



Open source

By: Morten Johannes Ervik, IARC

Version: August 26, 2010

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1 Introduction

CanReg5 is an open source tool to input, store, check and analyse cancer registry data. It has modules to do data entry, quality control, consistency

checks and basic analysis of the data. The main improvements from the previous version are the new database engine, the improved multi user capacities and that the development is managed like an open source project. Also included is a tool to facilitate the set up of a new or modification of an existing database by adding new variables, tailoring the data entry forms etc.

Version 5 of CanReg is now ready for download.

1.1 A short introduction to the database structure in CanReg5

New in CanReg5 is the three level table structure. Where CanReg4 stored everything in one big table of tumours, CanReg5 splits this information in three tables: Patient, Tumour and Source. For each patient, you can store as many tumour records as you need, and for each tumour you can store as many source records as you need. This allows us to do more with our databases, for example related to completeness by counting number of sources, but it poses some problem that might require manual intervention during the conversion process of a system from CanReg4 to CanReg5.

For example, some of you might store multiple sources in each tumour record in CanReg4. This should be split into several source records for this tumour record in CanReg5, but this is not an easy task to automate since all registries that have opted for this have solved it in a different way in CanReg4.

One way around this is to put all the fields related to the source table in CanReg5 so that you are sure not to lose any data, and then start from the date you start using CanReg5 to store multiple source records per tumour.

The best way, but a more time consuming one, is to set up the source table (by editing the system definition XML) to only contain the data you want to store per source and then work on the exported file from CanReg4 and import additional source information at a later stage. (General import of data is not yet functioning adequately in CanReg5 - only import & migration of old data.)

You can of course choose not to use the source table, as well - just record the source information per tumour like you would in CanReg4. This can be set up while migrating your system definition files.

1.2 Forum, Issue tracker, community site, twitter

We have created a project page at Project Kenai to help us keep track of issues with CanReg5: <http://kenai.com/projects/canreg>. This consists of one open forum, one closed user forum and an issue tracker (standard BugZilla). To have access to the user forum and the issue tracker you need to create an account at Project Kenai and ask to be associated with the CanReg project. This is free of charge. Using these tools allows you to see what error reports other CanReg users have already filed and if solutions have already been proposed and also discuss potential improvements for CanReg5.

You can of course still send us emails.

If you encounter any problems please provide a description of it along with the specifications of your computer. (Operating System (Windows XP, Vista, OSX, Linux?), memory, processor speed etc.) Also it would be very useful if you can precise the **version** and the **build code** of your CanReg5. This can be found on the bottom left of the welcome screen and on the “About” screen. (For example Version: “4.99.0b586”)

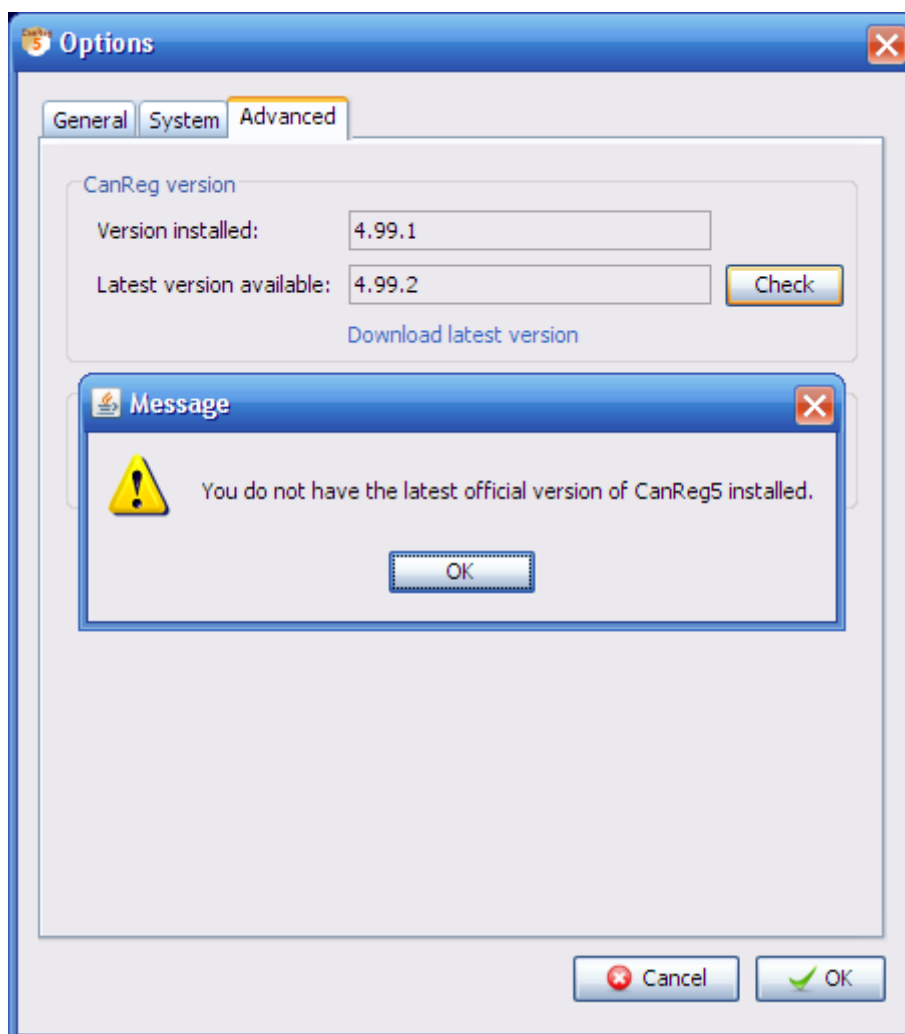
Please be aware that some problems can be avoided by installing the latest version of the Java Runtime Environment (Version 6) before you start. (Available from <http://java.com/en/download/manual.jsp>.)

Videos documenting certain operations described below can be downloaded from: <http://www.iacr.com.fr/CanReg5/videos.zip> .

Last, but not, least: CanReg has its own stream on twitter. Please follow: <http://twitter.com/canreg> for updates.

1.3 Getting hold of the latest version of CanReg

If you are running version 4.99.1 (or newer) of CanReg, you can launch CanReg and click “Options...”, go to the “Advanced” tab. There you see your current version, i.e. 4.99.1. If you click “Check” CanReg will look for an updated version. Afterwards you can click “Download latest version” to get the zip-file containing the most recent version of CanReg5.



If you have version 4.99.0 or no CanReg5 at all you can download the newest version from here: <http://www.iacr.com.fr/CanReg5/CanReg5.zip>

1.4 Logfile

CanReg generates a logfile when you run it. This file is called `canreg5client.log` and is located in your home folder (on windows it is most probably under `C:\Documents and Settings\<your username>`) If you can attach this to emails with feedback/queries it would be very useful. Please note that this file is overwritten each time CanReg is started, so you need to “take it” just after, for example, your error

occurs. Example log-file:

```
<?xml version="1.0" encoding="windows-1252" standalone="no"?>
<!DOCTYPE log SYSTEM "logger.dtd">
<log>
<record>

    <date>2009-06-25T16:09:27</date>
    <millis>1245938967921</millis>
    <sequence>0</sequence>
    <logger>canreg.client.CanRegClientApp</logger>
    <level>INFO</level>
    <class>canreg.client.CanRegClientApp</class>
    <method>startup</method>
    <thread>10</thread>
    <message>CanReg version: 4.99.9b668 (20090625160546)</message>

</record>
<record>

    <date>2009-06-25T16:09:31</date>
    <millis>1245938971265</millis>
    <sequence>1</sequence>
    <logger>canreg.server.management.SystemDescription</logger>
    <level>INFO</level>
    <class>canreg.server.management.SystemDescription</class>
    <method>debugOut</method>
    <thread>11</thread>
    <message>create table APP.PATIENT ( PRID INTEGER NOT NULL PRIM

</record>
...
</log>
```

2 Installing and running CanReg 5

2.1 Install necessary helper applications

Before you install and run CanReg5 for the first time it is recommended that you install the following helper applications.

2.1.1 Java Runtime Environment

Install the latest Java Runtime environment (May 2010: Version 6 Update 20) You can get that from here:<http://java.com/en/download/manual.jsp>

2.1.2 PostScript Viewer

To view the tables generated by CanReg5 are PostScript files. PostScript is an open standard, so you can use many different tools to view them. (You can in many cases even send them directly to a printer.) Mac OS X and most Linux-distributions come with tools to view them by default.

On Windows, the tool I recommend is the open sourced and free GSview.

To run GS View you need to install Ghostscript first. This can be for example be downloaded from here:

<http://pages.cs.wisc.edu/~ghost/doc/GPL/gpl864.htm> (Scroll all the way down, under the heading Microsoft windows and download the “GPL Ghostscript 8.64 for 32-bit Windows (the common variety)”
(<http://mirror.cs.wisc.edu/pub/mirrors/ghost/GPL/g864/g864w32.exe>)

Run this file to install Ghostscript.

Then you can get GS View from here:

<http://pages.cs.wisc.edu/~ghost/gsview/get49.htm> (Most probably, you should pick the Win32 self extracting archive - the first download option.
<http://mirror.cs.wisc.edu/pub/mirrors/ghost/ghostgum/gsv49w32.exe>)

Run this file to install GS View.

2.2 Install CanReg5

CanReg5 is distributed as a zip-archive. To install it simply extract the content to a new folder, for example on your desktop. (It is important to keep the same directory structure as inside the zip-file.)

2.3 Un-install CanReg5

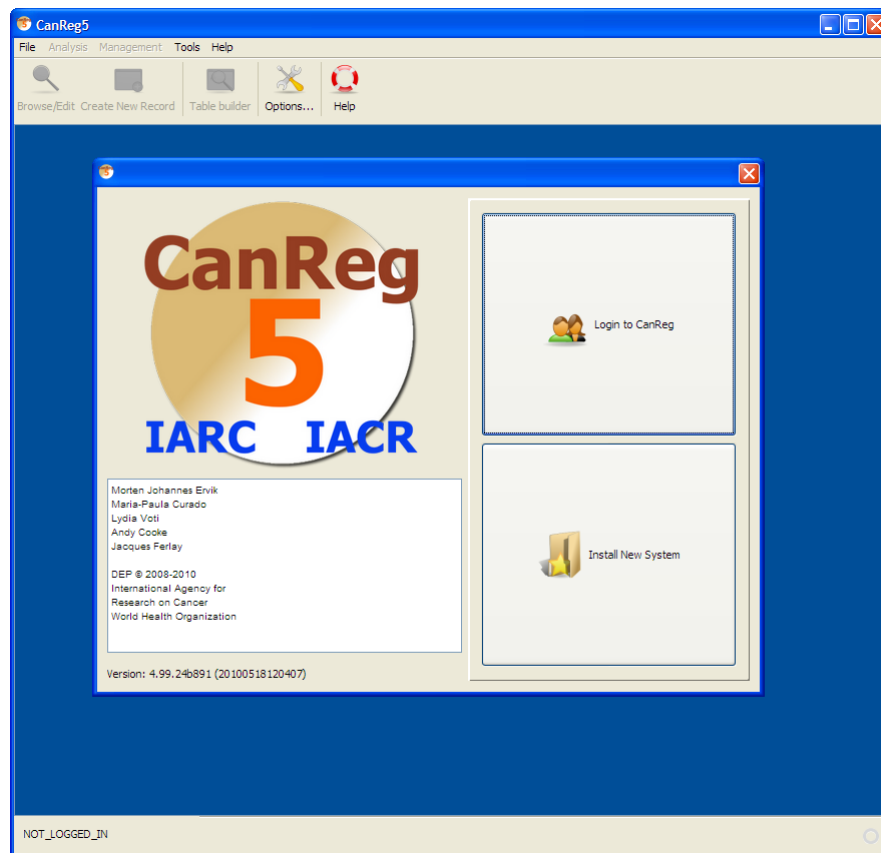
If you wish to un-install CanReg5, delete the following folders (or rename if you have anything valuable in them):

\\Documents and Settings\\<your username>\\.CanRegClient
\\Documents and Settings\\<your username>\\.CanRegServer

2.4 Run CanReg5

Go to the folder you installed CanReg5 in and double click on the coffee cup icon (CanReg.jar). **(If, at this point, CanReg5 does not start you might have to update your Java Runtime Environment and retry.** (See above.)

CanReg 5 Welcome window:

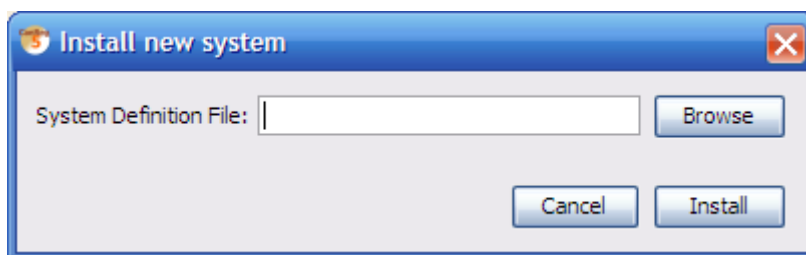


2.5 Demo system

Included is the dictionary for the training system located in the demo-folder in the zip-file. With this you can get a demo-system up and running to test some data entry. To run this demo system, install the TRN-file to set up the system. Afterwards you should import the dictionary using “Data Entry” - “Edit dictionary” and “Import complete dictionary from a file”, before you start to enter data.

2.6 Install a new CanReg5 system

If you want to install an already provided system definition (for example the demo system TRN) please click “Install New System”. CanReg5 will present you with the following message:



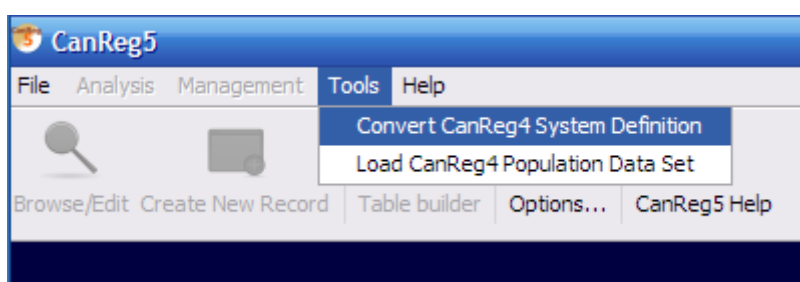
Click browse to find the system definition file. (If you want to use the TRN demo system look in demo/database and select TRN.xml and click open and then Install.)

2.7 Convert the CanReg4 system definitions

If you have a CanReg4 system you can use tools built into CanReg to help you migrate this to CanReg5.

First import the variables of CanReg 4 to CanReg 5 - the system definition of CanReg4.

Go to “Tool” in CanReg5 menu and click “Convert system definition”

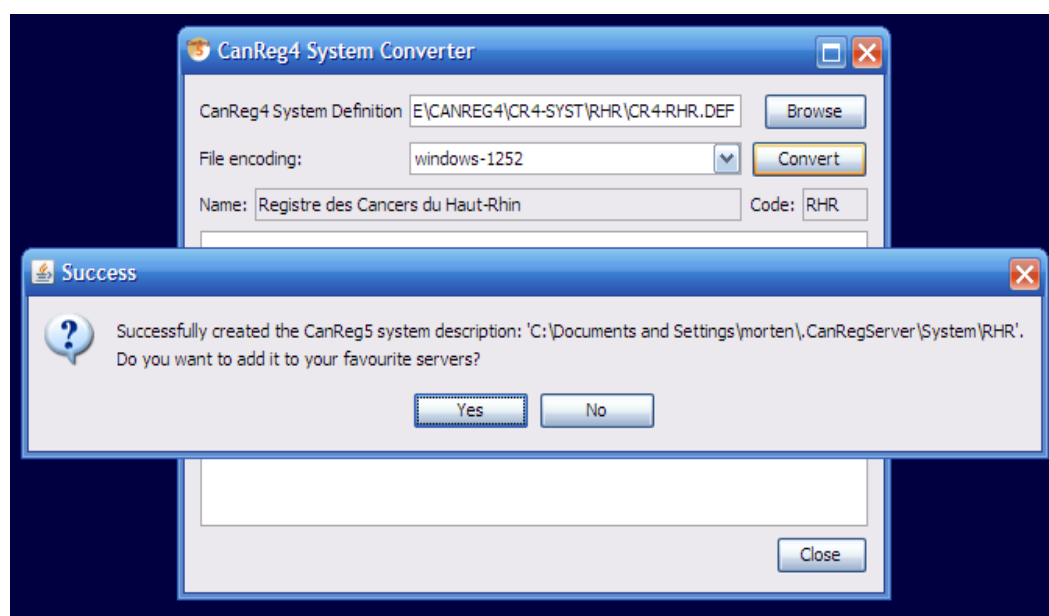


Do “Browse” to find your CanReg 4 system definition file. (This is a file located in the folder \\CR4SHARE\CANREG4\CR4-SYST\ followed by your 3 letter registry code i.e. TRN whose name is ending in .DEF (i.e. CR4-TRN.DEF).)

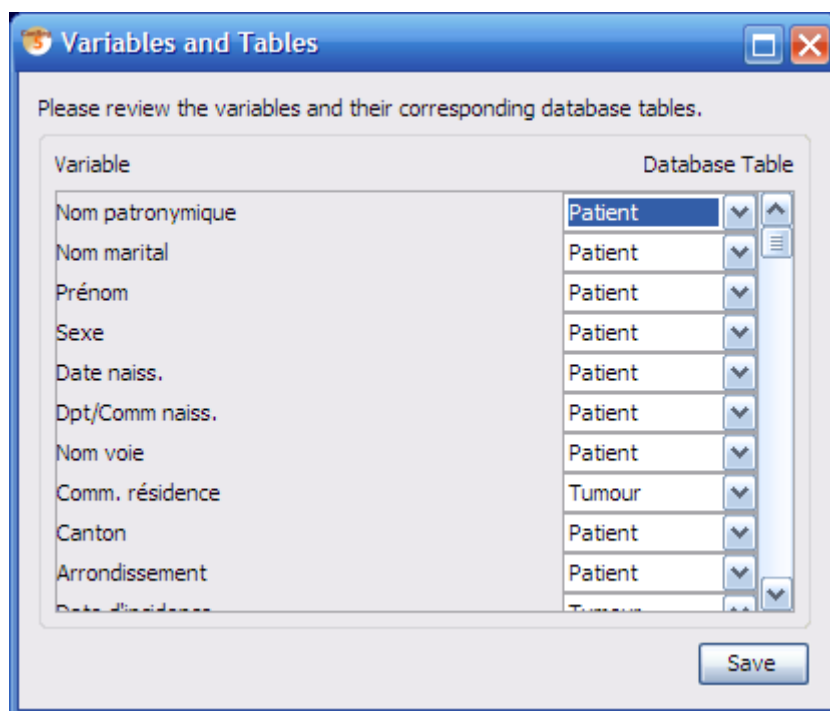
Select your CanReg4 file and double click it or click “Open”.

Click “Convert”.

The program will then ask you if you want to add this server to your favourites. Click “Yes” here.



The next step is the trickiest one during the conversion. Since we go from a tumour based database structure with only one big table with all the tumour and patient related information to a structure with both a table for tumour related information and patient related information we need to specify what variable goes in what table of CanReg5. We recommend putting the unique patient related information (name, date of birth and follow-up variables) in the patient table, source information in the Source table and pretty much the rest (tumour information, age, address etc) in the tumour table.



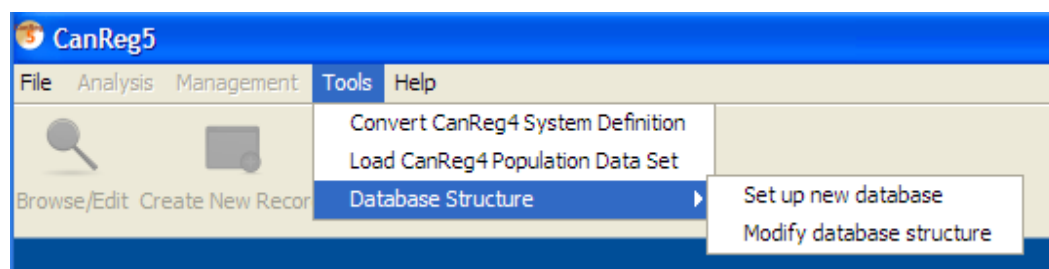
The program presents an initial proposal that you might agree with, but please go through one by one the variables and decide.

Click “Save”. You have now created an XML file that describes your CanReg5 system.

Optional: Before you proceed to the next step and launch the server you can, if you want(!), manually edit this XML file you have created by opening it in a text editor or a dedicated XML editor. The file is located in your user folder under .CanRegServer. (On my machine, for example, running Windows XP it is under: C:\Documents and Settings\morten\.CanRegServer\System.)

2.8 Setting up or modifying a CanReg system using the built in editor

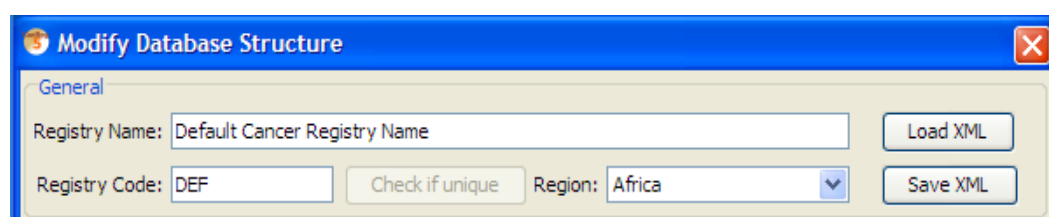
To modify an existing CanReg system or set up a new one you can use tools built into CanReg5.



They can be found under Tools -> Database Structure.

Note: Before using this tool it is highly recommended to perform a backup of your CanReg5 database!

For now please use “Set up new database”. This will give you the Modify Database Structure window.



Please click Load XML and either pick your own XML or, if you start from scratch, the TRN.xml or DEF.xml found in the CanReg installation. (You will need to load an existing XML to be able to create a working XML for your CanReg system.)

Please note that certain modifications done using this tool will impact the structure of the CanReg database to such an extent that it will have to be rebuilt afterwards. Others like renaming groups, changing the displayed name of a variable or reordering the variables are purely cosmetic and do not impact the database structure as such. If you wish to do changes to the structure of the database you'll need to export your data prior to those changes, delete the database files of the CanReg system, do required modifications using this tool or directly in the XML, relaunching the CanReg server and then import the data (this again will potentially have to be adapted to the structural changes).

When this has loaded you'll see all the info specifying this CanReg system. On the top you can specify the registry name, registry code and region of the registry. Below you have a list of the Dictionaries, then the Groups and then the Variables.

Modify Database Structure

General

Registry Name:

Registry Code: ☐ Region:

Groups

New Control Panel	<input type="button" value="+"/> <input type="button" value="-"/>	<input type="button" value="Remove"/> <input type="button" value="Edit"/>
Patient	<input type="button" value="+"/> <input type="button" value="-"/>	<input type="button" value="Remove"/> <input type="button" value="Edit"/>
Tumour	<input type="button" value="+"/> <input type="button" value="-"/>	<input type="button" value="Remove"/> <input type="button" value="Edit"/>
Hospital	<input type="button" value="+"/> <input type="button" value="-"/>	<input type="button" value="Remove"/> <input type="button" value="Edit"/>
Follow up	<input type="button" value="+"/> <input type="button" value="-"/>	<input type="button" value="Remove"/> <input type="button" value="Edit"/>

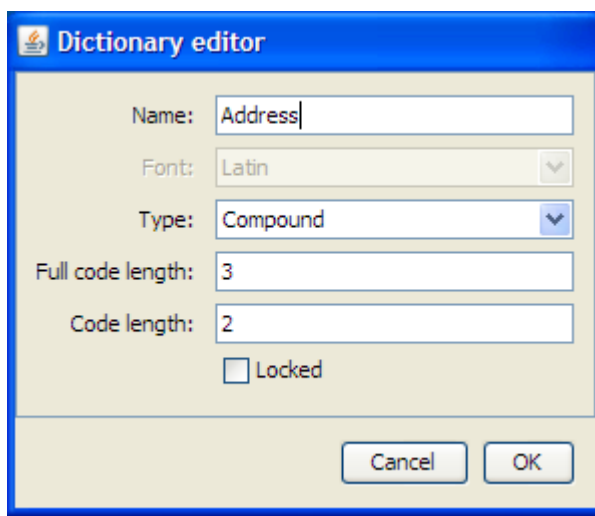
Variables

Surname	<input type="button" value="+"/> <input type="button" value="-"/>	<input type="button" value="Remove"/> <input type="button" value="Edit"/>
First names	<input type="button" value="+"/> <input type="button" value="-"/>	<input type="button" value="Remove"/> <input type="button" value="Edit"/>
Maiden name	<input type="button" value="+"/> <input type="button" value="-"/>	<input type="button" value="Remove"/> <input type="button" value="Edit"/>
Sex	<input type="button" value="+"/> <input type="button" value="-"/>	<input type="button" value="Remove"/> <input type="button" value="Edit"/>
Age	<input type="button" value="+"/> <input type="button" value="-"/>	<input type="button" value="Remove"/> <input type="button" value="Edit"/>
Birth date	<input type="button" value="+"/> <input type="button" value="-"/>	<input type="button" value="Remove"/> <input type="button" value="Edit"/>
Tribe	<input type="button" value="+"/> <input type="button" value="-"/>	<input type="button" value="Remove"/> <input type="button" value="Edit"/>
Address	<input type="button" value="+"/> <input type="button" value="-"/>	<input type="button" value="Remove"/> <input type="button" value="Edit"/>
Occupation	<input type="button" value="+"/> <input type="button" value="-"/>	<input type="button" value="Remove"/> <input type="button" value="Edit"/>
Incidence date	<input type="button" value="+"/> <input type="button" value="-"/>	<input type="button" value="Remove"/> <input type="button" value="Edit"/>
Topography	<input type="button" value="+"/> <input type="button" value="-"/>	<input type="button" value="Remove"/> <input type="button" value="Edit"/>

To add a dictionary, group or variable, click add in the proper pane. This will then appear as the last item in the corresponding list for you to edit.

Clicking edit on any button related to a dictionary, group or variable brings up the respective editor.

2.8.1 Modifying a dictionary

The image shows a Windows-style dialog box titled "Dictionary editor". It has a blue title bar with a small icon on the left. The main area is light beige and contains several input fields and a checkbox. The "Name" field is a text box containing the word "Address". The "Font" field is a dropdown menu showing "Latin". The "Type" field is a dropdown menu showing "Compound". The "Full code length" field is a text box containing the number "3". The "Code length" field is a text box containing the number "2". Below these fields is a checkbox labeled "Locked", which is currently unchecked. At the bottom right of the dialog are two buttons: "Cancel" and "OK".

Using the dictionary editor you can modify any dictionary in CanReg5. The fields are as follows:

Name: The name of the dictionary

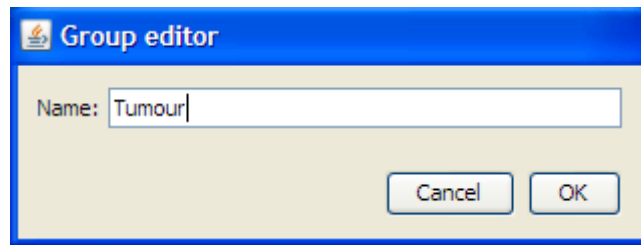
Type: This can either be “Simple” or “Compound”. A “Simple” dictionary is a plain list of codes and corresponding labels, whereas a “compound” dictionary has two levels of refinement. For example the user can pick the two first digits and then the last digit, as in the above example.

Full code length: The number of character the codes for this dictionary takes up in the database.

Code length: The number of characters in the first level of refinement in the case of a compound dictionary.

Locked: Will you allow the super user to modify this dictionary using the tools in CanReg, or should it be locked?

2.8.2 Modifying a group



Using the group editor you can modify any group in CanReg5.

Name: The name of the group

2.8.3 Modifying a variable

A screenshot of the 'Variable editor' dialog box. It has a blue title bar with a small icon and the text 'Variable editor'. The main area is light beige. It contains several fields and dropdown menus: 'Full name:' with text 'Address'; 'Short name:' with text 'Addr'; 'English name:' with text 'Address'; 'Standard Variable Name:' with a dropdown menu showing 'AddressCode'; 'Group:' with a dropdown menu showing 'Patient'; 'Fill in status:' with a dropdown menu showing 'Mandatory'; 'Multiple Primary Copy:' with a dropdown menu showing 'Probably'; 'Variable Type:' with a dropdown menu showing 'Dictionary'; 'Variable Length:' with text '3'; 'Dictionary:' with a dropdown menu showing 'Address'; 'Unknown code:' with an empty text field; and 'Table:' with a dropdown menu showing 'Tumour'. At the bottom right, there are two buttons: 'Cancel' and 'OK'.

Using the dictionary editor you can modify any variable stored in the CanReg5 database. The fields are as follows:

Full name: The name of the variable as displayed in data entry forms etc.

Short name: The name of the variable in the database. (This should be without any blanks and other special characters and reasonably short.)

English name: It is useful to provide an English name for the variable in case you want to collaborate with people in other countries.

Standard Variable Name: This maps the variable to a standard CanReg5 variable for the purpose of edit checks and analysis.

Group: The choice of group only affects the display during data entry.

Fill in status: Can be set to “Mandatory”, “Optional”, “Automatic” or “System”, depending on if you want to force the registrar to provide this information before confirming the record.

Multiple Primary Copy: Legacy information. Leave as other.

Variable Type: Can be “Alphabetic” (for plain text), “Asian text” (legacy field, same as “Alphabetic”), “Date”, “Dictionary”, “Number” and “Text Area”.

Variable Length: The length of the variable in characters.

Dictionary: If you chose “Dictionary” as type of variable you’ll have to choose a dictionary here.

Unknown code: Here you can specify the unknown code of this variable.

Table: Choose the table where this variable should be stored.

2.8.4 Set up search variables

Search Variables

Variable	Weight	Action
Surname	25.0	Remove
First names	20.0	Remove
Birth date	16.0	Remove
Sex	5.0	Remove
Tribe	8.0	Remove

Minimum match: 70.0 %

Add variable

Using this editor you can change the variables that come into play during person search in CanReg5, and their respective weights and minimum match criteria.

2.8.5 Coding

Coding

Male code: 1 Female code: 2 Unknown sex code: 9

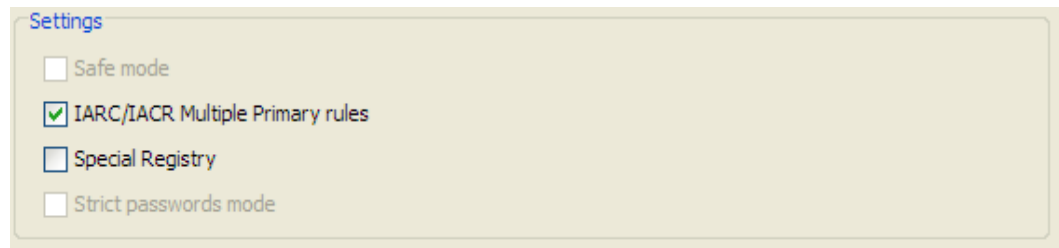
Date Format: dd/mm/yyyy Date Separator: /

Morphology Length: 4

☒ IARC/IACR Basis of Diagnosis codes

Here you can change some coding settings of your CanReg system. (Not yet implemented.)

2.8.6 Settings



Here you can change some settings of your CanReg system. (Not yet implemented.)

2.8.7 Saving the system

By clicking Save XML the system XML will be saved to the system folder of CanReg under the name <your system code>.xml (for example TRN.xml), ready for use.

2.9 Launching the CanReg server

After clicking “Login” on the welcome screen of CanReg you get the login screen. To launch the CanReg server click “Settings”. Click “Launch Server”.



If you get a java firewall query, please confirm that it is OK that java can communicate through you firewall by clicking “Unblock”, “OK” or “Yes”. If this is the first time you launch the server on this machine it will automatically create the database needed for CanReg5.

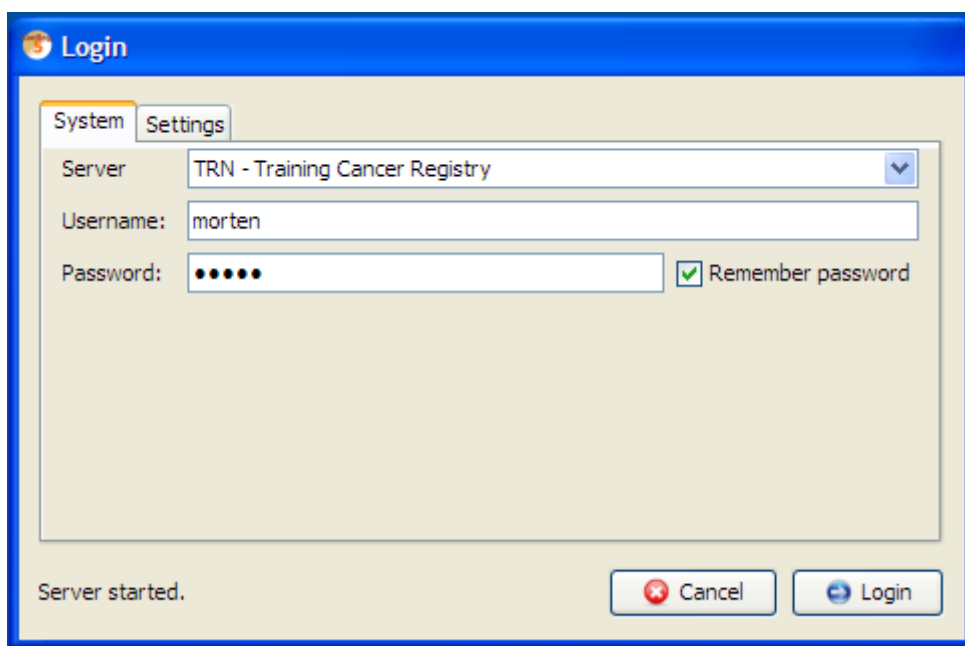
2.10 Login

After launching the server you can log on to your CanReg system.

2.10.1 Locally

If you want to log in to a CanReg server running on your local machine, after either installing a CanReg5 system XML or converted your CanReg4 system definition files you go to the “System” tab of the “Login”-window and choose your server from the drop down list. (Most probably already selected.) (The default username is “morten” and password is “ervik”. (All in small letters with no double quotes.) Click “Login” and you’ll be logged on.)

If you get an error message saying “Could not log in to the CanReg server on localhost with the given credentials.”, please make sure that you have entered the correct username and password and that the server is indeed running. (See “Launching the CanReg server” above.)



2.10.2 In a network

If you want to log on to a CanReg server running on another machine in your network you need to know the address of that machine. (Either it's IP address or name on the network.)

To find the IP address of a CanReg server you can go to the Settings tab on the "Login"-window and tick "Advanced" to get access to some more advanced tools, like the "Get IP Address" tool. Click this and you will get a message saying "The IP address of (your machine) is www.xxx.yyy.zzz. (Most probably something like 10.0.0.x or 192.168.0.x.) Take a note of those numbers.

Launch CanReg on the machine you want to run CanReg on. Click "Login" to get to the "Login" screen. There you can click "Settings" and type the IP address, www.xxx.yyy.zzz, you found above in the "Server URL" field along with the system code for your registry. (For example TRN.) If you click "Add server to list" the program will test the connection to the server and if this is OK this network server will be added to the list of servers you can log in to from this CanReg installation.

Click the "System" tab and choose this networked server from the drop down list of servers, enter username and password. (The default username is "morten" and password is "ervik". (All in small letters with no double quotes.) Click "Login" and you'll be logged on.) Click "Login" and you'll be logged on.)

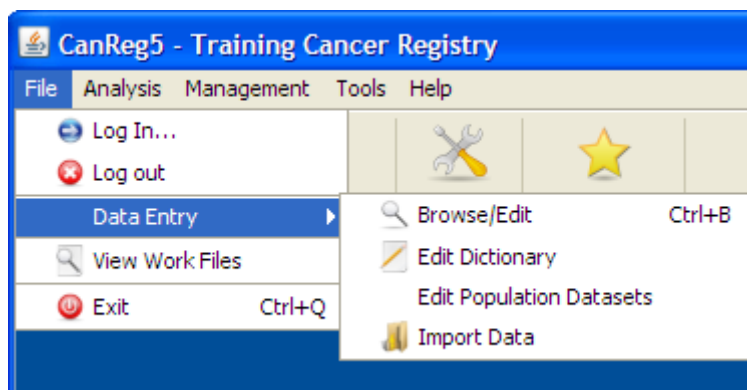
If you get an error message saying "Could not log in to the CanReg server on localhost with the given credentials.", please make sure that you have entered the correct username and password and that the server is indeed running. (See "Launching the CanReg server" above.)

The next time you want to log on to this server all you have to do is launch CanReg, select this server, enter username and password and click "Login".

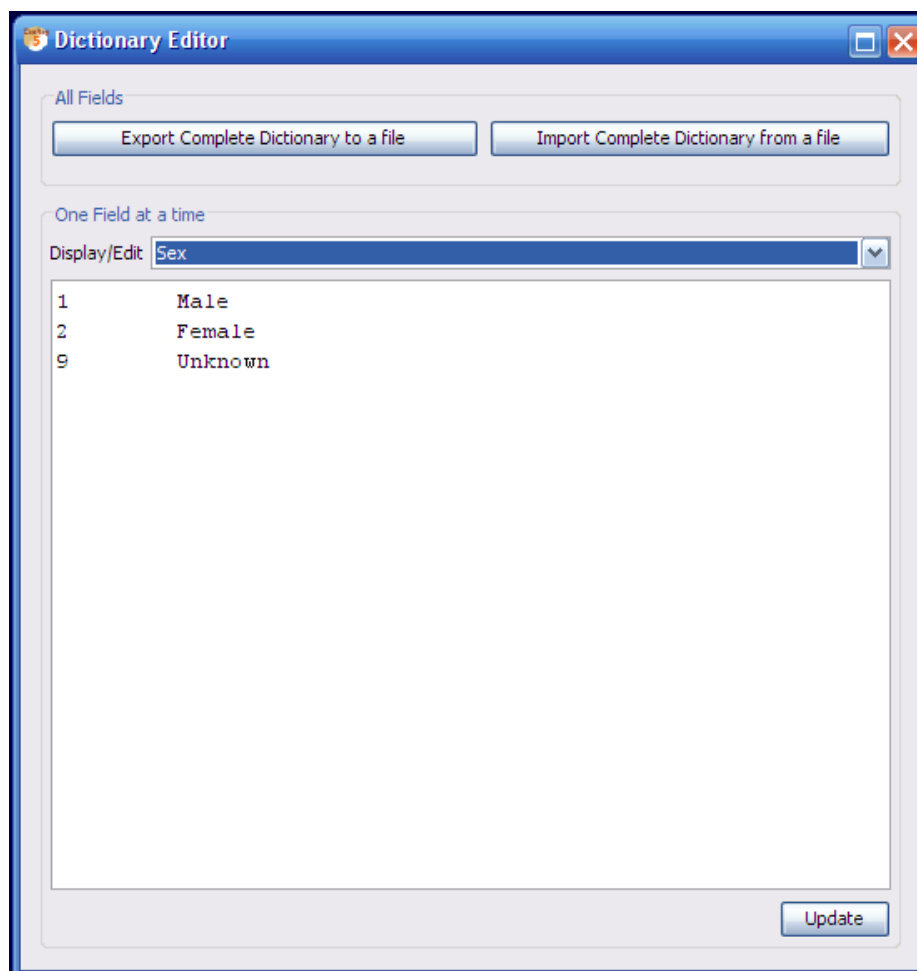
2.11 Import the dictionaries

If you are migrating from CanReg4 make sure to export the most updated dictionary from your CanReg4 system. (In CanReg4: "Data Entry", "Dictionary", "Export dictionary to text file") If you want to use the demo system, the dictionary is located in: demo/dictionary.

- Go to "File", "Data Entry", "Edit dictionary" in CanReg5

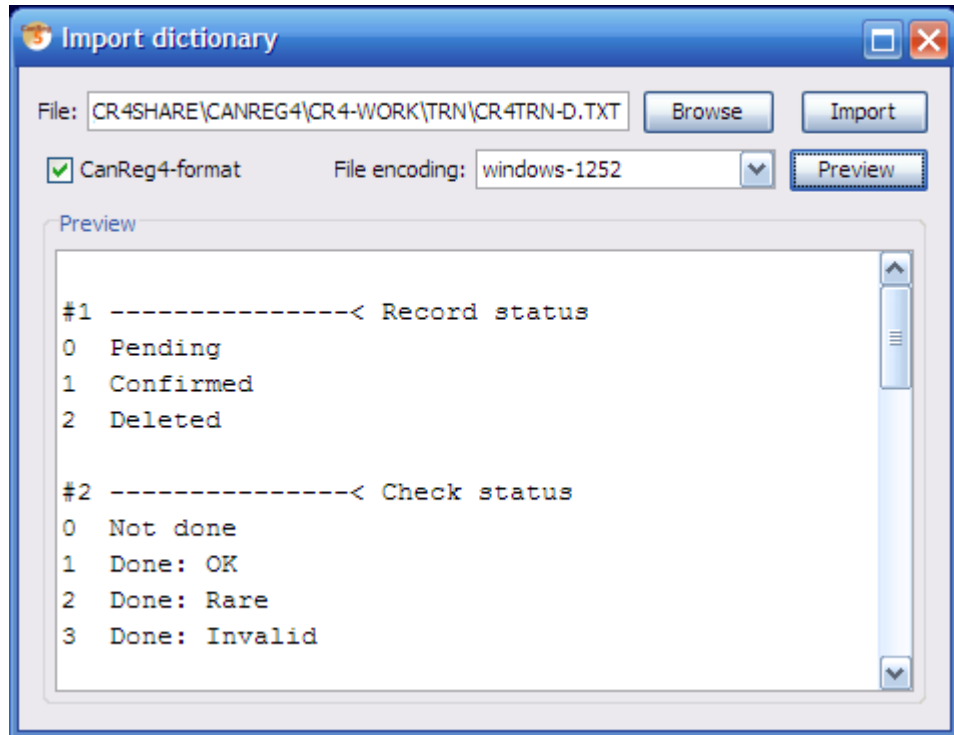


- Click on “Import complete dictionary from file”.



- Browse and select the dictionary from you CanReg4 work folder or elsewhere.

- Do Preview
- Tick “CanReg4 Format” if you are migrating from CanReg4, leave unticked if you are using the demo system or otherwise are importing a CanReg5 formatted dictionary.



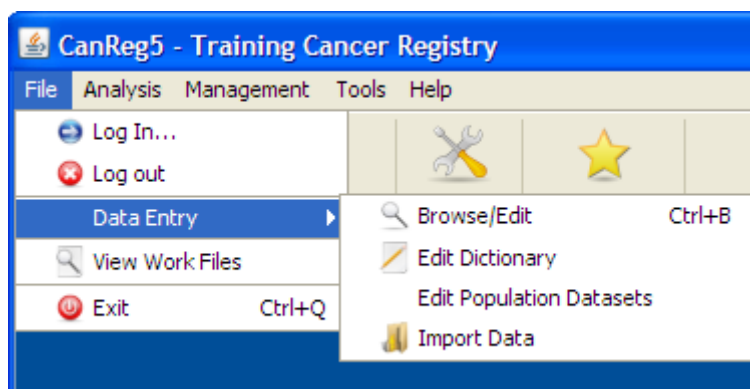
- Click Import. This might take some time. Please note the bar in the lower right indicating that the program is busy.
- Afterwards you will receive a message of success imported.
- Click OK.
- Go back to “File”, “Data Entry”, “Edit dictionary” and verify that the dictionaries have been imported.

2.12 Import the data from CanReg4

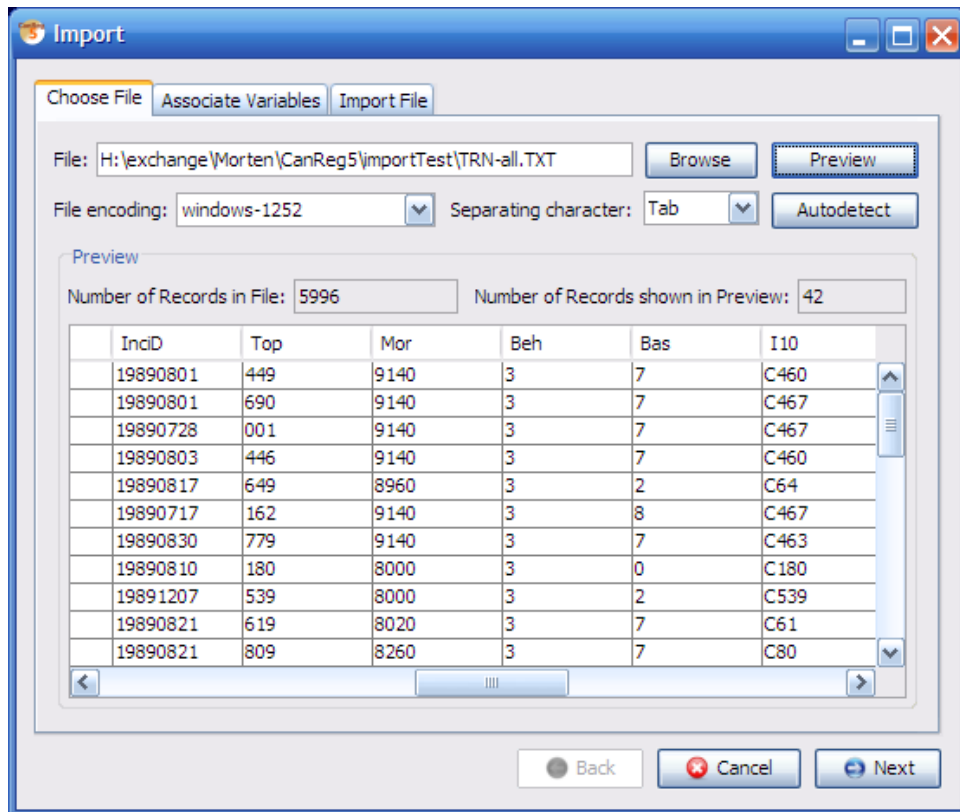
Make sure to export the most updated data from your CanReg4 system.

- In CanReg4: “Analysis”, “Export data”
- Tick “Export all variables”.

- Choose variables names short
- Under “Export File options” choose “Comma separated variables”
- Untick “Format date”
- Untick “Correct Unknown”
- Click “write data to file” and pick a file name that you can find back easily in CanReg5. For example on the desktop. Click “save”.
- Take a look at the data you have now exported and close CanReg4.
- Back in CanReg5 do “File”, “Data Entry” and “Import Data”.



- The program will ask you if you have all your data in one file. Answer “yes” as this is the case when migrating from CanReg4.
- Click “Browse” and locate the file from step A. Select it and click “Open”. You can if you want preview the file to see that you picked the right one and that the file looks OK. If for example Arabic names are garbled you should try to choose another “File encoding” (Default for Arabic text is ISO-8859-6).
- Set “Separating character” to Comma. (Or whatever separating characters your file has.)



- Click Preview to see that the data looks OK.
- Click “Next” (or select the tab “Associate Variables”)
- This lets you associate the variables in the file to import with the variables in the database. CanReg5 will find most of these associations by itself, but you should revise them to see if they look OK. Look for variable names in bold, as they are the one that are not assigned at all.
- Click “Next” (or select the tab “Import File”)
- Click “Import” (leave everything as by default – the import function only works on empty CanReg databases as per now...)
- Let CanReg5 import the data (this might take a while) and click “OK”.
- Click “Browse/Edit” and “Refresh Table” to see that the data has arrived well.

2.13 Import data from other programs

You can import data from other programs than CanReg4 by using the import tool in CanReg5. The only thing to pay attention to is that the data has to be coded in exactly the same way as in the CanReg5 database.

- Dates should be coded as year month day (yyyyMMdd)
- Topography in 3 digits ICD-O-3 with no leading C.
- Morphology in 4 (or 5) digits ICD-O-3.

Other fields with dictionaries, like for example addresses should follow the dictionary defined for them in CanReg5.

The data can either be in a single file as the example for CanReg4, or in one separate file for patient-information, tumour information and source information (with pointers to link sources to tumours and tumours to patients).

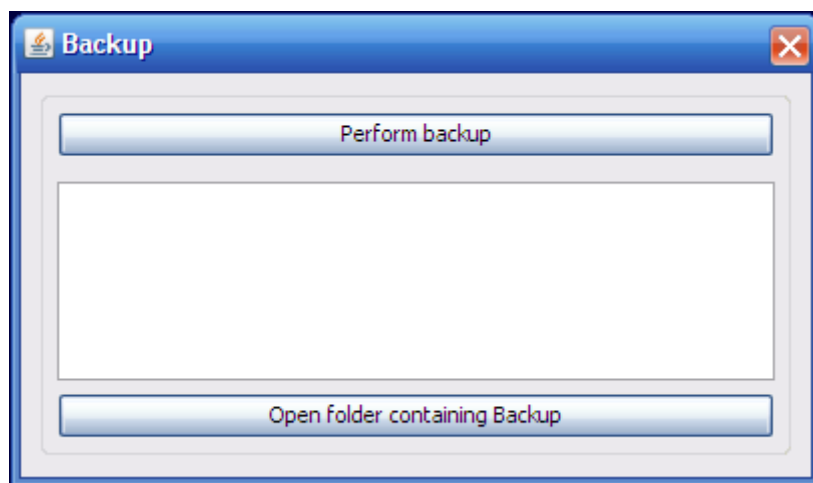
3 Working with CanReg5

3.1 Back up and restore

Backup-functionality can be found under the Management menu.

3.1.1 Perform backup

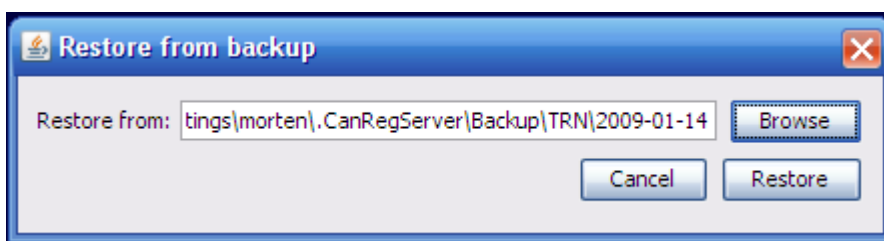
Under “Management” click “Backup”



Then click “Perform backup”. This creates the backup of the CanReg5 database on the server machine. If you are on the server machine, you can see the files you created by clicking “Open folder containing Backup”. It is stored in the **CanReg server** folder under Backup and 3 digit code of the registry and then the date of the backup. On my machine, for example, it is “C:\Documents and Settings\morten\.CanRegServer\Backup\TRN\2009-01-14”.

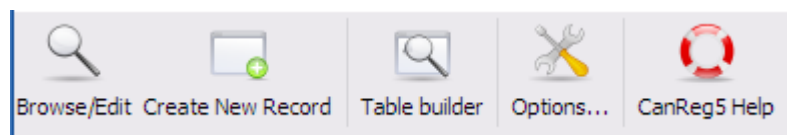
3.1.2 Restore from backup

If you are on the server machine you can restore the backup you created above by clicking “Restore” in the “Management”-menu and choose the folder with the date of the backup you want to restore - either by entering it or by browsing for it.

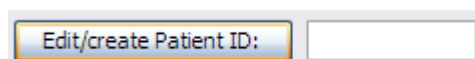


3.2 Enter cases

To get to a data entry form either press Create New Record from the menu bar



or enter a new record number in the browser and click “Edit Patient ID:”



This should resemble your CanReg4 data entry form, except that it is split in a patient part and a tumour part with a source part. Another thing to notice is the “Obsolete” button. This will flag the record as obsolete, so that it will not show up in analysis. It is a way to keep duplicate records that might contain valuable information. Pink fields are the mandatory ones. (Date format is still set to yyyyMMdd, but this will be improved later.)

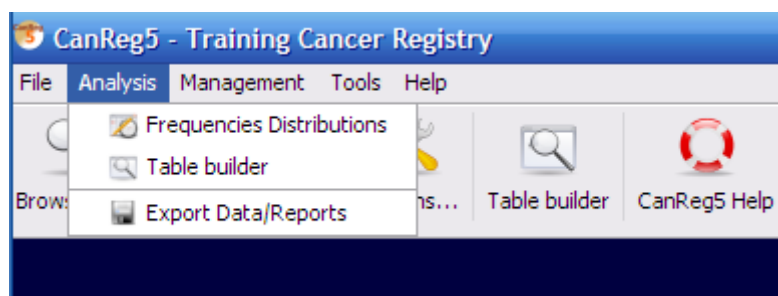
3.3 Export data

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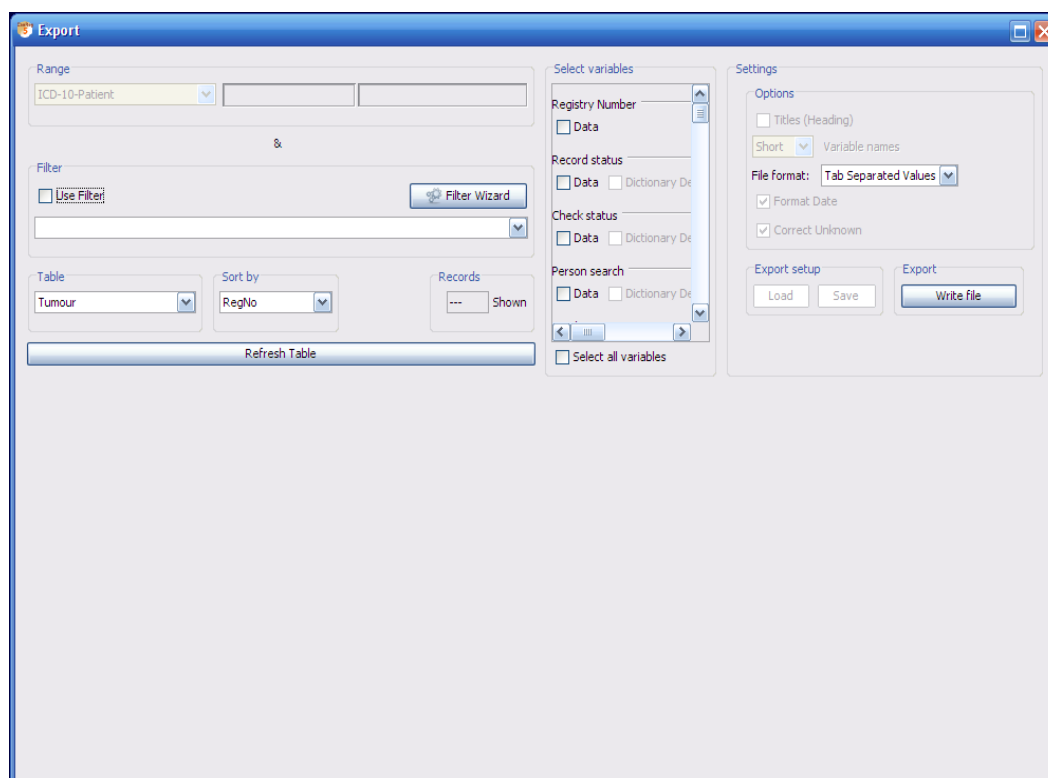
The screenshot shows the 'Patient ID: 19890001' form. At the top, there are buttons for 'Add tumour record', 'Add patient record', 'Merge with other Patient ID', and 'Enable obsolete records', along with a 'Print' button. The 'Patient: record1' section includes a 'Person Search' area with 'Run', 'Menu', and 'Save' buttons, and a 'By: unknown' field. Below this are fields for 'Maiden name', 'Sex' (1), 'Birth date' (19660701), 'Tribe', 'Langi', 'Occupation', and 'MiddleName'. A calendar for July 1966 is visible. The 'Tumour record1' section has 'Checks' and 'Record Status' (1 - Confirmed) buttons, a 'Sequence' dropdown, and a 'Number' field (32). It also includes a 'Total' field (1) and a 'Save' button. Below this are fields for 'Address' (120 KARMA) and 'City'. The 'Tumour' section contains fields for 'Topography' (449), 'Morphology' (9140), 'Behaviour' (3), 'Incidence date' (19890801), 'Basis diagnosis' (7), 'ICD-10' (C460), and 'ICCC code' (09c). The 'Sources' section has 'Add Source' and 'Remove Source' buttons. The 'Source: 1' section includes a 'Hospital' field (01 St. Peter's Hosp.) and a 'Path lab n°' field (52069/89).

3.3 Export data

To export your data go to Analysis – Export Data/Reports:



You will be presented with a screen that resembles the browse-screen:

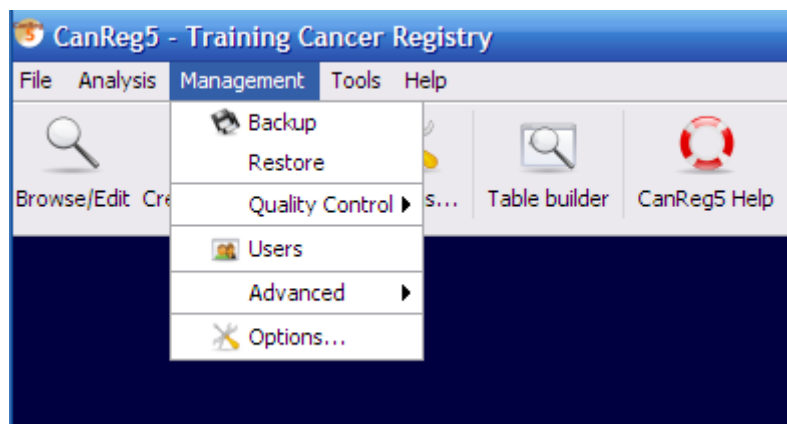


Now you can select some variables, and tables and sort method and export (some of) your data. Please note that some of the functionality, like the ability to store export-setups is not yet implemented.

If you export data to a “Tab Separated” file you can open this in general spreadsheets (like Excel).

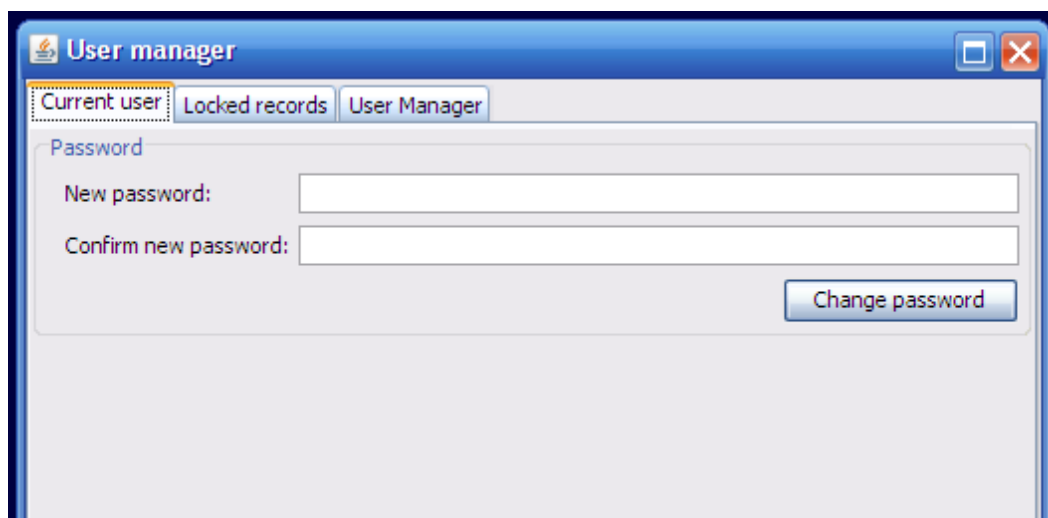
3.4 Manage users

The user manager is located under management – users:



Change your own password

To change your own password, go to the Current user tab in the user manager and enter your new password twice:

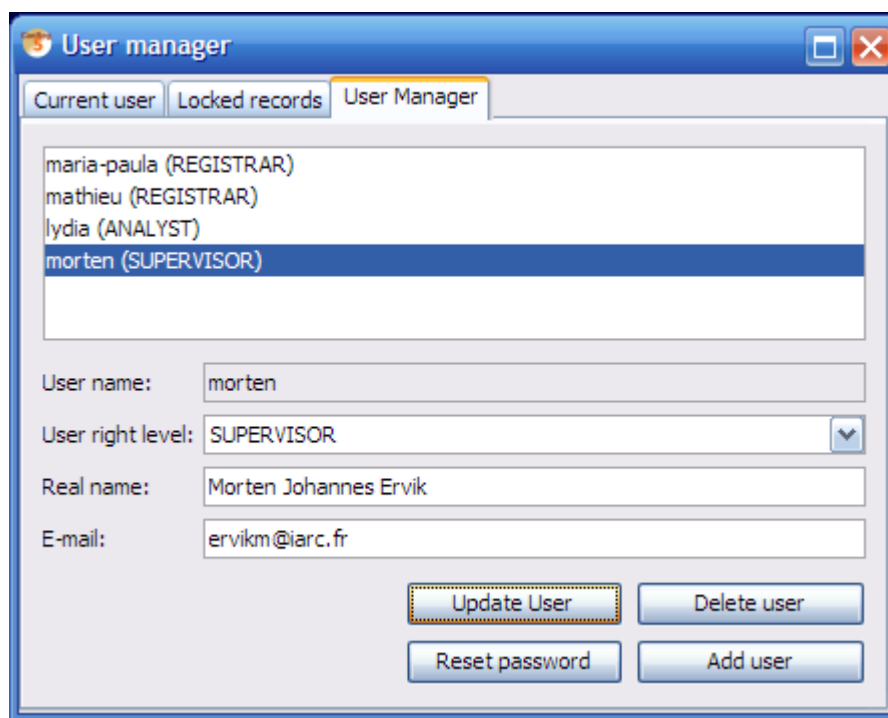


Locked records

Not yet implemented.

User manager

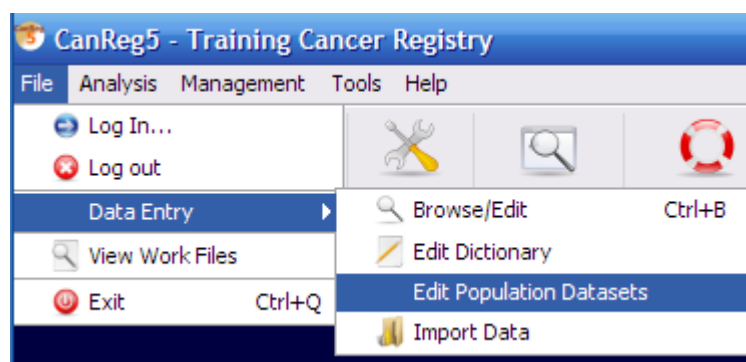
If you are logged in with Supervisor rights you have access to the User manager part of the user manager. This allows you to add and delete users.



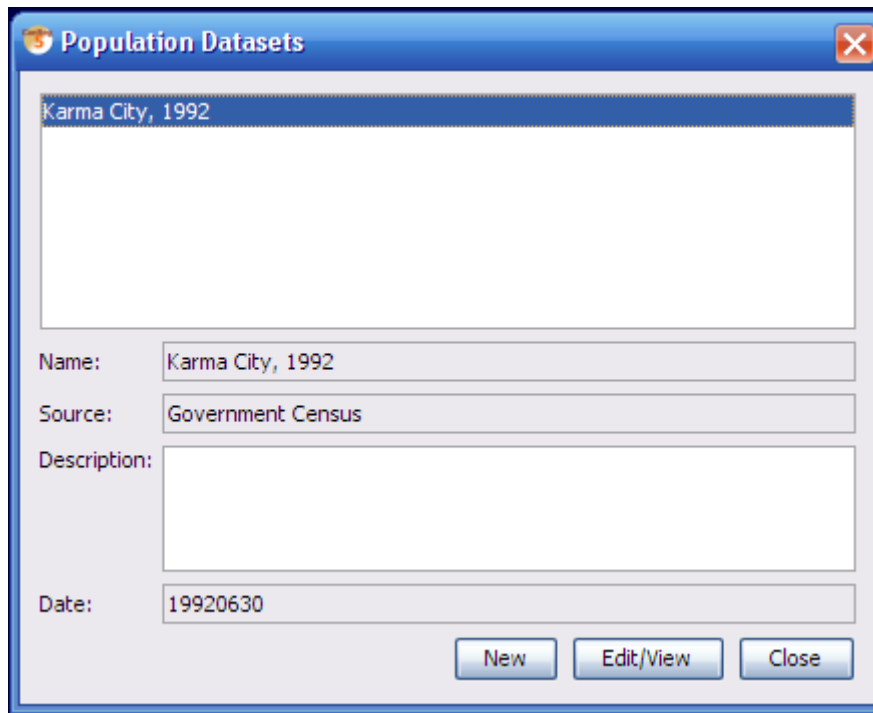
The default password of any user is its user name.

3.5 Population Dataset Editor

The Population Dataset editor lets you edit population data set to be used in the table builder. This is located under File – Data Entry Edit Population Dataset:

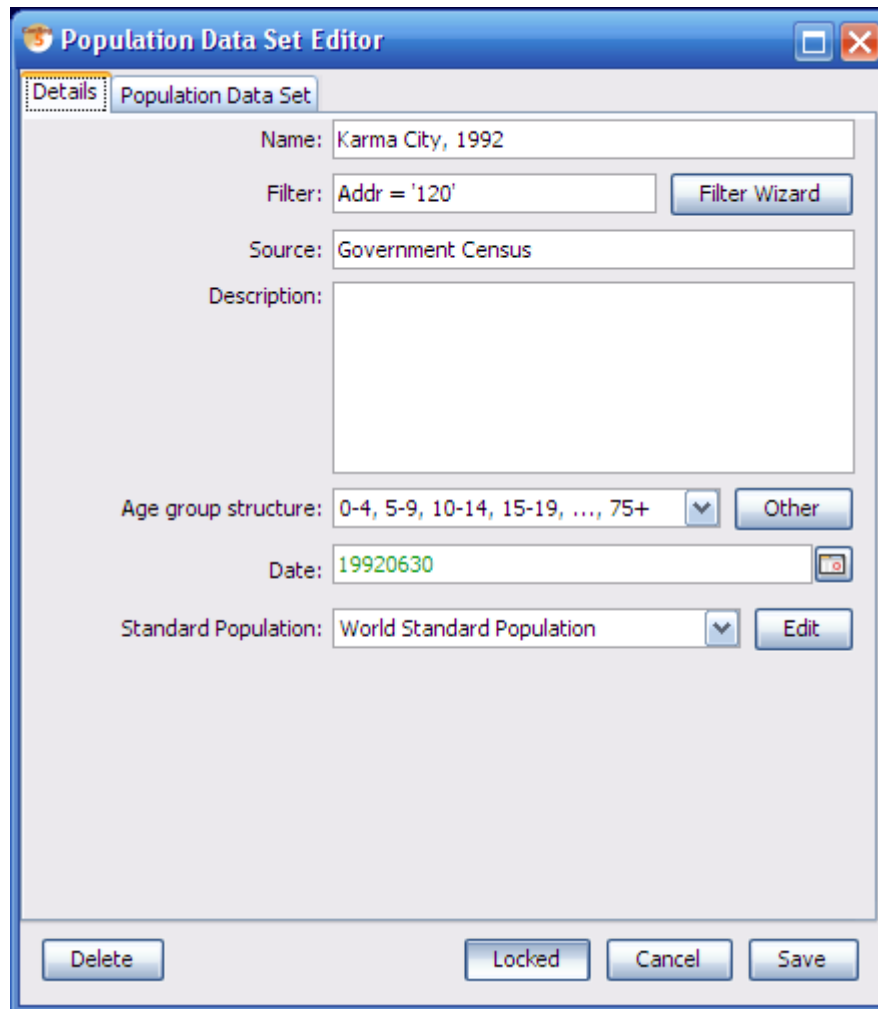


When you start it you get to the list of all your population datasets.



The image shows a software dialog box titled "Population Datasets". It features a blue title bar with a close button (X) in the top right corner. Inside the dialog, there is a list box at the top containing the text "Karma City, 1992". Below the list box, there are four labeled input fields: "Name:" with the value "Karma City, 1992", "Source:" with the value "Government Census", "Description:" with an empty text area, and "Date:" with the value "19920630". At the bottom right of the dialog, there are three buttons: "New", "Edit/View", and "Close".

Add one by clicking New. This opens the Population Dataset editor:



The image shows a Windows-style dialog box titled "Population Data Set Editor". It has a blue title bar with standard window controls. Inside, there's a tabbed interface with "Details" selected. The "Population Data Set" section contains several fields: "Name" (Karma City, 1992), "Filter" (Addr = '120') with a "Filter Wizard" button, "Source" (Government Census), "Description" (empty text area), "Age group structure" (0-4, 5-9, 10-14, 15-19, ..., 75+ with a dropdown arrow and an "Other" button), "Date" (19920630 with a calendar icon), and "Standard Population" (World Standard Population with a dropdown arrow and an "Edit" button). At the bottom, there are four buttons: "Delete", "Locked", "Cancel", and "Save".

Fill in the details:

- A name for the dataset
- A filter if it does not cover your entire area of your database.
- A source
- Some description (less than 255 characters)
- Choose the age group structure.
- Set the date of the population dataset. (In the example above it is mid 1992)

- The Standard population used for ASRs when building tables with this set.

Then fill the population dataset itself:

The screenshot shows the 'Population Data Set Editor' window. On the left, a sidebar titled 'Population Datasets' lists 'Karma City, 1992'. Below this, fields for 'Name', 'Source', 'Description', and 'Date' are visible. The main area displays a table with the following data:

Age Group	Male	Female
0-4	94229	96223
5-9	62071	68627
10-14	55023	70246
15-19	56087	78065
20-24	68891	69780
25-29	61606	55525
30-34	42327	33740
35-39	26704	20348
40-44	17137	12847
45-49	11742	8581
50-54	9197	8448
55-59	4696	3899
60-64	3884	5135
65-69	2327	2437
70-74	1854	2856
75+	2586	3832

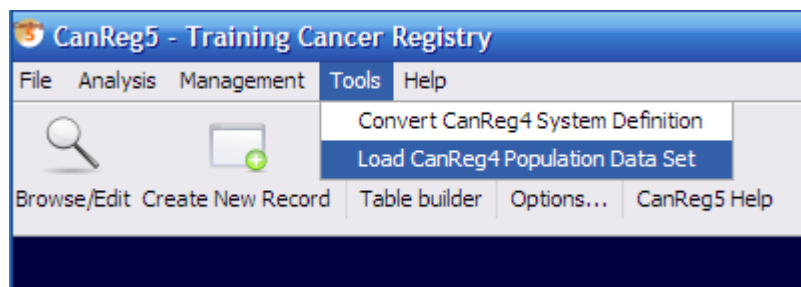
At the bottom of the window, there are buttons for 'Delete', 'Locked', 'Cancel', and 'Save'. Below the sidebar, there are buttons for 'New', 'Edit/View', and 'Close'.

(Please note that you can copy and paste population datasets back and forth from general spreadsheets like Excel.)

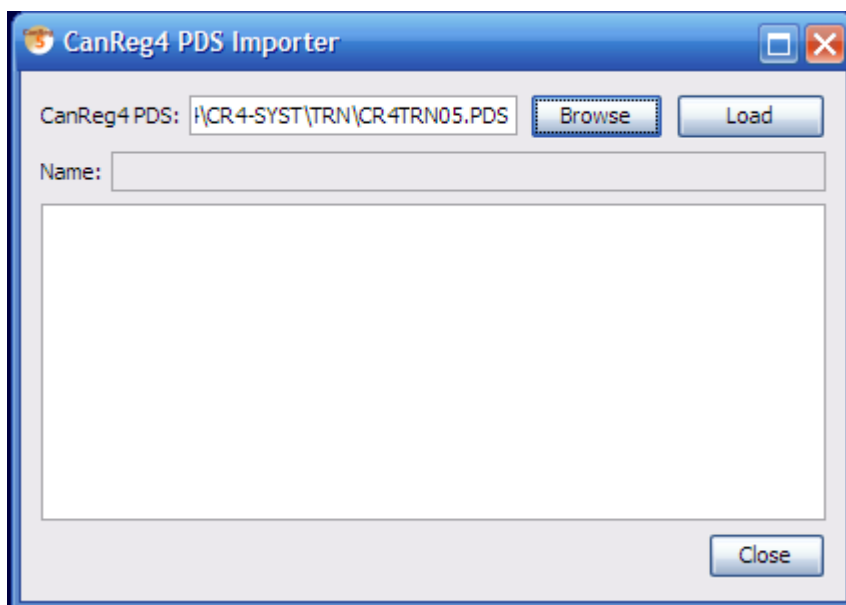
Click save to save your population dataset.

3.5.1 Import population data set from CanReg4

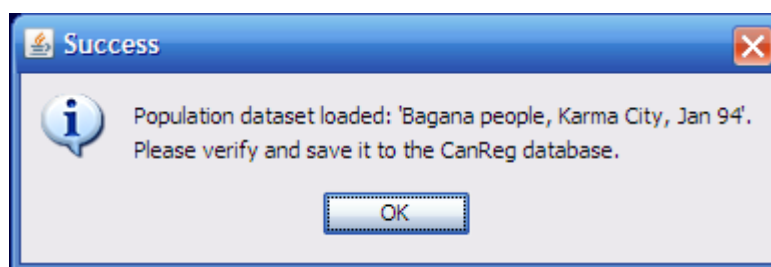
Alternatively you can import population data sets from CanReg4. To do this you go to the Tools menu and choose “Load CanReg4 Population Dataset”.



Click Browse to find the population dataset:

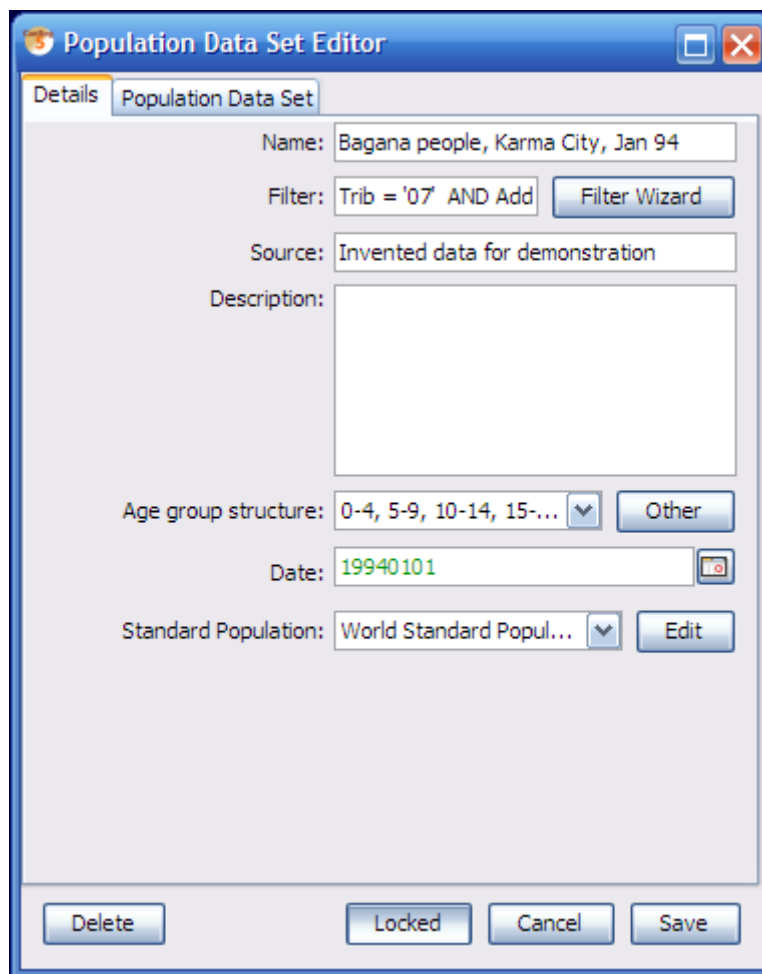


Then click Load and a confirmation message that the population dataset has been loaded will appear.



Click “OK”.

Next step is to revise the population dataset and see to that it has been imported correctly.

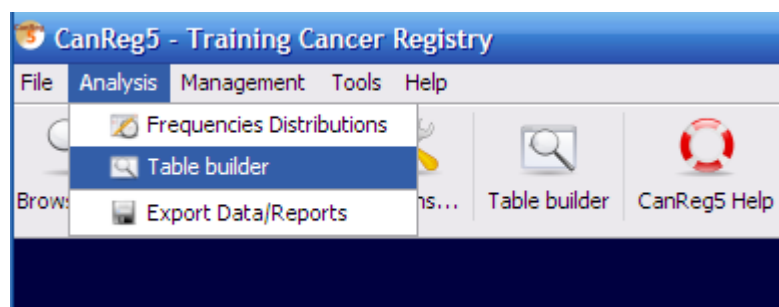


The image shows a software dialog box titled "Population Data Set Editor". It has two tabs: "Details" and "Population Data Set", with the latter being the active tab. The dialog contains several input fields and buttons. The "Name" field is set to "Bagana people, Karma City, Jan 94". The "Filter" field contains the text "Trib = '07' AND Add", with a "Filter Wizard" button to its right. The "Source" field is set to "Invented data for demonstration". Below this is a large empty text area for "Description". The "Age group structure" field shows a dropdown menu with "0-4, 5-9, 10-14, 15-..." selected, and an "Other" button to its right. The "Date" field contains the value "19940101" and has a small calendar icon to its right. The "Standard Population" field shows a dropdown menu with "World Standard Popul..." selected, and an "Edit" button to its right. At the bottom of the dialog are four buttons: "Delete", "Locked", "Cancel", and "Save".

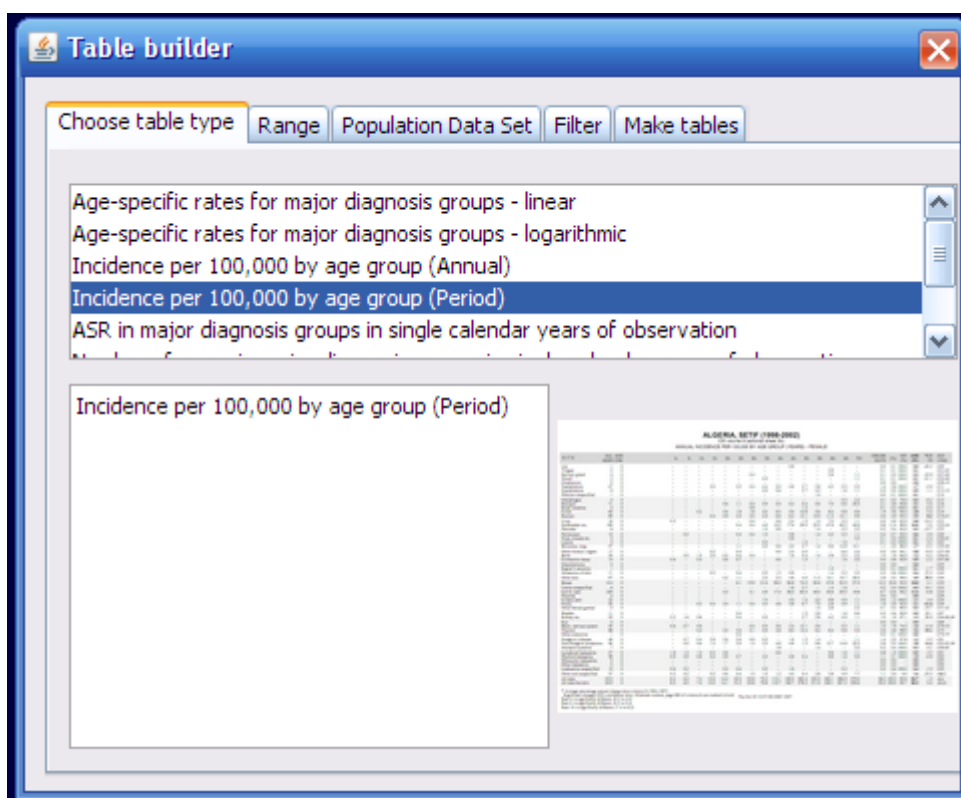
One important thing to do is to see to that the filter is correct. That for example the search variables are enclosed by 's. If you need to change anything in the dataset you need to unlock it by toggling the “Locked”-toggle.

3.6 Table builder

The Table builder lets you build incidence tables etc in CanReg. You find it under analysis – table builder.



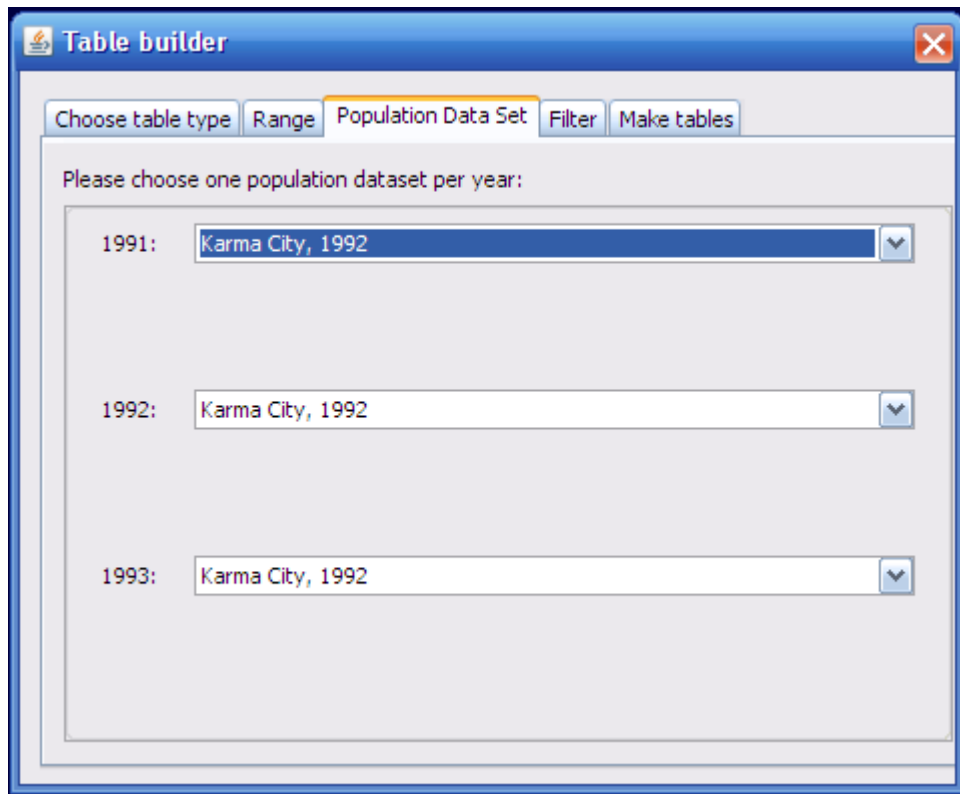
When you start it you first choose the type of table you want to produce. (Please note that it is only the Incidence per 100,000 by age group (period) and the Population pyramid that is implemented so far. . .) Pick Incidence per 100,000 by age group (Period):



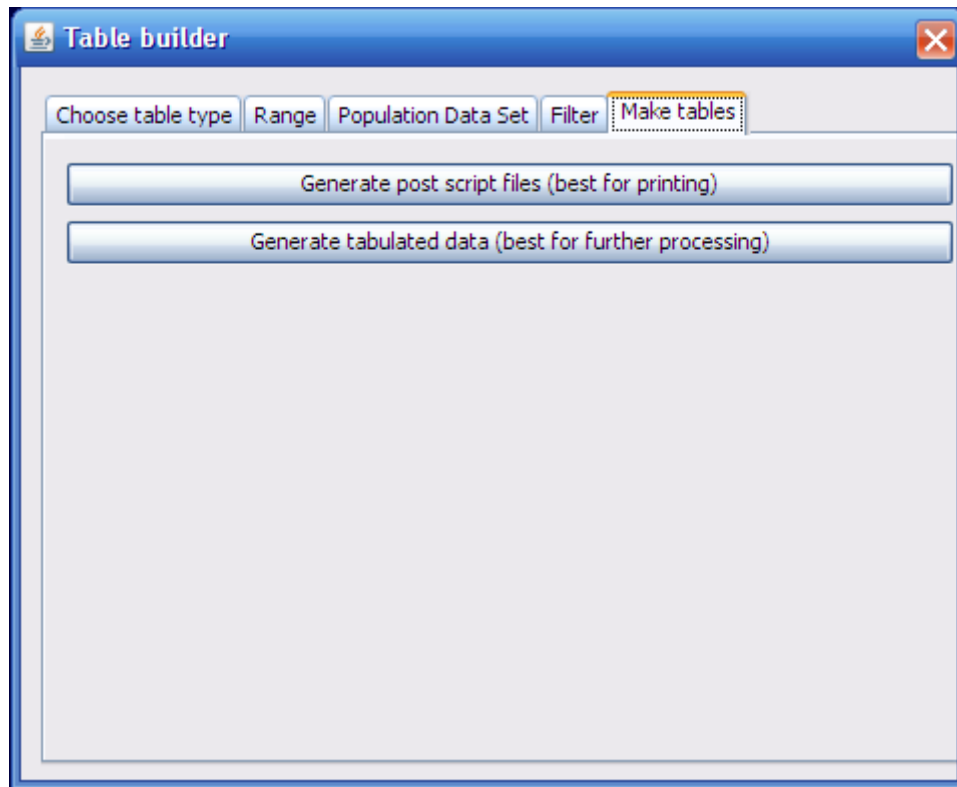
Then click on range to set the range of your analysis and set it to match the analysis you want to do, for example here we want to look at Karma City, 1991 to 1993:

The screenshot shows a 'Table builder' window with a blue title bar and a close button. Below the title bar is a tabbed interface with four tabs: 'Choose table type', 'Range' (which is highlighted with an orange border), 'Population Data Set', 'Filter', and 'Make tables'. The 'Range' tab contains four input fields with labels to their left: 'Start year:' with a value of 1991 and a small up/down arrow icon; 'End year:' with a value of 1993 and a similar icon; 'Mid-year:' with a value of 1992; and 'Number of years:' with a value of 3.

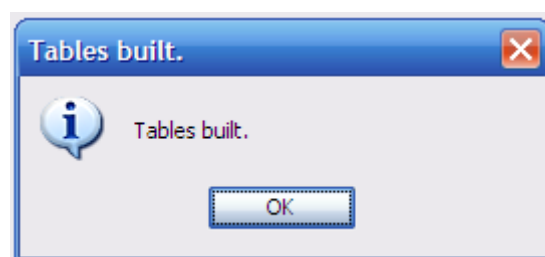
Click Population Data Set. Pick one population data set per year. This can be the same for all three if that year is representative of the period:



Then you can go to the Make tables tab to generate the actual tables. Click “Generate post script files” and choose a file name. (If the table generates more than one file (like it is the case for incidence per 100,000 some number or text will be added to the name you give for each file.)



You get a message saying, "Tables built."



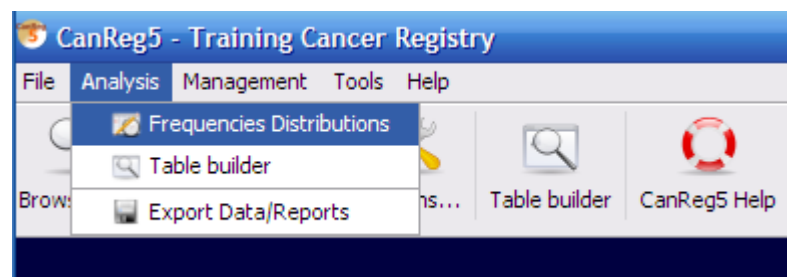
Click OK and if you have a program that can read PostScript (See page 44.) files the tables will be displayed after you press OK.

Training Cancer Registry (1991-1993)

		Incidence per 100,000 by age group (Period) - Male																CRUDE RATE	CUM (%)	CUM 0-64	CUM 65-74	ASR (W)	ICD (J08)
SITE	ALL AGES UNK	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+						
Lip	1 0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	0.07	0.4	C00
Tongue	3 0	-	-	-	-	0.5	0.5	-	-	1.9	-	-	-	-	-	-	-	0.2	0.3	0.01	0.01	0.2	C01-02
Mouth	4 0	-	-	-	-	0.5	-	-	1.2	-	2.8	-	-	-	-	-	-	0.3	0.4	0.02	0.09	0.7	C03-06
Salivary glands	3 0	-	-	-	-	-	-	-	-	1.9	2.8	-	-	-	-	-	-	0.2	0.3	0.03	0.03	0.3	C07-08
Tonsil	5 0	-	-	-	-	-	0.5	0.8	-	1.9	-	3.6	7.1	-	-	-	-	0.3	0.5	0.07	0.07	0.7	C09
Other oropharynx	0 0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.00	0.0	C10
Nasopharynx	6 0	-	0.5	-	-	-	0.5	0.8	-	1.9	2.8	3.6	-	-	-	-	-	0.4	0.6	0.05	0.05	0.6	C11
Hypopharynx	0 0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.00	0.0	C12-13
Pharynx unspecified	3 0	-	-	-	-	-	-	-	-	1.9	5.7	-	-	-	-	-	-	0.2	0.3	0.04	0.04	0.5	C14
Oesophagus	59 0	-	-	-	-	-	0.5	0.8	-	3.9	17.0	50.7	35.5	103.0	85.9	36.0	128.9	3.8	6.2	1.06	1.67	15.3	C15
Stomach	22 0	-	-	-	0.6	1.0	0.5	0.8	-	1.9	5.7	18.1	-	25.7	43.0	18.0	25.8	1.4	2.3	0.27	0.58	4.8	C16
Small intestine	1 0	-	-	-	-	-	-	-	-	-	2.8	-	-	-	-	-	-	0.1	0.1	0.01	0.01	0.2	C17
Colon	11 0	-	-	-	-	-	-	-	1.6	1.2	1.9	5.7	-	-	8.6	14.3	18.0	0.7	1.2	0.10	0.26	2.3	C18
Rectum	12 0	-	-	-	-	0.5	-	-	3.7	-	2.8	3.6	-	8.6	28.6	18.0	25.8	0.8	1.3	0.10	0.33	2.7	C19-20
Anus	2 0	-	-	-	-	-	-	-	-	1.9	-	-	-	-	-	-	-	0.1	0.2	0.01	0.08	0.5	C21
Liver	47 0	0.7	-	0.6	-	1.0	2.2	0.8	5.0	15.6	8.5	21.7	49.7	25.7	43.0	36.0	12.9	3.0	4.9	0.66	1.05	8.6	C22
Gallbladder etc.	0 0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.00	0.0	C23-24
Pancreas	6 0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	0.6	0.09	0.16	1.3	C25
Nose, sinuses etc.	6 0	-	-	-	-	-	-	0.8	-	-	5.7	-	-	-	-	-	-	0.4	0.6	0.07	0.14	1.4	C26-31
Larynx	4 0	-	-	-	-	-	0.5	0.8	-	-	2.8	3.6	-	-	-	-	-	0.3	0.4	0.04	0.04	0.4	C32
Trachea, bronchus and lung	17 0	-	-	-	-	-	0.8	5.0	1.9	2.8	10.9	-	-	25.7	14.3	36.0	-	1.1	1.8	0.24	0.49	3.4	C33-34
Other thoracic organs	1 0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.04	0.04	0.3	C37-38
Bone	12 0	-	1.1	0.6	0.6	0.5	-	0.8	-	-	-	3.6	7.1	8.6	14.3	18.0	12.9	0.8	1.3	0.11	0.28	2.2	C40-41
Melanoma of skin	2 0	-	-	-	-	-	-	-	-	-	-	3.6	7.1	-	-	-	-	0.1	0.2	0.05	0.05	0.5	C43
Other skin	13 0	0.4	-	-	-	-	0.5	-	-	-	11.4	10.9	-	-	26.6	36.0	-	0.8	1.4	0.12	0.44	2.9	C44
Mesothelioma	0 0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.00	0.0	C45
Kaposi sarcoma	473 0	7.8	9.7	4.8	3.0	21.3	51.4	82.7	78.6	87.5	48.3	47.1	85.2	25.7	71.6	36.0	206.2	30.3	49.6	2.77	3.30	40.0	C46
Connective and soft tissue	12 0	-	0.5	1.2	-	-	-	1.6	-	3.9	2.8	3.6	7.1	-	-	-	-	0.8	1.3	0.10	0.10	1.6	C47-C49
Breast	6 0	-	-	-	-	-	-	0.8	-	-	2.8	-	-	14.2	8.6	-	-	0.4	0.6	0.13	0.13	1.4	C50
Penis	12 0	-	-	-	0.6	-	-	0.8	-	5.8	-	-	-	-	-	14.3	12.9	0.8	1.3	0.07	0.50	2.9	C60
Prostate	63 0	-	-	-	-	-	-	-	-	1.9	5.7	25.4	14.2	77.2	157.6	251.7	219.1	4.0	6.6	0.62	2.67	19.5	C61
Testis	3 0	-	-	-	-	-	-	-	1.2	-	-	-	-	8.6	18.0	-	-	0.2	0.3	0.05	0.14	0.8	C62
Other male genital organs	3 0	-	-	-	0.6	-	-	-	-	-	-	-	-	-	-	18.0	-	0.2	0.3	0.04	0.13	0.7	C63
Kidney	9 0	1.8	-	-	-	-	-	1.6	-	1.9	-	-	-	-	-	14.3	-	0.6	0.9	0.03	0.10	0.9	C64
Renal pelvis	0 0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.00	0.0	C65
Ureter	0 0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.00	0.0	C66
Bladder	9 0	0.4	-	-	-	-	-	0.8	-	-	-	2.8	3.6	-	8.6	-	36.0	0.6	0.9	0.08	0.26	2.0	C67
Other urinary organs	0 0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.00	0.0	C68
Eye	29 0	3.5	1.1	0.6	0.6	1.5	0.5	2.4	1.2	5.8	2.8	7.2	7.1	-	-	-	-	1.9	3.0	0.17	0.17	2.2	C69
Brain, nervous system	2 0	0.4	-	-	-	-	-	-	-	-	-	-	-	-	8.6	-	-	0.1	0.2	0.04	0.04	0.4	C70-72
Thyroid	3 0	-	-	0.6	-	-	0.5	-	-	-	-	-	-	-	8.6	-	-	0.2	0.3	0.05	0.05	0.4	C73
Adrenal gland	1 0	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	0.00	0.0	C74
Other endocrine	1 0	-	-	-	-	0.5	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.00	0.00	0.0	C75
Hodgkin disease	3 0	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	14.3	-	0.2	0.3	0.05	0.12	0.8	C81
Non-Hodgkin lymphoma	46 0	3.5	0.4	3.6	1.8	1.0	1.6	1.6	2.5	1.9	5.7	3.6	7.1	8.6	-	-	-	2.9	4.8	0.24	0.24	3.3	C82-85,C96
Immunoproliferative diseases	0 0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.00	0.0	C88
Multiple myeloma	3 0	-	-	-	-	-	-	0.8	-	-	-	-	-	-	8.6	-	18.0	0.0	0.0	0.00	0.00	0.0	C89
Lymphoid leukaemia	2 0	0.4	-	-	-	-	-	-	-	1.9	-	-	-	-	-	-	-	0.1	0.2	0.01	0.01	0.2	C91
Myeloid leukaemia	1 0	-	-	-	-	-	-	-	-	-	-	3.6	-	-	-	-	-	0.1	0.1	0.02	0.02	0.2	C92-94
Leukaemia unspecified	4 0	-	-	0.6	-	0.5	-	0.8	1.2	-	-	-	-	-	-	-	-	0.3	0.4	0.02	0.02	0.2	C95
Myeloproliferative disorders	0 0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.00	0.0	MDP
Myelodysplastic syndromes	0 0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.00	0.00	0.0	MD3
Other and unspecified	41 0	1.1	-	1.2	-	1.0	1.1	2.4	5.0	9.7	2.8	10.9	28.4	25.7	14.3	-	103.1	2.6	4.3	0.45	0.52	6.8	MD4
All sites	966 0	20.2	19.9	13.3	8.3	30.0	61.7	104.7	107.3	159.5	156.1	242.8	298.1	411.9	630.3	665.2	850.7	61.9	81.7	14.65	13.11	132.2	ALLCH4
All sites but C44	953 0	19.8	19.9	13.3	8.3	30.0	61.1	104.7	107.3	159.5	144.8	232.0	298.1	411.9	608.6	629.3	850.7	61.0	80.0	14.21	13.22	132.2	ALLCH4

3.7 Frequency distributions

Frequencies distributions let you look at the data in your database as frequencies by year. You can cross-tabulate several variables. To start this module go to Analysis – Frequencies Distributions:



If you click Refresh table with no filter and no selected variables you get a table of cases per year.

Range: ICD-10-Patient

&

Filter: ☐ Use Filter [Filter Wizard](#)

Refresh Table

Select variables:

- Registry Number: ☐ Data
- Record status: ☐ Data ☐ Dictionary Description
- Check status: ☐ Data ☐ Dictionary Description
- Person search: ☐ Select all variables

Print Table

YEAR	CASES
1901	1
1939	1
1977	1
1980	1
1984	1
1986	1
1987	1
1989	177
1990	396
1991	665
1992	707
1993	837
1994	996
1995	1643
1996	568
1999	1

You can sort by any field by clicking its header. For example by number of cases:

YEAR	CASES ▼
1995	1643
1994	996
1993	837
1992	707
1991	665
1996	568
1990	396
1989	177
1901	1
1939	1
1977	1
1980	1
1984	1
1986	1
1987	1
1999	1

You can filter the result by adding a filter like for example on incidence date. You can also add as many variables as you want.

YEAR	HOSP	CASES
1993	01	626
1992	01	558
1991	01	506
1993	06	92
1992	06	62
1993	03	62
1991	06	61
1991	05	44
1992	03	44
1991	03	32
1992	05	31
1993	05	21
1993	99	18
1991	04	5
1991	11	5
1993	02	5
1991	07	4
1991	09	4

This table can be selected and copied and pasted into Excel, for example. (No right-click shortcut for that is implemented yet, but you can select the lines you want and press Ctrl-C (on Windows and Linux) or Apple-C (on Mac) and paste it into other programs.

A Frequently asked questions (FAQ)

A.1 Server

Q: When I click the “Launch Server”/“Test Connection” button, it takes **more than 3 minutes** to launch the server and I get the message that the “Server [is] already running”. Afterwards I cannot log in.

A: Xenios found the following solution: On our PCs, we use Microsoft Internet Explorer 7. In the “Tools / Internet Options / Connections / LAN Settings” we have a tick in the checkbox for “Use a proxy server

for your LAN” and the address and port of the proxy server filled in accordingly. I put a tick in the checkbox for “Bypass proxy server for local addresses”, clicked the “Advanced” button and typed the IP address of the PC (localhost) in the “Do not use proxy server for addresses beginning with:” box.

A.2 Conversion CanReg4 to CanReg5

Q: In what table should the variable age be stored?

A: The tumour table. Like that, if the same patient has a new tumour you can (probably) keep the patient record and just add a new tumour record. Birth date is stored in the patient table. (Incidence date with the tumour.)

Q: Do I need to “install” the CanReg5 system definition file after converting from CanReg4 using the built in tool?

A: After converting the system you don’t need to “install” it afterwards as the XML file is automatically copied to your system folder during conversion.

Q: I get errors during import of the data from CanReg4. The process stops after a certain percentage every time.

A: Try exporting your data with a comma separated variables instead of the default tab-separated ones (or vice versa) and see if that helps.

A.3 Dictionary

Q: Can I import dictionaries from other CanReg systems to my own?

A: Since most CanReg systems have different dictionary structure (length of codes, order of dictionaries etc.) you need to import the dictionary corresponding to your system or do necessary modifications.

A.4 Tables

Q: What program can I use to view the postscript files with?

A: PostScript is an open standard, so you can use many different tools to view them. (You can in many cases even send them directly to a printer.) Apple’s OSX and most Linux-distributions (Ubuntu,

RedHat, SuSE etc) come with a tool to view them by default. On Windows the tool I recommend is the open sourced and free GSview. (Available from: <http://pages.cs.wisc.edu/~ghost/gsview/>) To run GS View you need to install Ghostscript first. This can be downloaded from here:

<http://pages.cs.wisc.edu/~ghost/doc/GPL/gpl864.htm> (Scroll all the way down, under the heading Microsoft windows and download the “GPL Ghostscript 8.64 for 32-bit Windows (the common variety)” (<http://mirror.cs.wisc.edu/pub/mirrors/ghost/GPL/gs864/gsv49w32.exe>) Run this file to install Ghostscript. Then you can get GS View from here: <http://pages.cs.wisc.edu/~ghost/gsview/get49.htm> (Most probably, you should pick the Win32 self extracting archive - the first download option.

<http://mirror.cs.wisc.edu/pub/mirrors/ghost/ghostgum/gsv49w32.exe>) Run this file to install GS View.

A.5 Import

Q: Some letters are distorted/missing in records after an import. (For example when importing Arabic names.) Why is that?

A: If the data is from a program that does not code the data using Unicode (for example previous versions of CanReg) you need to specify the coding scheme/“codepage” during import of that file to your database. If you pick the wrong one your data might get distorted. To solve this problem you need to re-import the data. Please use the preview button during import to see to that you have the right coding scheme.

B Known issues

B.1 Known bugs (errors)

Some known bugs:

- The result set in the browser is sometimes very slow to scroll around in.
 - Temporary solution: Use filters to minimize the number of records shown at any time or only browse the “Patient” or the “Tumour” table.
 - Severity: Shouldn’t cause loss of data

- Priority: Low
- Category: Database/Browser
- The result set in the browser can loose it's content.
 - Temporary solution: Refresh the table to get the data back. Use filters to minimize the number of records shown at any time or only browse the “Patient” or the “Tumour” table.
 - Severity: Shouldn't cause loss of data
 - Priority: Low
 - Category: Database/Browser
- Server does not start if language is set to Turkish due to special rules in Turkish regarding “upper casing” of letters.
 - Temporary solution: set the language of the server to any other language than Turkish.
 - Severity: Does not cause information loss
 - Priority: Medium
 - Category: Server

B.2 Known limitations

- Not all edit checks are in place?
- Date fields not yet properly formatted.
- You need a population dataset with 5 years age groups for many of the tables to work properly...
- Age can not yet be calculated automatically.

C Changelog

4.99.29 (5.0 RC14)

- Updated jlooks to 2.3.1 and jcalendar to 1.3.3

4.99.28 (5.0 RC13)

- Searches and sorts in the database are now case insensitive using the primary component of the letters (i.e. 'â' equals 'A', 'é' equals 'E')
- Updated database engine to Apache Derby 10.6.1.0. (Needed for case insensitive searches. Plus security fixes, performance issues etc.)
- When Turkish language is detected default to english for now to avoid problems with capitalization.
- Other bugfixes.

4.99.27 (5.0 RC12)

- Set up new CanReg system: Fixed a bug where varaibles removed were not removed.
- Set up new database: Indexes are now updated properly in XML.
- Improved russian translation.
- Other bugfixes.

4.99.26 (5.0 RC11)

- Disabled some debug code from the release build.

4.99.25 (5.0 RC10)

- First draft of the Russian translation ready.
- Created a jsmooth file to build .exe's for CanReg5 on windows.
- Fixed a bug in the merge two patient-function.
- CanRegDAO save record now truncates variables if needed.
- CanRegClientView removed ICD-0-3 manual link.
- CanRegDAO save rumour now harmonizes tumour record ids better.
- Improved exception handling.

- Work on internationalization.
- Updated the handbook.

4.99.24 (5.0 RC9)

- Internationalized strings that were hardcoded before.
- Improved layout of the RangeFilter.
- Updated the about.html
- Changed the XML parser. Now using the standard javax.xml.parsers instead of the apache one.
- Handbook now in Latex (Lyx) under version control.

4.99.23 (5.0 RC8)

- Improved the export of the sources.
- Range in Global Person Search implemented. Double click now works.
- Improved error-handling of the person search module.
- Minor fixes and updates.
- Tidied the source.

4.99.22 Build 858

- Database engine switched to Java DB 10.5.3.0
- RangeFilter now adds 's if needed by each variable.
- Other bug fixes.

4.99.21 Build 848

- Access to handbook, possibility to download latest version.
- DatabaseVariableEditor now throws error messages if somethings not right with the variable definition during system setup.
- ICC3 converter implemented.

4.99.20

- Internationalization work. Portugese translation started. French translation continued.

4.99.19 Build 829

- Hourglass feedback added for longish operations.
- Problem with truncated dictionary labels solved.
- Fixed a bug where all checks show up in the result message, even though they are OK.
- TableBuilder: Fixed a nullpointer error that could occur if no cases in table
- Improved the layout of certain screens.
- French translation started.

4.99.18 Build 821

- Better handling of malformed date strings.
- Date of last contact check implemented.
- Better handling of check results.
- Started implementation of auto age calculation.
- RecordEditor and RecordEditorPanel: Improved the way check status is handled.

4.99.17 Build 818

- DateHelper: difference in dates in days calculated properly.
- RecordEditor: Better error handling
- AutoFillHelper: Added comments
- VariableEditorPanel: Better handling of null-pointers, number no longer defaults to -1.

- `ModifyDatabaseStructureIF`: GUI fixes
- `UserManagerInternalFrame`: Better error handling
- `Tools.buildIndexMap`: better handling of indexes with missing variables
- `DateVariableEditorPanel`: Better error handling
- `ExportReportInternalFrame`: Better error handling
- `CanRegClientView`: display set up new system-menu
- `CheckAgeIncidence`: better error message
- `DateHelper`: fixed a one-off error when
 `birthday,month=incidenceday,month`

4.99.16 Build 806

- Set up new database now in the menu
- Deleting records can now throw `SQLExceptions`.

4.99.15 Build 804

- Import from multiple files now implemented.
- `DatabaseStructure` editor implemented with a default XML.
- `InternalFrames/windows` better positioned on various screen-sizes.
- `RangeFilterPanel` now handles source tables and empty index lists better, fires table changed events.
- `VariablesChooserPanel` now only displays the variables from valid table(s).
- `Browser`: Fixed a bug where you could not open records by double clicking on them if looking at source or source+tumour tables.
- Tooltip texts updated.
- `TranslateListElement`: A simple way to translate list elements implemented

- `EditDictionaryInternalFrame`: Fixed a bug that occurred if a dictionary had more errors than possible to display.
- `QueryGenerator` improved.
- Improved the display of variable names (`FastFilter`, `RangeFilter`, `Browser`.)
- `SystemDescription`: Changes to accommodate the changes in `DatabaseListElements`, added setters to change the database's doc.
- `DateHelper`: fixed a bug that occurred when date was not set and was read. Buddhist Calendar work started.
- Handles better locked tumour records.
- `FirstNameSexInternalFrame`: better handling of unisex names.
- Checks: now support better unknown codes.
- Performance fixes.
- Other stability and bug fixes.

4.99.14 Build 764

- `ExportReport` now lets you export category and description of dictionary elements and output long variable names, format dates and correct unknown dates.
- `SystemDefinitionConverter` strips blanks from database variable names.
- `DateHelper`: Dates are now transformed "backwards" so that a two digit year contains the last two digits...
- Updated the xsd of the system XML.
- Import function now generates record IDs if none are specified.
- Import: fixed a bug where the import would brake down if the IDs were defined in the import file.

- FastFilter: reworked the logic and text on screen
- BrowseInternalFrame: Sort by column is now highlighted, layout improved