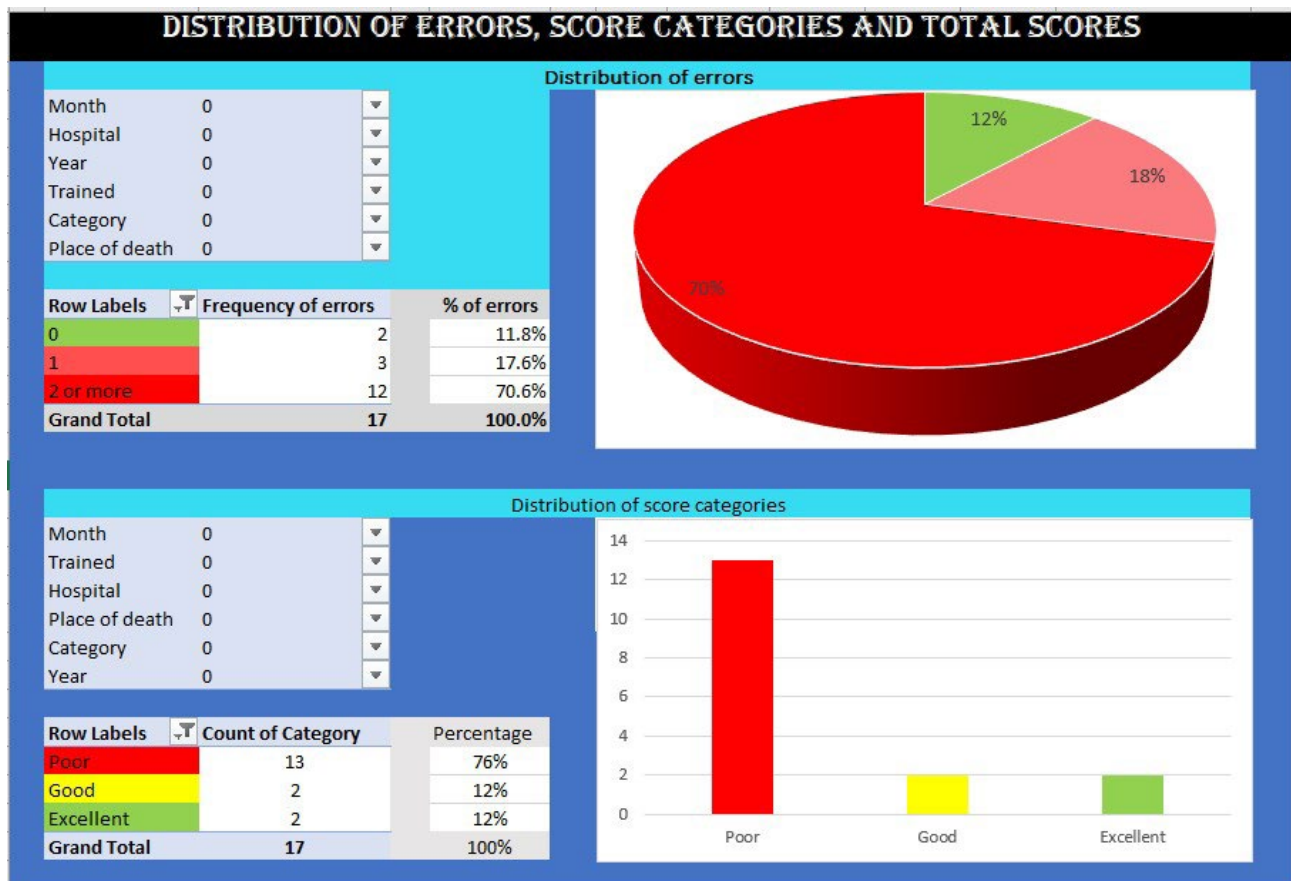
Worksheet 7: "Analysis Q1-6"

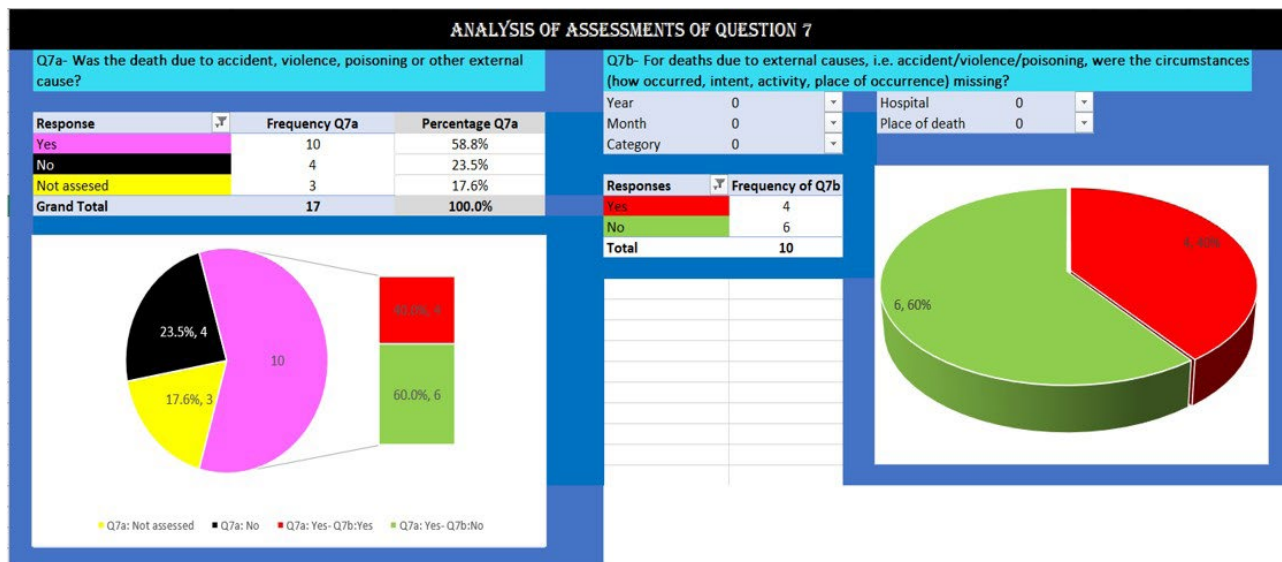| Purpose	Features
This worksheet gives the outputs in relation to questions 1 to 6 of the tool.	■ Frequency tables are automatically generated for the values entered in Worksheet 2 (**Figure 11**);
	■ Pie-charts are automatically generated from the values entered in Worksheet 2 (**Figure 11**);
	■ Colour codes of all responses are same as the codes mentioned in other worksheets;
	■ Automatic updating of all tables and charts will happen with a single click on the "Refresh all" button under the "Data" option of the menu.

Figure 11: Examples of automatically generated tables and figures in Worksheet 7

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Worksheet 8: "Analysis Q7"

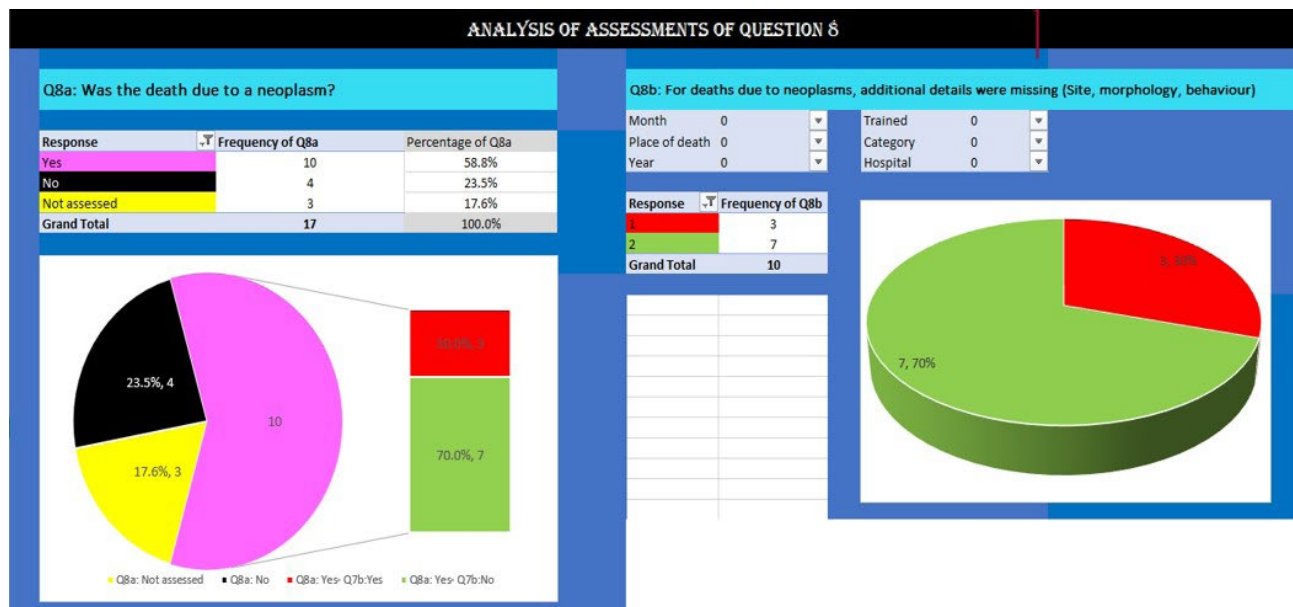| Purpose	Features
This worksheet gives the outputs in relation to Question 7 which includes deaths due to external causes.	■ A frequency table and a "bar of pie chart" are automatically generated for the main response to Question 7a (**Figure 12**); ■ A frequency table and a pie chart are automatically generated for the main response to Question 7b (**Figure 12**); ■ Colour codes of all responses are same as the codes mentioned in other worksheets; ■ Automatic updating of all tables and charts will happen with a single click on the "Refresh all" button under the "Data" option of the menu.

Figure 12: Automatically generated tables and figures in Worksheet 8

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Worksheet 9: "Analysis Q8"

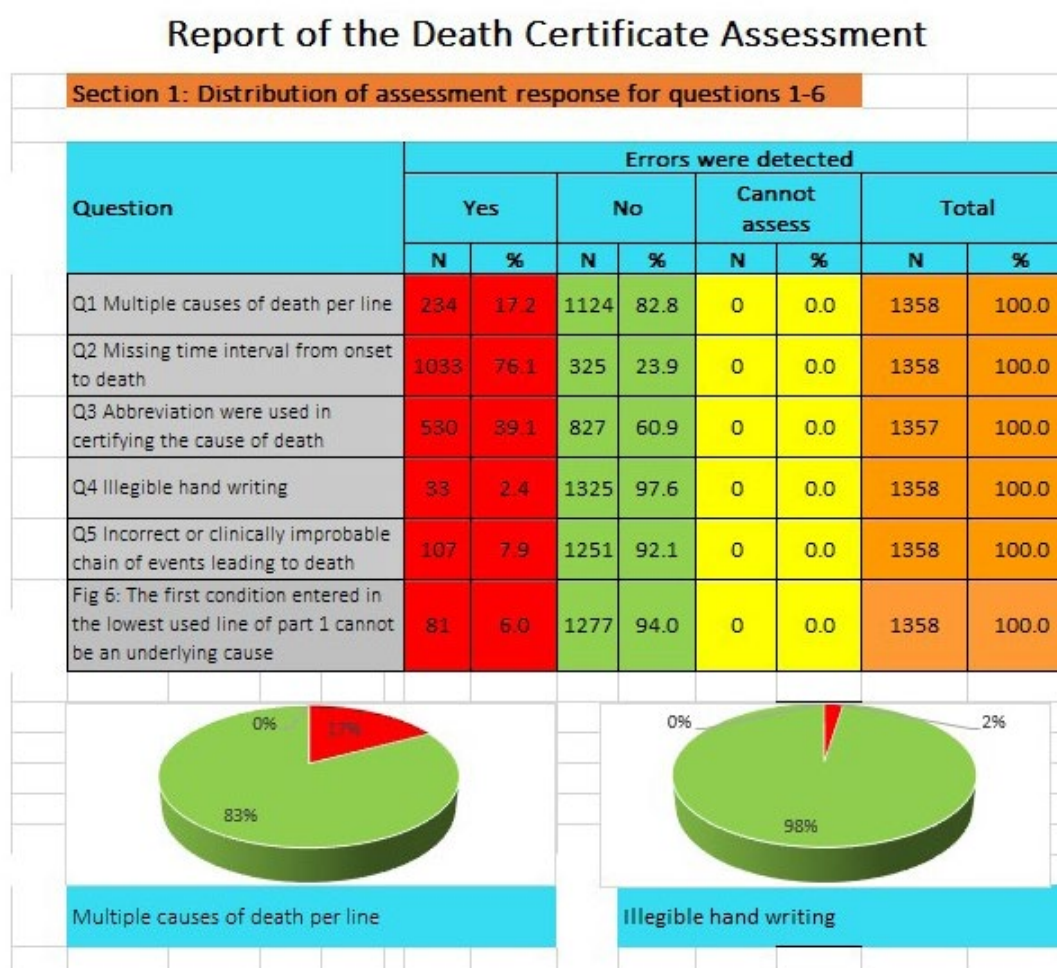| Purpose	Features
This worksheet gives the outputs in relation to Question 7 which includes deaths due to neoplasms.	■ A frequency table and a "bar of pie chart" are automatically generated for the main response to Question 7a (**Figure 13**); ■ A frequency table and a pie chart are automatically generated for the main response to Question 7b (**Figure 13**); ■ Colour codes of all responses are same as the codes mentioned in other worksheets; ■ Automatic updating of all the tables and charts will happen with a single click on the "Refresh all" button under the "Data" option of the menu.

Figure 13: Automatically generated tables and figures in Worksheet 9

"Worksheet 10: Print preview"

Purpose	Features
This worksheet enables viewing of an automatically generated printable report with pre-filled values based on entered data and selection done in the analysis.	■ The template is already customised. Click on the "Print" command in the "File" menu to print (**Figure 14**); ■ Automatic updating of all the tables and charts will happen with a single click on the "Refresh all" button under the "Data" option of the menu.

Figure 14: Print preview option and customised ready-to-print template

Report of the Death Certificate Assessment

Section 1: Distribution of assessment response for questions 1-6

Question	Errors were detected							
	Yes		No		Cannot assess		Total	
	N	%	N	%	N	%	N	%
Q1 Multiple causes of death per line	234	17.2	1124	82.8	0	0.0	1358	100.0
Q2 Missing time interval from onset to death	1033	76.1	325	23.9	0	0.0	1358	100.0
Q3 Abbreviation were used in certifying the cause of death	530	39.1	827	60.9	0	0.0	1357	100.0
Q4 Illegible hand writing	33	2.4	1325	97.6	0	0.0	1358	100.0
Q5 Incorrect or clinically improbable chain of events leading to death	107	7.9	1251	92.1	0	0.0	1358	100.0
Fig 6: The first condition entered in the lowest used line of part 1 cannot be an underlying cause	81	6.0	1277	94.0	0	0.0	1358	100.0

Multiple causes of death per line

Illegible hand writing

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Worksheet 11: "Intermediate datasheet" (hidden)

Purpose	Features
This worksheet helps in the generation of tables and graphs and is not meant to be used by the data-entry operators.	■ Automatic generation of text codes from the numeric codes entered in Worksheet 5 (i.e. Enter data) (**Figure 15**); ■ This worksheet is not meant for handling and is used for the generation of outputs by the system (so it is kept hidden).

Figure 15: Intermediate datasheet of Worksheet 11 (hidden)

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