DEVELOPING THE WORKFORCE

Assessing the quality of death certification: Instructions for the online assessment tool

Resources and Tools 3

November 2016
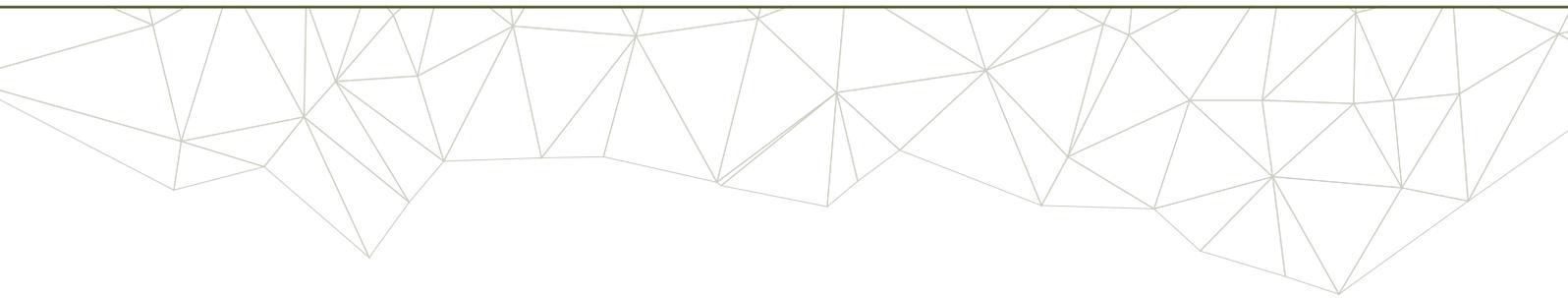
About this series

Capacity-building resources and tools are designed to assist countries improve their systems and to influence and align CRVS practice in countries with established international or best practice standards. These products have and will be created and disseminated to help countries develop critical CRVS capacity among technical officers and ministries.

Other products available from the Civil Registration and Vital Statistics, Data for Health Initiative:

Working Papers

Working papers are the principle knowledge products of the Civil Registration and Vital Statistics Initiative at The University of Melbourne. Easily accessible, they collectively form a lasting repository of knowledge generated under the Data for Health Initiative based on in-country experience. Working papers are intended to stimulate debate and promote the adoption of best practice in CRVS in partner countries and world-wide.

The series focuses on a range of knowledge gaps, new tools, methods and approaches, and raises and debates fundamental issues around the orientation, purpose and functioning of CRVS systems. Generally, working papers contain more detailed information than an academic paper, are written in less academic language, and are intended to inform health system dialogue in and between countries and a range of development partners.

Technical Reports

Technical reports describe the methods and findings of CRVS activities in partner countries implemented under the Data for Health Initiative. The series also reports on work in progress, particularly for large or complex initiatives, or on specific components of projects that may be of more immediate relevance to stakeholders.

The series serves to describe the state of CRVS systems in partner countries and provides a baseline for comparison between countries and over time. It also provides a preliminary diagnostic analysis for use by countries in highlighting areas needing improvement.

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Introduction

The Civil Registration and Vital Statistics (CRVS), Data for Health Initiative (D4H), at The University of Melbourne has developed an assessment tool to assess the quality of death certification practices through checking for the presence of common errors in death certificates. This can be used to assess the quality of death certification as part of routine assessment, or to assess the training needs of doctors in designing cause of death certification training. The tool can also be used to evaluate the effect of death certification training.

To facilitate data entry and the easy analysis of death certificates, an online version of the tool has been developed. This document provides guidance on how to use the online version of the assessment tool.

Before using the online assessment tool, it is recommended that you read 'Assessing the quality of death certification'. This document provides detailed information on each of the steps of the assessment tool, and how to answer the questions. The document is available for download at:

mspgh.unimelb.edu.au/dataforhealth/resources

HOW CAN I ACCESS THE ONLINE TOOL?

Log in to the tool at **d4hresources.com.au**

When you see the welcome screen click on LOG IN and type in your username and password.

Figure 1: Welcome screen
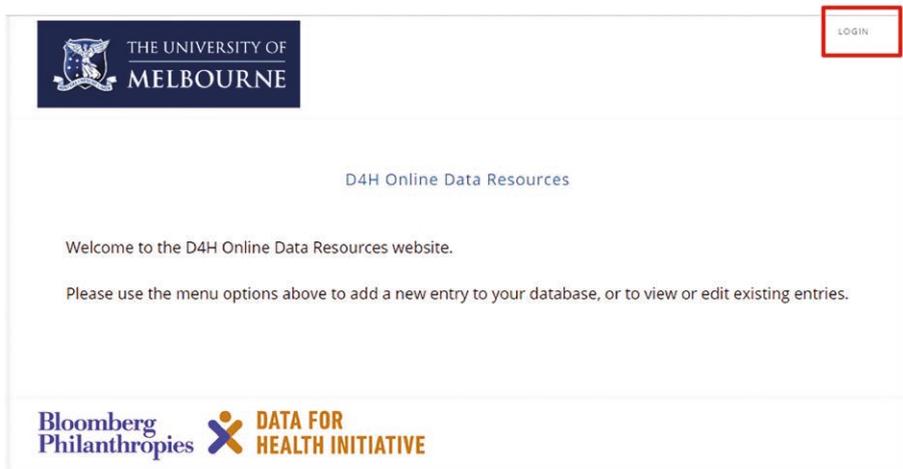
Figure 2: Log in screen
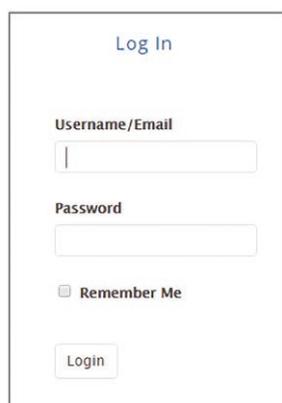
If you do not have a username or password please contact your local trainer who introduced you to this tool, or email **CRVS-info@unimelb.edu.au** with your name, country, and hospital/health facility name to request access.

Please note that access to the online assessment tool is currently limited to those countries that are part of the Data for Health (D4H) Initiative, and those who have participated in cause of death certification training.

HOW DO I ENTER DATA?

Once you have logged in, you will be taken to the main menu page. From here, you can update your user profile or go to the medical certification of cause of death (MCOD) assessment tool.

Figure 3: Main menu page
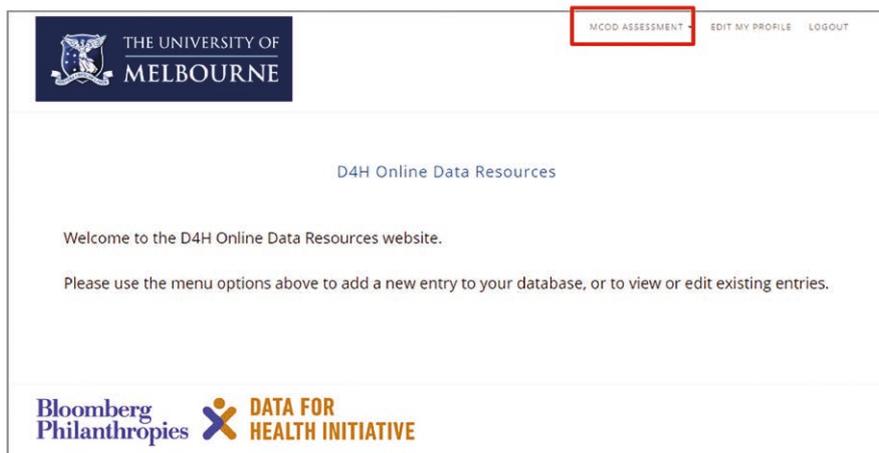
To open the MCOD assessment tool and create a new entry, click on MCOD ASSESSMENT on the top-right of your screen and select ADD ENTRY by clicking on it.

Figure 4: Drop-down menu under MCOD ASSESSMENT
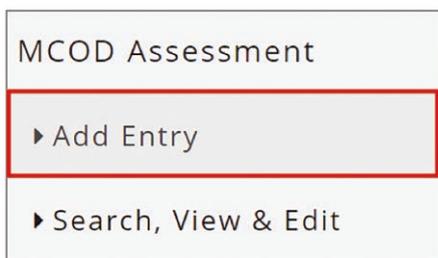
This will take you to the assessment screen as shown below (Figure 5).

Now you are ready to enter data into the tool. This can be done in one of two ways:

1. You can do the assessment using the paper-based version first (available at **mspgh.unimelb.edu.au/dataforhealth/ resources**), and then enter the data online; OR

2. You can enter the data directly online as you do the assessment.

We recommend that you use the paper-based version of the tool first until you are familiar with the assessment. Also, for countries with limited or intermittent Internet or power, recording the data on paper first may help in case of access issues.

Figure 5: MCOD Assessment Tool, data entry screen one

HOW DO I EXPORT DATA?

Only Editors are able to export data. For more information on User profiles, see the USER PROFILES section of this document (page 41).

If you are not an Editor, contact the trainer from who you got your login details or email **CRVS-info@unimelb.edu.au** with your login details and the site Administrator can export and email the data to you.

From the main menu page, click on MCOD ASSESSMENT on the top-right of your screen and select EXPORT ENTRIES by clicking on it (Figure 6).

Figure 6: Drop-down menu under MCOD Assessment (editor view)

This will automatically download a Microsoft Excel .csv file to your computer.

Click on the file to open it, and then select 'Save As' to select the destination folder, file name and file type of the database export.
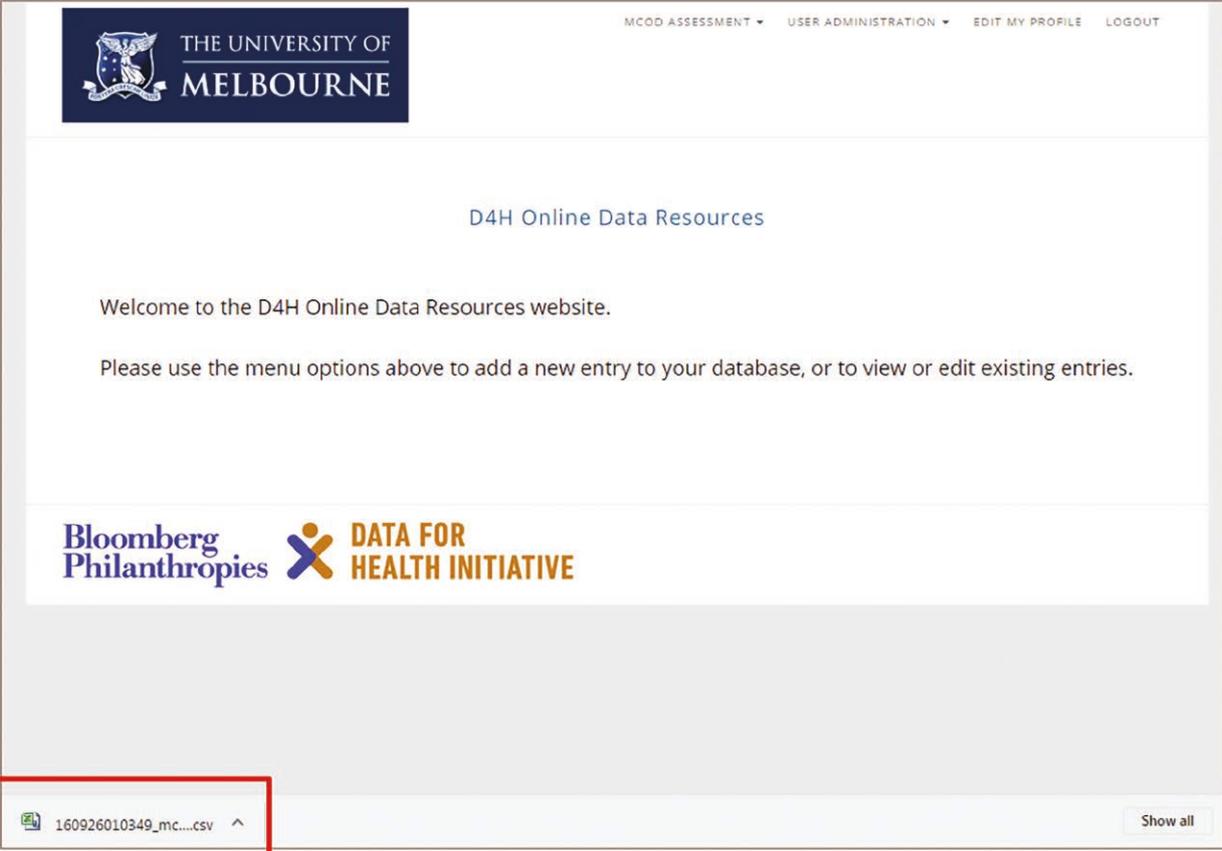
The assessment tool

ENTERING GENERAL DETAILS OF THE DECEASED

Age at death

First enter the age in numbers (ie 3, 21, 8.5).

If the age is not recorded on the death certificate enter 999.

Then specify the units of the age (days, months or years).

This is a **mandatory** field.

Please note that the online tool will automatically select an age group based on the age you enter.[1] This will not be shown online, but will appear in the database and exported Excel spreadsheet.

Figure 8: Data entry options for age of the deceased

Sex of deceased

Next, use the radio button to select the sex of the deceased.

If the sex is not recorded on the death certificate select not recorded.

This is a **mandatory** field.

Figure 9: Data entry options for sex of the deceased
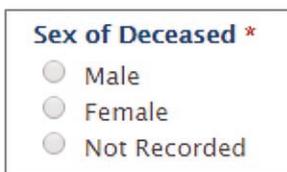
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1   For ease of data analysis, the following broad age groups have been selected: 0-28 days; 29 days <1 year; 1-4 years; 5-14 years; 15-44 years; 45-64 years; 65-84 years; 85+ years

ENTERING DEATH CERTIFICATE DETAILS

Country

This tool is designed to be used in several countries.

Use the drop-down menu to select your country. Please note that only countries that are part of the CRVS D4H Initiative are listed in the drop-down menu.

This is a **mandatory** field.

If you are using the tool for training purposes, or want to enter pretend data, select the ***Test*** option for country. This will make it clear in the database that the data should not be used for analysis.

Note: To review or export this data, make sure your user profile has the country set to ***Test.***

Figure 10: Drop-down menu for country selection
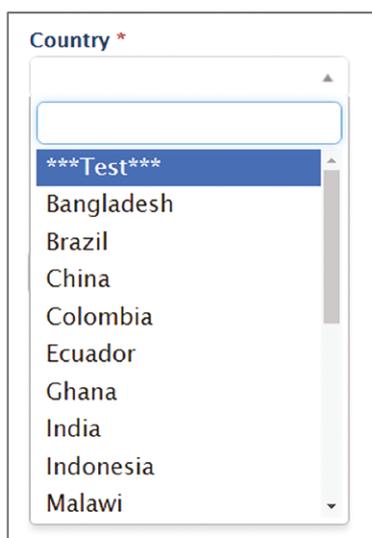
Hospital name or health area

Type in the hospital name or the health area[2] where the death occurred.

If the hospital name or health area was not written on the death certificate, type 'Not Recorded'.

This is a **mandatory** field.

Figure 11: Hospital name or health area text entry box

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2   Health area may refer to the division, district or region, pending the level of analysis you want to perform on the data

Place of death

Use the drop-down menu to select the appropriate place of death (ie hospital or other health facility, home, etc.).

If the place of death is not listed, select OTHER and then type in the correct place of death in the additional data entry box that will appear.

This is a **mandatory** field.

Figure 12: Place of death text entry box

Figure 13: Additional text entry box for place of death details

Certifier

Use the drop down menu select the designation of the certifier.

If the certifier is not a hospital or community doctor select OTHER and type in the designation of the certifier (for example, 'Midwife').

This is a **mandatory** field.

Figure 14: Certifier text entry box

Figure 15: Additional text entry box for certifier details

SAVING AND MOVING TO THE NEXT SCREEN

Once you have entered all the data on the deceased and death certificate, click on the NEXT button. If you have not completed any of the mandatory fields, an error message will appear and you will be asked to complete the fields.

You cannot move on to the next part of the assessment before this page has been completed.

Once you have completed all the missing fields, click on the NEXT button.

Figure 16: Example of an incomplete submission and error message

ASSESSING DEATH CERTIFICATES FOR THE PRESENCE OF ERRORS

Now that you have entered general details of the deceased and death certificate details, it is time to do the death certificate assessment.

First, go through Parts 1 and 2 of the death certificate (where the medical data is entered) (Figure 17). Read it and try to understand the certificate.

Figure 17: International form of medical certificate of cause of death, Parts 1 and 2 (WHO 2016)

Frame A: Medical data: Part 1 and 2				
1 Report disease or condition directly leading to death on line a Report chain of events in due to order (if applicable) State the underlying cause on the lowest used line		a	Cause of death	Time interval from onset to death
		b	Due to:	
		c	Due to:	
		d	Due to:	
2 Other significant conditions contributing to death (time intervals can be included in brackets after the condition)				

Then, using the online assessment tool, go through each error one by one.

Select the answer using the radio buttons or the drop down menu.

Figure 18: MCOD Assessment Tool, data entry screen two

MCOD Assessment

Did the death certificate have any of the following errors?

1 Multiple causes per line
- Yes
- No

2 Interval between onset and death was left blank
- Yes
- No

3 Blank lines within the sequence/chain of events (not using consecutive lines)
- Yes
- No

4 Abbreviations were used
- Yes
- No

5 Illegible hand writing
- Yes
- No

6 Incorrect/clinically improbable sequence of events leading to death
- Yes
- No
- Illegible hand writing

7 Ill-defined condition entered as underlying COD
- Yes
- No
- Illegible hand writing

1 MULTIPLE CAUSES PER LINE

There should only be one cause recorded per line in Part 1 of the death certificate.[3]

If the certifier has documented multiple causes per line in Part 1 of the certificate select YES. **This is an error.**

If there is more than one cause reported on one line and the certifier has not used 'due to' in between causes and the sequence is unclear, select YES. **This is an error.**

If they have recorded a single cause per line, select NO.

If they have recorded multiple causes per line, but the certifier has clearly demonstrated the sequence by writing 'due to' in between causes, select NO.

Figure 19: Assessment question one

2 INTERVAL BETWEEN ONSET AND DEATH

The approximate time interval between onset of the condition(s) and death should be reported for all conditions reported in Part 1 of the certificate.

In the death certificate there is column to document the time interval between onset of the condition and death.

If the time interval between onset and death was left blank (ie it was not completed or filled in), select YES. **This is an error.**

If the interval was completed, select NO.

Figure 20: Assessment question two

3 PRESENCE OF BLANK LINES WITHIN THE SEQUENCE OF EVENTS

The sequence of events leading to death should be reported on consecutive lines in Part 1 of the death certificate.

If blank lines have been left within the sequence of events leading to death, select YES. **This is an error.**

If consecutive lines have been used (ie there are no blank or empty lines), select NO.

Figure 21: Assessment question three

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3   If there are multiple causes in the sequence leading to death, and not enough blank lines to record them on, then it may be acceptable to write multiple causes per line.
     If this is the case, it is important that the certifier clearly demonstrates the sequence, by writing 'due to' in between conditions written on the same line

4 ABBREVIATIONS USED IN CERTIFYING THE DEATH
Abbreviations should not be used when certifying deaths as abbreviations can mean different things to different people. There is a chance that coders may misinterpret the abbreviation and code the death to a non-relevant code.

If abbreviations have been used in certifying the death, select YES. **This is an error.**

If abbreviations have not been used, select NO.

Figure 22: Assessment question four

5 ILLEGIBLE HAND WRITING
The death certificate should be clearly and legibly written.

If the handwriting is illegible (ie you cannot read what it says), select YES. **This is an error.**

If the handwriting is legible, select NO.

Figure 23: Assessment question five

6 SEQUENCE OF EVENTS LEADING TO DEATH
Certifiers should identify one clear sequence of events leading to death and document that sequence in Part 1 of the death certificate.

If the sequence of events leading to death reported in Part 1 is incorrect or clinically improbable select YES. **This is an error.**

If the sequence is correct or clinically probable, select NO.

If you are unable to determine the sequence due to illegible handwriting, select ILLEGIBLE HAND WRITING. **This will be recorded as an error.**

Figure 24: Assessment question six

7 ILL-DEFINED CONDITIONS ENTERED AS UNDERLYING CAUSE OF DEATH

Ill-defined conditions should not be entered as the underlying cause of death.

If an ill-defined condition is entered as the underlying cause of death, select YES. **This is an error.**

If the underlying cause of death is not due to an ill-defined condition, select NO.

If you are unable to determine the underlying cause of death due to illegible handwriting, select ILLEGIBLE HAND WRITING. **This will be recorded as an error.**

Figure 25: Assessment question seven

If you select NO the tool will automatically take you to the next question.

If you select YES, you will then be shown the following specific questions about the reported ill-defined condition. Select all those that apply.

If the ill-defined condition is not listed, select OTHER and type the response in the additional text entry field that appears.

Figure 26: Additional questions for ill-defined conditions

8 ADDITIONAL ERRORS

In this the tool we have looked at the most commonly reported errors. But there could be other errors in the death certificates you assess.

If there are additional errors in the certificate that have not already been reported as part of questions one to seven, select YES.

If there are no additional errors, select NO.

Figure 27: Assessment question eight

8. Were there any additional errors on the death certificate?
- Yes
- No

If you select NO the tool will automatically take you to the next question.

If you select YES, you will then be shown the following specific questions about the other errors. Select all those that apply.

If the error is not listed, select OTHER and type the error in the additional text entry field that appears.

Figure 28: Additional questions for other errors

8a. If yes, select all that apply:
- For deaths due to external causes, additional details were missing
- For deaths due to neoplasms, additional details were missing
- Changes/alterations made by any means other than drawing a line through the original text (i.e. using correction fluid)
- No units specified for Age
- ☑ Other

Common errors are described below.

8.1 Deaths due to external causes

When certifying a death due to external causes the circumstance of the injury/event should be reported as the underlying cause of death.

For deaths due to injuries, the certifier should include details on:

- Site of the injury

- Intent of the injury (accidental, intentional, or undetermined)

- Nature of the injury (ie death by hanging).

For deaths due to poisonings, the certifier should include details on:

- Substance of the poison used

- Intent of the poisoning (accidental, intentional, or undetermined)

- Adverse effect in therapeutic use.

If any of the additional details (as listed above) are missing for deaths due to external causes, select this option.

8.2 Deaths due to neoplasms

When certifying a death due to neoplasms it is important to record the details of the neoplasm in as much detail as possible.

This should include:

- Site of the neoplasm (where appropriate)

- Whether benign or malignant

- Whether primary or secondary (if known), even if the primary neoplasm had been removed long before death

- Histological type (if known).

If any of the additional details (as listed above) are missing for deaths due to neoplasms, select this option

8.3 Changes and alterations to the original text

Changes and alterations to the original text should be made by drawing a line through the original text.

The use of correction fluid, or any other means that erase the original text, are not best practice. If changes or alterations have been made to the certificate by any other means than drawing a line through the original text, select this option.

8.4 Specifying units for the age

Units must be specified for the age (ie minutes, hours, days, weeks, months, years).

If units have not been specified for the age on the certificate, select this option.

SUBMITTING ENTRIES

Once you have completed data entry for questions one to eight, you need to submit the data into the online database.

If you are happy that you have filled out all of the questions, click the SUBMIT button.

If you want to go back and review the data, click the PREVIOUS button.

Figure 29: Previous and submit buttons

Once you have submitted your entry, write down the ENTRY ID as displayed in the confirmation message. This is useful for searching and editing this entry should you need to later on.

Figure 30: Location of Entry ID
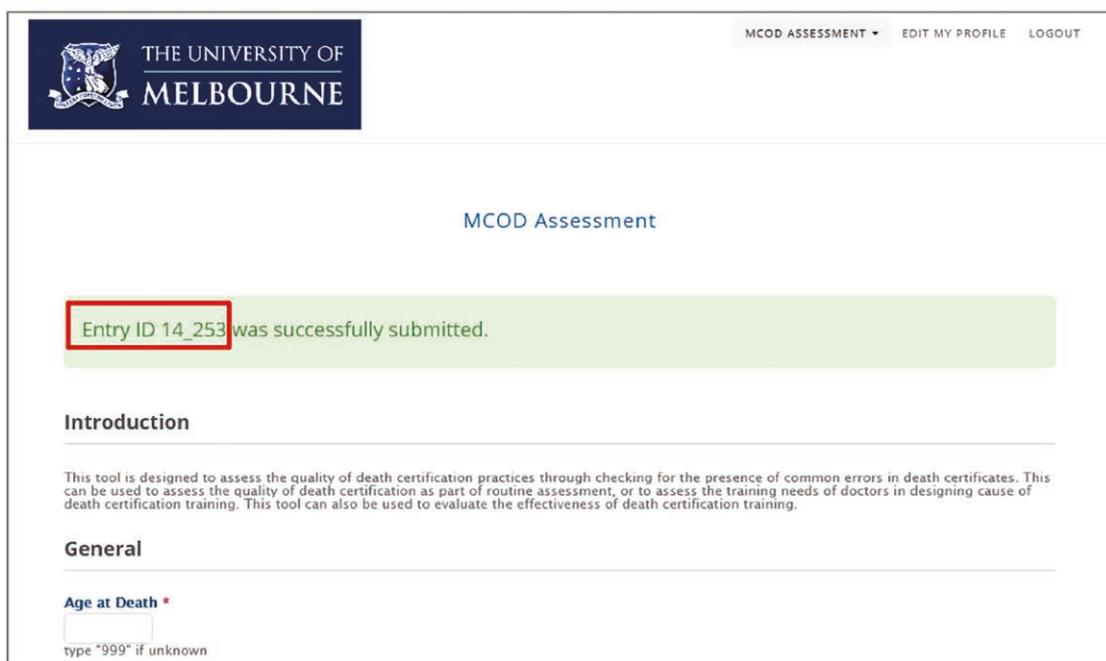
In the hard copy of the tool you will notice that you need to enter whether the certificate is correctly filled.

In this online tool we have automated this question so that you do not have to answer it manually.

If you have identified any errors in the certificate the tool will select NO (the certificate has not been correctly completed) and you will see that information in the database once exported.

SEARCHING, VIEWING AND EDITING ENTRIES

You have the ability to search, view and edit entries in the database.

This function allows you to submit incomplete data, and go back and complete at a later date; it also allows you to update any information that may have been entered incorrectly.

From the main menu page, click on MCOD ASSESSMENT.

Figure 31: Main menu page
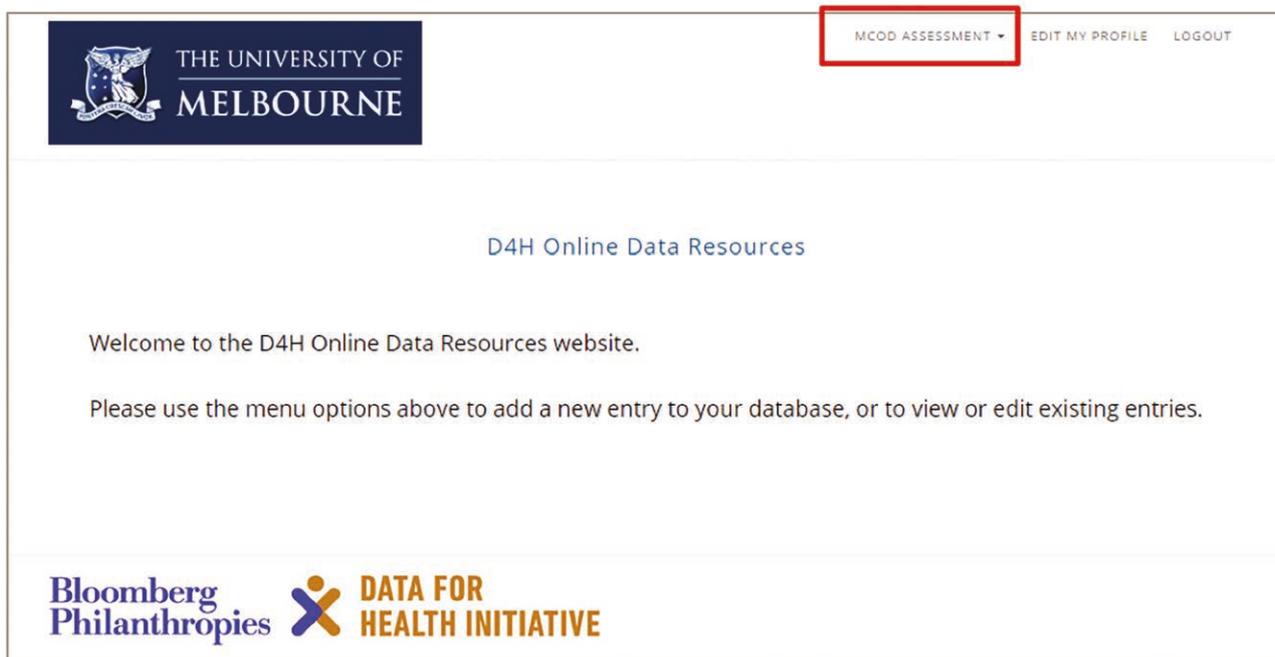
From the drop-down box that appears, select SEARCH, VIEW AND EDIT by clicking on the text.

Figure 32: Menu options under MCOD Assessment
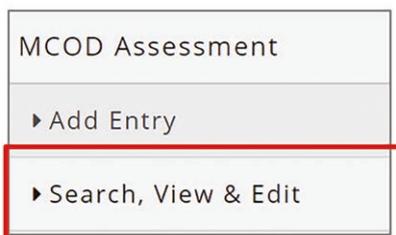
This will take you to the SEARCH, VIEW AND EDIT screen.

Figure 33: Search view and edit, main screen

You can search for entries by using any of the three following criteria:

1. Entry ID

2. Entered by (name of the person who did the data entry)

3. Hospital Name/Health Area.

When typing in the fields to search by, you may also enter only part of the information and all results containing this partial information will be returned.

The example below shows a search using Hospital Name/Health Area: 'national' and the three entries returned.

Figure 34: Search view and edit, screen showing search criteria

You are only able to EDIT those entries that you have entered.

Figure 35: Search, view and edit screen with edit and delete options

To delete an entry, click on the DELETE button. A text-box prompt will appear, asking if you want to delete. Select OK to delete, or CANCEL to go back to the search, view and edit screen.

Figure 36: Pop-up box to confirm deletion of entry
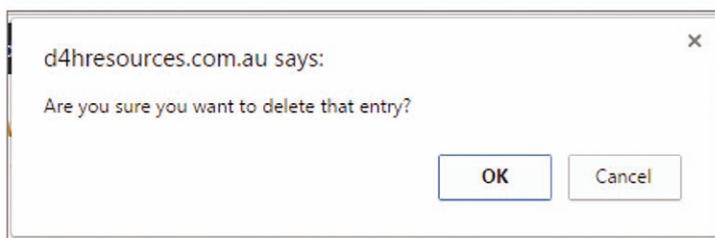
To edit an entry, click on the EDIT button.

This will take you back to the MCOD Assessment Tool, data entry screen one, where you can update any incorrect details, or complete incomplete entries.[4]

Once you have finished making your edits, you will need to click on the SUBMIT button to re-submit the updated data.

4   Note that any changes to the data will be recorded in the database

How To Analyse The Data Using Pivot Tables

The database will be exported as an Excel file and you can either analyse manually or use any software program you are familiar with to analyse the data.

One easy way to analyse the data is through using the Pivot Table function in Excel. This is a normal Excel function and not a specific program linked to the online assessment tool.

INSERTING PIVOT TABLE

To create a pivot table:

■ Highlight only the data area of the Worksheet you want to include in the pivot table

■ Go to **Insert > PivotTable**

■ Check that the range of cells is correct (Figure 38) and that New Worksheet is selected, and click OK.

Figure 37: Inserting a pivot table
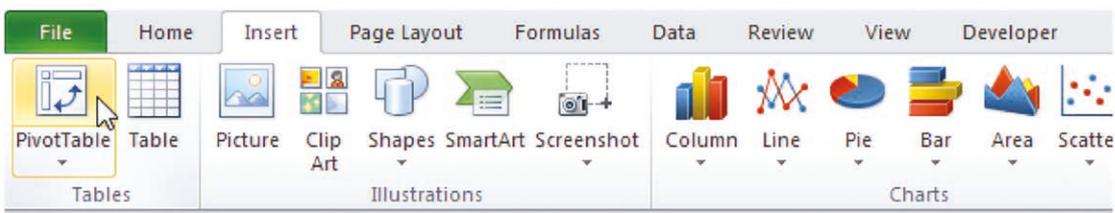
Figure 38: Dialog box to confirm data selection
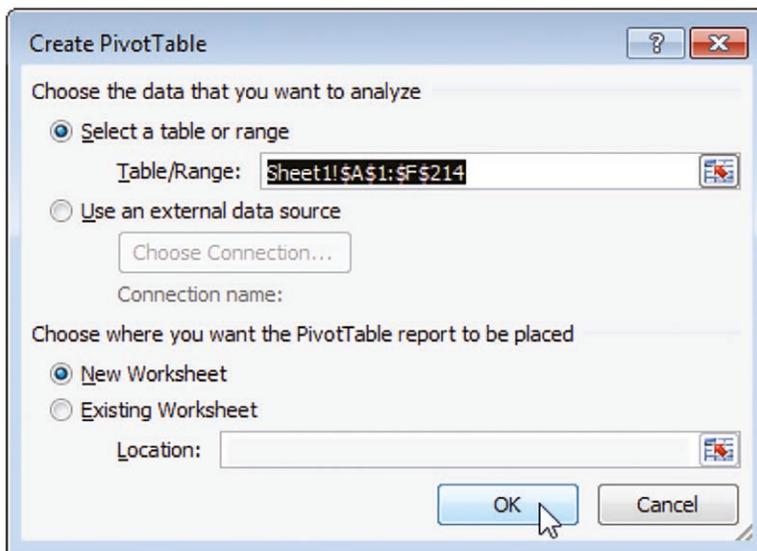
Excel will automatically open a new Worksheet which will look like this:

Figure 39: Blank pivot table worksheet
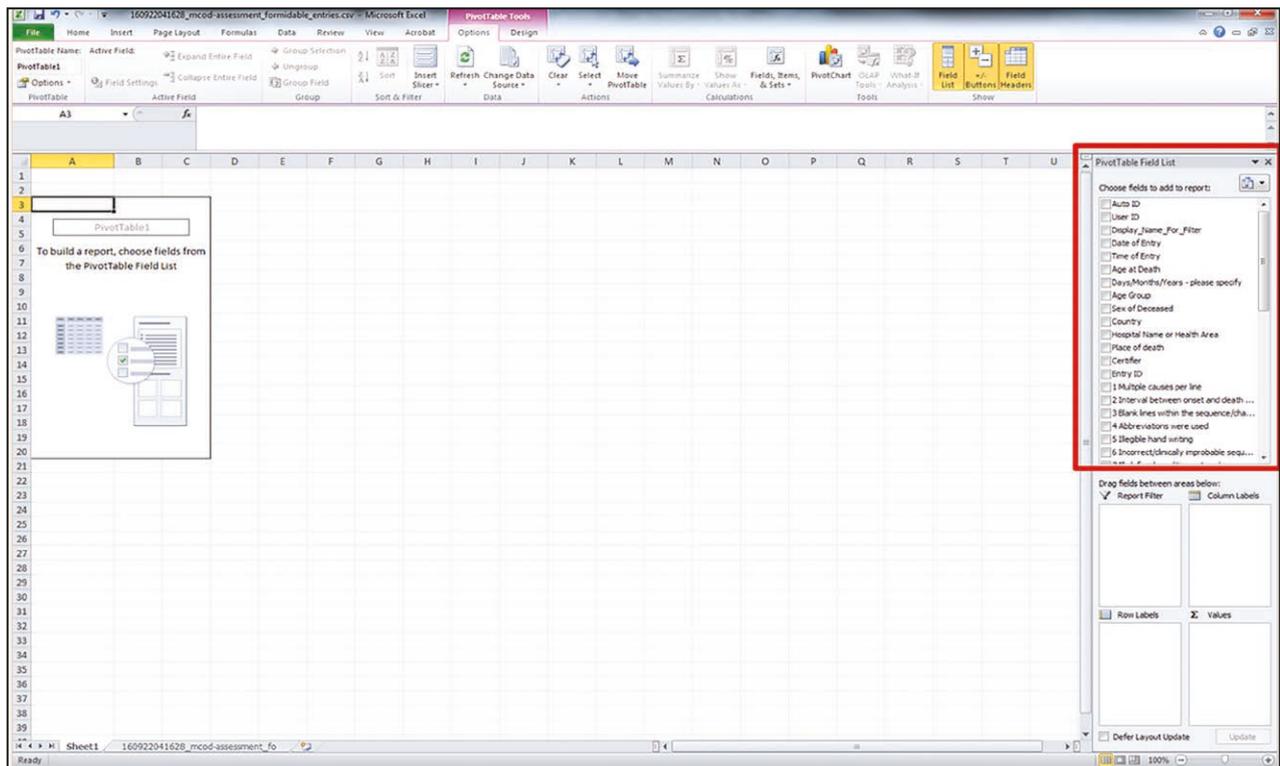
Notice that on the right hand side there is a box called **PivotTable Field List**. This contains all of the column headings from the original data sheet.

The very first thing to do is to 'drag' AUTO ID into the VALUES box (bottom right-hand corner).

If the text in the VALUES box reads 'Sum of Auto ID', we need to change this to read 'Count of Auto ID'.

Click on the down arrow next to 'Sum of Auto ID'.

Figure 40: Changing value field settings
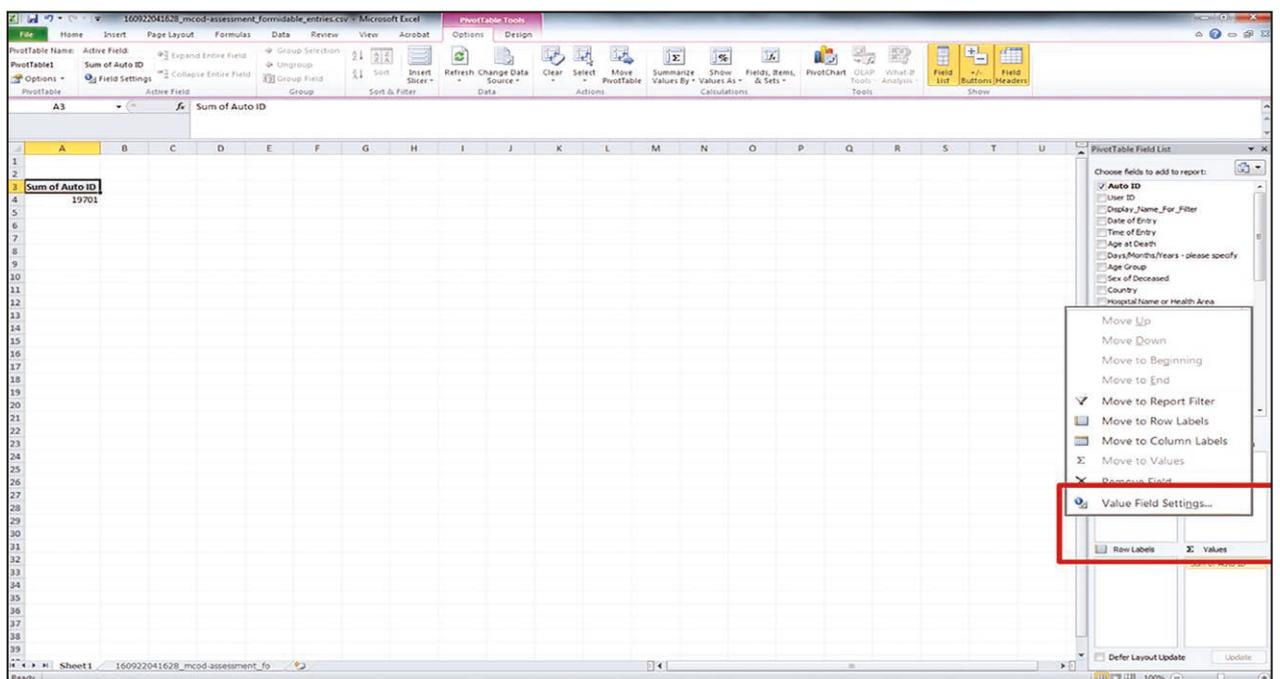
Select 'Value Field Setting'.

On the 'Summarise value field by' tab, change it to 'Count' and click OK.

Figure 41: Changing value field settings
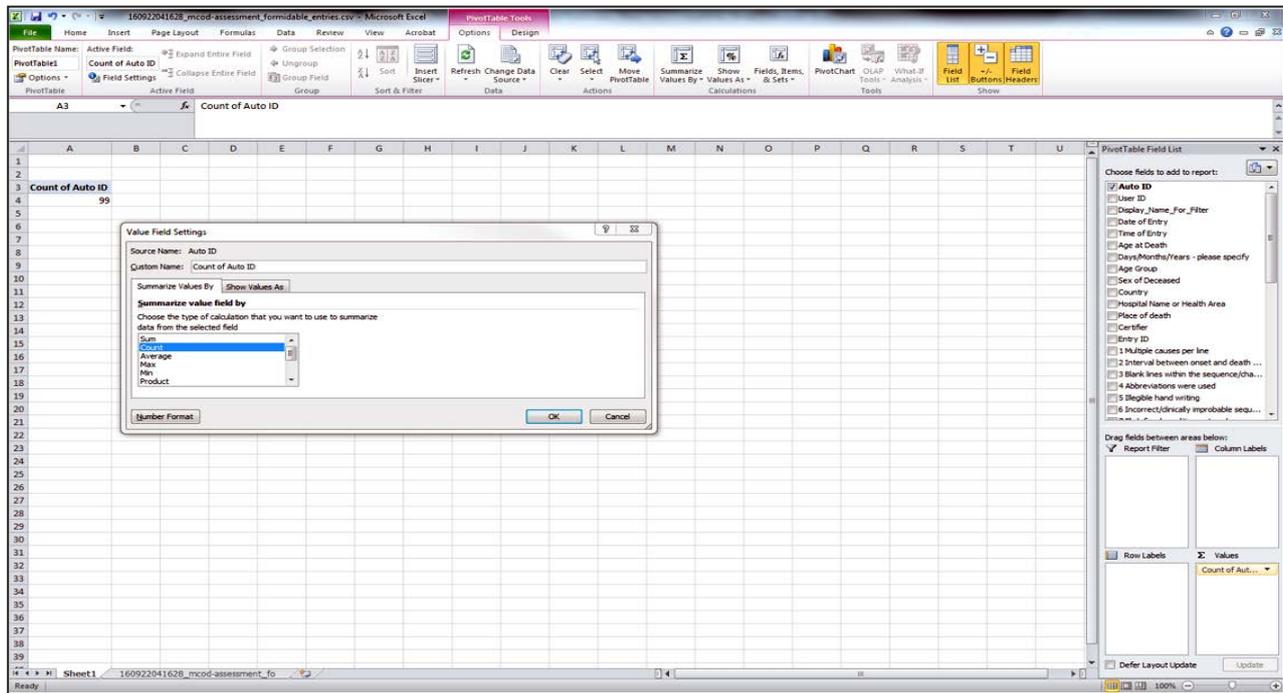
You should now see 'Count of Auto ID' in the main Worksheet, and this should match the number of entries you have entered, and/or expect to see in the database.

Now you can drag and drop any error label to a row or column box to calculate the errors.

ANALYSING USING PIVOT TABLES

Once you have the basic structure established Pivot Tables can be used to very quickly summarise your data for you. To work out how many certificates in my sample had multiple causes entered per line:

- Click on '1 Multiple causes per line' in the Pivot Table Field List

- While still holding the mouse-button down, drag the text to the 'Row Labels' box.

This will produce the following table:

Figure 42: Example of analysis for multiple causes per line
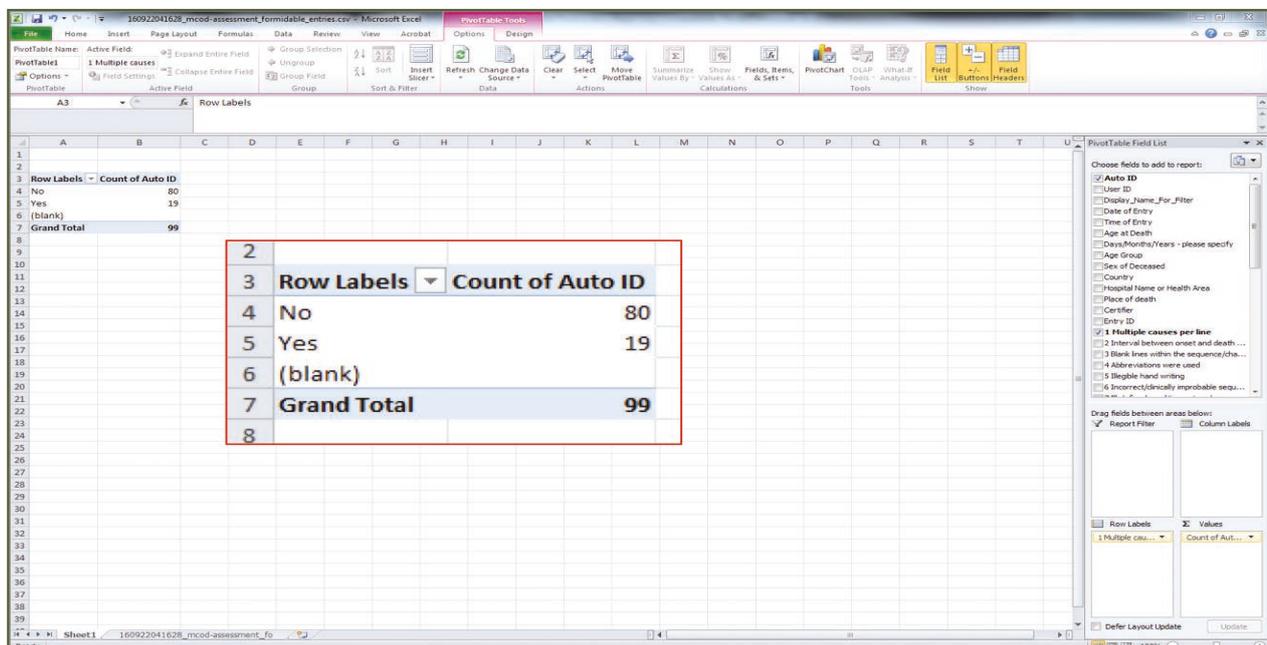
From this, we can see that 19 certificates had multiple causes per line ('Yes'), while 80 certificates did not have multiple causes per line.

When you want to look at another error (or variable), you can drag the original text back up the Pivot Table Field List. Or you can click on the down arrow next to the text and select 'Remove Field'.

You can easily analyse a number of different variables at the same time. In the example below, we can see that, of the deaths recorded from Sri Lanka, 10 had multiple causes per line, while four did not. All 14 certificates were certified by a hospital doctor.

Figure 43: Example of analysis using many variables
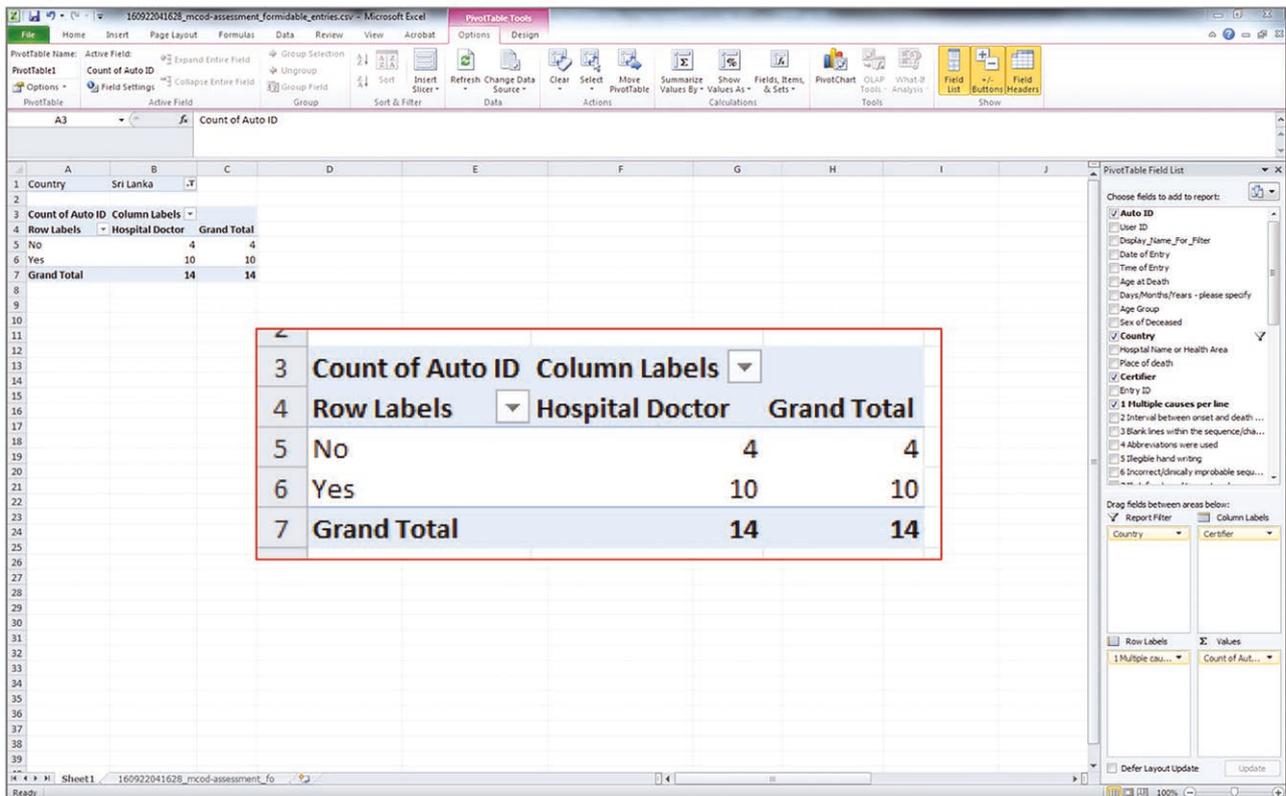
It is important to note that Pivot Tables are 'living' tables and will change each time you change what is in the Pivot Table Field List. If you want to save any of the data, copy and paste the table into a new Worksheet in Excel, or into a Word Document.

Technical Notes For Master Trainers

HOW TO CREATE USERS

There are two main users for the online assessment tool:

1. **Contributors**. Able to add new entries; search all entries; and edit/delete their entries only

2. **Editors**. Same rights as Contributors, but also have the ability to edit/delete any entry, export entries to .csv and create new 'Contributor' users.

To create a new user as a Contributor,[5] click on USER ADMINISTRATION and click on REGISTER NEW USER.

Figure 44: Register new user menu
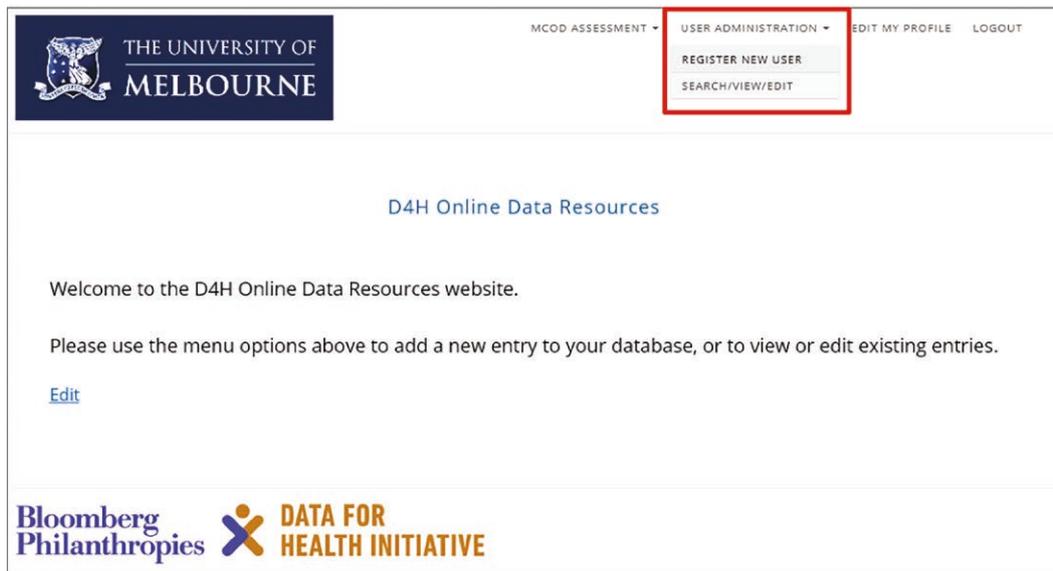
You will be taken to the Register New User page which contains the fields to be completed in order to register the new user.

Figure 45: Register new user page
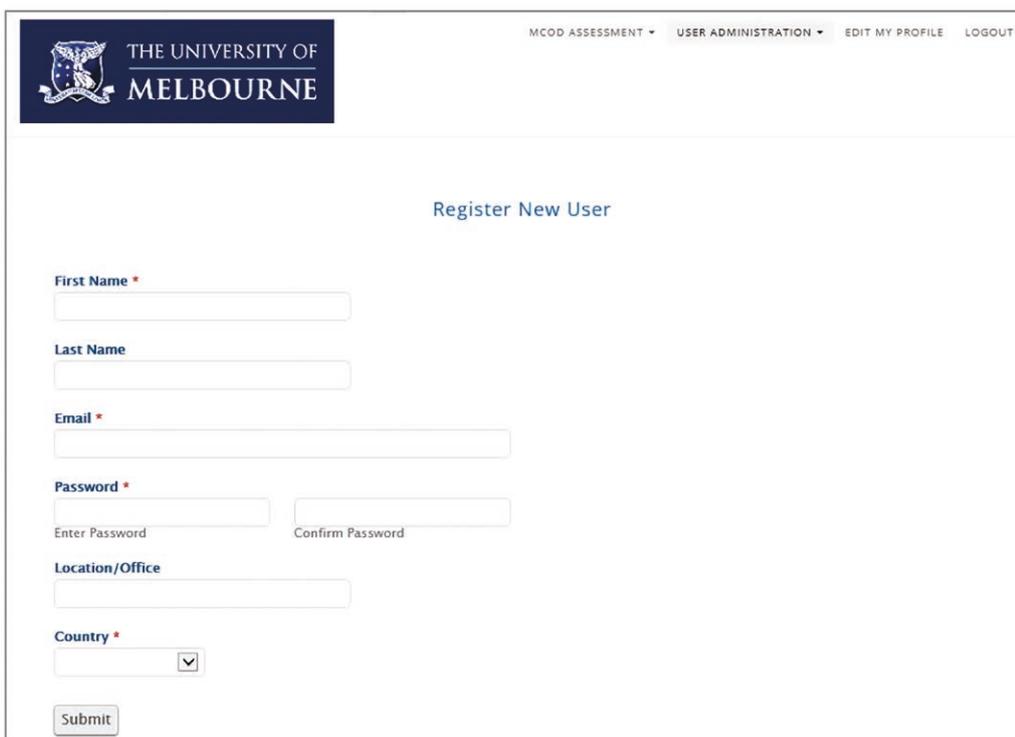
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5   Contributor is the default user type that can be created. To have a new user created at Editor Level, please follow the steps to create a new user, then email CRVS-info@unimelb.edu.au with a request to have this user elevated to Editor Level. Once elevated, this user will be able to create/manage users as well as export data and will be considered a Master Trainer

The following fields are **mandatory** and must be completed:

1. First Name – Enter the new user's First Name

2. Email – Enter the new user's email address (this will also be used to login once created)

3. Password – Enter the new user's Password, and confirm this in the Confirm Password field

4. Country – This field must be populated with the country that they will be entering data for. Note that this field will also determine which country's data will show when they log in and go to the Search, View & Edit section of the tool.

The following fields are optional but should be filled if this information is known:

1. Last Name – Enter the new user's last name

2. Location/Office – This could be the Hospital/Health Area they work in or the office location etc.

Once the fields have been populated and you are ready to create the user, click on SUBMIT at the bottom of the form.

Figure 46: Register new user form completed

A confirmation message will then appear to show you that the user was created successfully.

Figure 47: Register new user successful

HOW TO SEARCH/VIEW/EDIT AND DELETE USERS

In the same way that you can search, view and edit MCOD Assessment entries, you (as a Master Trainer/Editor) can search, view and edit Users that you have created, as well as delete Users.

To view all User Entries, click on USER ADMINISTRATION and click on SEARCH/VIEW/EDIT.

Figure 48: Search/View/Edit User administration menu item
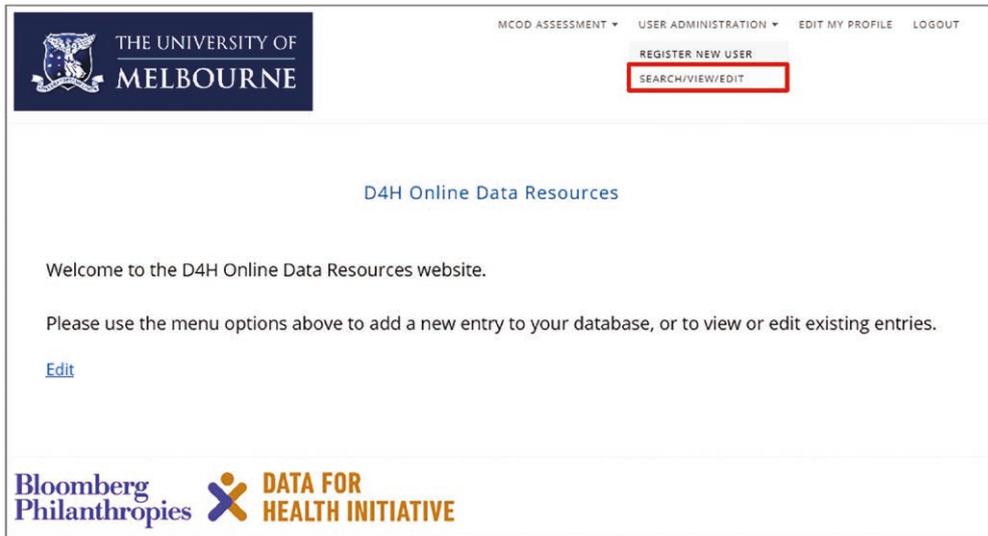
You will be taken to the Search, View and Edit page which will allow you to search for users using the fields provided. A list of all users, with the same country setting as your own account, will also appear below the search fields for quick access to edit or delete a user.

Figure 49: Search/View/Edit user administration screen
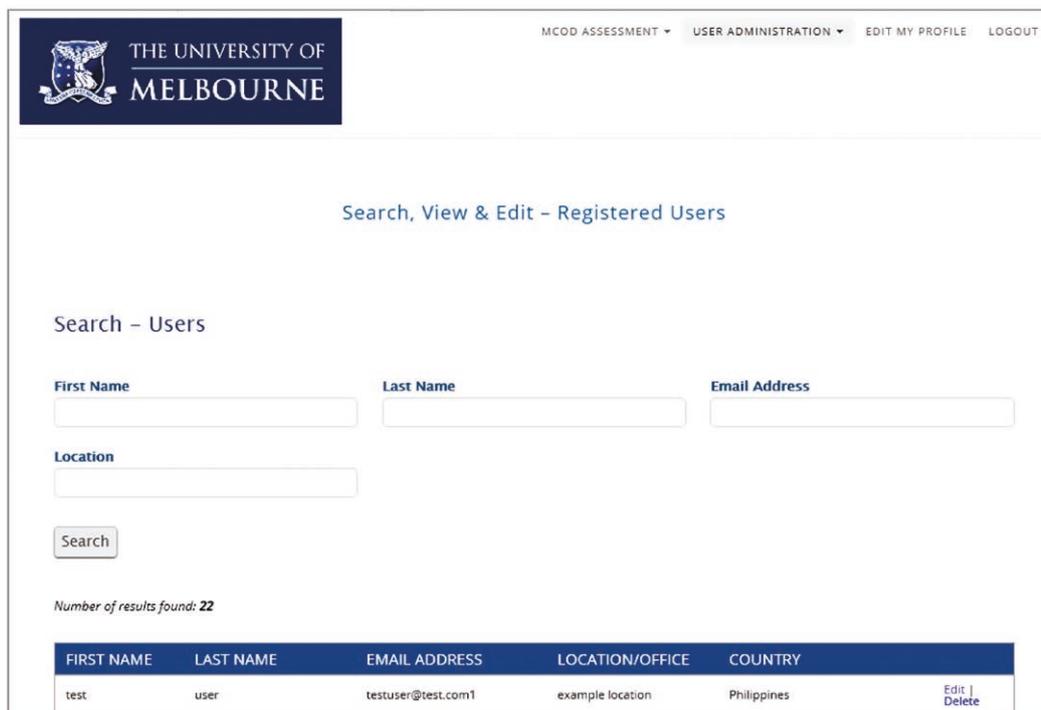
Note: You will able to see and access ALL users created with the same country setting as you and therefore extreme care should be taken if editing or deleting a user.

To delete a user, click on the DELETE link in the same row as the user you wish to delete. A prompt will appear to confirm deletion, click OK.

Figure 50: Delete user confirmation message
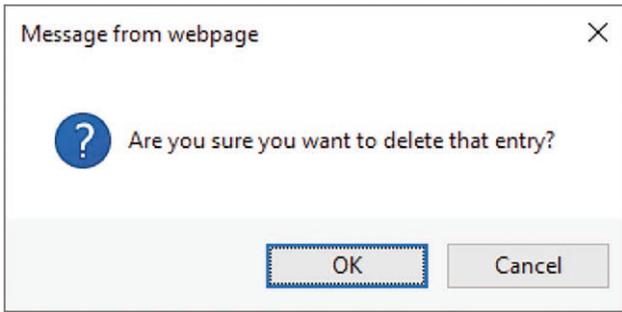
To edit a user, which will allow you to update or change a user's name, email, password, location or country information, click on the EDIT link in the same row as the user you wish to make changes to.

This will take you to the Register New User form, but with all of the existing information populated for the user being edited. Simply change any of the information in the fields and click UPDATE to save to the database.

Figure 51: Edit user screen

A confirmation message will let you know that the changes were made successfully.

Figure 52: Edit user confirmation

USER PROFILES

Because this online tool has been designed for use with multiple countries, many of the pages have been limited to only show the database entries for the country that is specified in a user's profile. This limitation applies to the search/view/edit areas of the tool (MCOD Assessment and User Administration), and also the export function which is available to Editor level users only.

If you, or one of your trainees, are not able to see the correct data when using any of these screens, confirm that the Country information is set correctly in your user profile.

To do this for yourself or to assist other users who are logged in, click on the EDIT MY PROFILE menu option at the top of the screen and confirm that the COUNTRY dropdown box is populated with the name of the country whose data you wish to view or export.

Figure 53: Edit profile – check country information

To check this on behalf of a user, simply use the SEARCH/VIEW/EDIT menu option under USER ADMINISTRATION, confirming that the country dropdown is correctly set. Make any changes required and click on UPDATE. The user can then refresh their page and the data should be shown as expected.

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.

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