

CRUK-DSS: Documentation

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Abstract

This document provides guidance on how to install the CRUK-DSS module and configure it for launch from within SystmOne. It also explains in details the various functionalities of the CRUK-DSS module.

Please note the main purpose of the DSS studies is to help develop a diagnostic decision support system (DSS) for use in general practice. We do not yet have the validation and approval to use this outside research, therefore, the DSS prototype should not be used as a diagnosis prompt at this stage.

Chapter 1

Installation

This documentation assumes you already have the SystmOne software installed and configured. If that is not the case, you should install SystmOne first, following the instructions in <https://tpp-uk.com/resources/>. Configuring the DSS for use with SystmOne requires the use of the Setup/Users&Policy/Program&Maintenance menu in SystmOne to create a link to an external program as well as the configuration of the SystmOne toolbar. So please ensure that the user who is logged into SystmOne and is performing the DSS configuration steps has the **right permissions and access rights** to use the Setup/Users&Policy/Program&Maintenance menu and configure the SystmOne toolbar.

This documentation also assumes that your computer has OpenGL 2.0 (or above) available. If this is not the case, please update your graphics card drivers prior to installing and using the CRUK-DSS module. The following page shows how to check which version of OpenGL is supported by your computer: <https://support.pix4d.com/hc/en-us/articles/203876689-How-to-verify-the-supported-OpenGL-versions-of-the-graphics-card>. If you need to perform drivers updates and your drivers are Intel drivers, you could use the Intel Driver & Support Assistant (<https://www.intel.com/content/www/us/en/support/detect.html>) to do your driver updates. Also, make sure you are able to uncompress zip archives. You can either use Windows's inbuilt facility for that or download a software like 7-zip to unzip archives.

1.1 Installing the DSS

You first need to download the software that corresponds to the study you are taking part in. To that purpose, please go to this page: <https://www.kcl.ac.uk/lsm/research/divisions/hscr/research/groups/mdmi>. You can see a screenshot of the page in Figure 1.1.

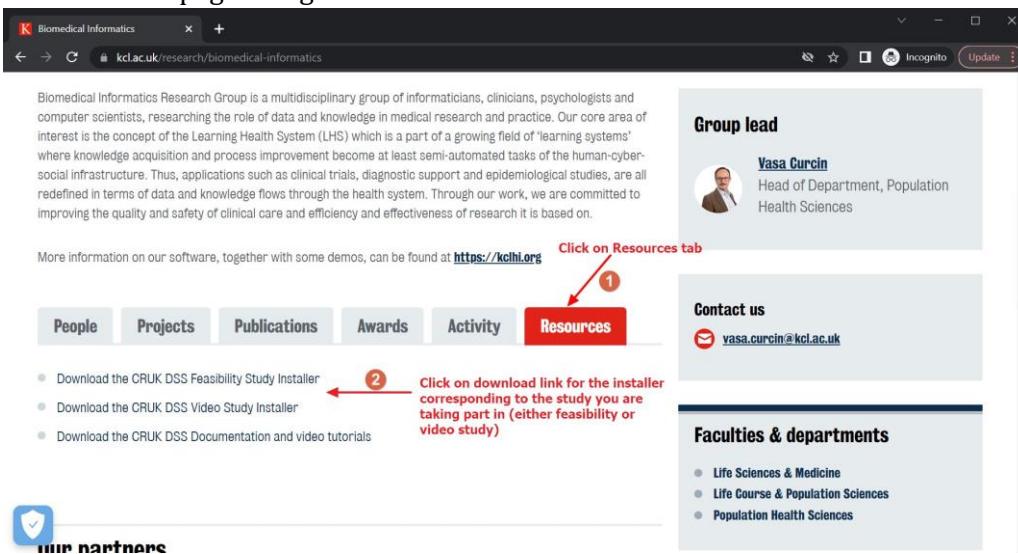


Figure 1.1: Screenshot of the webpage where you can download the CRUK DSS installers

Once on the webpage just mentioned, first click on the Resources tab (as shown in Figure 1.1), then depending on which study you are taking part in, download the zip archive corresponding to your study:

- for the feasibility study, download the archive by clicking on the Download the CRUK DSS Feasibility study installer link below the Resources tab (See the screenshot in Figure 1.1). You will be redirected to the following page:

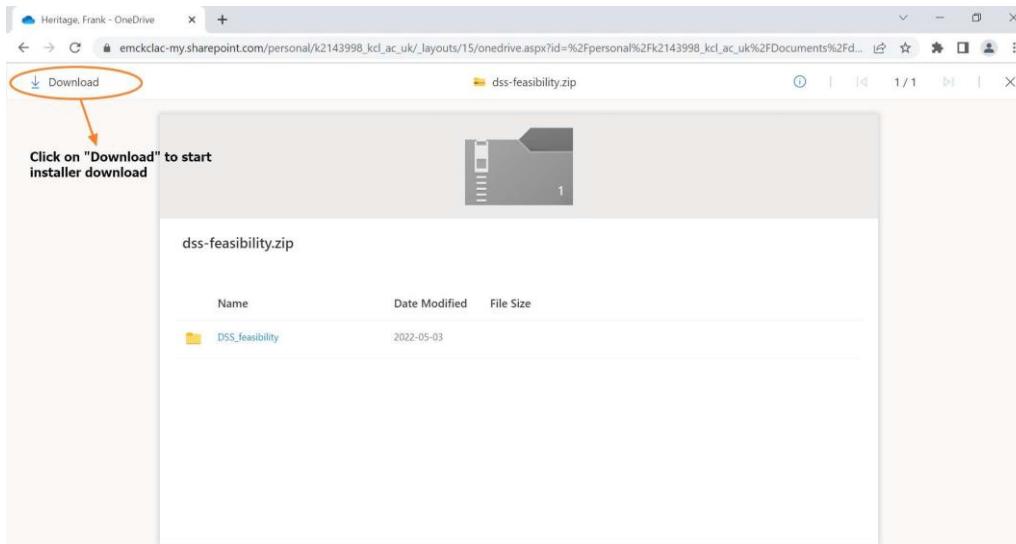


Figure 1.2: Screenshot of feasibility study installer download page

If you click on the “Download” link at the top left of the page (see Figure 1.2), you should get a `dss-feasibility.zip` archive.

- for the video study, download the archive by clicking on the Download the CRUK DSS Video study installer link below the Resources tab (See the screenshot in Figure 1.1). You will be redirected to the following page:

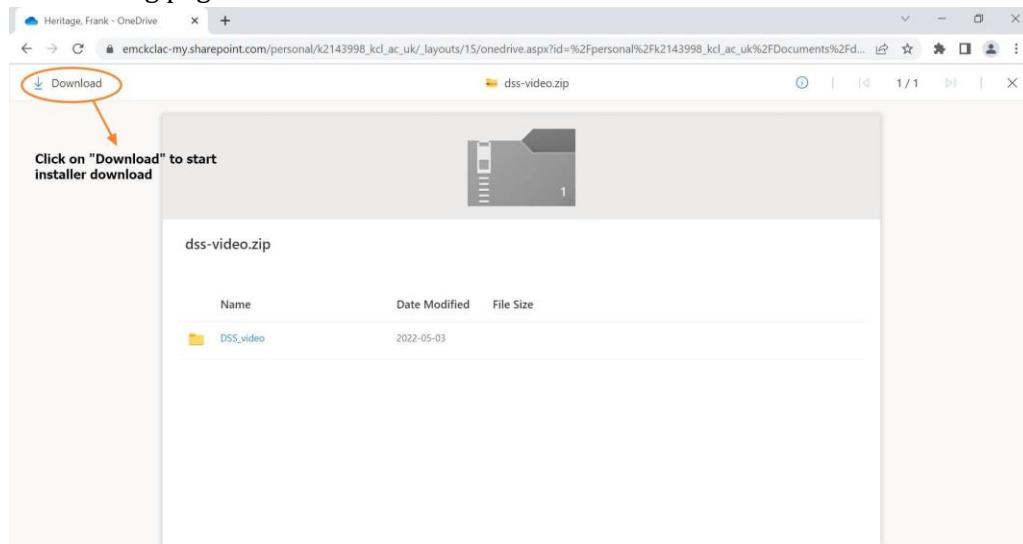


Figure 1.3: Screenshot of video study installer download page

If you click on the “Download” link at the top left of the page (see Figure 1.3), you should get a `dss-video.zip` archive.

The installation process being identical for both studies, we will only show the process for one archive (e.g the feasibility study archive). If you participate in both studies, you only need to follow the steps 1 to 4 below for each archive downloaded (i.e once for `dss-feasibility.zip` and once for `dss-video.zip`).

1. *Step 1:* Go to the directory in which you have downloaded the zip archive of the software you want to install (e.g `dss-feasibility.zip` for the feasibility study or `dss-video.zip` for the video study).

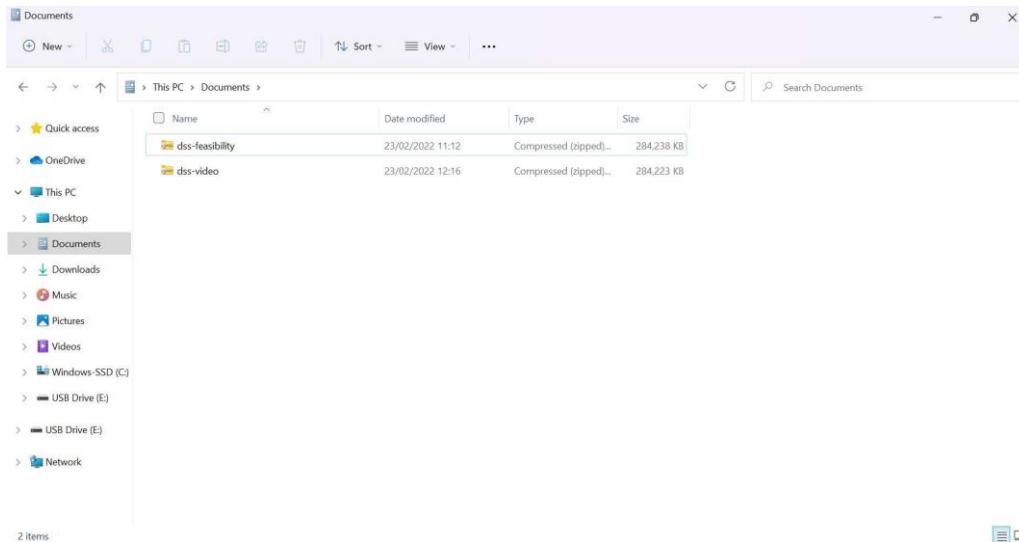
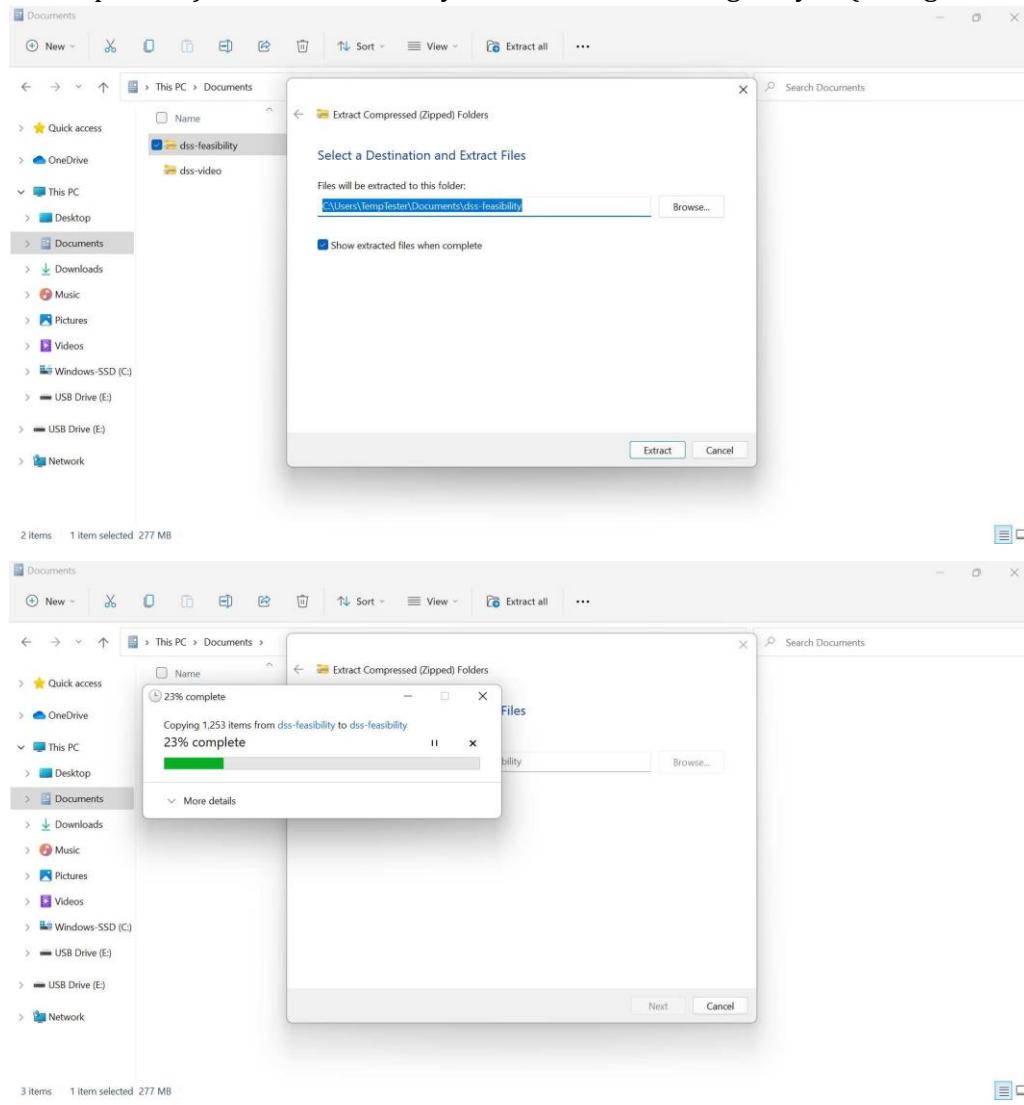


Figure 1.4: Example screenshot of directory where both DSS installer archives have been downloaded

2. *Step 2:* Unzip the zip archive of the software you want to install (e.g `dss-feasibility.zip` for the feasibility study or `dss-video.zip` for the video study). If using the Windows uncompressing facility, use the “Extract here” or “Extract All” option and default parameters proposed.

You should have a new directory (either `dss-feasibility` or `dss-video` depending on the archive you uncompressed) inside the directory the archives were originally in (see figure at the bottom of Figure 1.5 below).



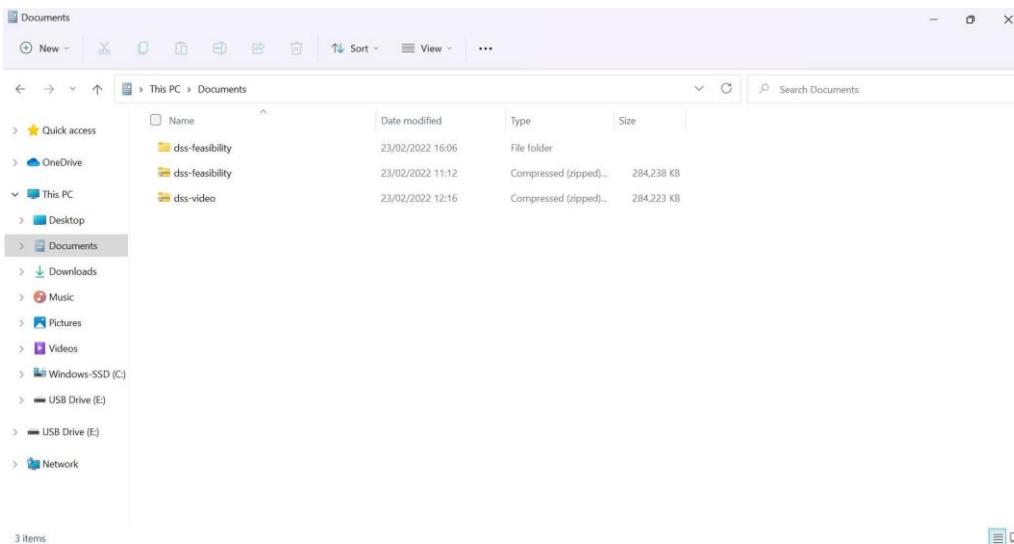
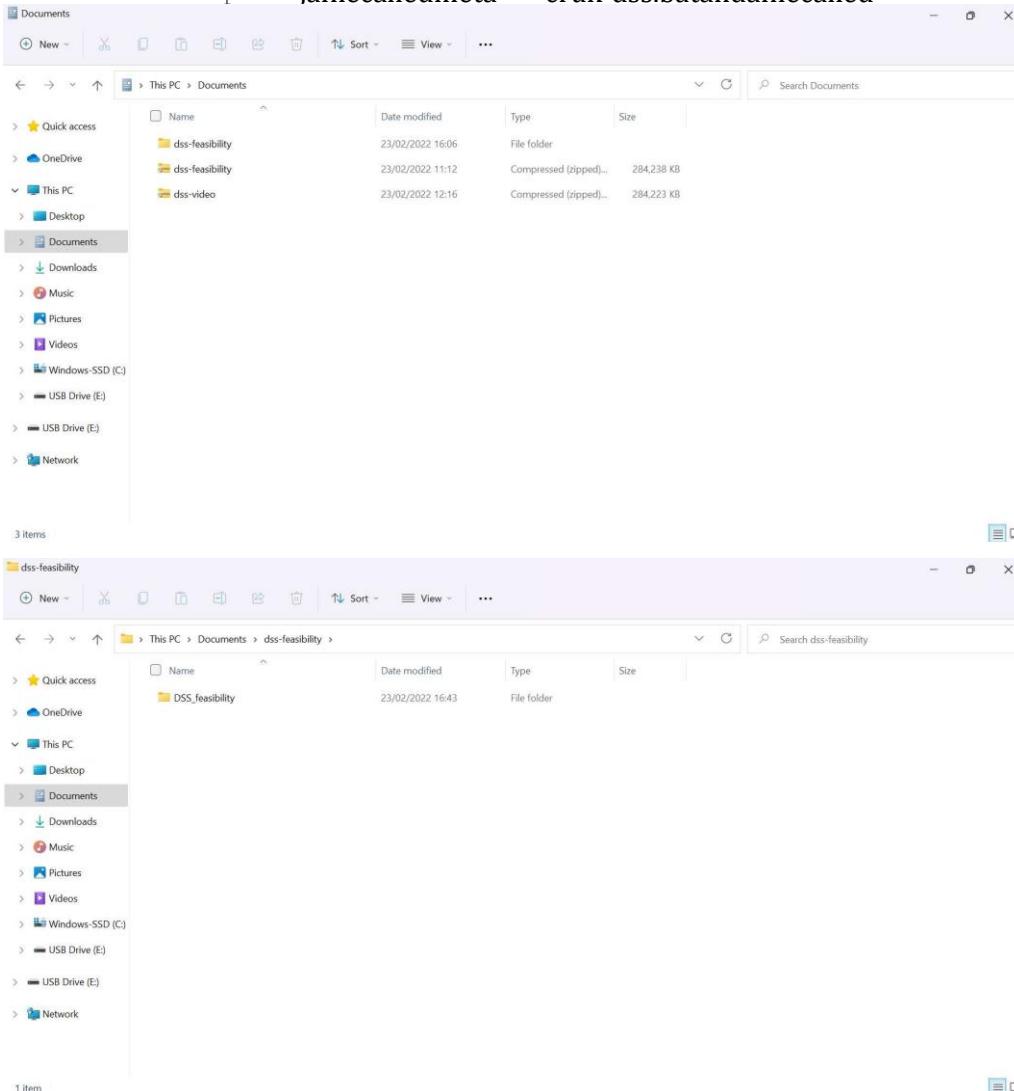


Figure 1.5: Uncompressing the archive of the feasibility study installer (`dss-feasibility.zip`) in the download repository

3. *Step 3:* Double-click on this new directory (i.e `dss-feasibility` or `dss-video` depending on the archive you uncompressed). Inside the new directory `dss-feasibility` or `dss-video` depending on the archive you uncompressed), is another directory with a similar name (i.e `DSS feasibility` or `DSS video` depending on the archive you uncompressed).

Once again, double-click on this directory (i.e `DSS feasibility` or `DSS video` depending on the archive you uncompressed). You should now see four elements in the folder: a folder called `dss`, a file called `first-time setup.bat`, a file called `meta`, cruk `dss.bat` and a file called `setIniField.exe`.



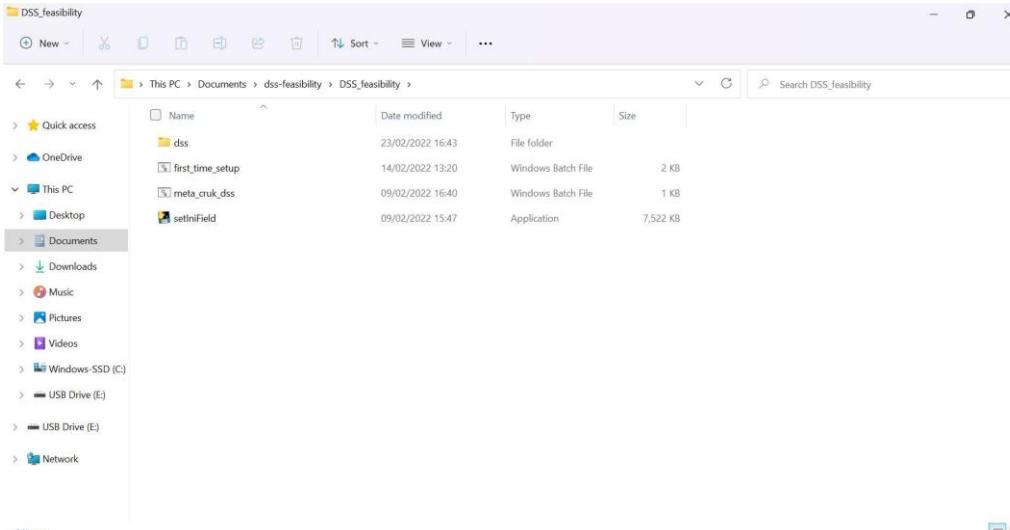


Figure 1.6: Navigating the folder obtained from uncompressing the feasibility study installer archive (`dss-feasibility.zip`) in the download repository

4. *Step 4:* Double-click on the `first_time_setup.bat` file. You should see a screen similar to the screen in Figure 1.7. Wait until the black command line window closes on its own. You are now ready to move to the configuration steps in SystmOne (see Section 1.2) or alternatively, to the creation of DSS launch shortcuts (see Section 1.3).

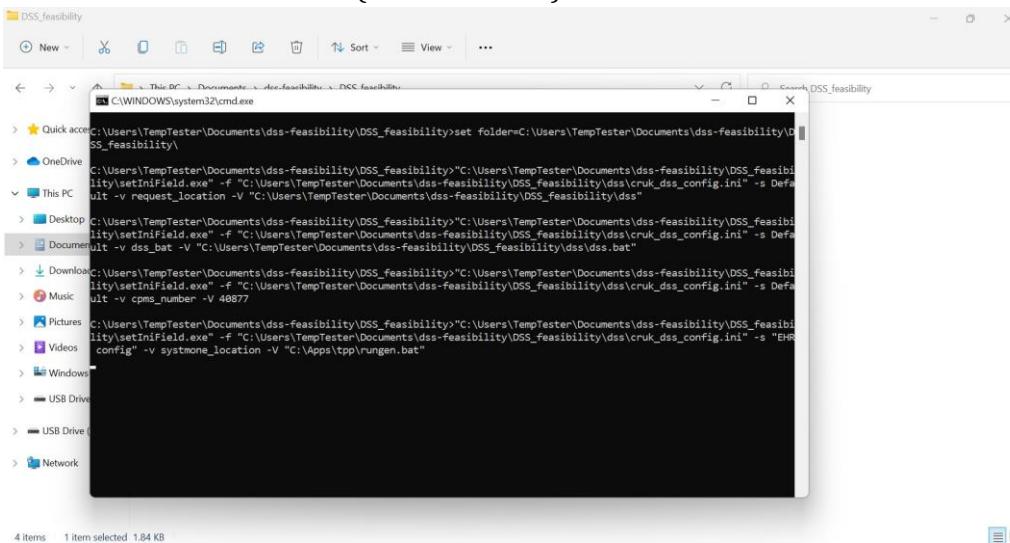


Figure 1.7: Screen during the execution of the `first_time_setup.bat` script

1.2 Configuration steps on SystmOne

Once you have completed the steps from Section 1.1, please start SystmOne and log into it with your user account to finish setting up the DSS for use with SystmOne. Make sure your user account has the right permissions to use **Setup/Users & Policy/URL & Program Maintenance** menu to create a link to an external program as well as permissions to configure the SystmOne toolbar. If not, please ask a SystmOne administrator to give you those permissions to proceed with the instructions in this section.

1. *Step 1:* Once logged into SystmOne, go the **Setup** menu. Select the **Users & Policy** option in the menu, then the **URL & Program Maintenance** option from the menu. See screenshot below.

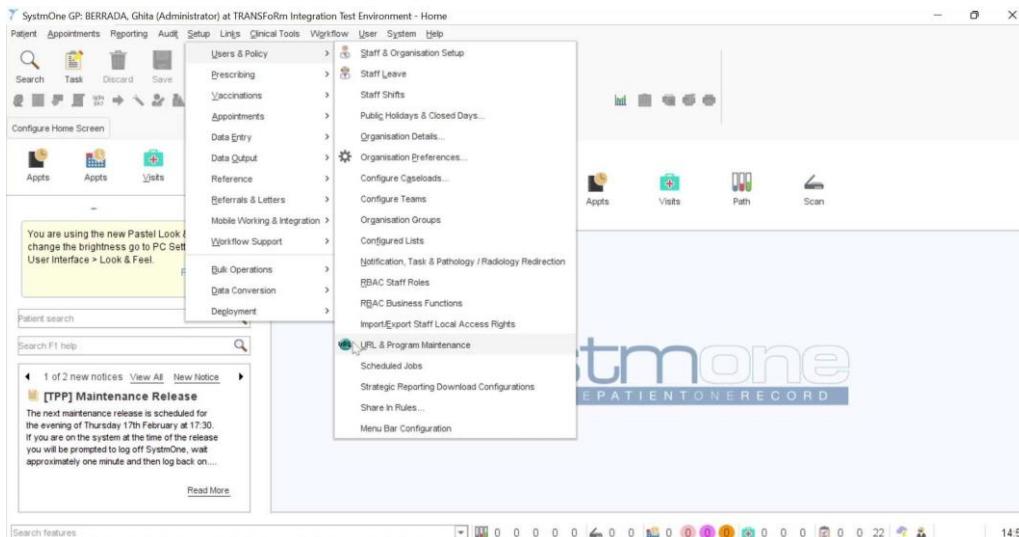


Figure 1.8: SystmOne screen when selecting the menu to create a program link

2. Step 2: In the screen that appears, press the **New URL** button in the toolbar as shown in Figure 1.9.

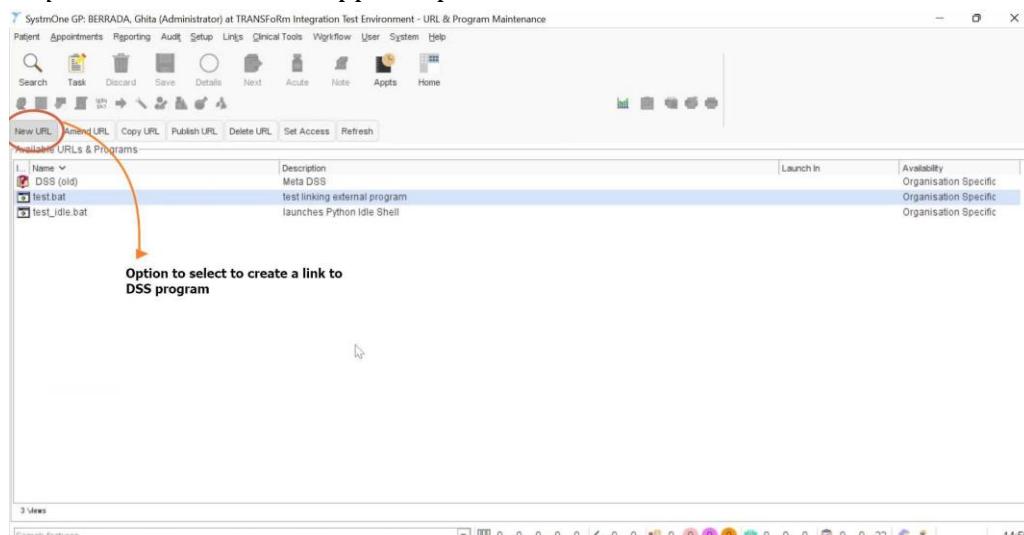


Figure 1.9: Screenshot that shows SystmOne screen after selection of the correct option from **Setup** menu as well as highlights the button to press (**New URL**) to proceed to the next step You should see the following popup appear:

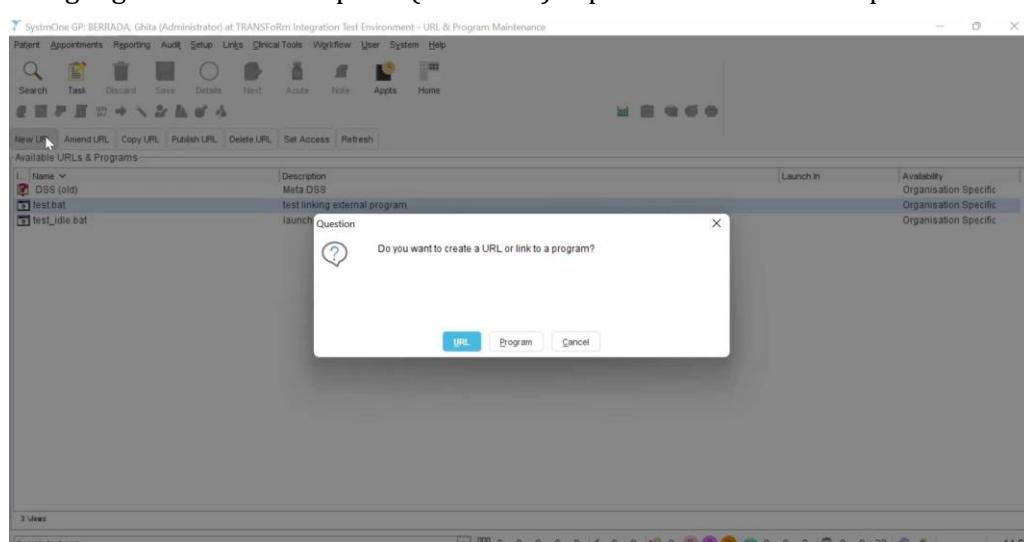


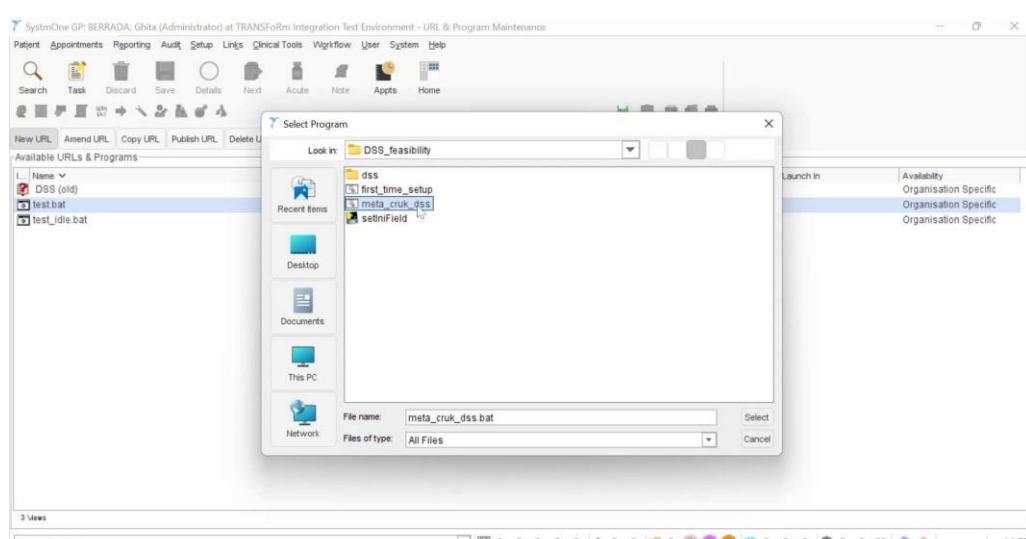
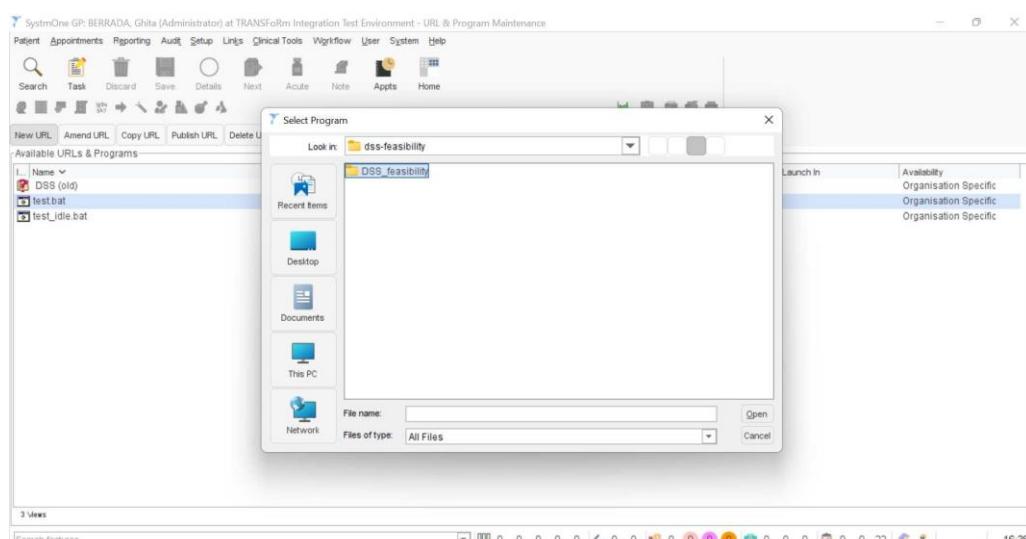
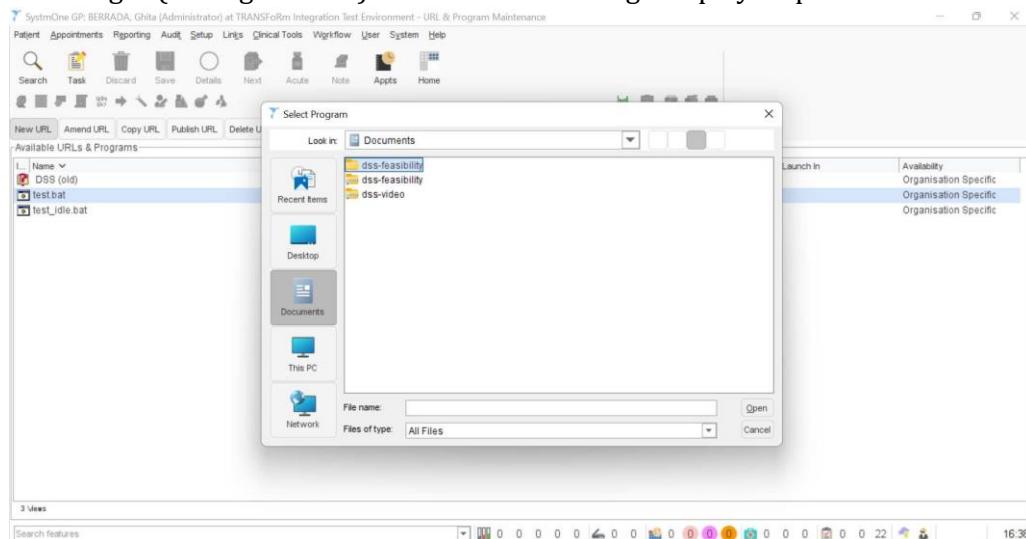
Figure 1.10: Popup that appears after pressing the (**New URL**) button in the SystmOne toolbar

Press the **Program** button in the popup to continue.

3. Step 3: In the next screen, go to the location of the folder obtained as a result of uncompressing the software archive from Section 1.1 (i.e either dss-feasibility or dss-video).

Open that folder, then open the folder inside (either DSS feasibility or DSS video depending on the archive uncompressed in Section 1.1) then select the meta_cruk_dss.bat that should normally be inside. Then press the button Select.

The images (see Figure 1.11) below detail this stage step by step.



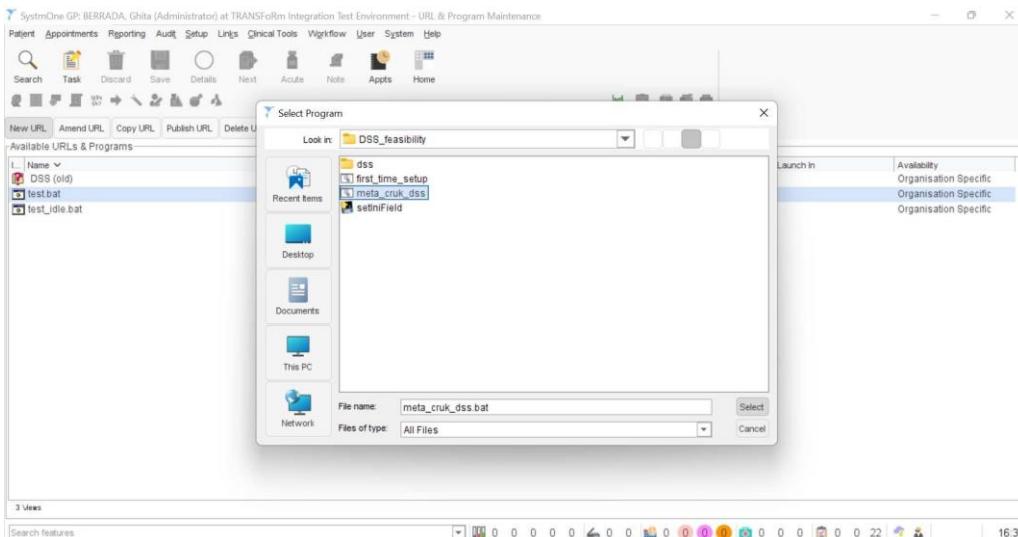


Figure 1.11: Linking the DSS script/program to SystmOne

4. *Step 4:* In the next screen, fill in the name field with an expressive name (e.g CRUK DSS (feasibility study) for the feasibility study software or CRUK DSS (video study) for the video study software), choose an icon you like and fill in the description field with an expressive and easily recognizable descriptor (e.g Launches CRUK DSS (feasibility study) for the feasibility study software or Launches CRUK DSS (video study) for the video study software). See Figure 1.12 for reference.

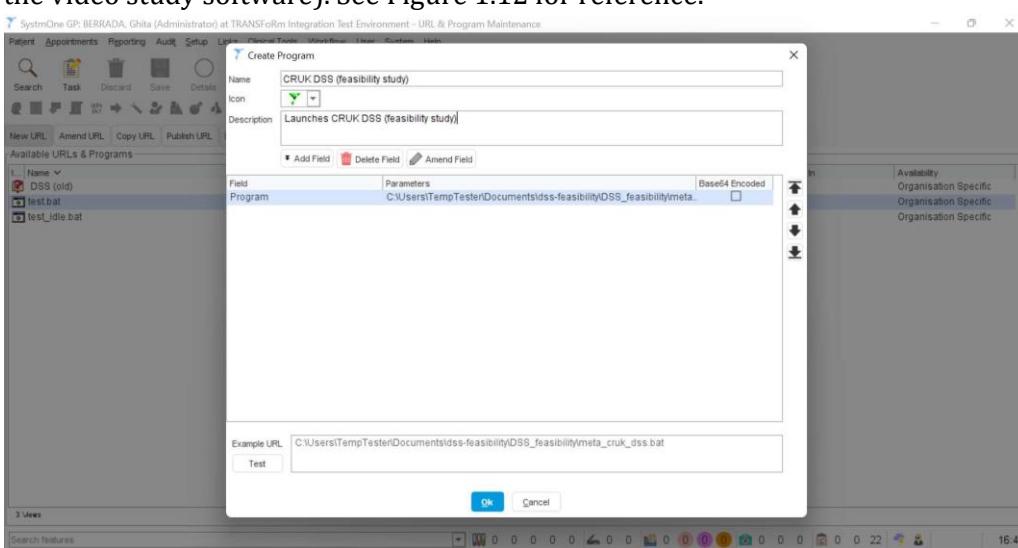


Figure 1.12: Filling in the details of the DSS script/program to be linked to SystmOne

When you're done, press the **OK** button. The program you've just created should appear under the list of available URLs and Programs in SystmOne as shown in Figure 1.13.

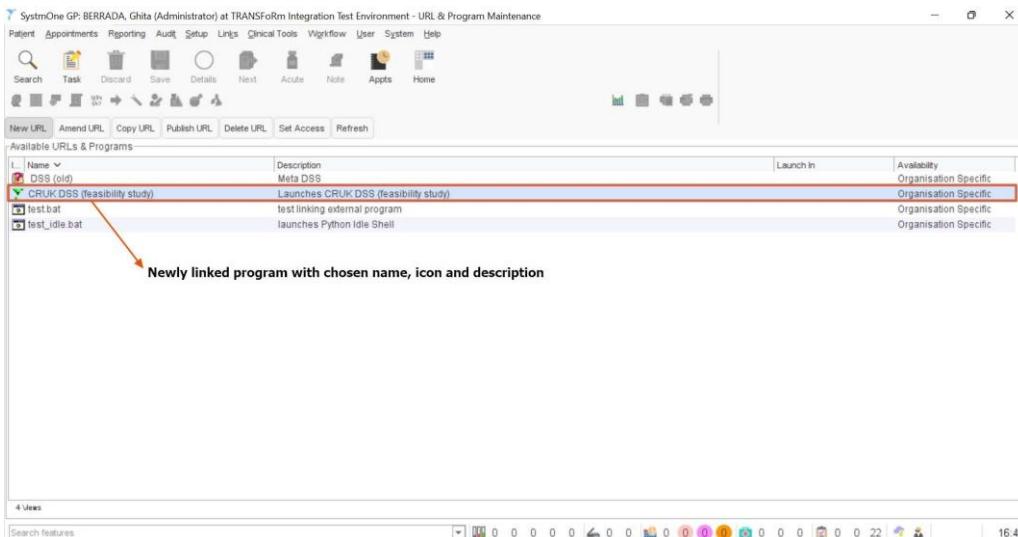


Figure 1.13: Filling in the details of the DSS script/program to be linked to SystmOne

We'll now move to adding a button on the SystmOne toolbar to allow us to launch the DSS directly from SystmOne.

- Step 5: Go to an empty space on the SystmOne toolbar and right-click with the mouse. You should see a menu appear as shown in Figure 1.14.

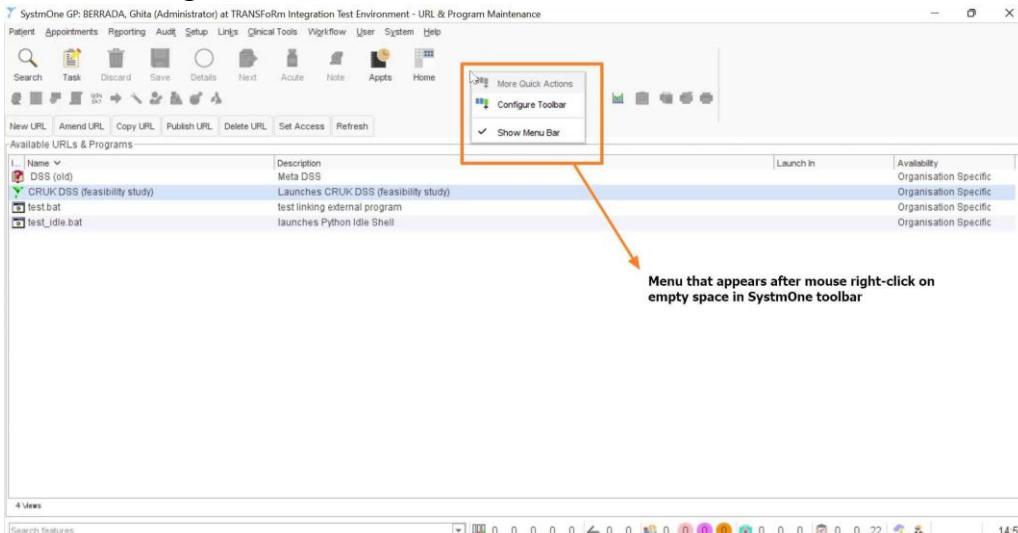


Figure 1.14: Menu that appears after mouse right-click on SystmOne toolbar

In the previous menu, select the Configure Toolbar option. A confirmation popup as in Figure 1.15 will appear. Select Yes to continue.

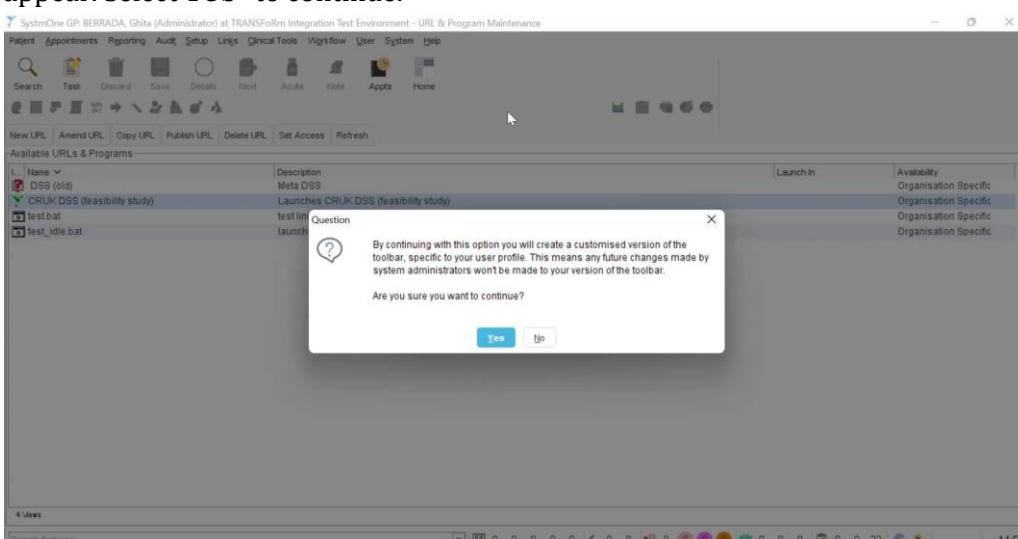


Figure 1.15: Popup that appears after selecting the Configure Toolbar option

6. Step 6: In the menu that appears next, select the New Button Set option (see Figure 1.16 below).

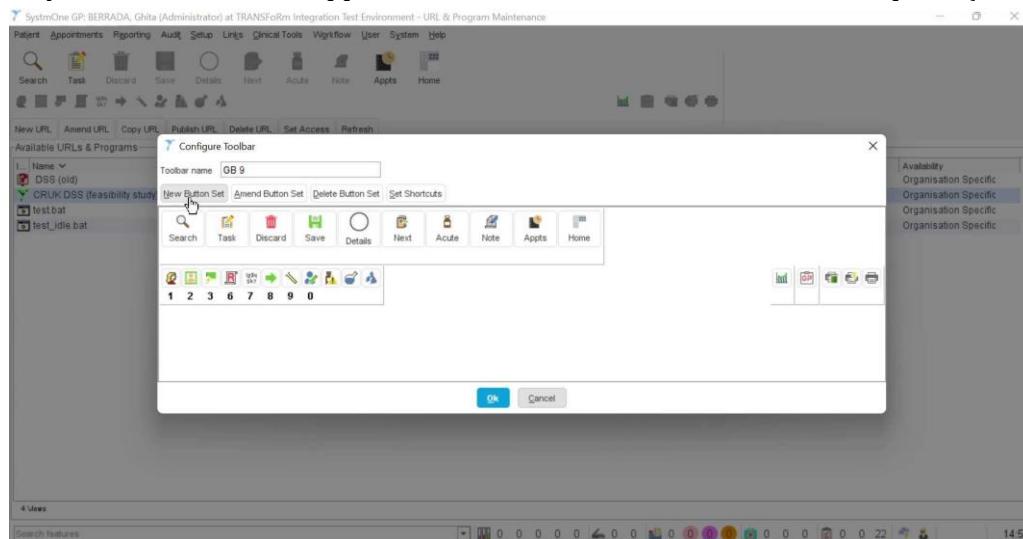


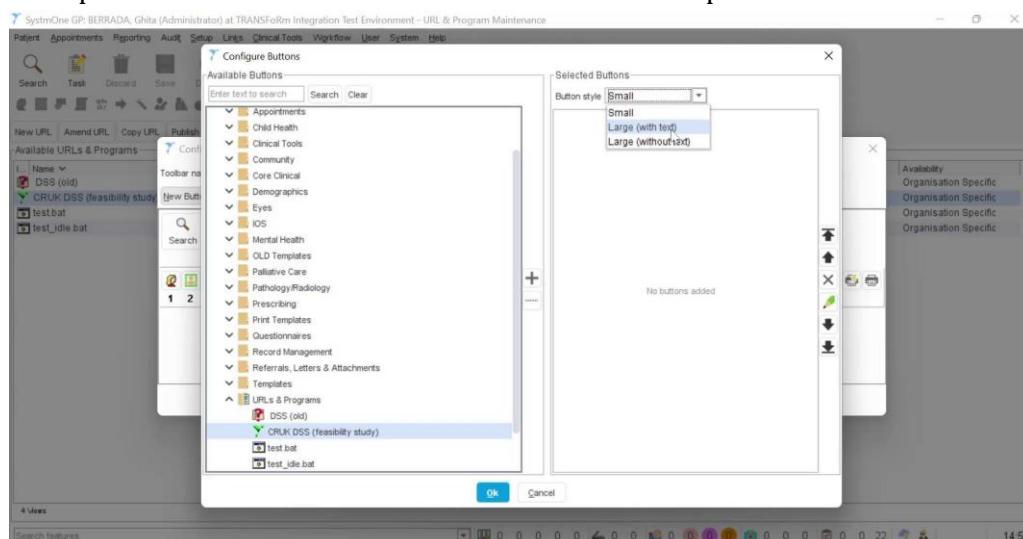
Figure 1.16: Button configuration menu

A new window will open. On the panel on the left side of the window (Available buttons panel), look for the URL & Program Maintenance node, expand it and select (i.e click) on the option that corresponds to the DSS program (e.g in this case the CRUK DSS (feasibility study) option). See the image at the top of Figure 1.17 for details.

Then in the right panel (i.e Selected buttons panel), in the Button style dropdown, select the Large (with text) option. See the image at the top of Figure 1.17 for details.

At this point, click on the + button in the middle of the window. Your screen should look like the image at the bottom of Figure 1.17.

Then press the button OK at the bottom of the window to proceed.



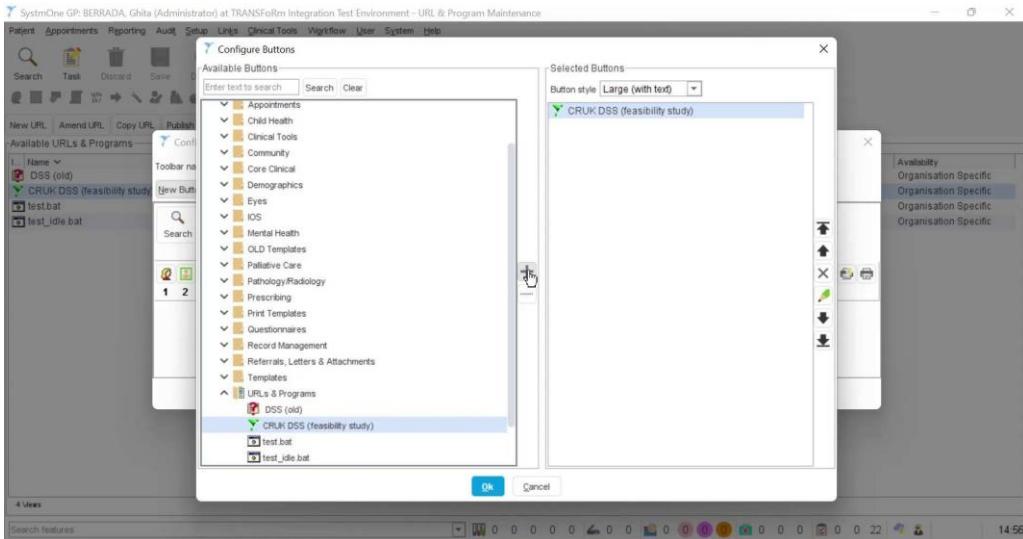


Figure 1.17: Button configuration steps

7. Step 7: You will now have a screen that shows a preview of the toolbar with the new button (see Figure 1.18).

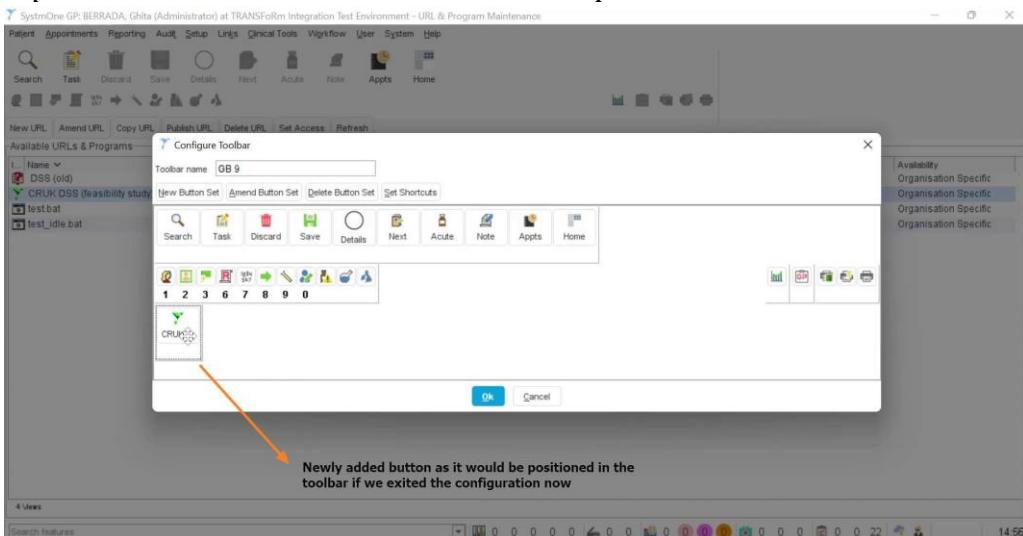


Figure 1.18: Button configuration menu with preview of newly added button position

To finish the configuration, click on the newly added button and move it to somewhere on the toolbar where it would be more visible and easily accessible (e.g. next to the Home button). Figure 1.19 shows the result of moving the newly added button.

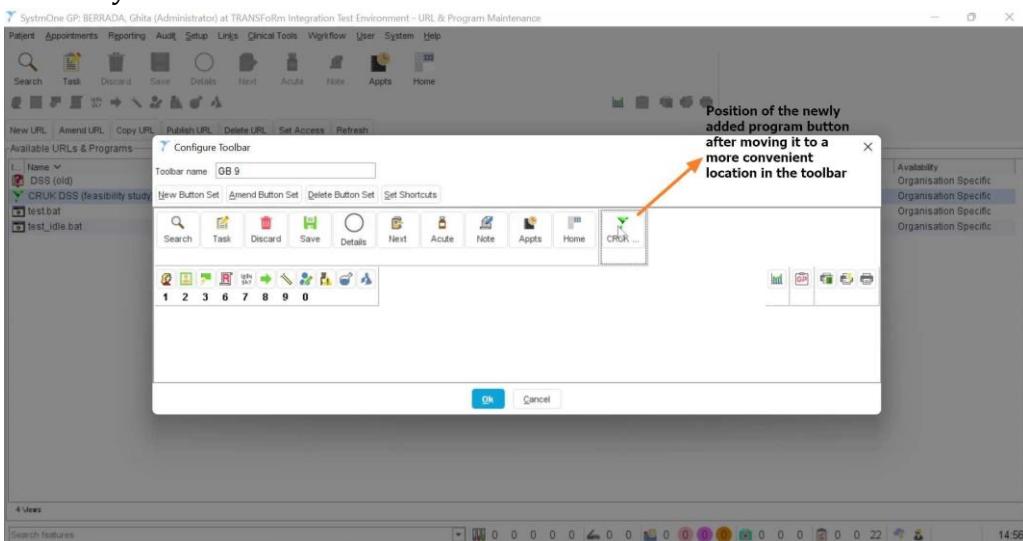


Figure 1.19: Button configuration menu with newly added button more conveniently positioned

Once you're satisfied with the positioning of the button, click on the **OK** button at the bottom of the menu. The installation and configuration of the DSS are now complete. To start using the DSS, you only need to open a patient record before pressing the button you have newly added to the SystmOne toolbar.

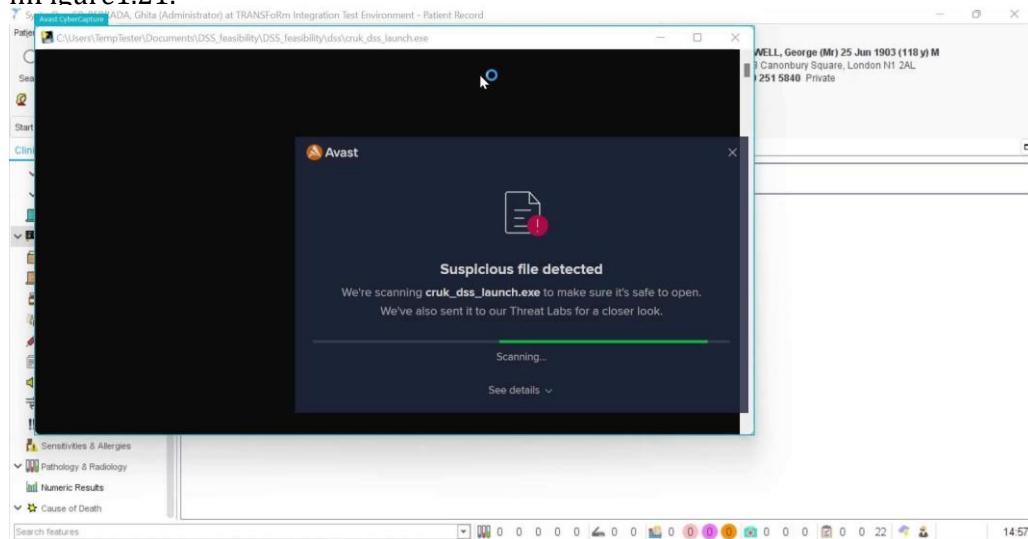
Note that, if you participate in more than one study, i.e both the feasibility study and the video study, we recommend you follow the configuration steps in this section twice so that you have two launch buttons side by side on the toolbar.

When you launch the DSS for the first time, you might see a popup similar to the one in Figure 1.20. If that is the case, just approve the request on the popup.



Figure 1.20: Popup showing at startup of DSS for DeviceID setup/confirmation

Occasionally, the first launch of the DSS might set off an antivirus scan and notification. If prompted to allow or block the application, allow the application (i.e. `cruk-dss-launch.exe`) and discard the notifications as shown in Figure 1.21.



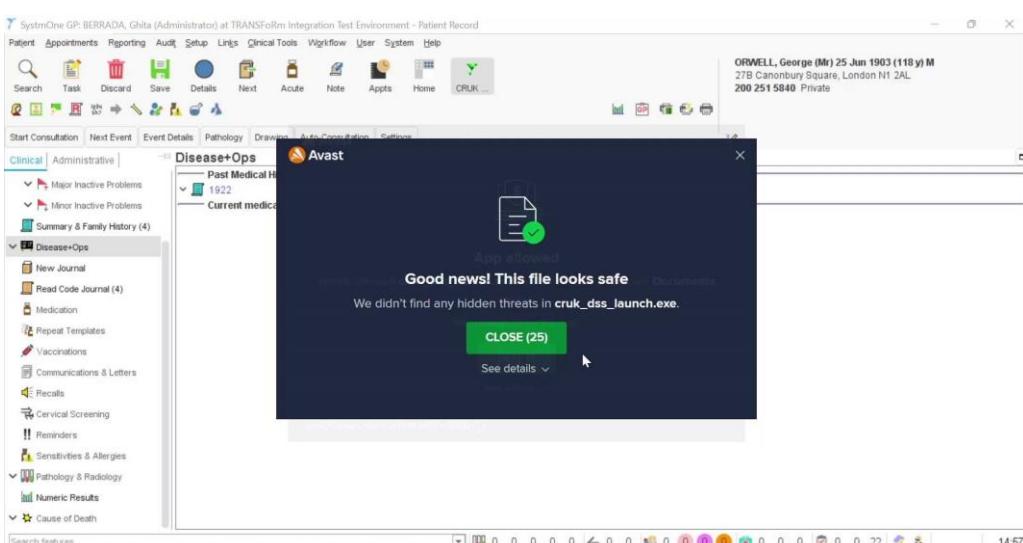
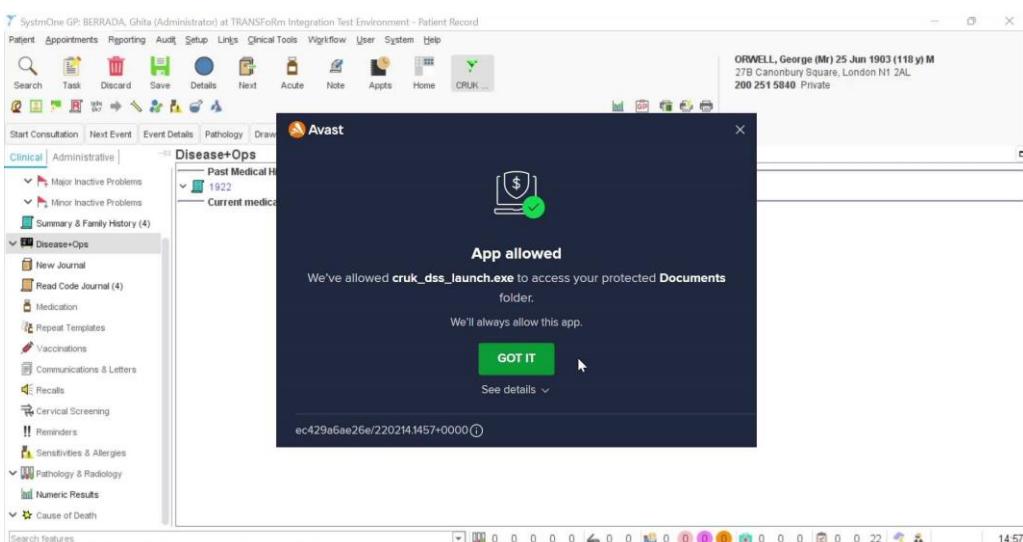
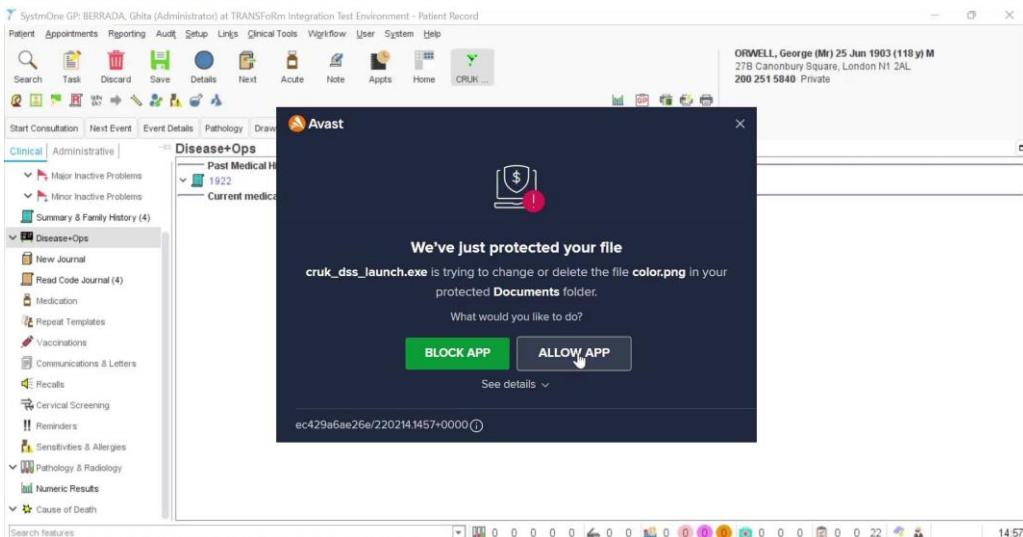


Figure 1.21: Antivirus scan and notifications set off by first launch of DSS

1.3 Alternative configuration steps and launch mechanism

If, when you launch the DSS using the button on the SystmOne toolbar (configured as described in section 1.2), the DSS does not launch and you only see a white screen as shown in Figure

1.22, you can instead create Desktop and/or taskbar and/or Start menu shortcuts to the DSS executable that you can then use to launch the DSS instead of using the SystmOne toolbar button.¹

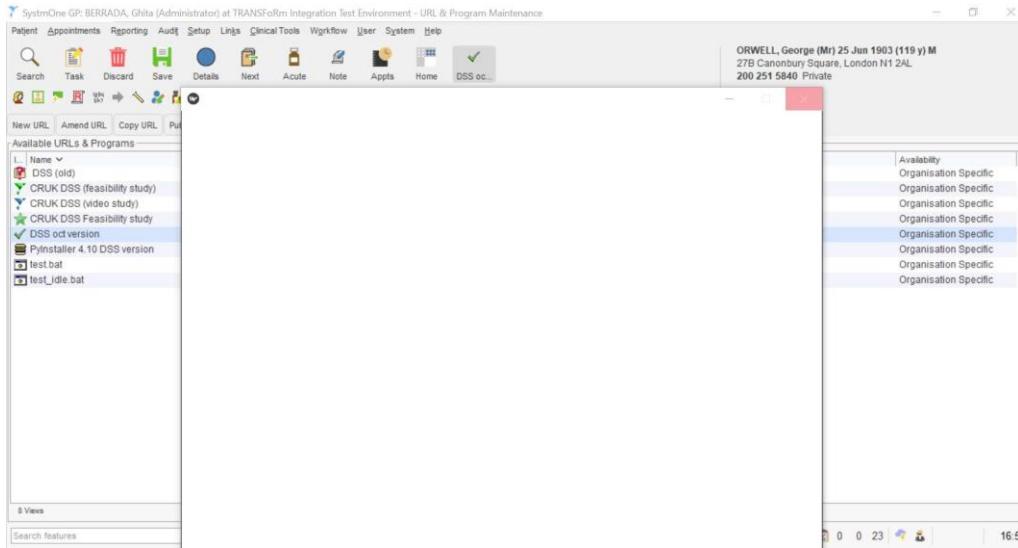
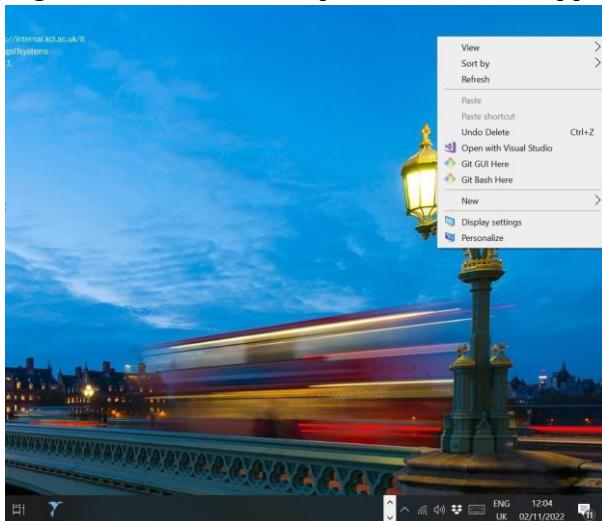


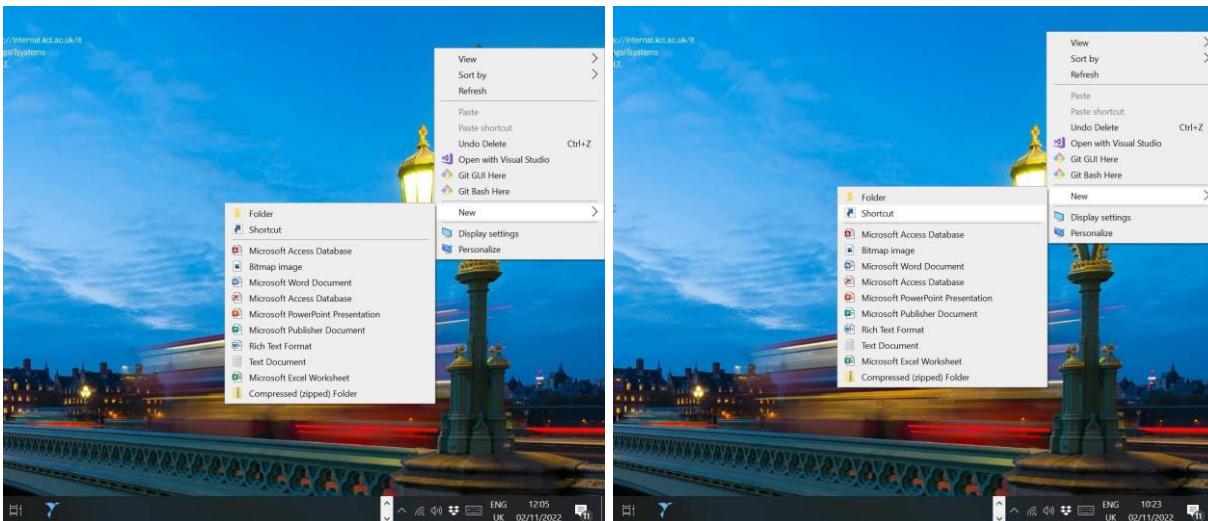
Figure 1.22: Screenshot of the DSS screen when it stalls after being launched through the SystmOne toolbar button
Before creating the shortcuts, there is a configuration step which identical to To create the Desktop and/or Start menu and/or taskbar shortcuts, you should proceed as follows:

1. Right-click on the Desktop. A menu should appear as shown in the figure below.

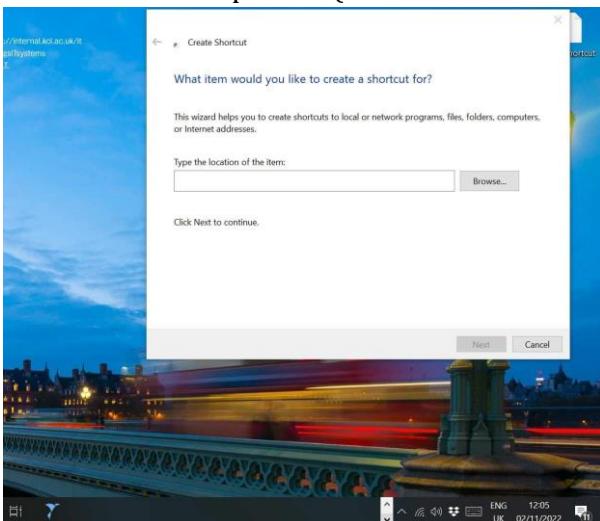


2. From the menu, select the option 'New', then 'Shortcut' as shown below.

¹ Creating such shortcuts circumvents the mechanisms SystmOne uses to interpret Batch scripts, which we think are the root of the launch issue pictured in Figure 1.22.



A menu with an input box (and with title “Create Shortcut”) as shown in the following figure will appear:

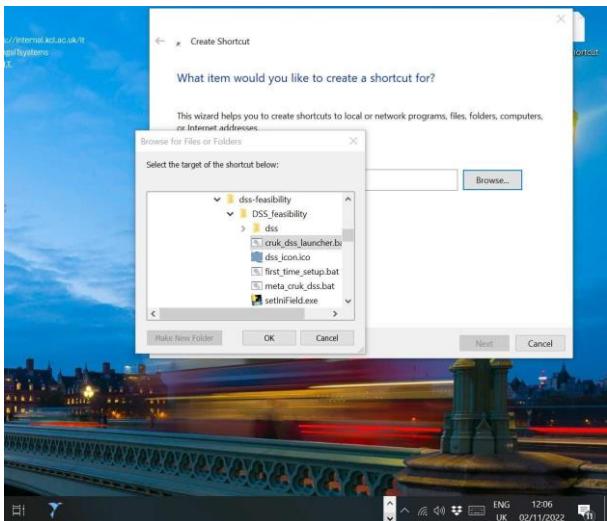


3. In the input box, you will need to type the following line `cmd.exe /c "path to DSS executable\cruk dss launcher.bat"` where path to DSS executable is the absolute path to the file `cruk dss launcher.bat` (you will find this file in the `dss-feasibility\DSS feasibility` folder within the folder where you extracted the installer archive if you are taking part in the feasibility study and in `dss-video\DSS video` folder within the folder where you extracted the installer archive if you are taking part in the video study).

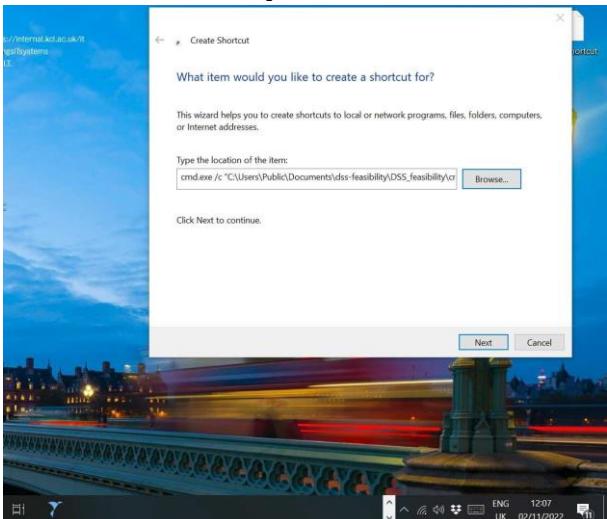
So, for example, if you have unzipped the feasibility study installer into "`C:\Users\Public\Documents`" , the full path to `cruk dss - launcher.bat` would normally be "`C:\Users\Public\Documents\dss-feasibility \DSS feasibility\cruk dss launcher.bat`"

and the command you then type into the input box would be `cmd.exe /c "C:\Users\Public\Documents\dss-feasibility \DSS feasibility\cruk dss launcher.bat"`

You can make the typing slightly simpler by first selecting the location of the `cruk dss launcher.bat` file using the `Browse` button next to the input box. The figure below shows the menu that appears when you press the `Browse` button and scroll through it to reach the location of the `cruk dss launcher.bat` file:

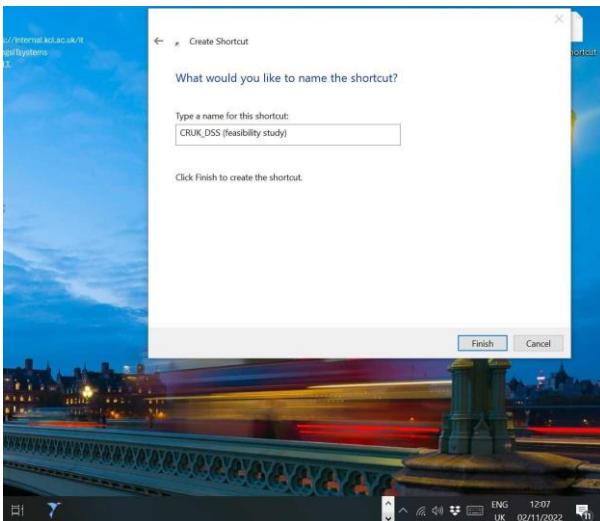


Once you select `cruk_dss_launcher.bat` from the above menu, press the **OK** button. The full path to the `cruk_dss_launcher.bat` file without quotation marks will appear in the input box: add quotation marks around the path and type `cmd.exe /c` before the path between quotation marks leaving a space between the `cmd.exe /c` and the path between quotation marks. The figure below shows a screenshot of the menu with the input box filled with the correct command:



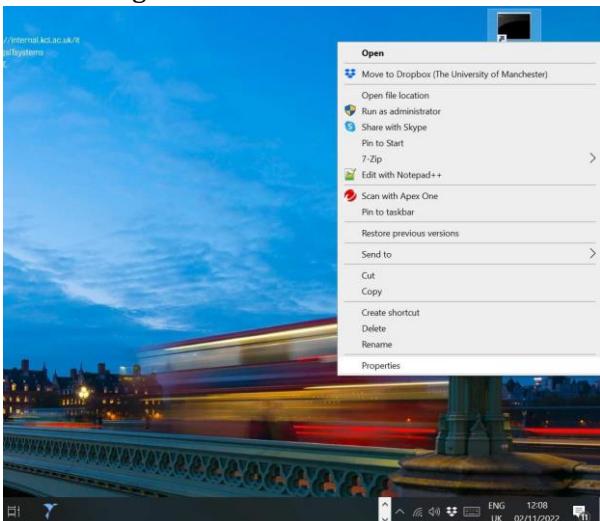
Once you are done filling in the input box, press the button **Next**.

4. In the input box in the next menu that appears, type an evocative name for the shortcut you are about to create e.g CRUK DSS (feasibility study) for the installer for the feasibility study or CRUK DSS (video study) for the installer for the video study. The goal here is to give a name to the shortcut that really describes what the shortcut is about. When you're done, press the button **Finish**.



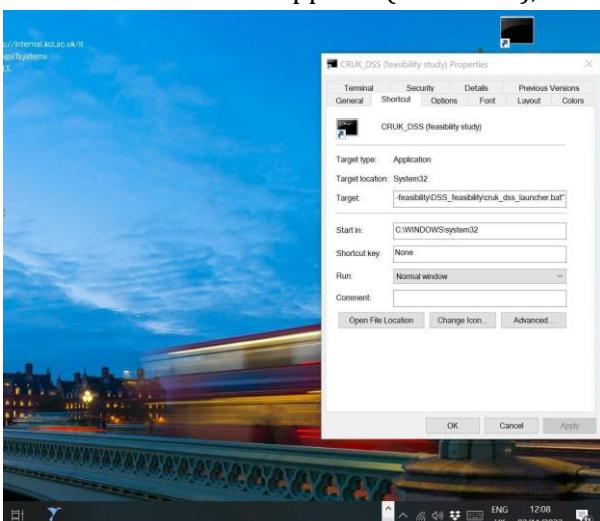
We're technically done with creating a Desktop shortcut and we could stop here but the icon for the shortcut currently looks like the icon for Command Line so it's a bit confusing. So we're first going to change the look of the icon and then add Start menu and taskbar shortcuts (they don't exist yet!).

5. To change the icon, right-click on the Desktop shortcut you have just created. You should see a menu appear as in the figure below.

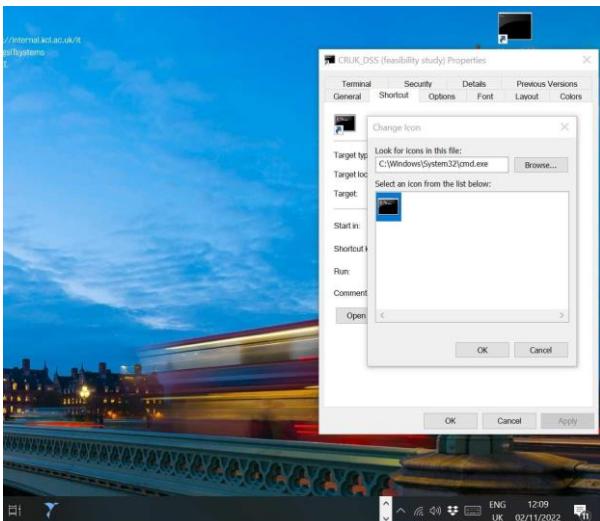


Select the **Properties** option.

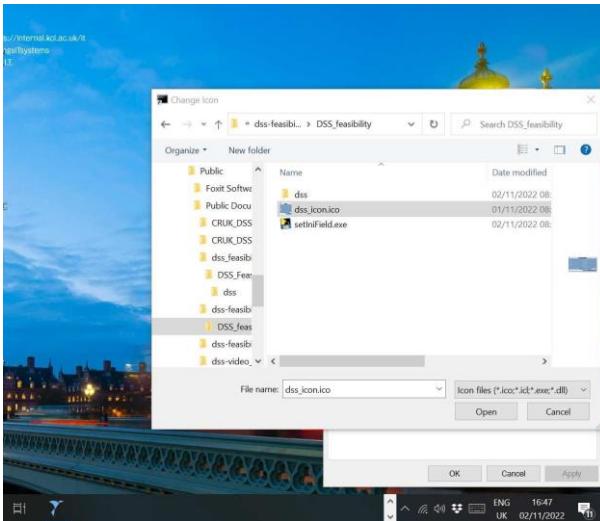
6. In the new menu that appears (see below), click on the **Change Icon** button.



The popup below appears:

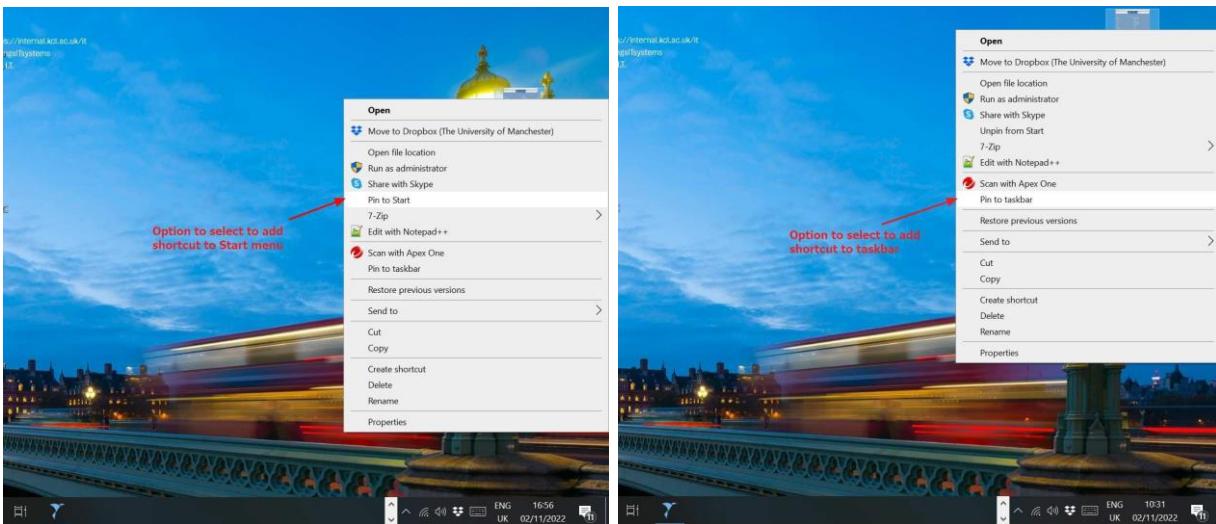


Press the **Browse** button and find the icon you want to use: you can use any image as an icon provided it has the .ico extension². In the same folder as the `cruk_dss launcher.bat` and `meta cruk_dss.bat` we talked about previously, we make available a possible icon file called `dss_icon.ico`: you can use this file if you wish. Press the buttons **Open** then **OK** and **OK** in the consecutive menus you see to confirm your icon selection. You're now done changing icons and the appearance of your shortcut should now have changed.

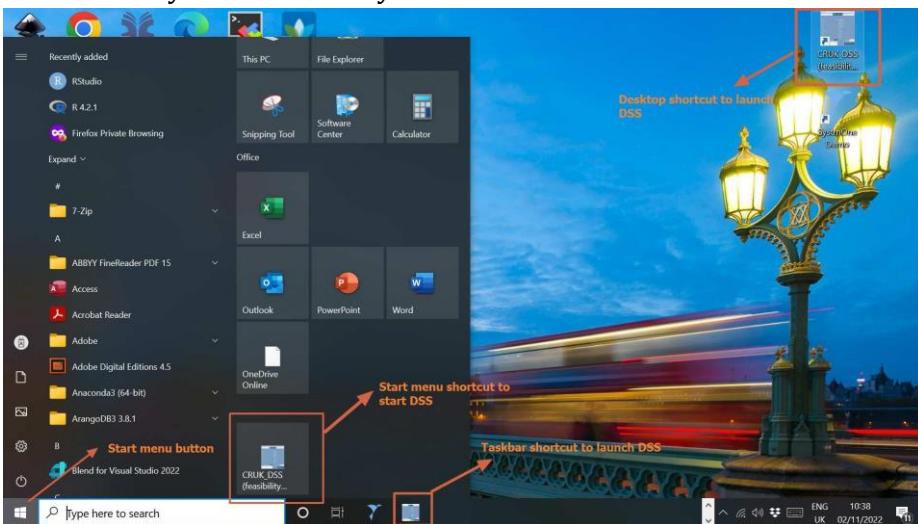


7. We'll finally add taskbar and Start menu shortcuts. This step is optional as you can launch the DSS using the Desktop shortcut you've already created. If you still want to create the additional shortcuts, here is how to proceed: right-click on the Desktop shortcut you've already created, in the menu that appears, there are two options (**Pin to Start** and **Pin to taskbar**) that you can choose to select in any order you like, e.g select **Pin to Start** then right-click on Desktop shortcut to see the menu options again and then select **Pin to taskbar**. You can, of course, also choose to only create only one of the two shortcuts i.e either the Start menu or the taskbar shortcut.

² You can make a .ico out of .jpg or .png image file by opening the .jpg or .png file in GIMP and exporting the file to .ico format.



Here is what you would see if you had created all three shortcuts:



If you create the three shortcuts as instructed, you can simply press one of them to launch the DSS. Just make sure that, before you do, SystmOne is running, you are logged into SystmOne and you have a patient record open. Otherwise, you will see warning popups explaining that the DSS can't run because SystmOne is not running (see Figure 1.23) or because you're not logged in (see Figure 1.24) or you don't have a record open (see Figure 2.1).

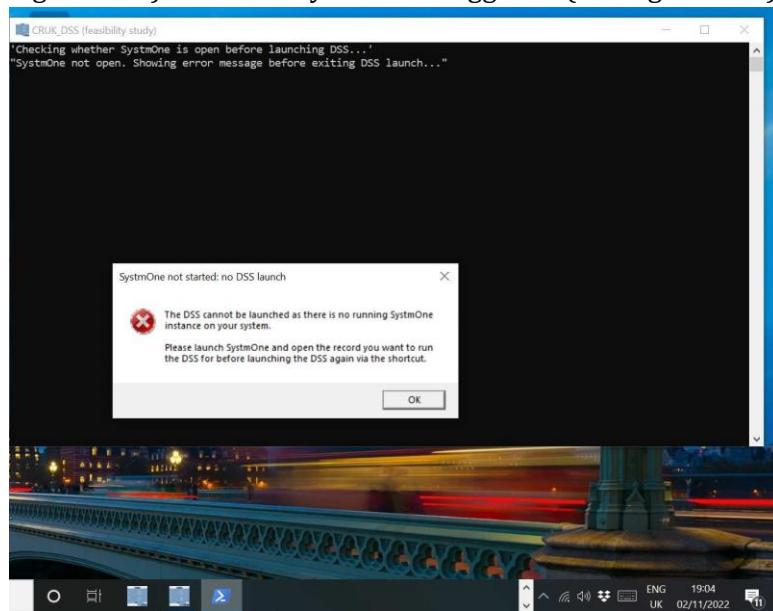


Figure 1.23: Popup appearing at the launch of the DSS when SystmOne is not running on the system

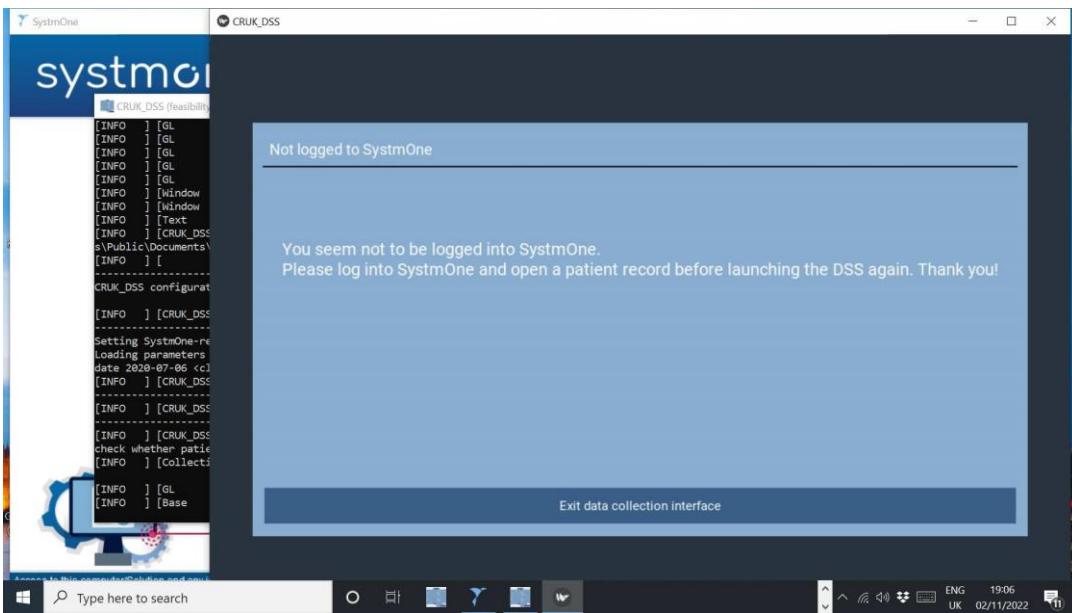


Figure 1.24: Popup appearing at the launch of the DSS when the user is not logged into SystmOne

The shortcuts' creation explanations above assumed that you were making a single set of three shortcuts (i.e Desktop, Start menu and taskbar shortcuts) corresponding to either of the studies (i.e feasibility or video study) you are taking part in. If you are taking part in both the feasibility and video study, you are, of course, welcome to repeat the instructions a second time, making sure to use the path to the executable to the second study in the step that requires executable paths and giving an appropriate name to the shortcut in the shortcut naming step, so that you generate two sets of shortcuts, one for the feasibility study and one for the video study.

Chapter 2

CRUK-DSS functionalities

Before using the DSS, please open a patient record in SystmOne first. If no record is opened, you should see a popup as in Figure 2.1 prompting you to open a patient record and relaunching the DSS.

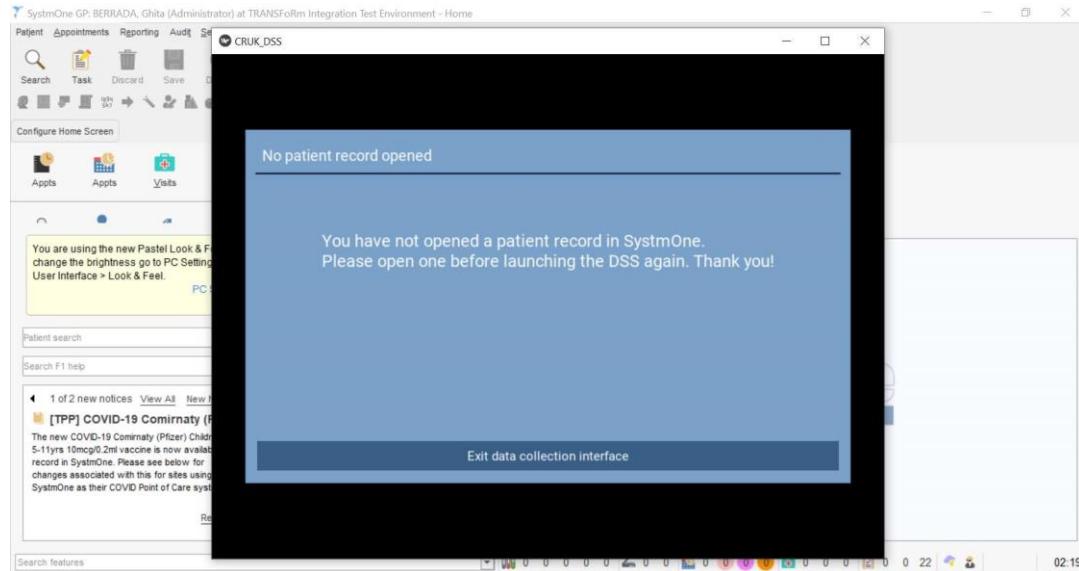


Figure 2.1: Popup appearing at the launch of the DSS when no patient record is opened in SystmOne

2.1 Data collection interface

2.1.1 Schema of the Data collection interface components

The figure below (2.2) shows the various components of the Data collection interface.

1 Demographics component
2 Reason for encounter (RfE) field
3 "Done" Button

Figure 2.2: A schema of the Data collection interface components

2.1.2 The Demographics components

The first element of the interface is the collection of Demographics components (element 1 in Figure 2.2). This element shows some basic patient demographics, such as patient name, date of birth and gender, for confirmation.

2.1.3 The Reason For Encounter field (RfE)

This field is element 2 in the schema of Data Collection interface components (Figure 2.2).

This is a field with autocomplete: as you type letters, suggestions will appear. Figure 2.3 shows an example what the screen looks like while you type an RfE into the field (here, the user starts to type "hemoptysis").

Figure 2.3: Screen while typing into the RfE field

You can choose to type the RfE completely in the field yourself or choose an RfE from the autocomplete suggestion list. Note that you can scroll the autocomplete suggestion list for further options.

This field is the only mandatory field in the interface. The DSS cannot proceed to the next step if this field is not filled. A warning popup (as shown in Figure 2.4) should appear on the screen in case you try to proceed to the next step without having filled this field.

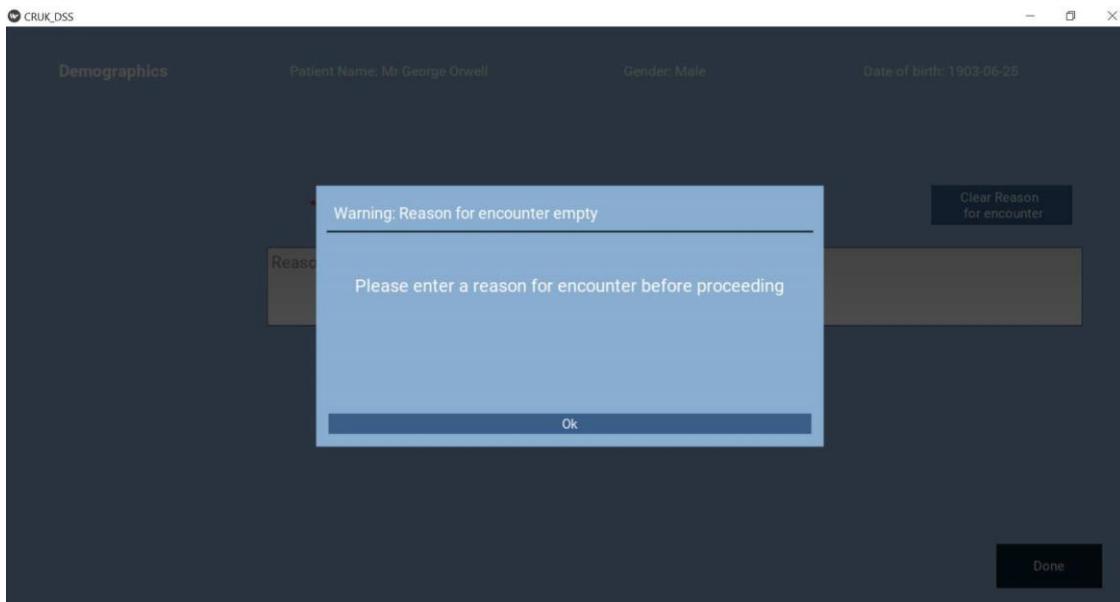


Figure 2.4: Popup that appears when “Done” button is pressed while the Reason for Encounter field is still empty

2.2 DSS interface

When you press the “Done” button the data collection interface (component 3 in Figure 2.2), the DSS interface makes its first apparition and you’ll see a popup with a list of likely diagnoses that you can scroll through as in shown in Figure 2.5. The list, as it currently appears, is generated based on matching RfE (originally encoded in SNOMED), gender and age with an existing (limited) database of association rules (encoded in ICPC2) and ranking the matches by order of decreasing rule confidence, rule lift and rule sensitivity. So, the ordering of the list is not random or alphabetical. But, since the data used to generate the matches is limited (limited number of association rules and limited items to match against the rules) and the process of translating SNOMED codes to ICPC2 and back adds complexity and imprecision (e.g to go from the SNOMED codes of RfE to ICPC2 to allow matching against association rules encoded in ICPC2 then translating the ICPC2 codes for differential diagnoses obtained from matched rules to SNOMED), the differential diagnoses list should currently be considered as not validated and **SHOULD NOT BE USED TO MAKE DIAGNOSTIC DECISIONS.**

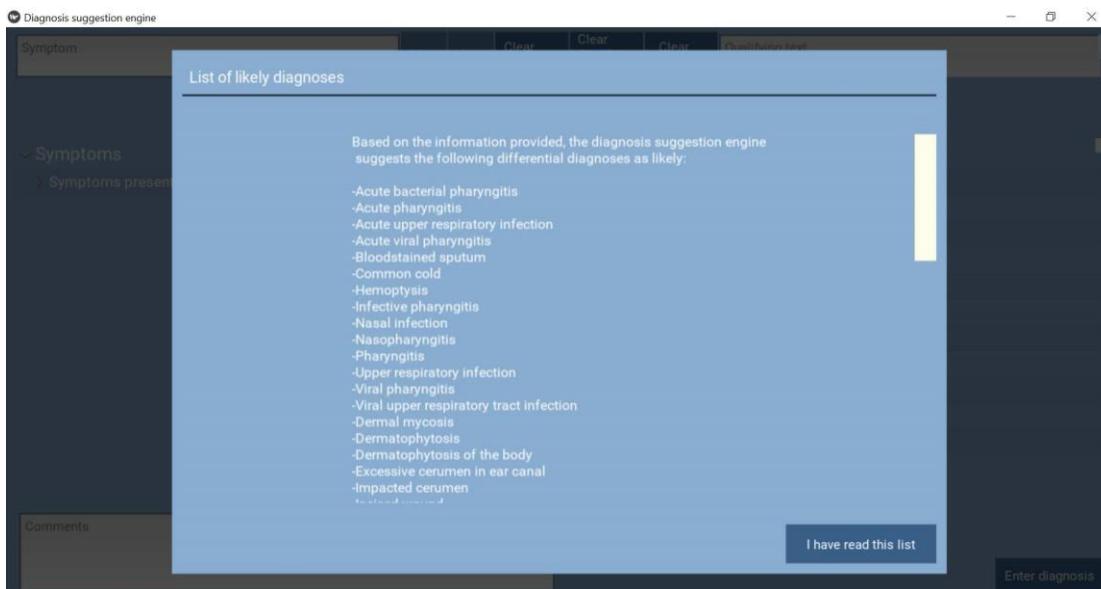


Figure 2.5: Screen after “Done” button on data collection interface is pressed and DSS interface first appears (list of likely diagnoses)

After you have scrolled through the list of suggested likely diagnoses and you click on the “I have read this list” button, the DSS interface proper will show up as in Figure 2.6

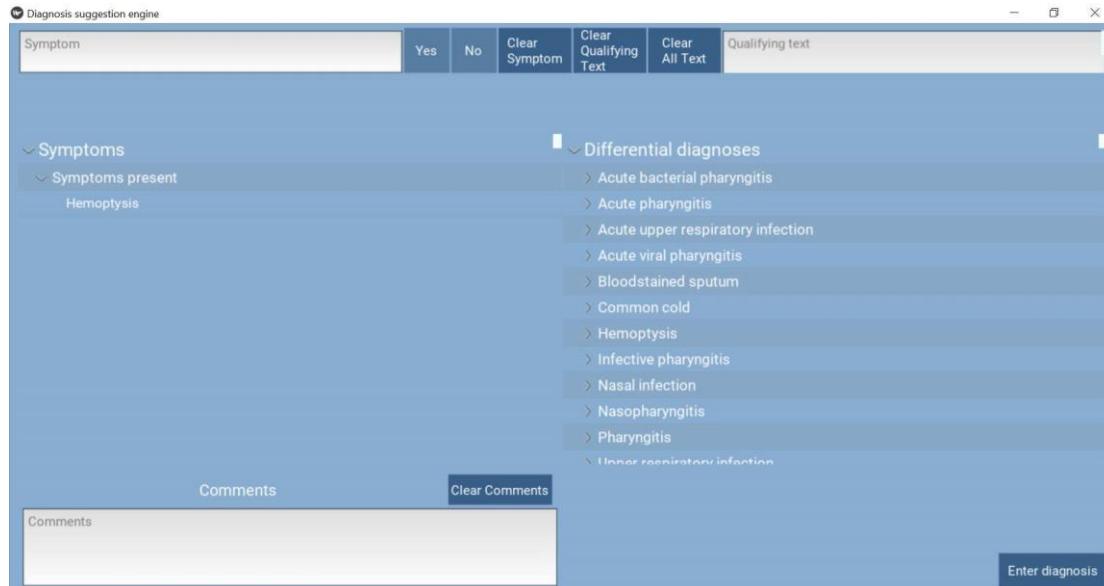


Figure 2.6: DSS interface

2.2.1 Schema of the DSS interface components

The figure below (Figure 2.7) shows the various components of the DSS interface.

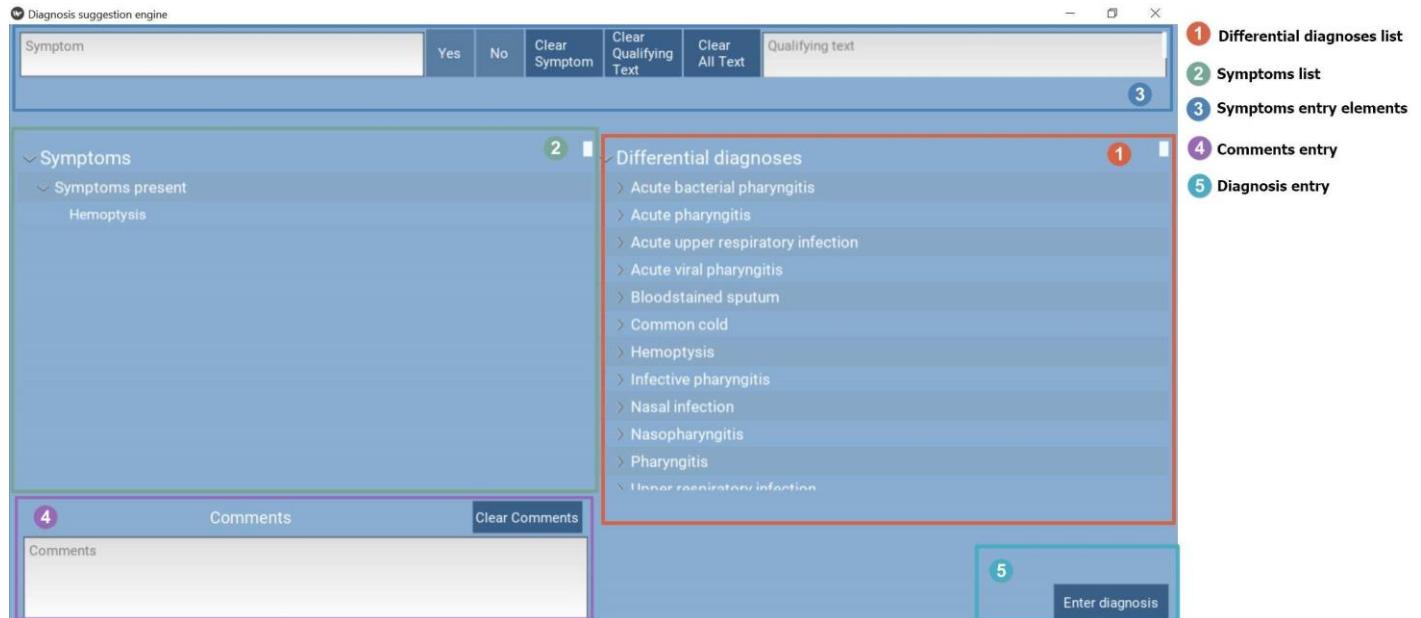


Figure 2.7: A schema of the DSS inferface components

2.2.2 Adding symptoms

Symptoms can be added in two ways: through the symptoms input box at the top left of the screen (left of Symptoms entry element in Figure 2.7 i.e element 3 in the figure) or by clicking on a symptom on the differential diagnoses list (symptom in element 2 in Figure 2.7).

Case 1: Entry of symptoms via the symptoms input box

Figure 2.8 illustrates the entry of a symptom through the input box at the top left of the screen.

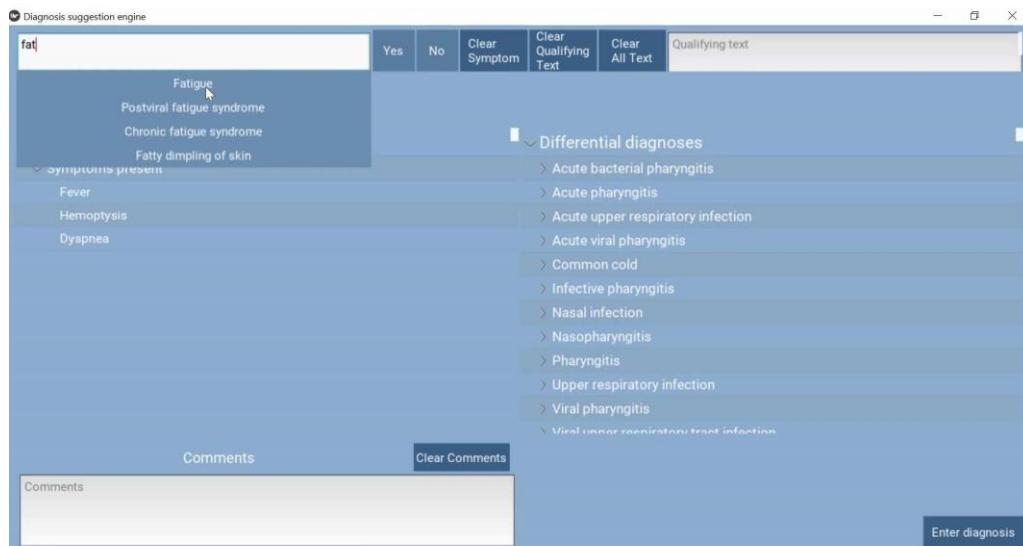
In the input box at the top left of the screen marked "Symptom", start typing the symptom you want to enter. This field has auto-complete functionality so a list of suggestions will show below the input box as you type: you can scroll through the list of suggestions and/or continue typing and when you see your preferred suggestion, click on it. The input box will be populated with the selected suggestion. You can choose optionally to type a qualifier (e.g "Fever over 39 °C" or "Non blanching" in reference to a symptom "Skin rash") in the qualifier text box: the qualifier accepts as much text as you want and accepts multiline text. Be aware that each line in the qualifier box will be

considered a distinct qualifier and will appear as a different node below the symptom node in the symptoms list element (element 2 in Figure 2.7).

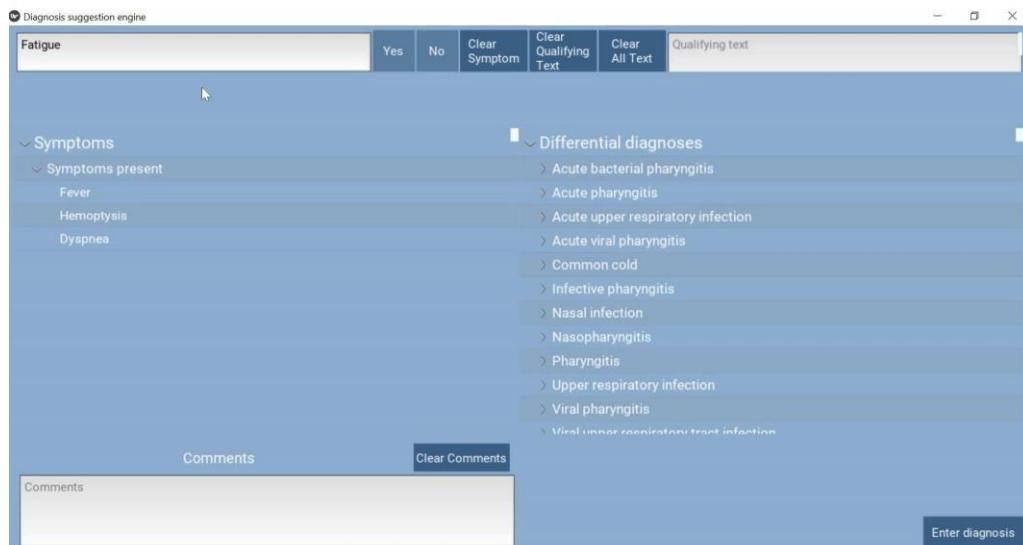
You can delete the content of either of the input boxes or both input boxes with the buttons “Clear Symptom”, “Clear Qualifying Text” or “Clear All Text”: “Clear All Text” deletes the content of both input boxes, “Clear Symptom” the content of the symptom input box and “Clear Qualifying Text” the content of the qualifying text input box. If you delete the content of the symptom input box before having pressed either of the “Yes” or “No” button, no symptom will have been added to the symptoms list and you will have to restart the symptom entry process again.

Once your symptom input box is populated and optionally your qualifying text input box is populated, you can press either the “Yes” or “No” to add the symptom along with its qualifying text to the symptoms list: if you press “Yes”, the symptom alongside its qualifying text will be added to the list of “Symptoms present” but if you press “No”, the symptom alongside its qualifying text will be added to the list of “Symptoms absent” (see Figure 2.8).

1 Typing symptom "Fatigue" into symptom input box



2 View of "Symptom input" box once "Fatigue" is selected (mouse click) from autocomplete list in figure above (step 1 above)



3 Addition of "Fatigue" to "Symptoms list" (element 2 in DSS interface components figure i.e Figure 2.6) after clicking "Yes" button in "Symptoms entry elements" component (element 3 in DSS interface components figure i.e Figure 2.6)

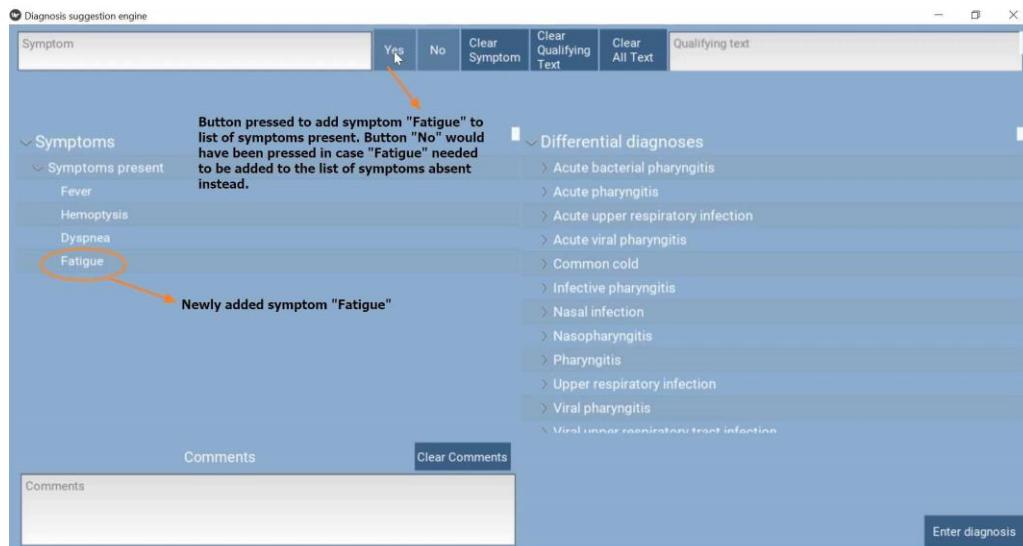


Figure 2.8: Symptom entry via symptom input box Case 2: Adding a symptom through selection from differential diagnoses list

Figures 2.9 and 2.10 show the second way of entering a symptom i.e the entry of a symptom through the differential diagnoses list.

To see the symptoms associated with each differential diagnosis on the list, simply click on the little triangular arrow next to the diagnosis of interest. For example, to see symptom “Cough” to then add it to the list of symptoms present, we expand the differential diagnosis “Acute pharyngitis” as in step 1 of Figure 2.10.

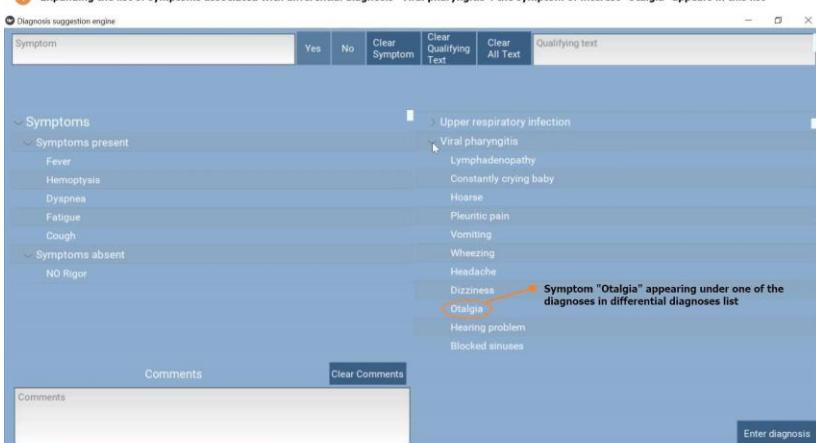
You should then click (with the mouse) on the symptom you want to denote as present (e.g “Cough” in Figure 2.10) or absent (e.g “Otalgia” in Figure 2.9). A popup then appears as in step 2 of Figures 2.9 and 2.10 and you should select to the “No” or “Yes” radiobutton as in step 3 of Figures 2.10 and 2.9 to denote either the presence or absence of the symptom (“Yes” for presence and “No” for absence).

You can also add a qualifier for the symptom in the qualifier text input box if you so wish (the “Clear Qualifying Text” button allows you to clear any text you’ve entered into the qualifier text input box).

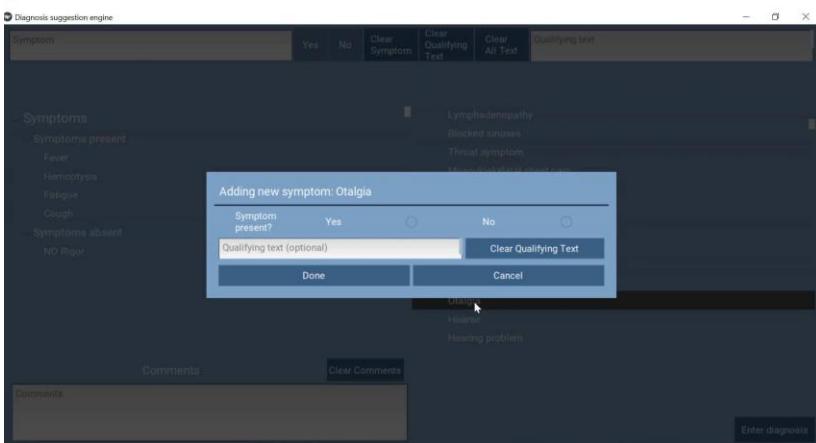
Once you’re done, if you click on the “Done” button, the symptom (with qualifiers if any) will be added to the appropriate part of “Symptoms” list (i.e “Symptoms present” or “Symptoms absent” list) in the DSS GUI interface, i.e element 2 in Figure 2.7 as shown in Figures 2.9 and 2.10. If you click the “Cancel” button, no action will be performed and the DSS GUI interface will remain unchanged.

Case 1: Adding symptom absent "Otalgia"

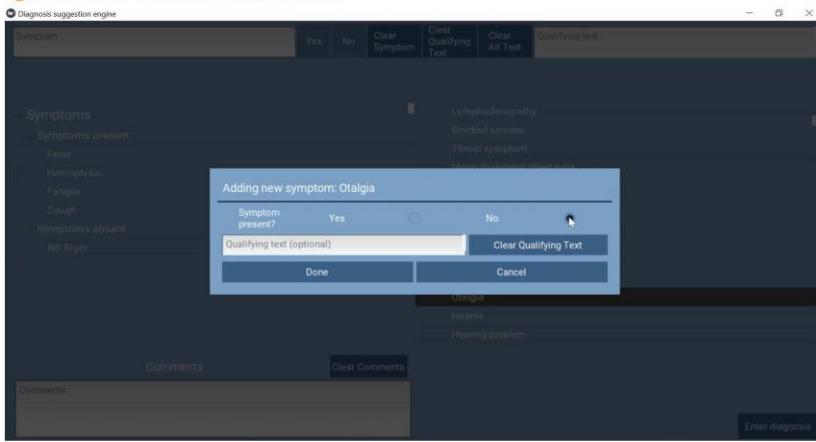
- 1 Expanding the list of symptoms associated with differential diagnosis "Viral pharyngitis": the symptom of interest "Otalgia" appears in this list



- 2 Popup that appears when one clicks on symptom "Otalgia" in the list



- 3 Select radiobutton "No" to indicate the absence of symptom



- 4 Newly entered symptom "Otalgia" appears under the "Symptoms absent" list in the "Symptoms list" element (element 2 in Figure 2.7) once the "Done" button is pressed in the popup from step 3 above

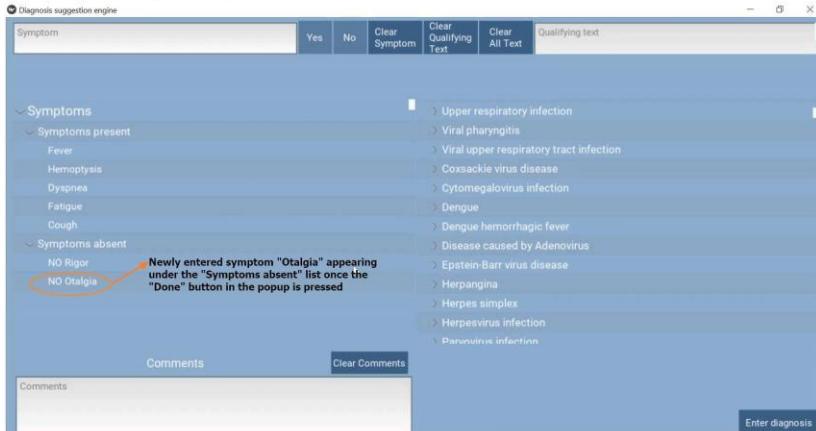
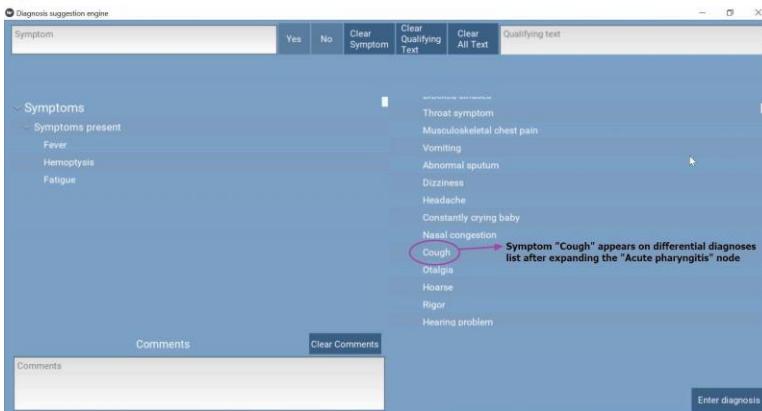


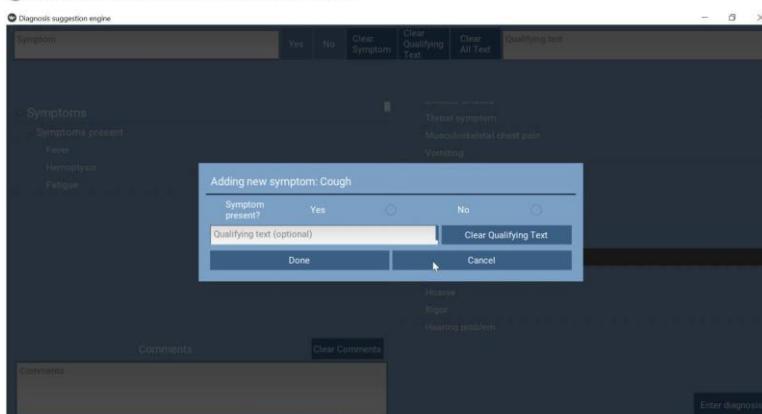
Figure 2.9: Absent symptom entry via differential diagnoses list

Case 2: Adding symptom present "Cough"

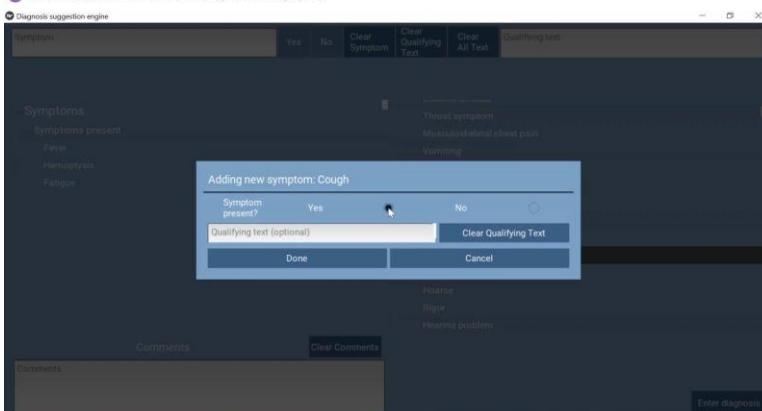
- 1 Expanding the list of symptoms associated with differential diagnosis "Acute pharyngitis": the symptom of interest "Cough" appears in this list



- 2 Popup that appears when one clicks on symptom "Cough" in the list



- 3 Select radiobutton "Yes" to indicate the presence of symptom



- 4 Newly entered symptom "Cough" appears under the "Symptoms present" list in the "Symptoms list" element (element 2 in Figure 2.7) once the "Done" button is pressed in the popup from step 3 above

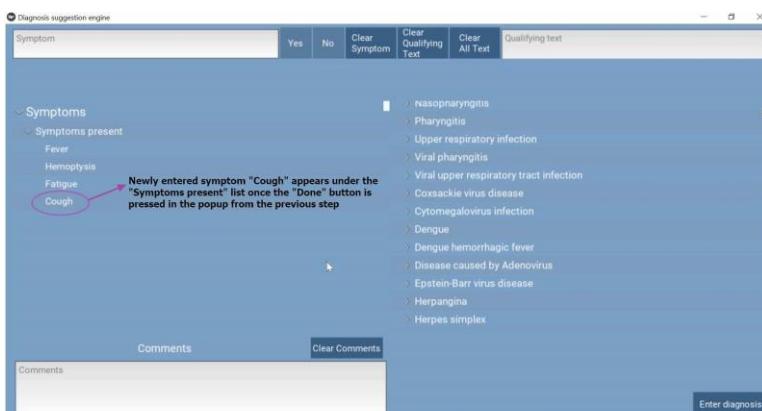


Figure 2.10: Present symptom entry via differential diagnoses list **Impact on differential diagnosis list**

When a symptom has been added as present or absent, it doesn't only show as absent or present under the appropriate list in the Symptoms list (element 2 in Figure 2.7). The presence or absence of the symptom is also indicated in the differential diagnosis list (element 1 in Figure 2.7). Absent symptoms show as crossed and present symptoms show up in bold under the respective differential diagnoses as shown in Figure 2.11.

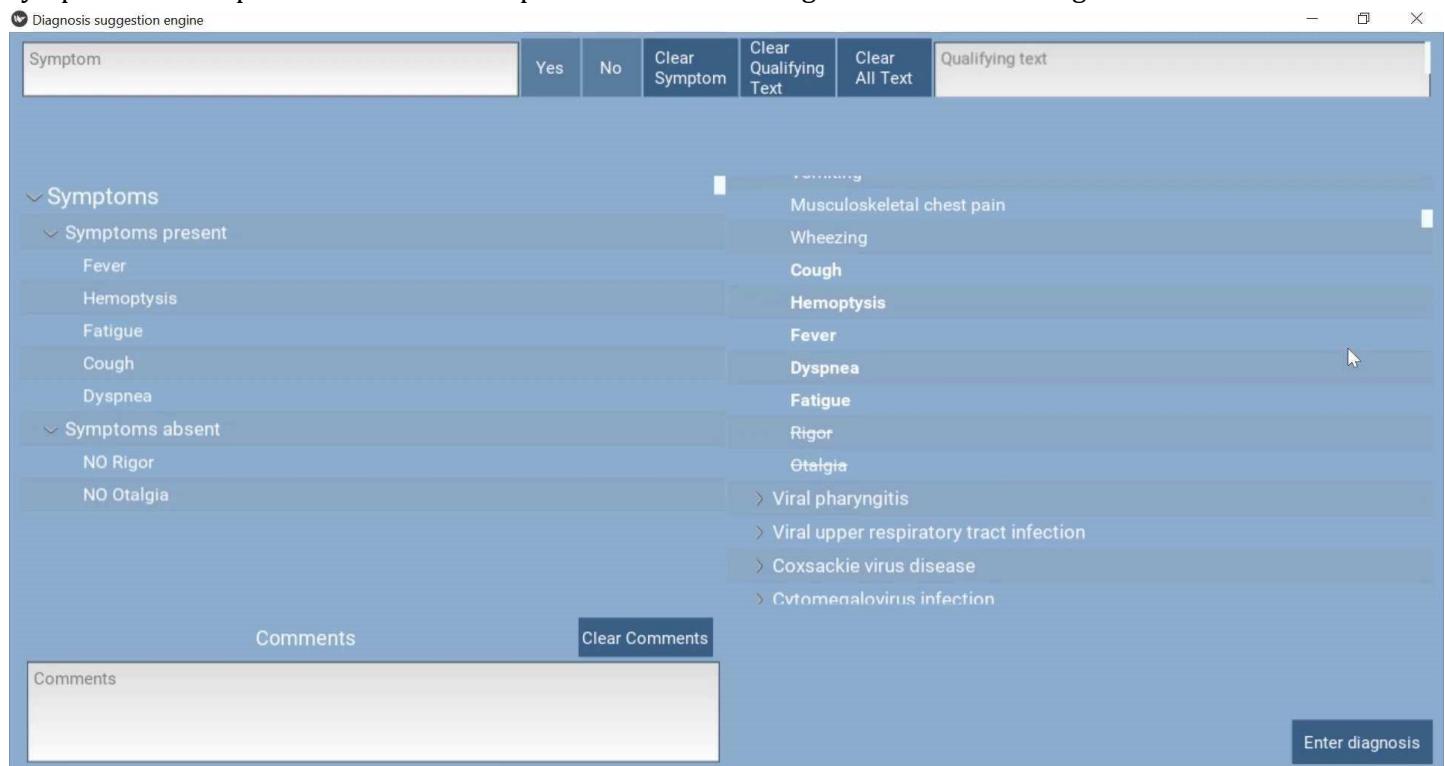


Figure 2.11: Present symptom entry via differential diagnoses list

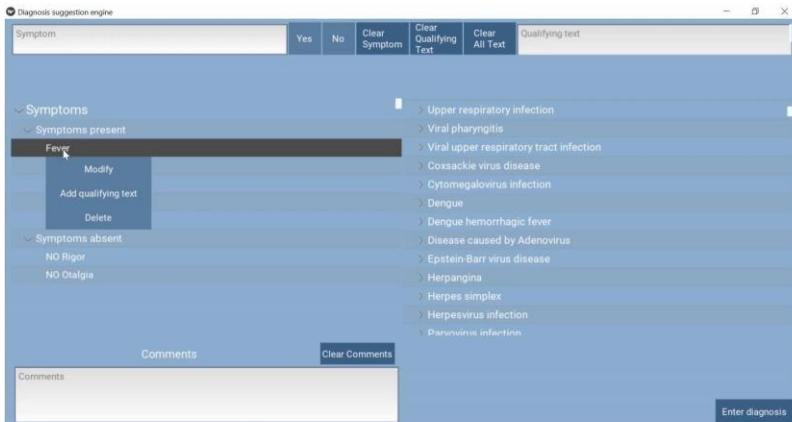
2.2.3 Modifying or deleting already added symptoms

Once a symptom has been added to the symptoms list, you can move it from the list of symptoms present to symptoms absent and vice versa, modify the spelling if needed, add or remove symptom qualifiers or delete the symptom. To do that, in the Symptoms list, with the mouse, simply click or right-click on the symptom of interest.

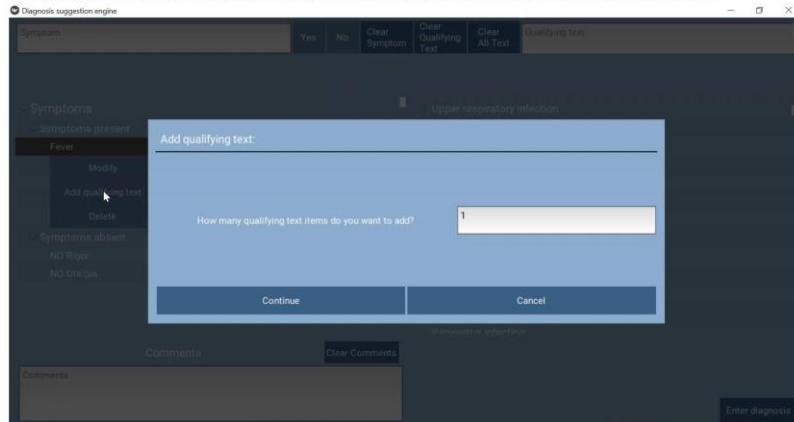
The following sections explain in details how to perform the actions described earlier (removing/modifying/adding a symptom qualifier, deleting a symptom, modifying a symptom's spelling or moving a symptom from the list of symptoms present to the list of symptoms absent and vice versa).

Adding a symptom qualifier

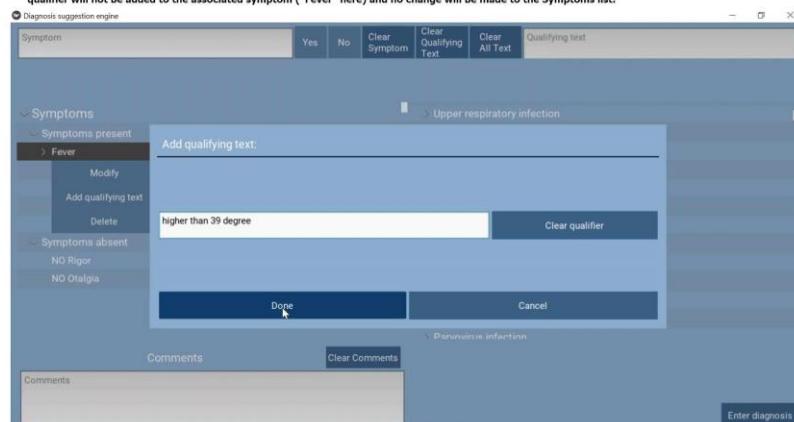
1 Menu appearing next to symptom ("Fever") to which qualifier needs to be added, once the symptom is clicked



2 Popup appearing after the "Add qualifying text" option is selected from the menu in step 1. In this step, enter the number of qualifiers you want to add then press the button "Continue" to go on with specifying to qualifiers. If you don't want to add qualifiers anymore, press "Cancel" instead.



3 Entry of qualifier in qualifier input box (in popup that appears after "Continue" button from step 2 is pressed). To have this qualifier appear in the Symptoms list (element 2 in Figure 2.7) alongside its associated symptom, press the "Done" button when done with your entry. If you press "Cancel", the qualifier will not be added to the associated symptom ("Fever" here) and no change will be made to the Symptoms list.



4 Newly entered qualifier appearing alongside associated symptom "Fever" in Symptoms list (element 2 in Figure 2.7) after "Done" button pressed in popup from step 3

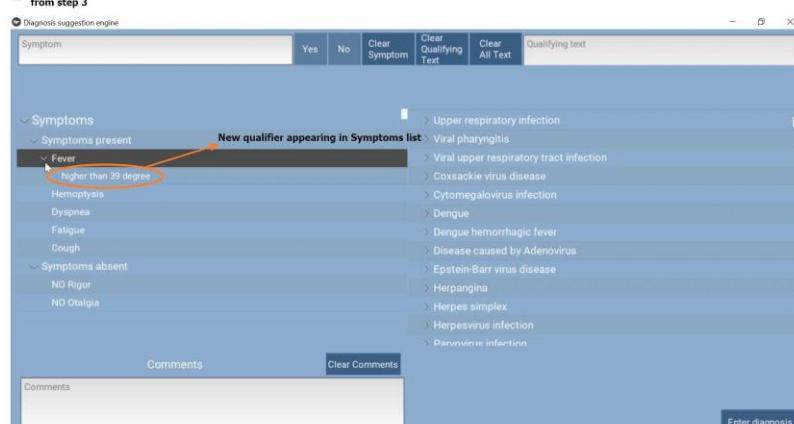


Figure 2.12: Adding a new qualifier to a symptom already added to the Symptoms list

After you've added a symptom to the list of symptoms (either present or absent), you can add one or multiple new qualifiers to it as shown in Figure 2.12. Please note that you can only add qualifiers to one symptom at a time.

To do so, please follow these steps:

1. Click or right-click with the mouse on the symptom you want to add the qualifier(s) to (e.g "Fever" in Figure 2.12). A menu with three options ("Modify", "Add qualifying text" or "Delete") appears. Please select the "Add qualifying text" option.
2. At this point, a popup will show up (step 2 of Figure 2.12) to prompt you to enter the number of qualifiers you want to add. By default, the value is set to 1 for one new qualifier. Typically, one qualifier would correspond to one line of text. Press the "Continue" button if you want to go on and enter the qualifier(s) or "Cancel" if you don't want to add any qualifier anymore.
3. After you've pressed the "Continue" button, a popup similar to the one shown in step 3 of Figure 2.12 will appear and all you need to do is enter the qualifier(s) in the input box(es) (in the case where you specified a number of qualifiers higher than one, more than one input box will appear in the popup as shown in Figure 2.13). Once you're done, either press the "Done" button if you are satisfied with your changes and want the qualifiers to be added to the Symptoms list alongside their associated symptom (e.g "Fever" in Figure 2.12) or "Cancel" if you decide not to add any qualifiers anymore (no changes will be made to the Symptoms list if you press this button).
4. If you press the "Done" button, the newly entered qualifier(s) will appear in the Symptoms list alongside their associated symptom as shown in step 4 of Figure 2.12.

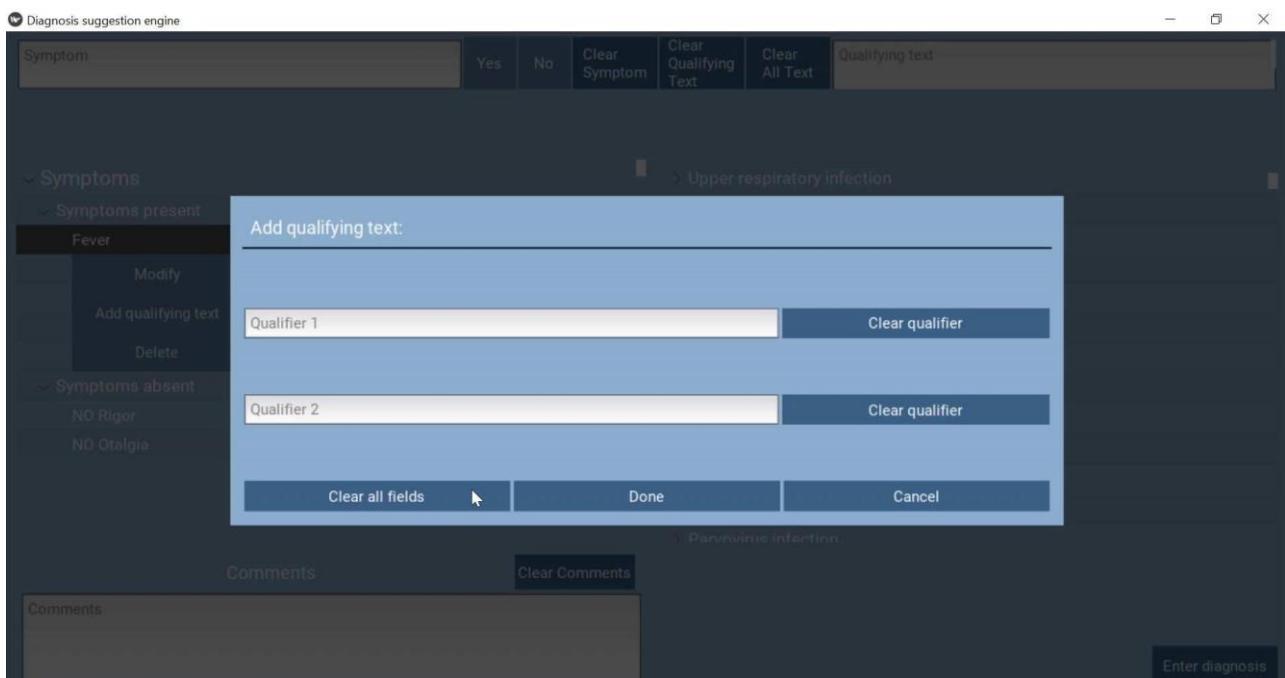


Figure 2.13: Entry of multiple qualifiers

Removing or modifying a symptom qualifier

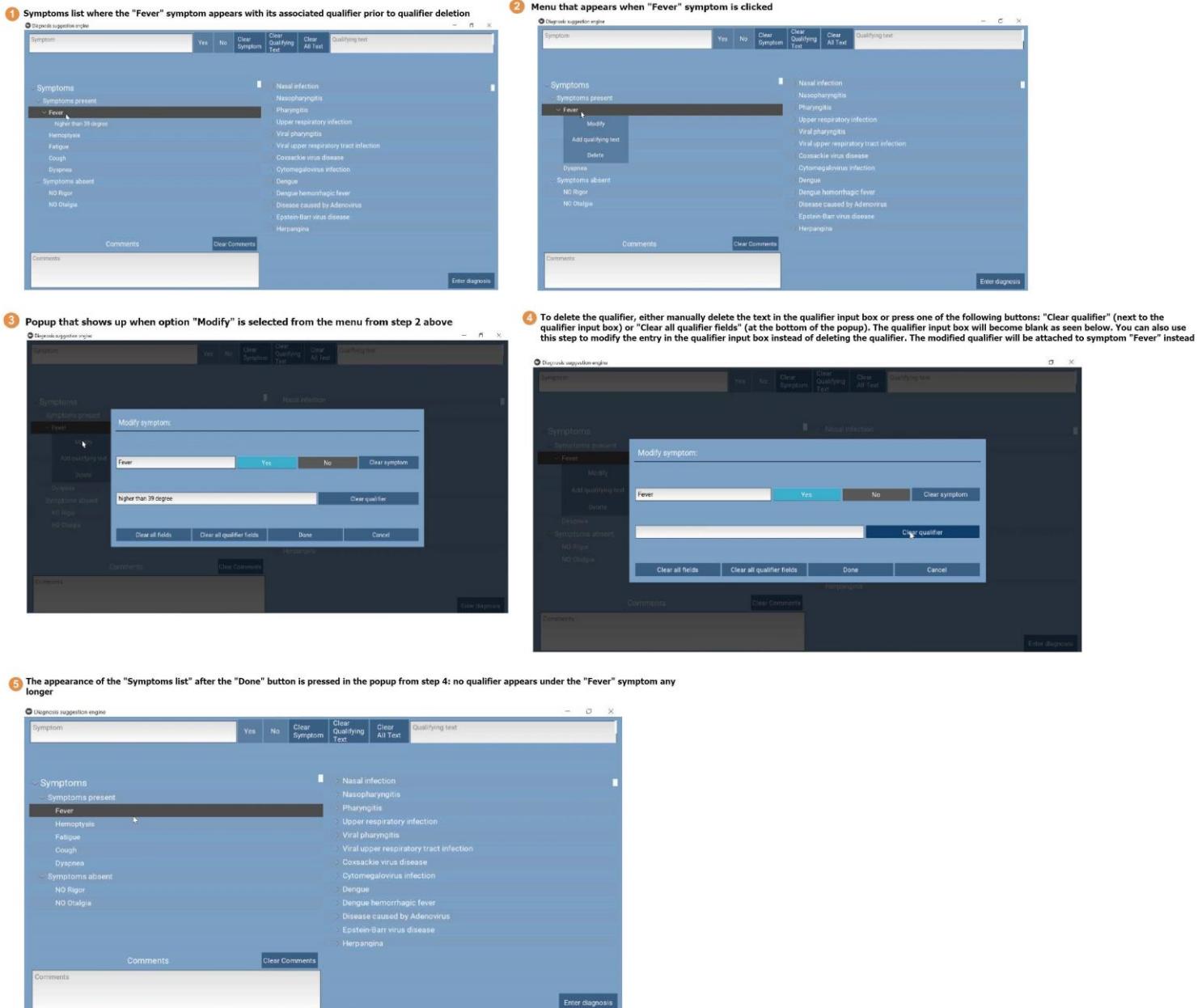


Figure 2.14: Removing the qualifier associated with a symptom already added to the Symptoms list

After you've added a symptom to the list of symptoms (either present or absent) and it already shows with its associated qualifier in the Symptoms list ((element 2 in Figure 2.7)), you can click or right-click with the mouse on the symptom of interest in the Symptoms list to either remove or modify the qualifier associed with the symptom. Figure 2.14 shows how to remove the qualifier associated with a particular symptom. The procedure to modify the qualifier is extremely similar.

To remove or modify the qualifier associated with a symptom already added to the Symptoms and appearing in it, just follow these steps:

1. Click or right-click with the mouse on the symptom that has the qualifier you want to modify or delete (e.g."Fever" in Figure 2.14). A menu with three options ("Modify", "Add qualifying text" or "Delete") appears. Please select the "Modify" option.
2. After you've clicked on the "Modify" option, a popup will show up as in step 2 of Figure 2.14. To remove the qualifier, either clear the qualifier text manually or click on the "Clear qualifier" button next to the qualifier text box. To modify the qualifier, simply type in your modifications inside the qualifier text box. Once you're done, click on the "Done" button: the Symptoms list will be updated to reflect the changes you've made until

this point (either removal of the qualifier associated with the symptom or modification of the qualifier). If you wish to interrupt the process at any point and make no changes to the Symptoms list, press the “Cancel” button.

Moving a symptom from the list of symptoms present to the list of symptoms absent and vice versa

Moving a symptom from the list of symptoms present to the list of symptoms absent

If you've added a symptom to the list of symptoms present but would like to move it to the list of symptoms absent, it is easy to do so as shown in Figure 2.15.

To do so, please follow these steps:

1. Click or right-click with the mouse on the symptom that you want to move to the list of symptoms absent(e.g “Dyspnea” in Figure 2.15). A menu with three options (“Modify”,“Add qualifying text” or “Delete”) appears. Please select the “Modify” option. See step 1 in Figure 2.15).
2. A popup will appear as in step 2 of Figure 2.15 with the “Yes” button originally colored in blue (to indicate that the symptom you want to move is originally in the list of symptoms present). To indicate the absence of the symptom, you now have two choices: either click on the “Yes” button (which originally appears in blue) to deselect it so that both “Yes” and “No” buttons are deselected and appear in gray as in the image on the left of step 3 in Figure 2.15 or press the “No” button to select it (the “No” button should now appear blue as in the image on the right of step 3 in Figure 2.15). Once you're done, and if you still want to move the symptom, press the “Done” button. If you don't want to move the symptom anymore, press the “Cancel” button instead and no changes will be made to the Symptoms list.
3. If you pressed the “Done” button in the previous step, the symptom (e.g “Dyspnea” in Figure 2.15) will appear in the list of symptoms absent as shown in step 4 of Figure 2.15.

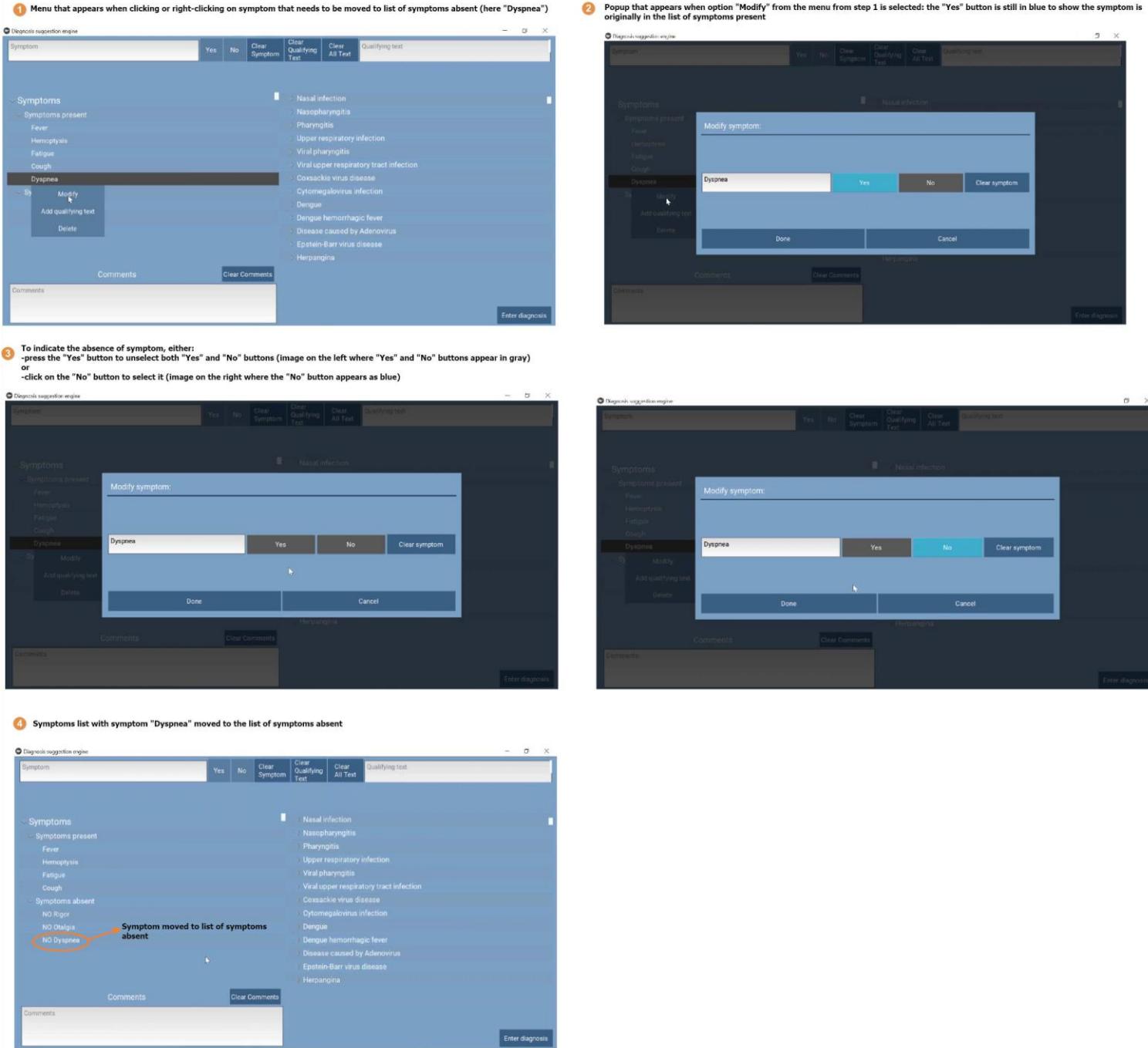
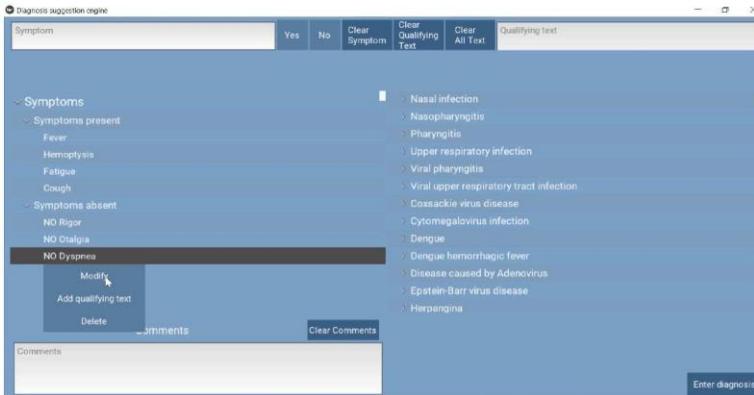


Figure 2.15: Moving a symptom from the list of symptoms present to the list of symptoms absent

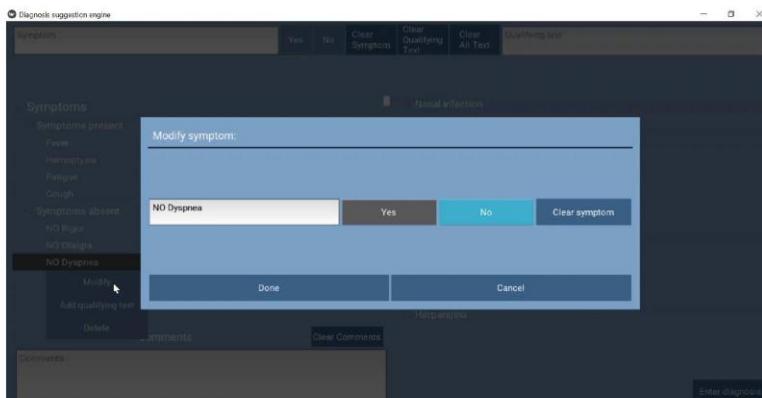
Moving a symptom from the list of symptoms absent to the list of symptoms present

The procedure here is very similar to the one described when moving a symptom from the list of symptoms present to the list of symptoms absent.

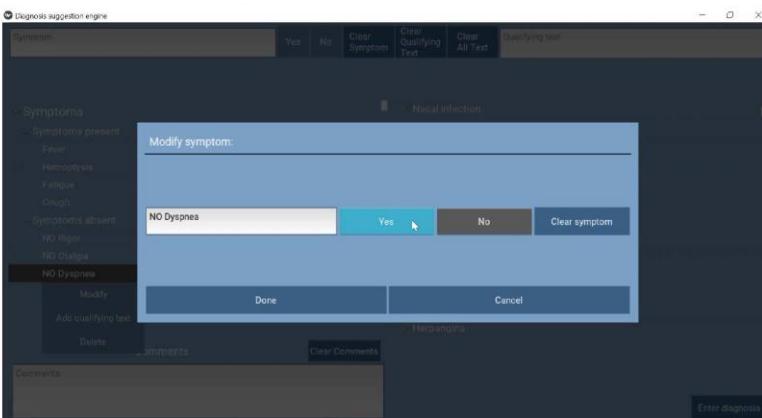
① Menu that appears when clicking or right-clicking on symptom that needs to be moved to list of symptoms present (here "Dyspnea")



② Popup that appears when option "Modify" from the menu from step 1 is selected: the "No" button is in blue to show the "Dyspnea" symptom is originally in the list of symptoms absent



③ Click on the "Yes" button (which turns blue) instead of the original "No" button to indicate the presence of symptom "Dyspnea" (instead of its absence). Then click on the "Done" button at the bottom of the popup.



④ Symptom "Dyspnea" now appears in the "Symptoms list" under the "Symptoms present" list.

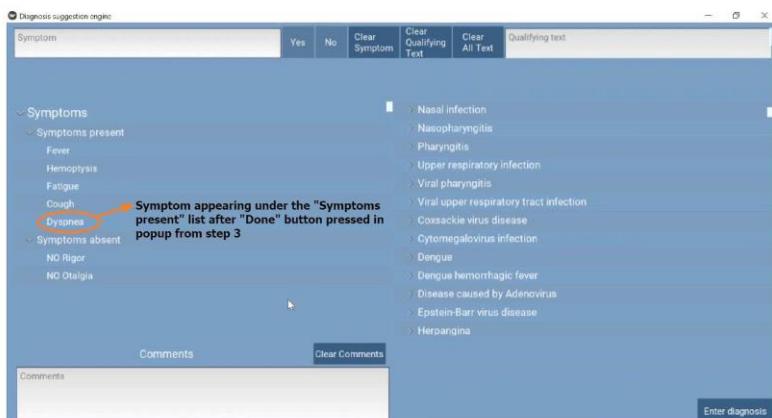


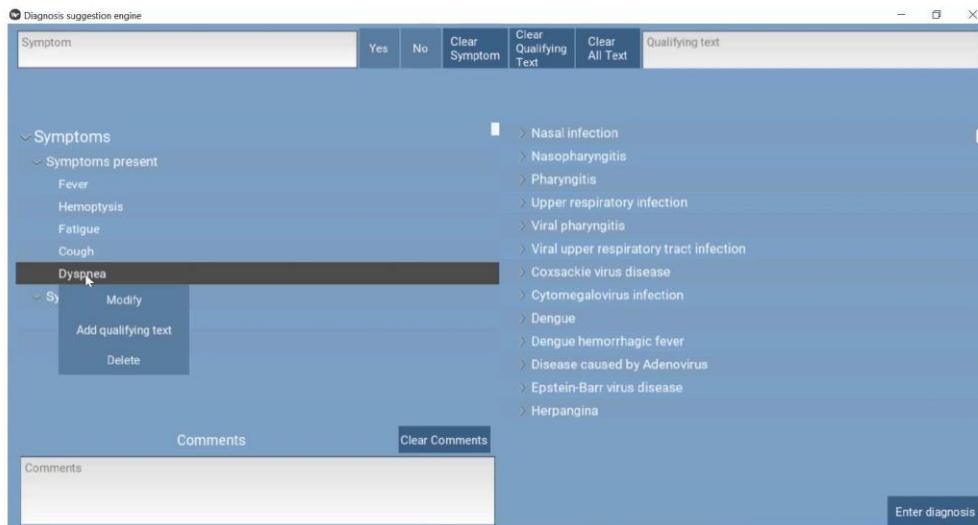
Figure 2.16: Moving a symptom from the list of symptoms absent to the list of symptoms present

Figure 2.16 shows how to move a symptom from the list of symptoms absent to the list of symptoms present:

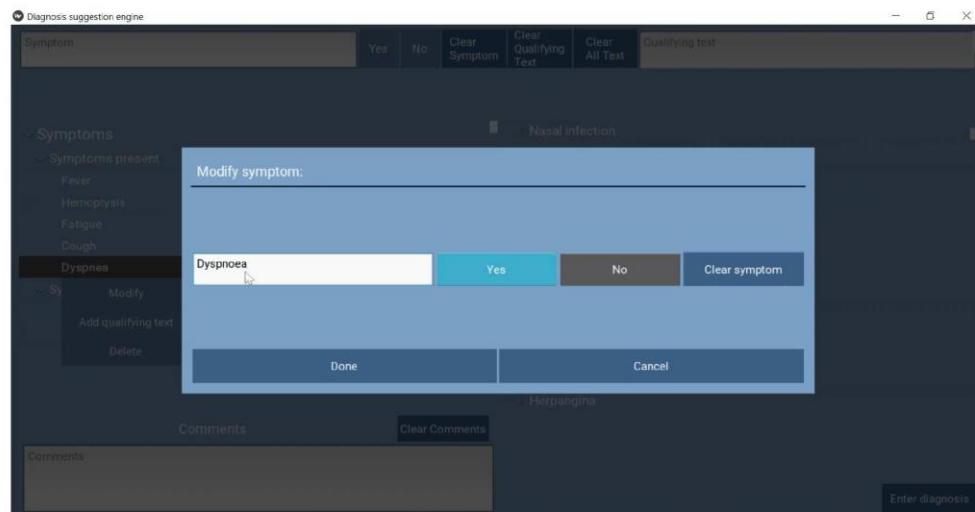
1. Click or right-click with the mouse on the symptom that you want to move to the list of symptoms present (e.g. "Dyspnea" in Figure 2.16). A menu with three options ("Modify", "Add qualifying text" or "Delete") appears. Please select the "Modify" option.
2. A popup will appear as in step 2 of Figure 2.16 with the "No" button originally appearing in blue, i.e. selected to indicate the absence of the symptom. To indicate that the symptom is present, simply click on the "Yes" button: the "Yes" button should now appear blue as in the bottom image in step 3 in Figure 2.16. Once you're done, and if you still want to move the symptom, press the "Done" button. If you don't want to move the symptom anymore, press the "Cancel" button instead and no changes will be made to the Symptoms list.
3. If you pressed the "Done" button, the symptom (e.g. "Dyspnea" in Figure 2.16) will appear in the list of symptoms present as shown in step 4 of Figure 2.16.

Modifying a symptom's spelling

1 Menu that appears when clicking or right-clicking on symptom whose spelling needs to be modified (here "Dyspnea")



2 Modification of the spelling of the symptom in the text input box of the popup that appears after the option "Modify" is selected from the menu in step 1 (from "Dyspnea" to "Dyspnoea" in this example)



3 The symptom now appears under its new spelling (here "Dyspnoea") in the Symptoms list after the "Done" button is pressed in the popup from step 2.

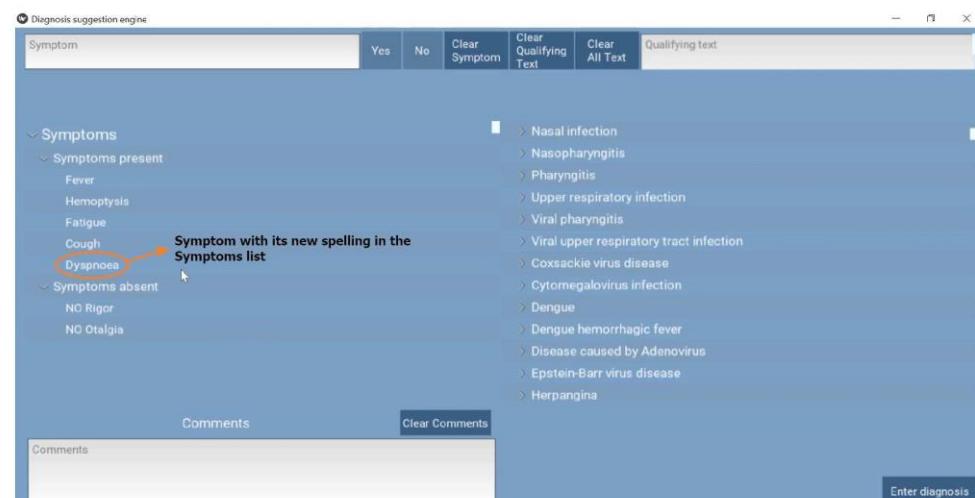


Figure 2.17: Modifying the spelling of a symptom already added to the Symptoms list

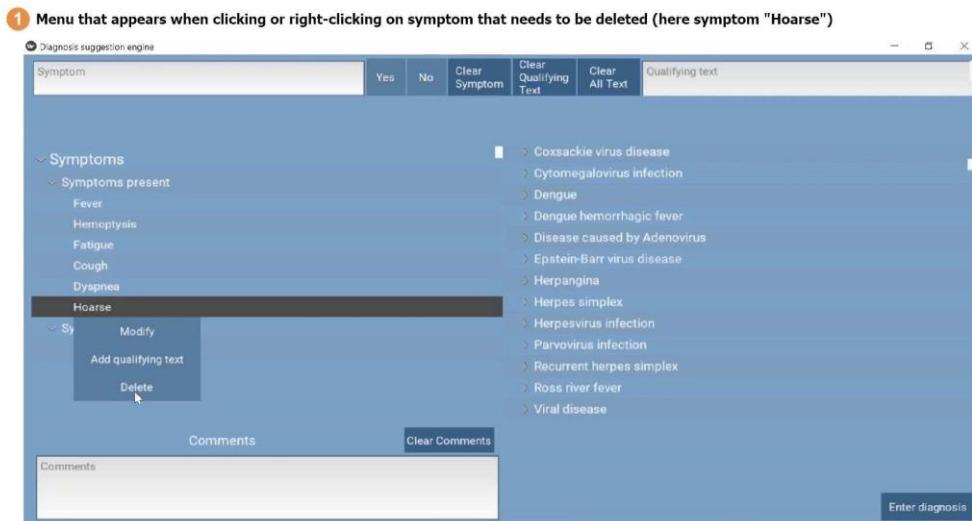
Once a symptom has been added to the Symptoms list, it is still possible to modify its spelling as shown in Figure 2.17.

To do so, please follow these steps:

1. Click or right-click with the mouse on the symptom whose spelling you want to modify (e.g “Dyspnea” in Figure 2.17)
2. Select the “Modify” option from the menu that appears.
3. A popup will show up with an input box that has the symptom’s original spelling: you can modify the content of the input box to change the spelling of the symptom to the spelling desired.
4. Once you’re done modifying the content of the input box, press the button “Done” if you want your new spelling changes to appear on the Symptoms list or the button “Cancel” if you want to undo your changes and for the Symptoms list to remain unchanged and keep the symptom’s original spelling
5. If you have pressed the “Done” button, the symptom will appear on the Symptoms list with its new spelling(e.g “Dyspnoea” in Figure 2.17)

Though modifying a symptom’s spelling is technically possible, it is highly recommended that you use the spelling of the symptom found in either in the differential diagnosis list or suggested by the autocompletion list as you type letters in the symptom input box (element 3 in Figure 2.7) as not doing so might affect how symptoms (in particular their presence or absence) is displayed in the differential diagnosis list.

Deleting a symptom



2 Symptom "Hoarse" does not appear under the Symptoms list anymore once option "Delete" is selected from the menu in step 1.

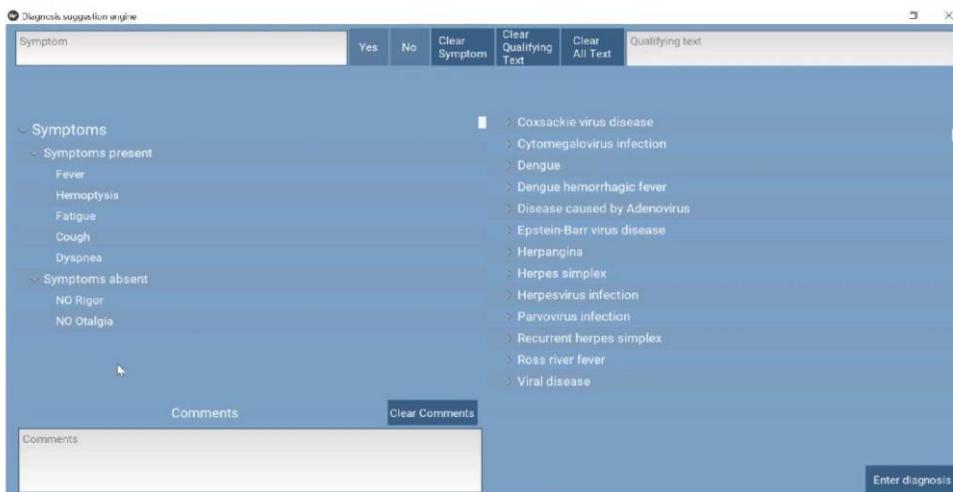


Figure 2.18: Deleting a symptom already added to the Symptoms list

You can delete a symptom already added to the Symptoms list as shown in Figure 2.18. To do so, simply click or right-click the symptom you want to delete in the Symptoms list (e.g the “Hoarse” symptom in step 1 of Figure 2.18): a menu with three options will appear (“Modify”, “Add qualifying text”, “Delete”). Select the “Delete” option: the symptom will no longer be listed in the Symptoms list as shown in step 2 of Figure 2.18.

2.2.4 Entering a diagnosis

Once you're done with entering symptoms and optionally modifying them, you can enter your diagnosis through the DSS interface.

To do so, press the "Enter diagnosis" button at bottom right corner of the DSS interface. A popup as shown in Figure 2.19 will appear: you can then start entering the diagnosis text in the input box provided.

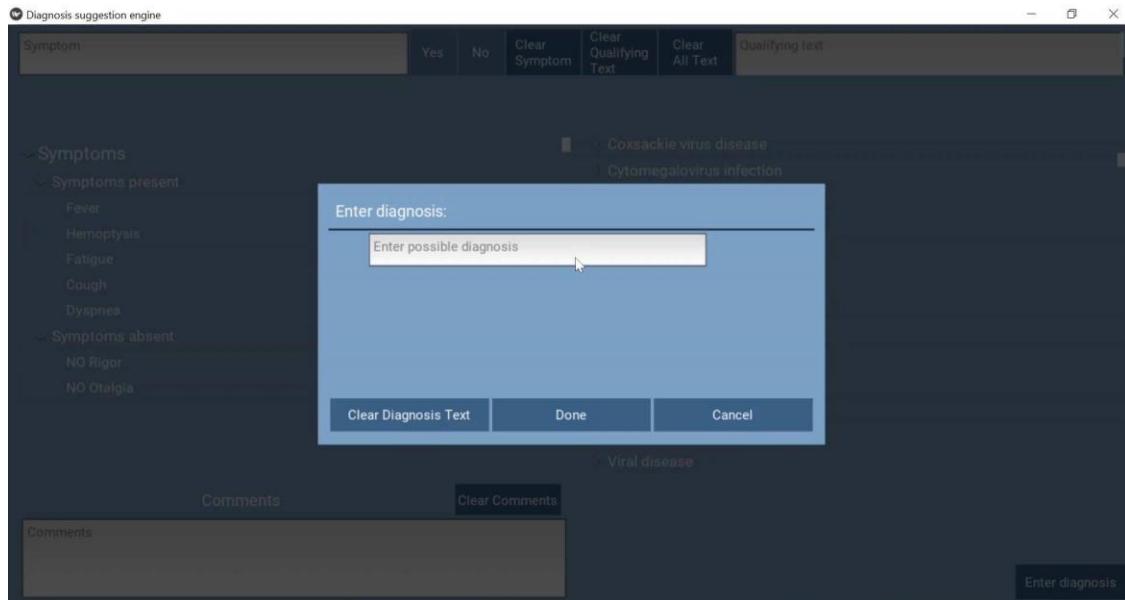


Figure 2.19: Popup that appears once the “Enter diagnosis” button is pressed

The input box, as is the case for the symptom input box, has autocomplete functionality so a list of suggestion will start appearing as you type letters in the input box as shown in Figure 2.20: Figure 2.20 shows the example of entering the first letters of the diagnosis “Tuberculosis”; “Tuberculosis” appears as the second option in the list and can be clicked on to be selected.

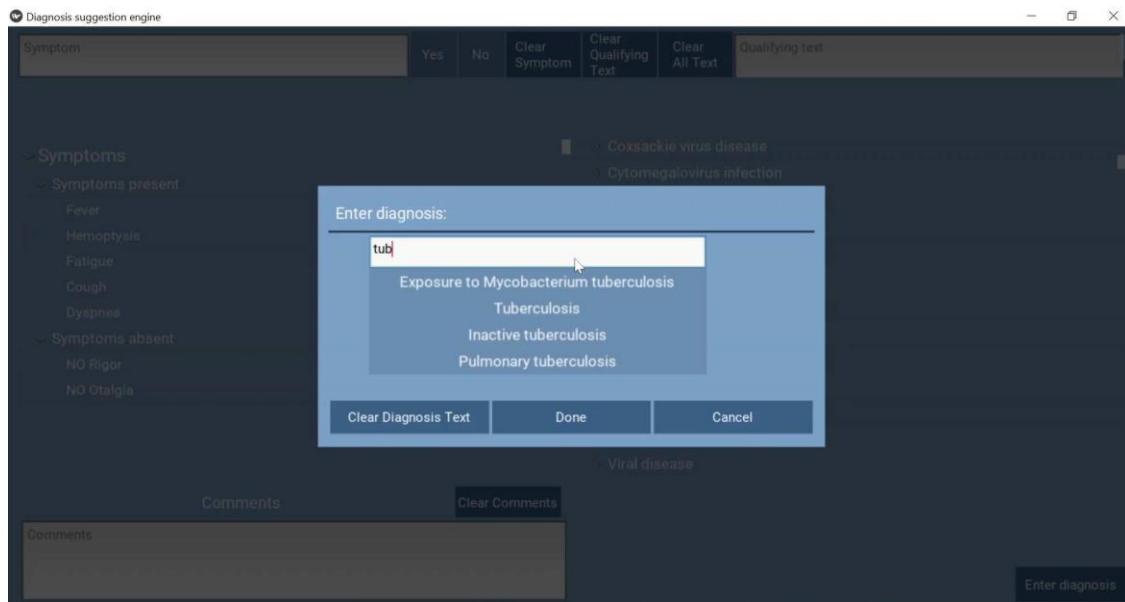


Figure 2.20: Screenshot of autocomplete functionality as “Tuberculosis” diagnosis is typed into diagnosis entry popup

Please select a diagnosis from the list of suggestions (the result will look like Figure 2.21) or keep typing until the desired input appears.

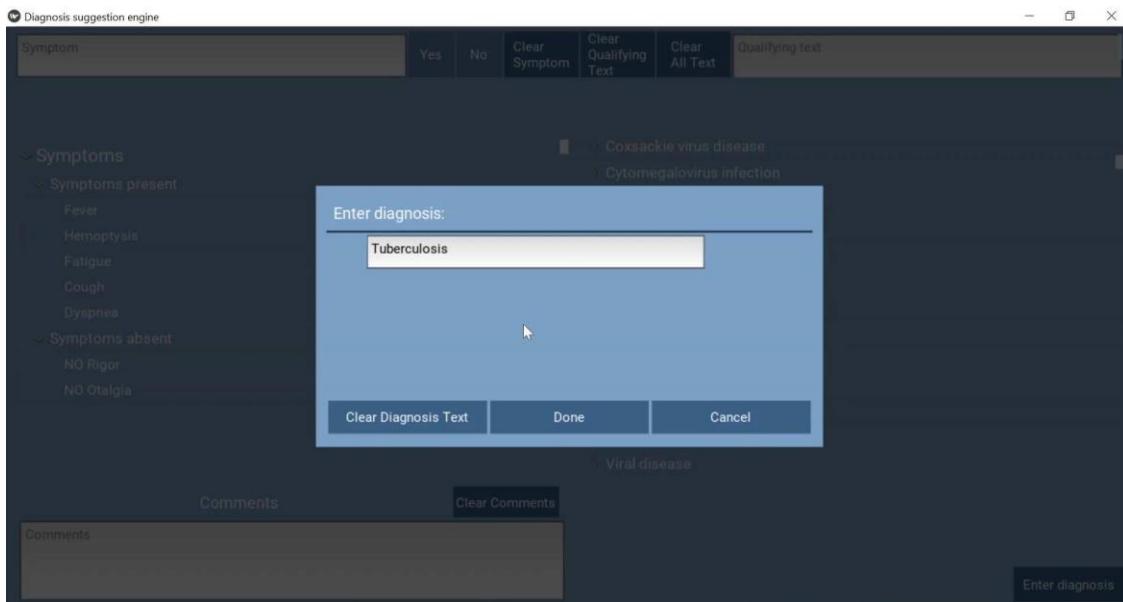


Figure 2.21: Screenshot of diagnosis entry popup as the “Tuberculosis” diagnosis selected from the autocomplete list

Once the diagnosis selected, press the “Done” button to proceed or the “Cancel” button to go back to the previous interface without entering a diagnosis (for example, if you wish to continue entering new symptoms).

Once you have selected a diagnosis, you will be returned to the main DSS interface and you will see a screen as in Figure 2.22.

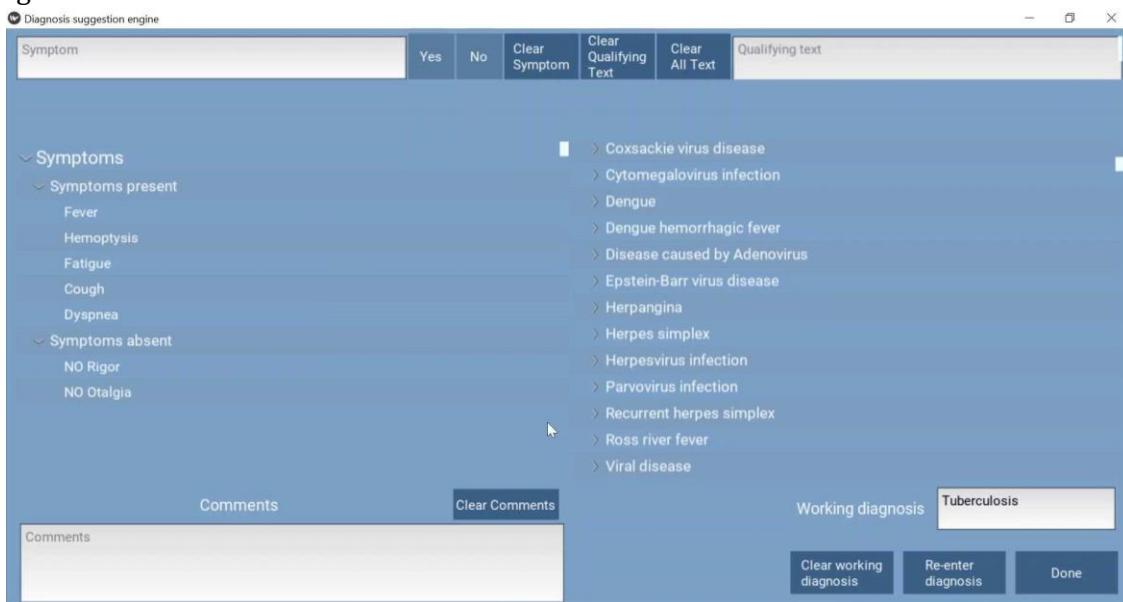


Figure 2.22: Screenshot of the DSS interface once the “Done” button has been pressed in the diagnosis entry popup

You have the option to re-enter the diagnosis by pressing the “Re-enter diagnosis” button on the interface. In this case. The same popup as in Figure 2.19 will appear and you would enter the new diagnosis in the diagnosis in the same way as previously.

Otherwise, if you are satisfied with the diagnosis already entered (e.g “Tuberculosis” here), simply press the “Done” button to indicate you have finished entering all the data you want to enter and you are ready to exit the DSS. All the data entered until this point (i.e symptoms with associated qualifiers, diagnosis as well as any comments in the “Comments” field) will now be written back in the patient’s SystmOne record. Once the DSS is done writing back data in SystmOne, you will see a popup as in Figure 2.23.

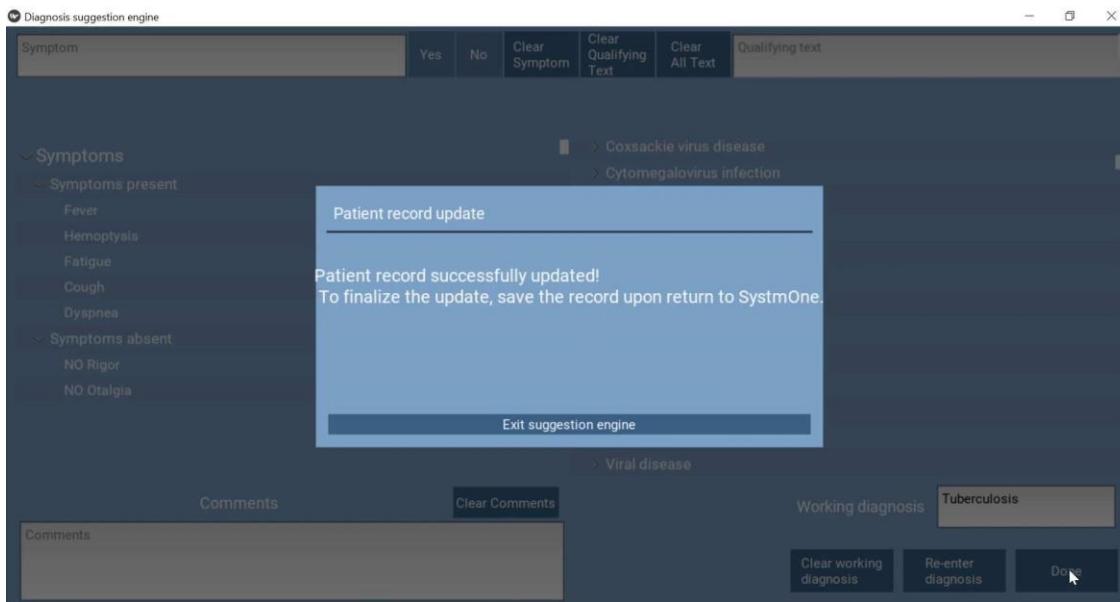


Figure 2.23: Screenshot of the DSS interface once the DSS has finished writing back data into SystmOne

You can now exit the DSS and go back to SystmOne by pressing the “Exit suggestion engine button” in the popup from Figure 2.23.

Once back in SystmOne, if on the left panel menu, under Disease and Ops menu, you select the New Journal option, you will be able to see the data newly written by the DSS into the patient’s record (see Figures 2.24 and 2.25 for screenshots of what this might look like for the feasibility and video study respectively):

- symptoms present are recorded as symptoms the appropriate associated clinical code (Read Code or SNOMED code depending on the code you are visualizing). Optional qualifiers are also taken into account.
- symptoms absent go into notes alongside optional qualifiers. They are also associated with a SNOMED code attached to the note.
- the diagnosis is recorded as such with an associated clinical code
- any comment put into the “Comments” field of the DSS interface is recorded into a note.
- a CPMS value that differs between feasibility and video study is associated with the full set of data entered through the DSS (this value is the only difference between the DSS for the feasibility study and the DSS for the video study)

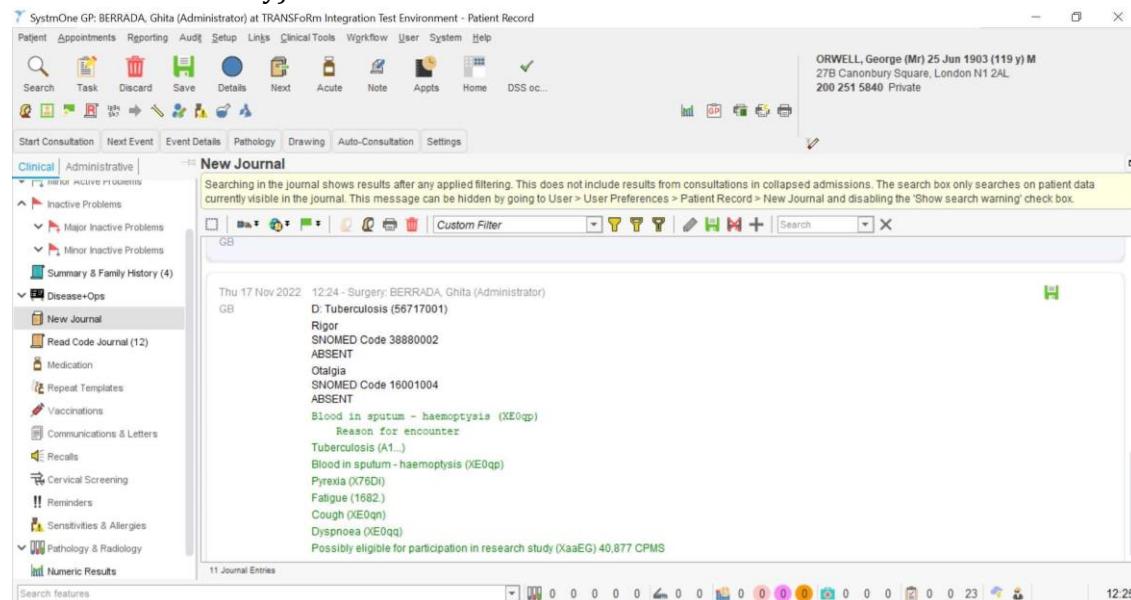


Figure 2.24: Screenshot of data written to SystmOne patient record by DSS (feasibility study)

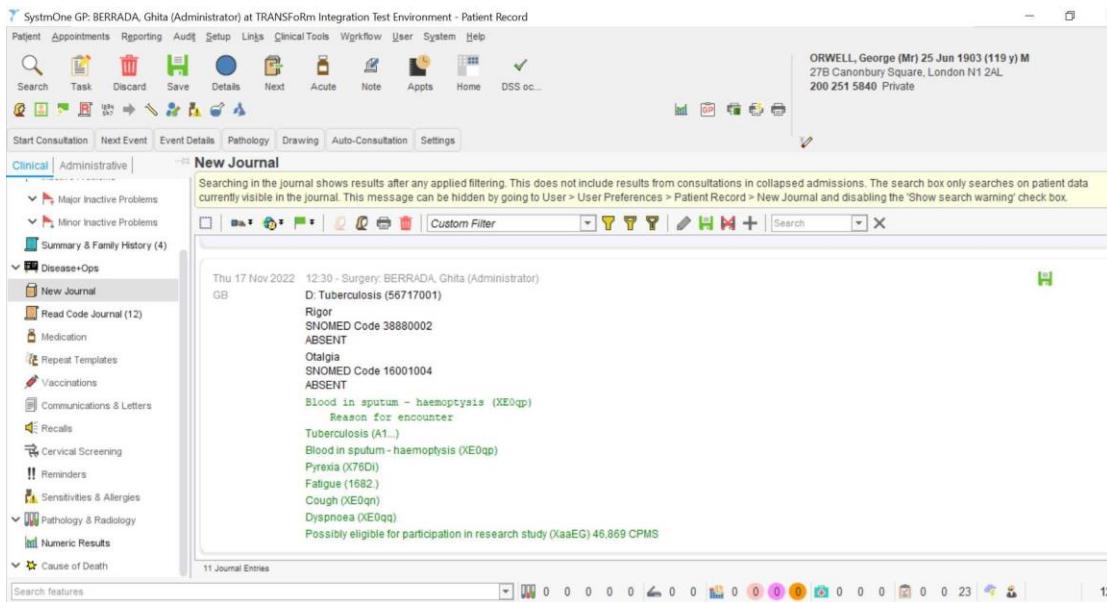


Figure 2.25: Screenshot of data written to SystmOne patient record by DSS (video study)

Please note that, **until you save the data that has been written by the DSS into the record**, the data is only **temporarily available** and would be lost if you close/discard the record without saving the data. Until you save the session (which you can do by going to the Patient menu in SystmOne and selecting the Save Patient option), none of the data written by the DSS into the record is permanent and you can continue to modify the record as you would modify the record for a consultation that does not involve the DSS. Here is an example of what could be done at this stage: the DSS mandates that you enter a diagnosis before you exit it and data is written back into SystmOne but, if you are, for example, uncomfortable with having to enter a diagnosis at this stage of examining your patient, you can remove the diagnosis you entered in the DSS from the SystmOne record before saving the record.

Once you are satisfied with the content of the SystmOne record, you can then save your record as described previously.

Please do make sure that all consultations that have made use of the DSS include SNOMED code 871801000000106 ("Possibly eligible for participation in research study") with value 40877 for the feasibility study (CPMS code of the feasibility study) or value 46869 for the video study (CPMS code for the video study).

Chapter 3

Uninstalling the DSS

Should you want to remove the DSS from your system, here is how to do it. If you are launching the DSS from the SystmOne toolbar, go to to SystmOne and

1. right-click on an empty space in the toolbar. In the menu that appears, select the Configure toolbar option as previously.
2. In the preview of the toolbar that appears on the next menu, select the button that corresponds to the launch button for the DSS, then click on the Delete Button Set button followed by the OK button. The launch button should now no longer appear on the SystmOne toolbar.
3. Now, go to the Setup/Users & Policy/ Program & Maintenance menu in SystmOne. Within the series of URLs and programs that appear, select the one that corresponds to the DSS. Then click on the Delete URL button. The DSS is now no longer linked to SystmOne.

4. To complete the uninstall, go the folder where you've unzipped the DSS archive and simply delete the whole folder. If you want to be completely thorough, you could also delete the downloaded archive and also empty the Recycle bin. You're done with the uninstall!

If you are using the Desktop, taskbar, Start menu shortcuts options to launch the DSS, things might be even simpler:

1. Right-click on the Desktop shortcut for the DSS and select the Unpin from Start option
2. Right-click on the Desktop shortcut for the DSS again and select the Unpin from again option
3. Select the Desktop shortcut and delete it
4. Go the folder where you've unzipped the DSS archive and simply delete the whole folder. If you want to be completely thorough, you could also delete the downloaded archive and also empty the Recycle bin. You're done with the uninstall!