Open source

By: Morten Johannes Ervik, IARC

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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 come 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 loose 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")

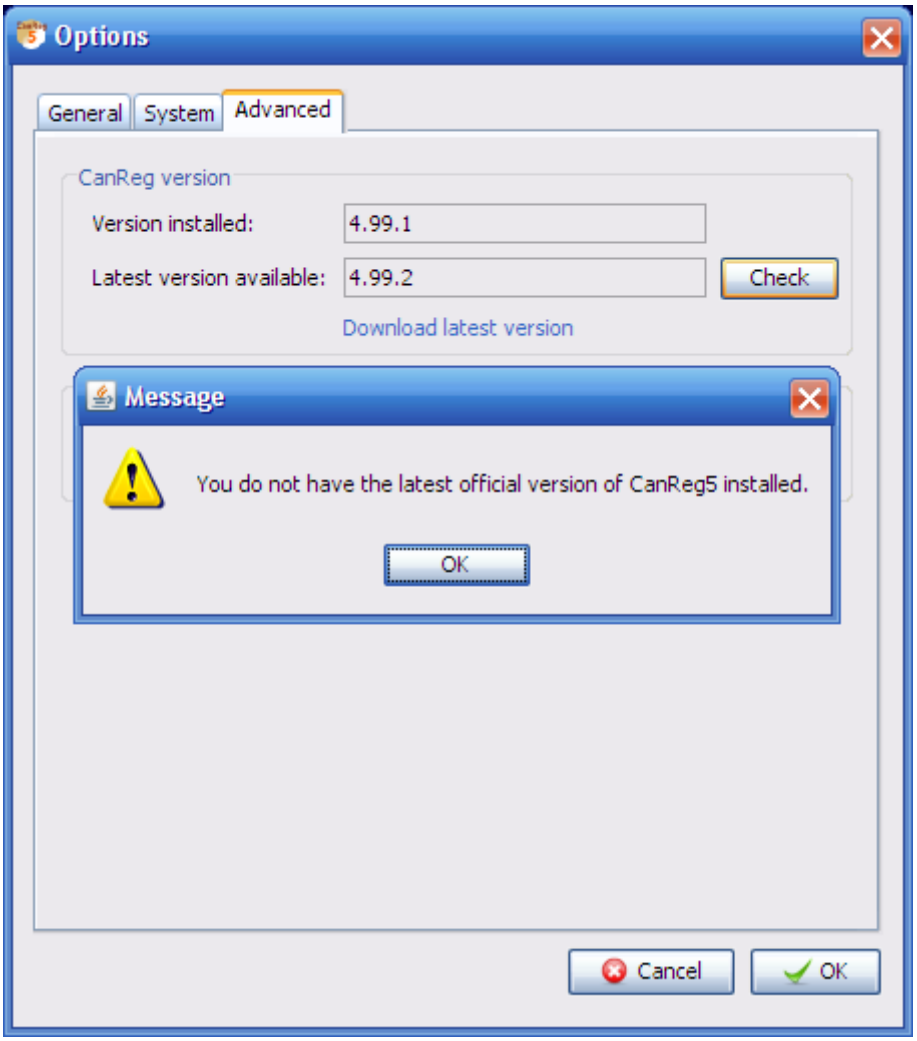
Please be aware that some problems can be avoided by installing the latest version of the Java Runtime Environment (Version 6) before you start. (Available from http://java.com/en/download/manual.jsp.)

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 PostScipt 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/gs864/gs864w32.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.

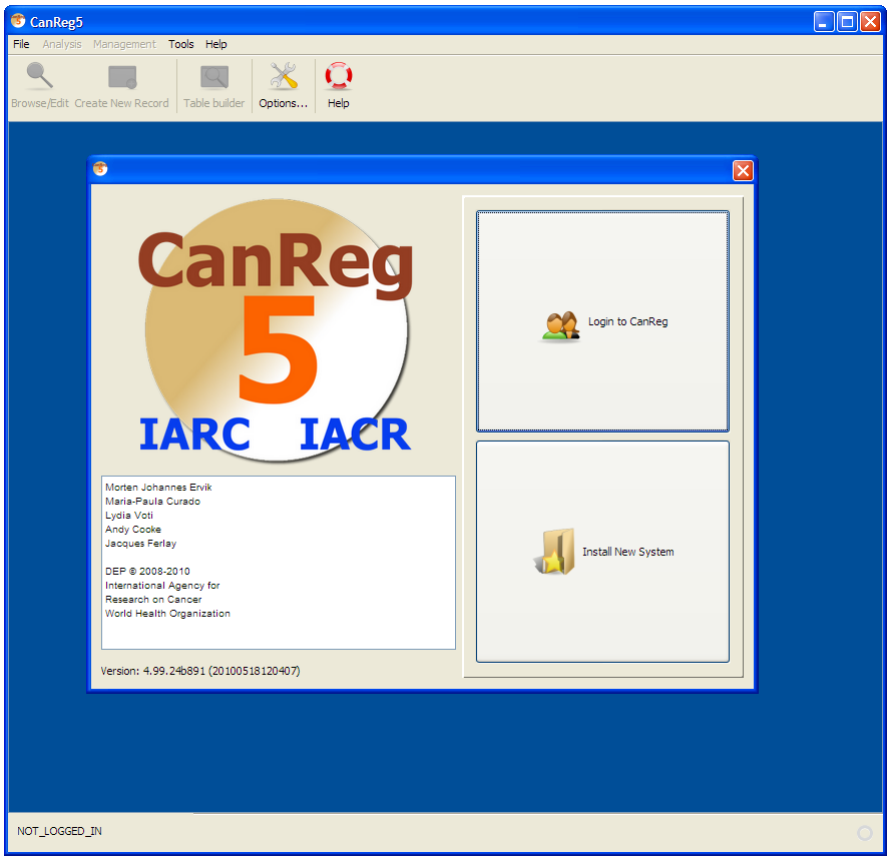
2.2 Install CanReg5

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 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:

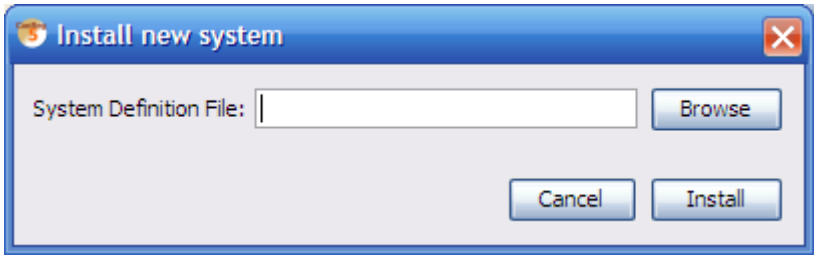


2.4 Demo system

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.

2.5 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:



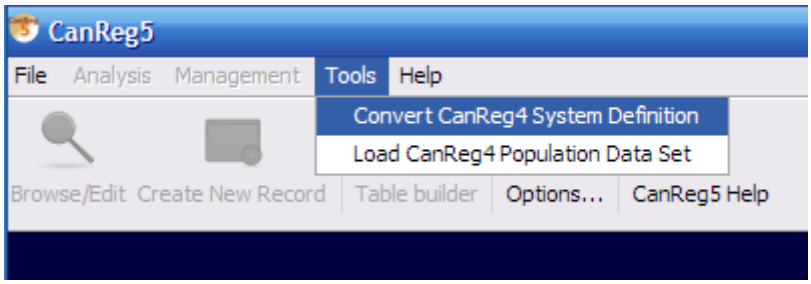
Click browse to find the system definition file. (If you want to use the TRN demo system look in demo/database and select TRN.xml and click open and then Install.)

2.6 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"

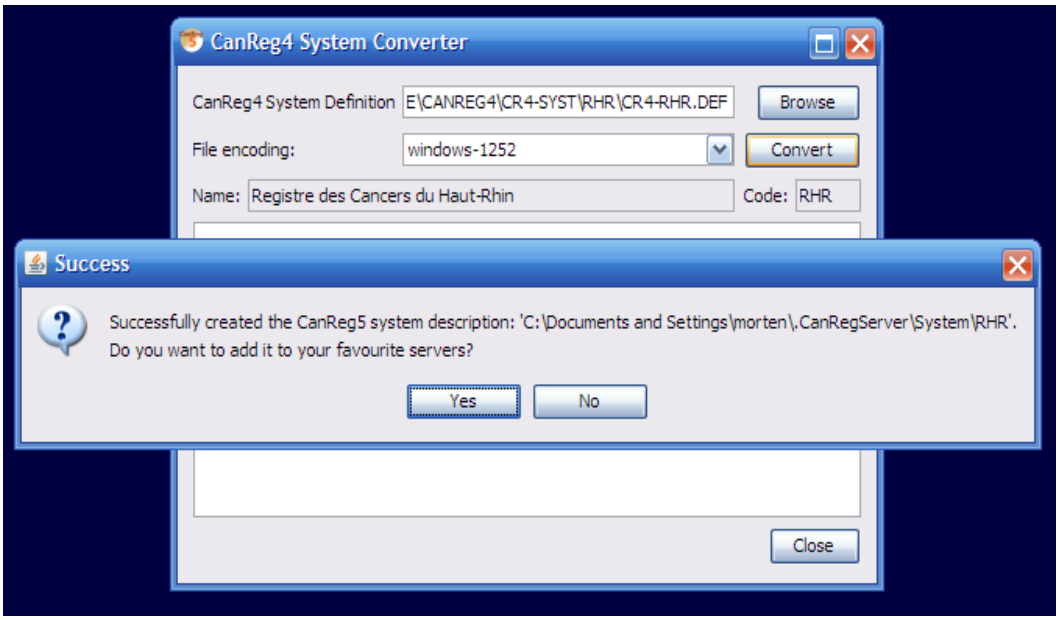


Do "Browse" to find your CanReg 4 system definition file. (This is a file located in the folder \\CR4SHARE\CANREG4\CR4-SYST\ followed by your 3 letter registry code i.e. TRN whose name is ending in .DEF (i.e. CR4-TRN.DEF).)

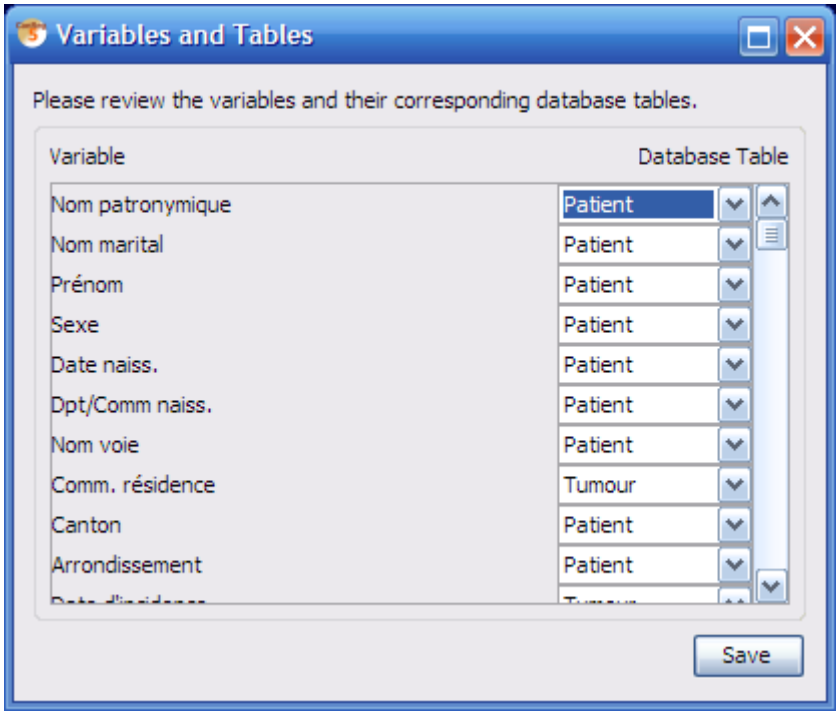
Select your CanReg4 file and double click it or click "Open".

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.



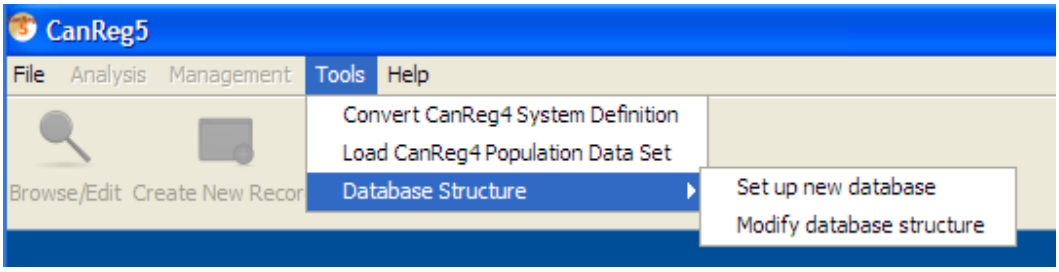
The program presents an initial proposal that you might agree with, but please go through one by one the variables and decide.

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.)

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

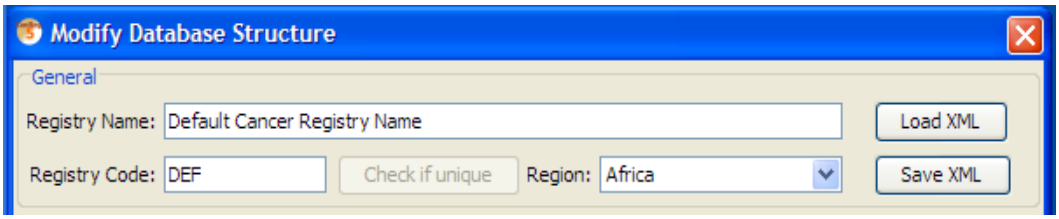
To modify an existing CanReg system or set up a new one you can use tools built into CanReg5.



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).

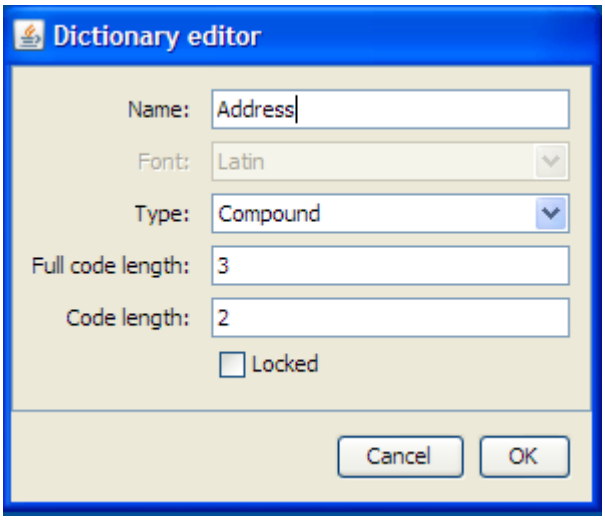
When this has loaded you'll see all the info specifying this CanReg system. On the top you can specify the registry name, registry code and region of the registry. Below you have a list of the Dictionaries, then the Groups and then the Variables.

Modify Database Structure
General
Registry Name: Training Cancer Registry
Load XML
Registry Code: TRN
Check if unique
Region: Training
Save XML
Groups
New Control Panel
Patient
Tumour
Hospital
Follow up
Remove
Edit
Add
Variables
Surname
First names
Maiden name
Sex
Age
Birth date
Tribe
Address
Occupation
Incidence date
Topography

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.

2.7.1 Modifying a dictionary



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

Name: The name of the dictionary

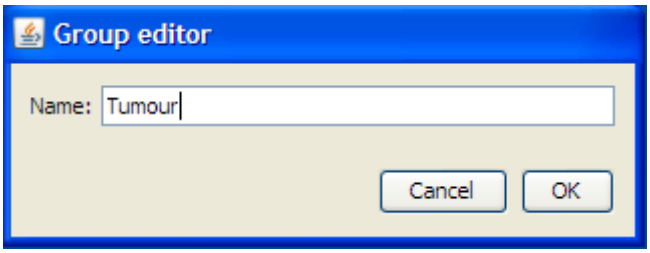
Type: This can either be "Simple" or "Compound". A "Simple" dictionary is a plain list of codes and corresponding labels, whereas a "compound" dictionary as two levels of refinement. For example the user can pick the two first digits and then the last digit, as in the above example.

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?

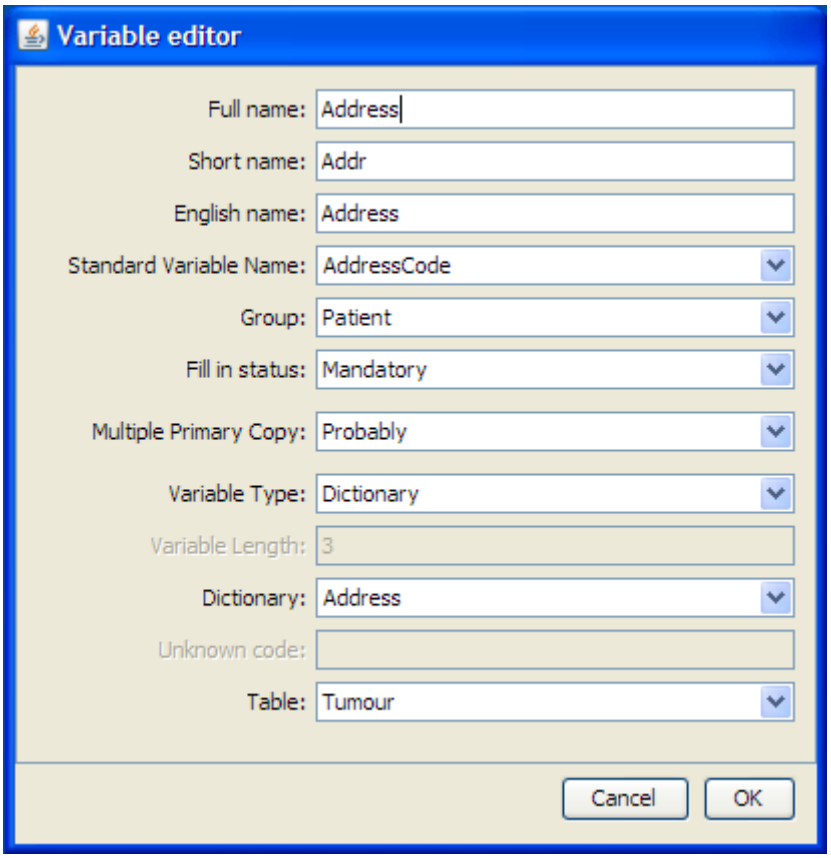
2.7.2 Modifying a group



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

Name: The name of the group

2.7.3 Modifying a variable



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.

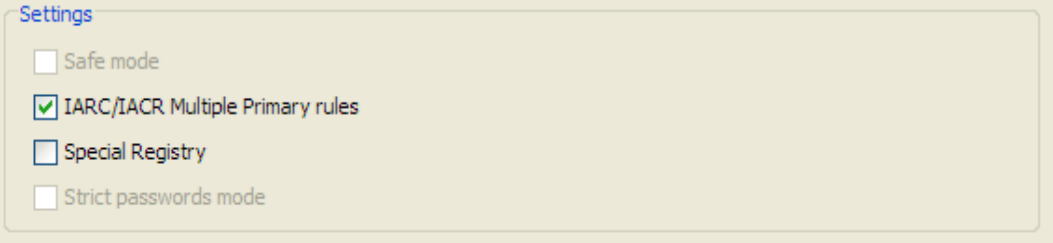
2.7.4 Set up search variables

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.

2.7.5 Coding

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

2.7.6 Settings



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

2.7.7 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.

2.8 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 comunicate 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.

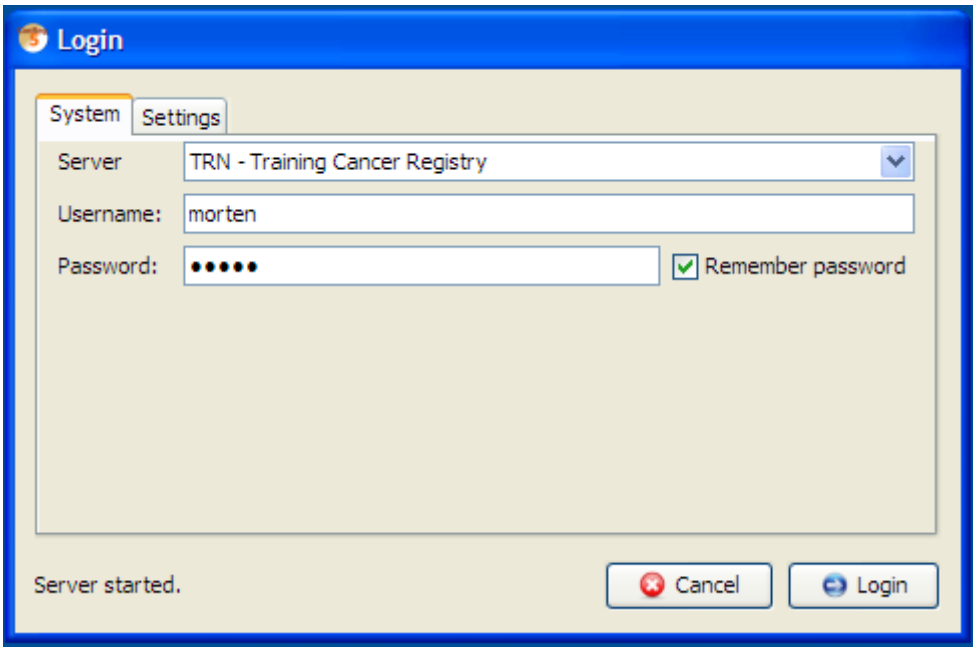
2.9 Login

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

2.9.1 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.)



2.9.2 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.)

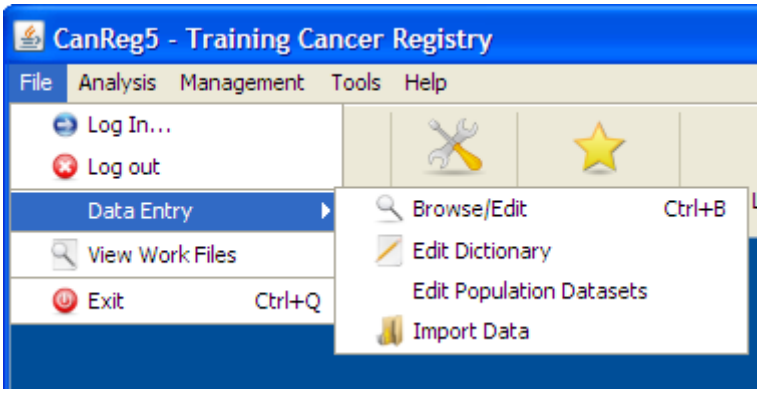
If you get an error message saying "Could not log in to the CanReg server on localhost with the given credentials.", please make sure that you have entered the correct username and password and that the server is indeed running. (See "Launching the CanReg server" above.)

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".

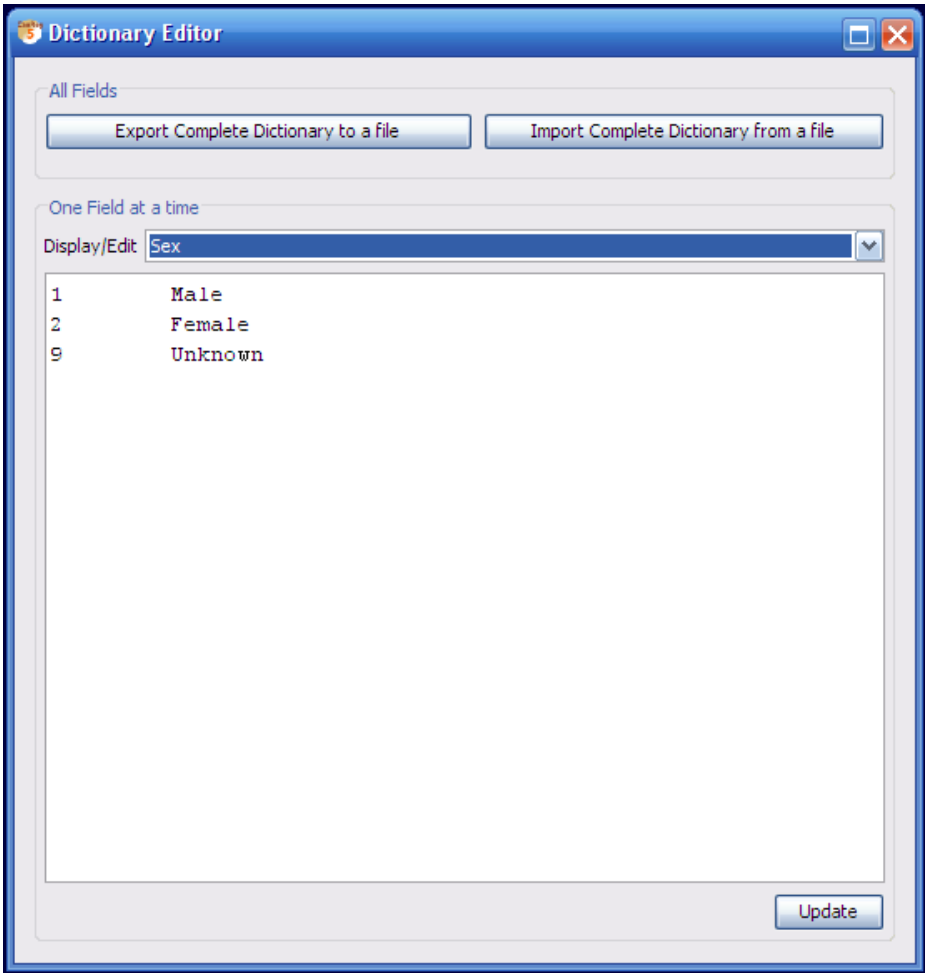
2.10 Import the dictionaries

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

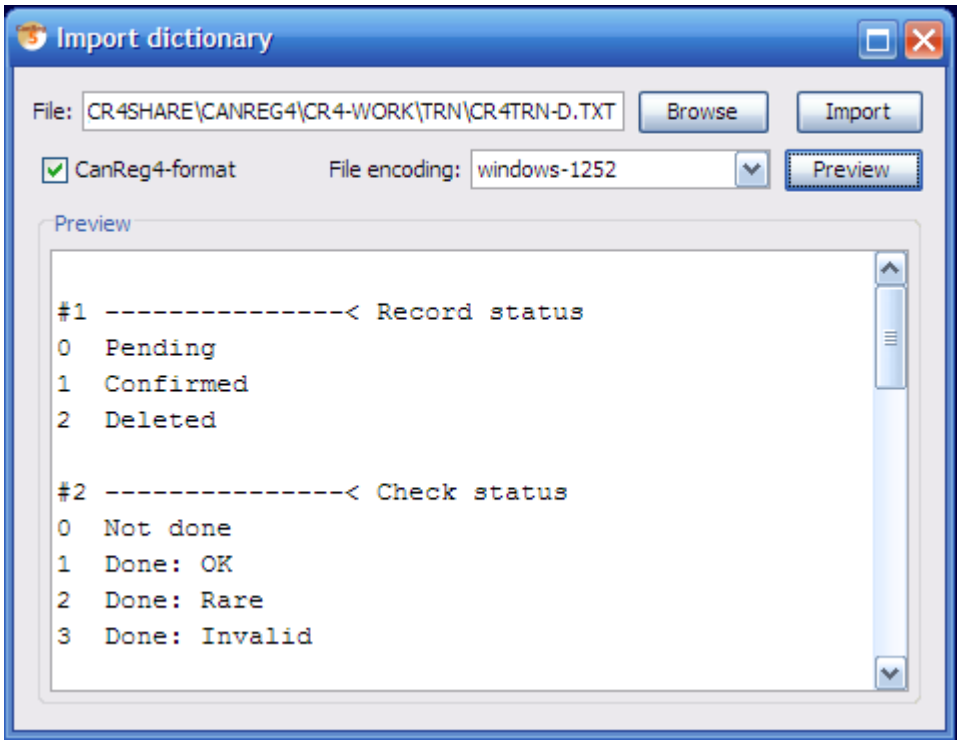


- Click on "Import complete dictionary from file".



- 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.



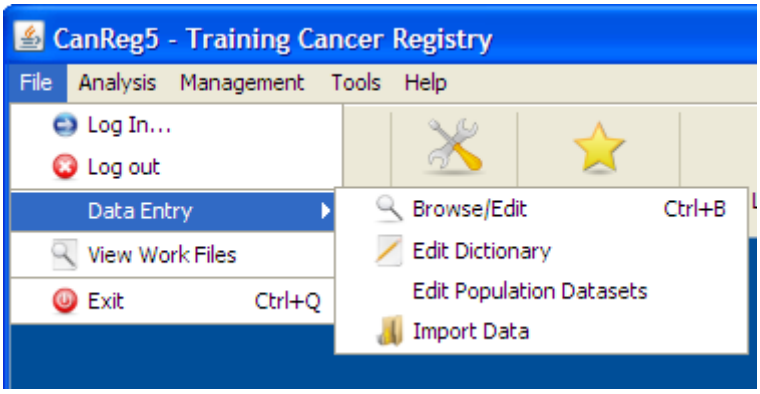
- Click Import. This might take some time. Please note the bar in the lower right indicating that the program is busy.
- Afterwards you will receive a message of success imported.
- Click OK.
- Go back to "File", "Data Entry", "Edit dictionary" and verify that the dictionaries have been imported.

2.11 Import the data from CanReg4

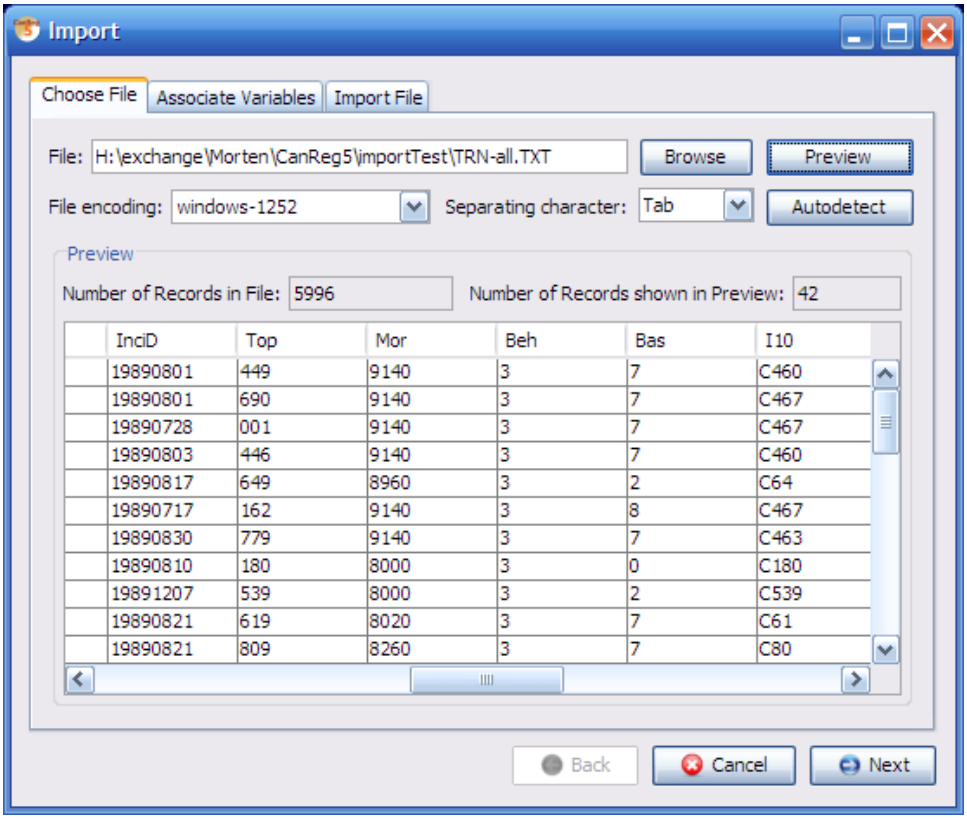
Make sure to export the most updated data from your CanReg4 system.

- 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.

2.12 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).

2.13 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

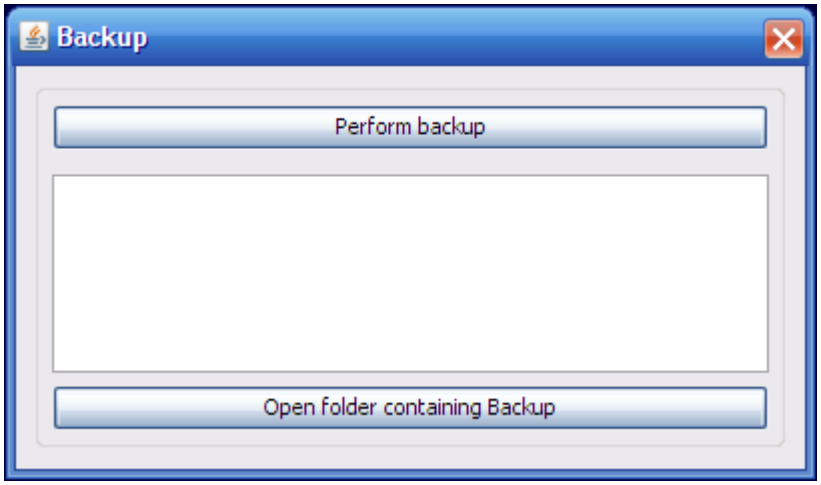
3 Working with CanReg5

3.1 Back up and restore

Backup-functionality can be found under the Management menu.

3.1.1 Perform backup

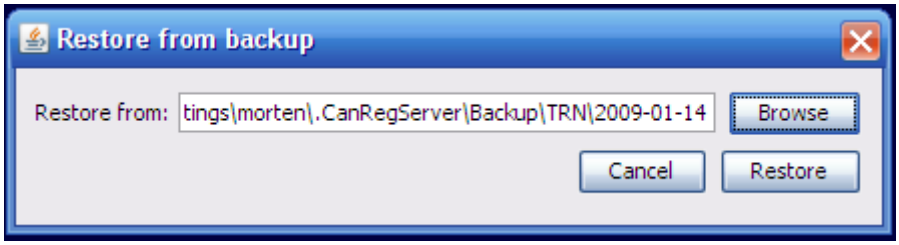
Under "Management" click "Backup"



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".

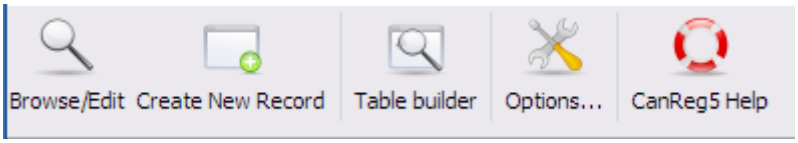
3.1.2 Restore from backup

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.

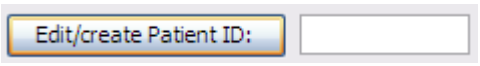


3.2 Enter cases

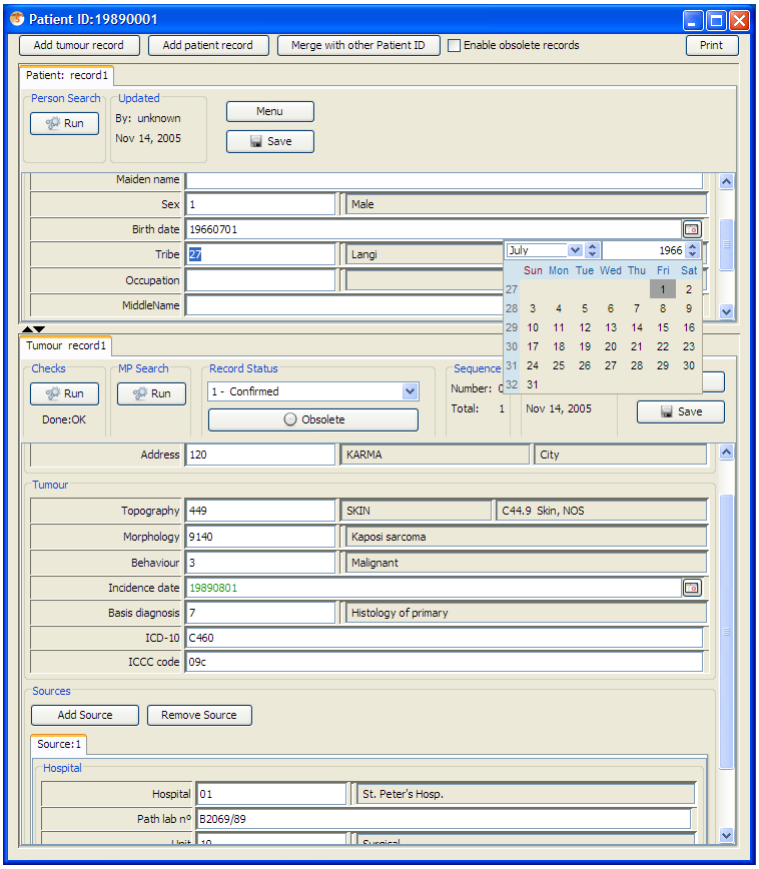
To get to a data entry form either press Create New Record from the menu bar



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

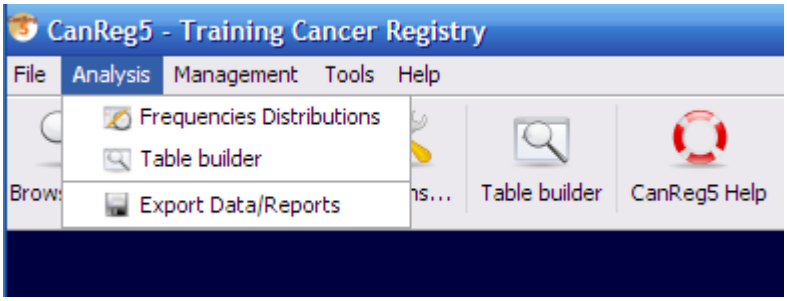


This should resemble your CanReg4 data entry form, except that it is split in a patient part and a tumour part with a source part. Another thing to notice is the "Obsolete" button. This will flag the record as obsolete, so that it will not show up in analysis. It is a way to keep duplicate records that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

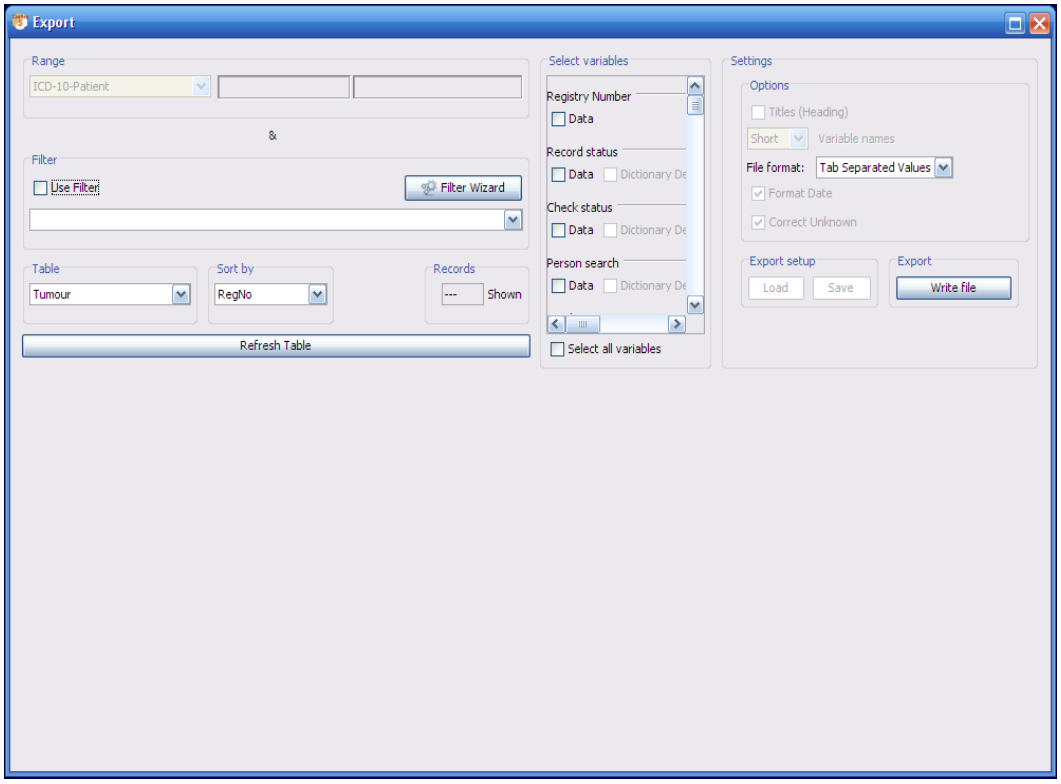


3.3 Export data

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



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

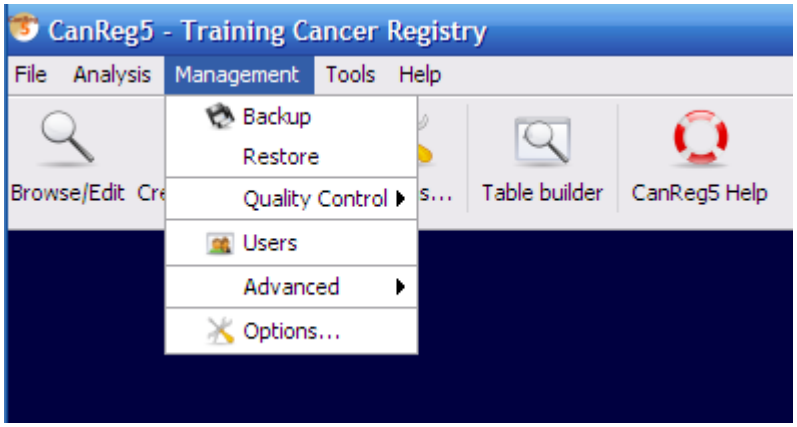


Now you can select some variables, and tables and sort method and export (some of) your data. Please note that some of the functionality, like the ability to store export-setups is not yet implemented.

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

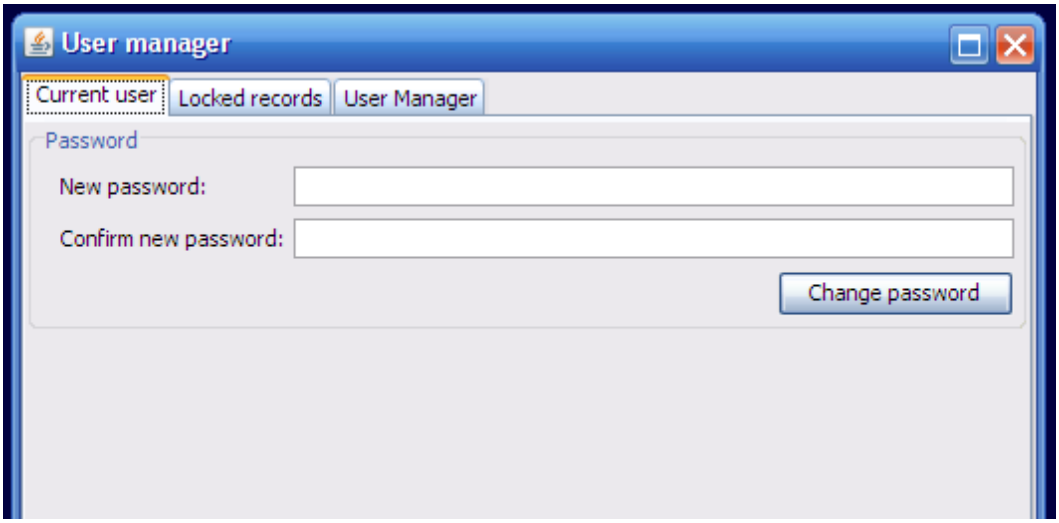
3.4 Manage users

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:

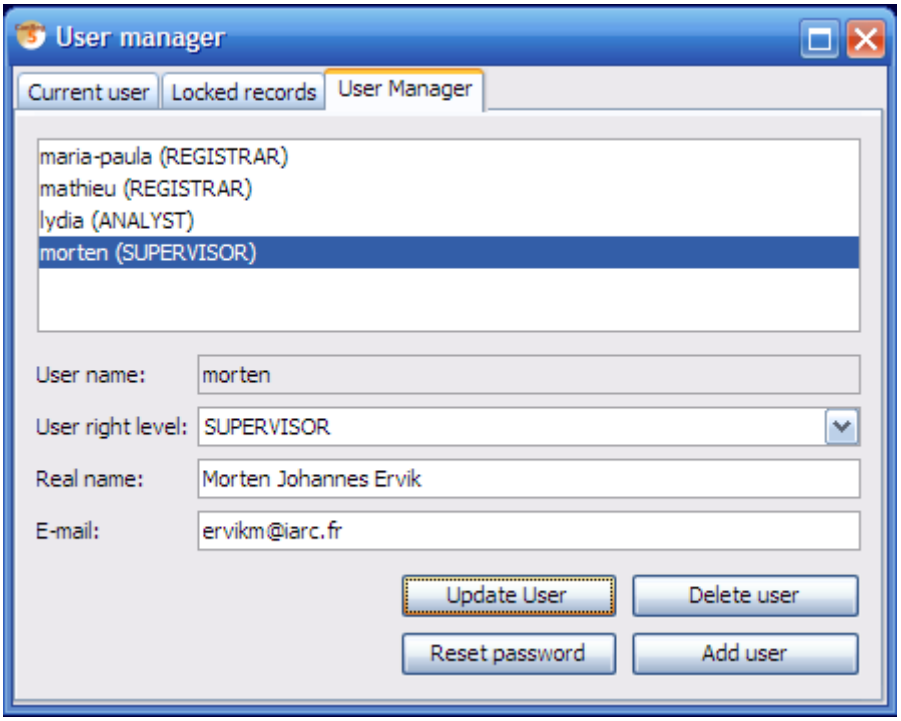


Locked records

Not yet implemented.

User manager

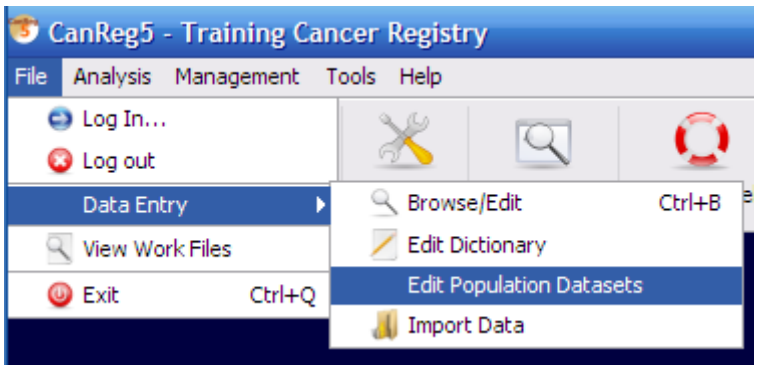
If you are logged in with Supervisor rights you have access to the User manager part of the user manager. This allows you to add and delete users.



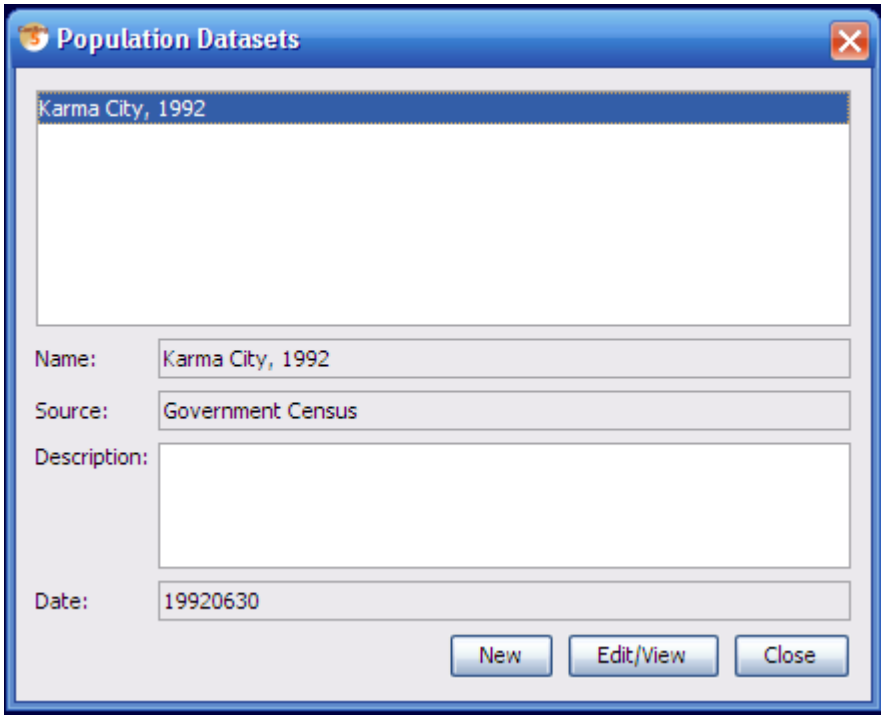
The default password of any user is its user name.

3.5 Population Dataset Editor

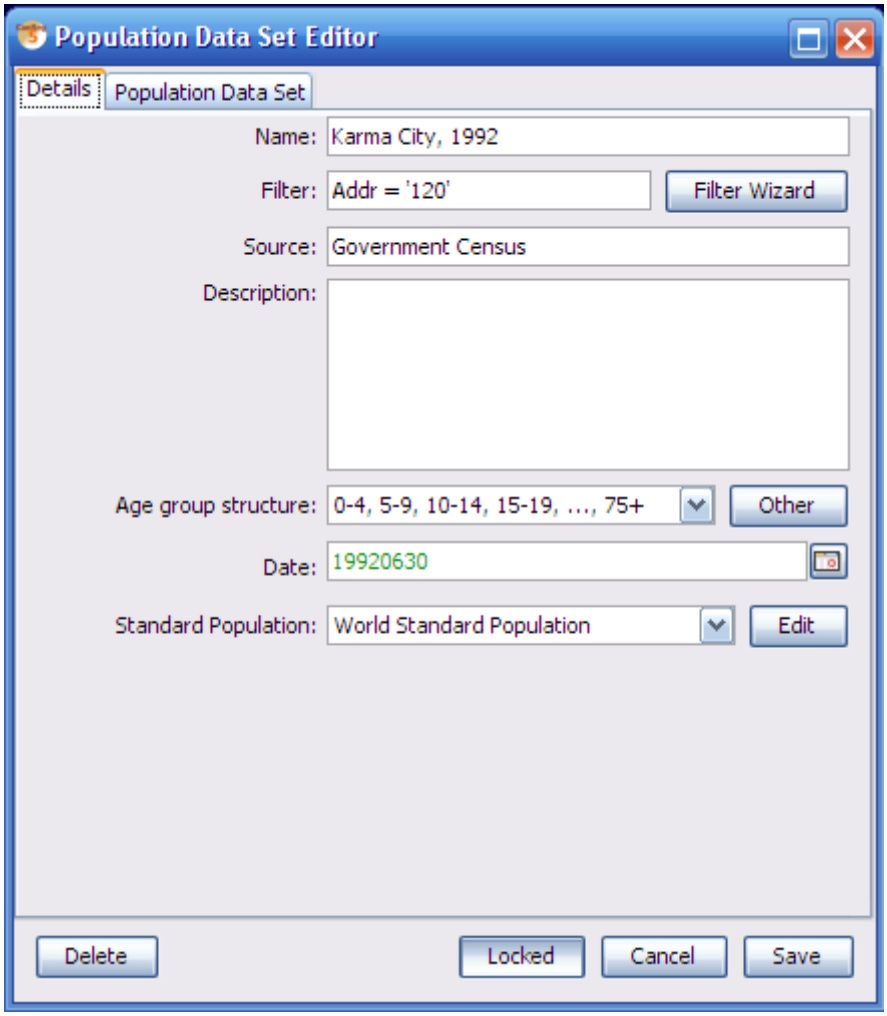
The Population Dataset editor lets you edit population data set to be used in the table builder. This is located under File – Data Entry Edit Population Dataset:



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



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

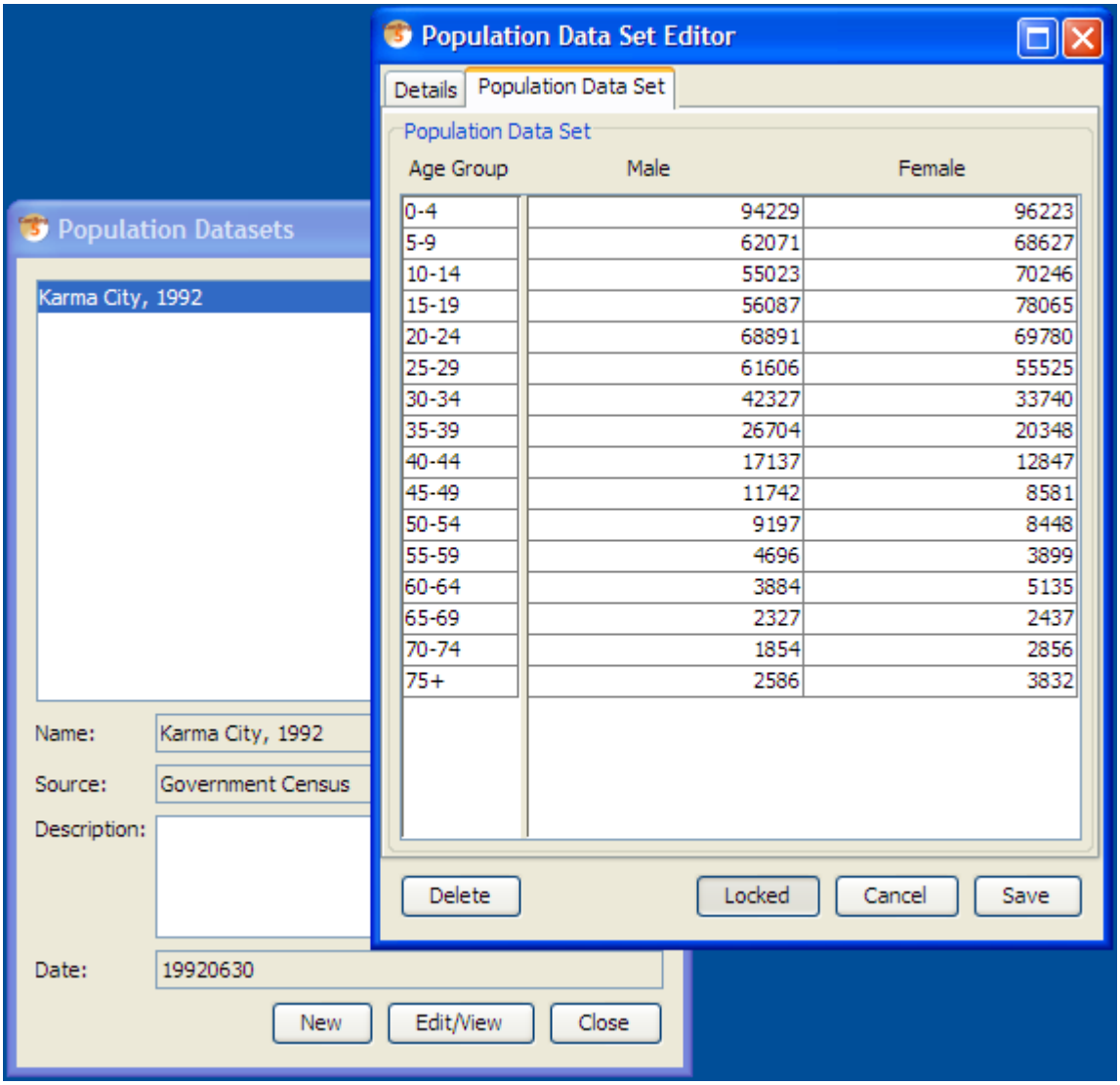


Fill in the details:

- 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:

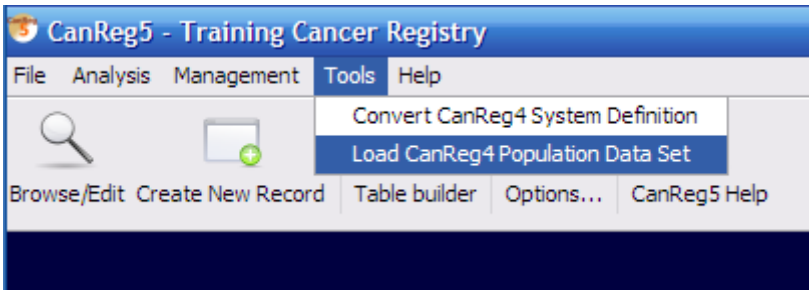


(Please note that you can copy and paste population datasets back and forth from general spreadsheets like Excel.)

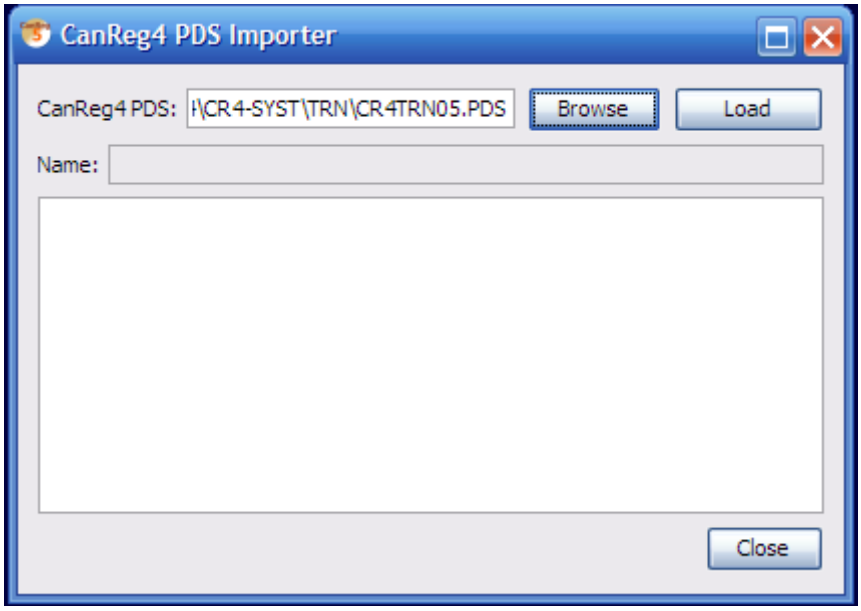
Click save to save your population dataset.

3.5.1 Import population data set from CanReg4

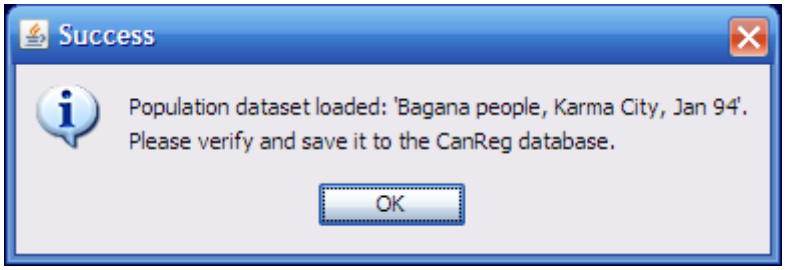
Alternatively you can import population data sets from CanReg4. To do this you go to the Tools menu and choose "Load CanReg4 Population Dataset".



Click Browse to find the population dataset:

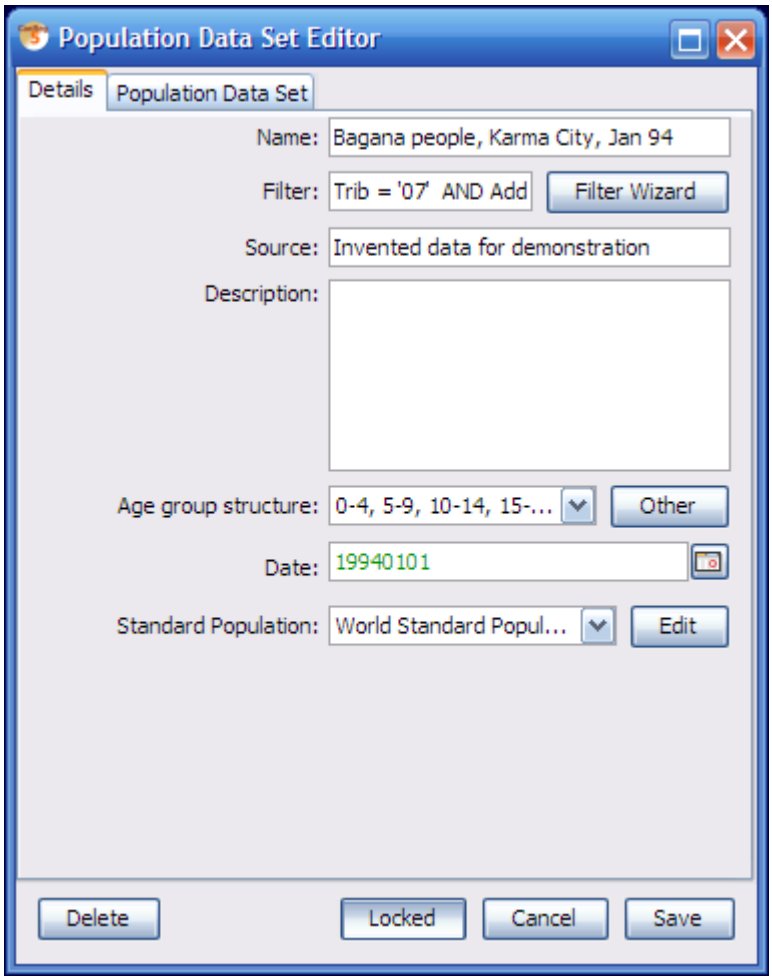


Then click Load and a confirmation message that the population dataset has been loaded will appear.



Click “OK”.

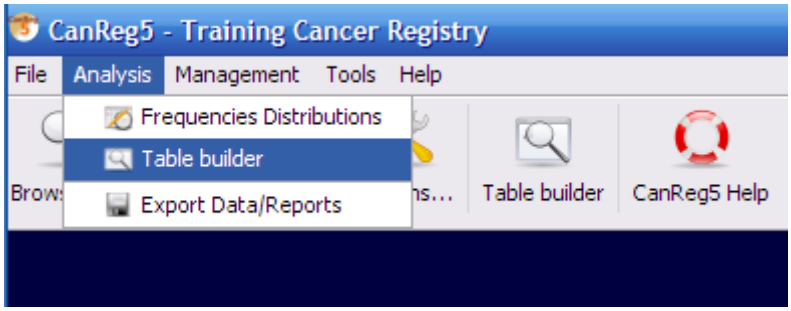
Next step is to revise the population dataset and see to that it has been imported correctly.



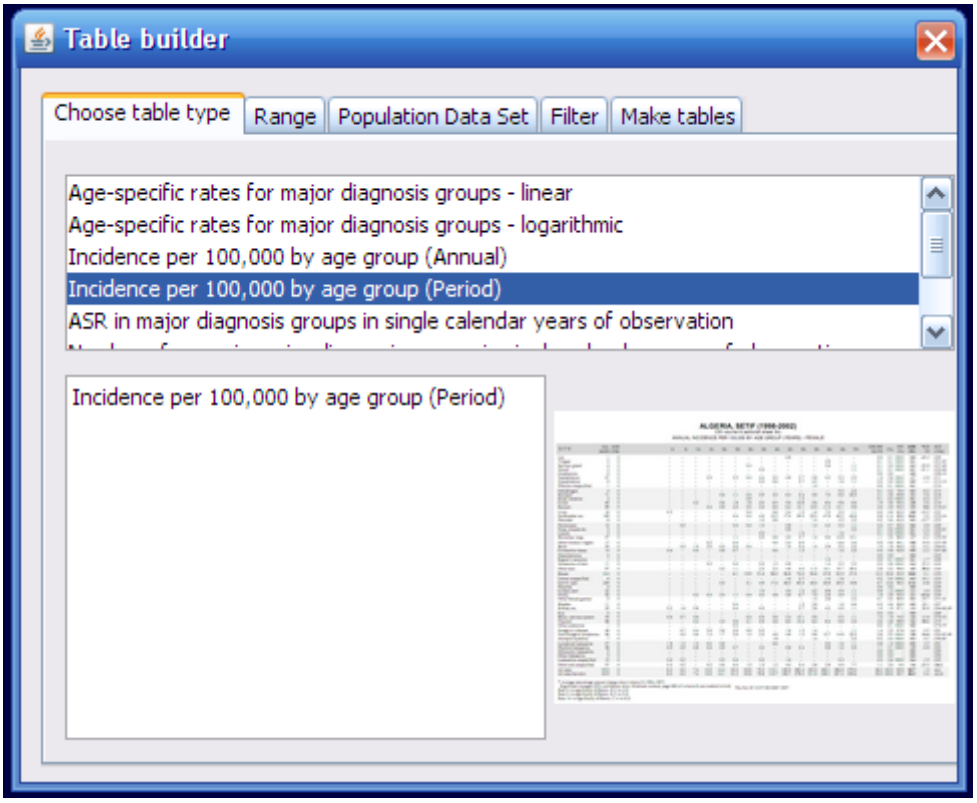
One important thing to do is to see to that the filter is correct. That for example the search variables are enclosed by ’s. If you need to change anything in the dataset you need to unlock it by toggling the “Locked”-toggle.

3.6 Table builder

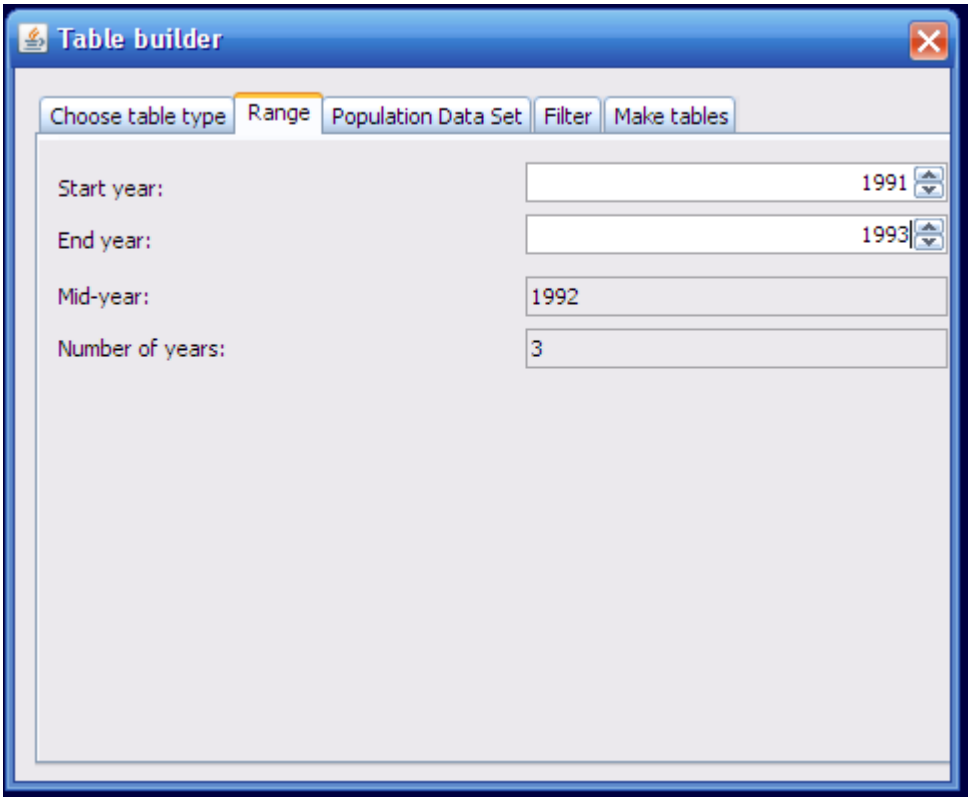
The Table builder lets you build incidence tables etc in CanReg. You find it under analysis – table builder.



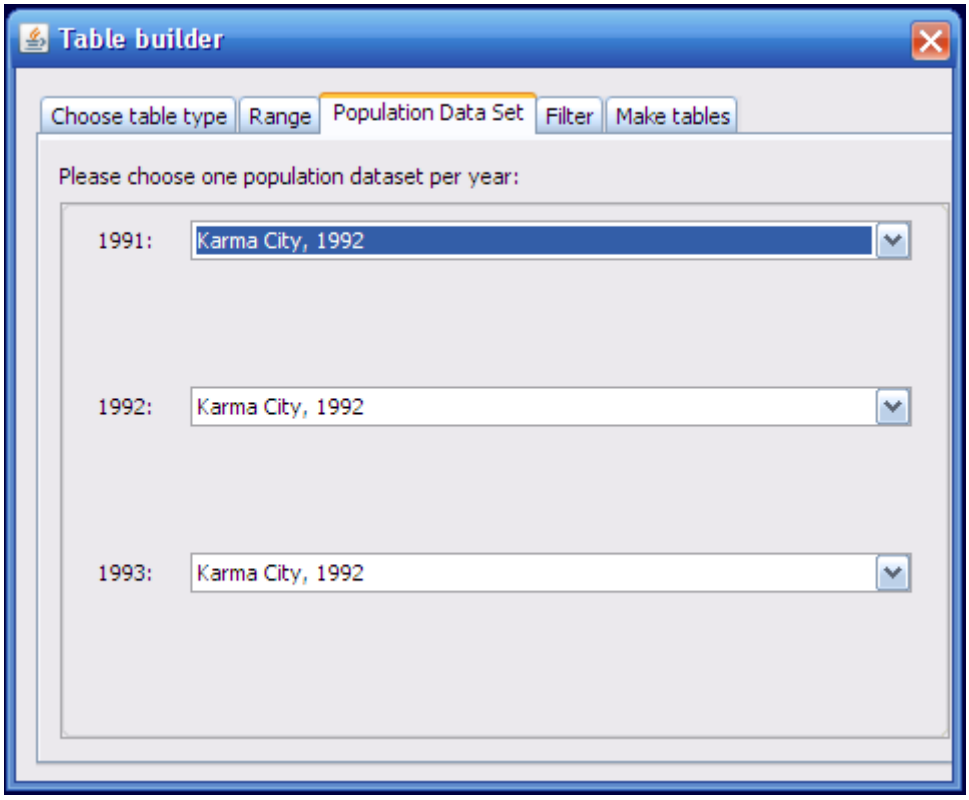
When you start it you first choose the type of table you want to produce. (Please note that it is only the Incidence per 100,000 by age group (period) and the Population pyramid that is implemented so far...) Pick Incidence per 100,000 by age group (Period):



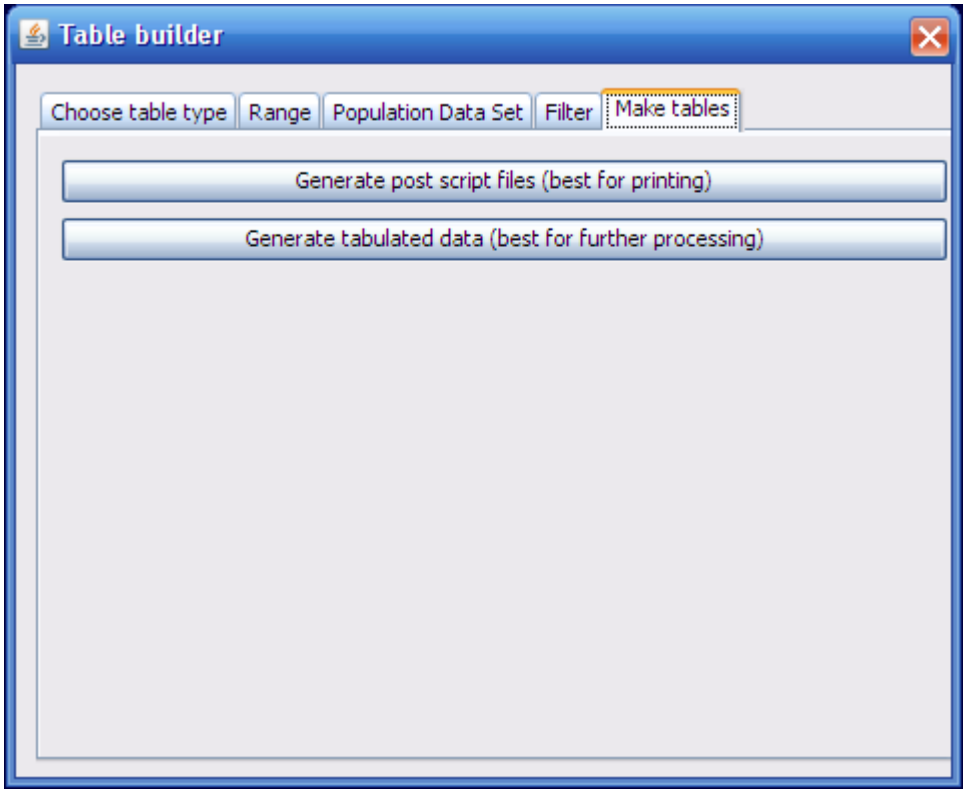
Then click on range to set the range of your analysis and set it to match the analysis you want to do, for example here we want to look at Karma City, 1991 to 1993:



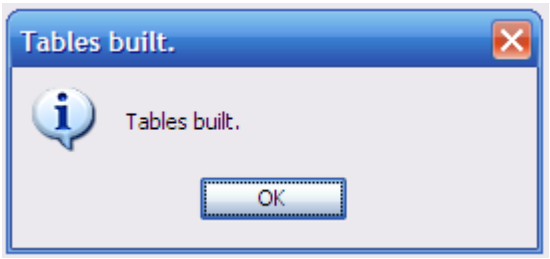
Click Population Data Set. Pick one population data set per year. This can be the same for all three if that year is representative of the period:



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 46.) files the tables will be displayed after you press OK.

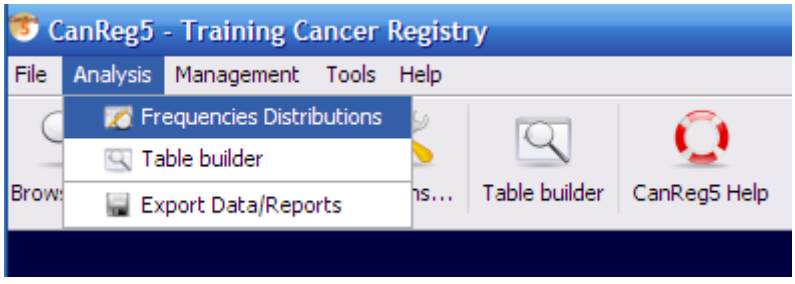
Training Cancer Registry (1991-1993)

Incidence per 100,000 by age group (Period) - Male

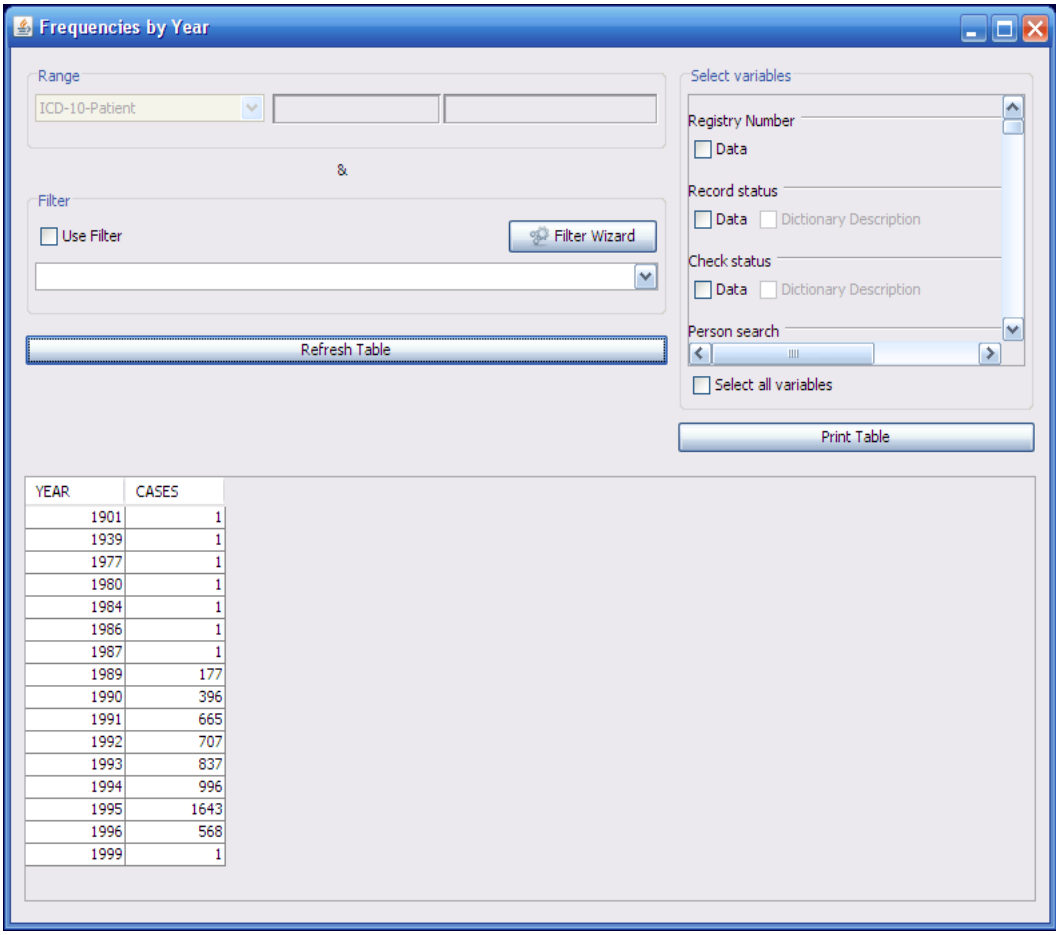
SITE	ALL AGES	AGE UNK	0-	5-	10-	15-	20-	25-	30-	35-	40-	45-	50-	55-	60-	65-	70-	75+	CRUDE RATE	(%)	CUM 0-64	CUM 0-74	ASR (W)	ICD (10th)
Lip	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	14.3	-	-	0.1	0.1	0.00	0.07	**0.4**	*C00*
Tongue	3	0	-	-	-	-	0.5	0.5	-	-	1.9	-	-	-	-	-	-	-	0.2	0.3	0.01	0.01	**0.2**	*C01-02*
Mouth	4	0	-	-	-	-	0.5	-	-	1.2	-	2.8	-	-	-	14.3	-	-	0.3	0.4	0.02	0.09	**0.7**	*C03-06*
Salivary glands	3	0	-	-	-	-	-	0.5	-	-	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	25.8	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	-	-	-	-	14.3	-	-	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	-	-	-	-	-	-	-	1.2	1.9	2.8	3.6	-	8.6	14.3	-	-	0.4	0.6	0.09	0.16	**1.3**	*C25*
Nose, sinuses etc.	6	0	-	-	-	-	-	-	0.8	-	-	5.7	-	7.1	-	14.3	-	12.9	0.4	0.6	0.07	0.14	**1.4**	*C30-31*
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	-	-	-	-	0.5	-	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	-	-	-	-	-	-	-	-	-	-	-	7.1	-	-	-	-	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*	-	-	*28.6*	*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	-	-	-	25.8	0.8	1.3	0.10	0.10	**1.6**	*C47,C49*
Breast	6	0	-	-	-	-	-	-	0.8	-	-	2.8	-	14.2	8.6	-	-	12.9	0.4	0.6	0.13	0.13	**1.4**	*C50*
Penis	12	0	-	-	-	0.6	-	-	0.8	-	5.8	-	-	7.1	-	14.3	71.9	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	-	-	-	-	-	-	-	7.1	-	-	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*	*25.8*	*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	-	0.5	-	-	-	-	-	-	-	-	-	-	8.6	14.3	-	-	0.2	0.3	0.05	0.12	**0.8**	*C81*
Non-Hodgkin lymphoma	46	0	3.5	6.4	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	-	0.2	0.3	0.05	0.14	**0.8**	*C90*
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*	*MPD*
Myelodysplastic syndromes	*0*	*0*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	*0.0*	*0.0*	*0.00*	*0.00*	*0.0*	*MDS*
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**	*O&U*
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		8.17	14.65	**135.1**	*ALL*
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	601.6	629.3	850.7	61.0	100.0	8.05	14.21	**132.2**	*ALLbC44*

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:



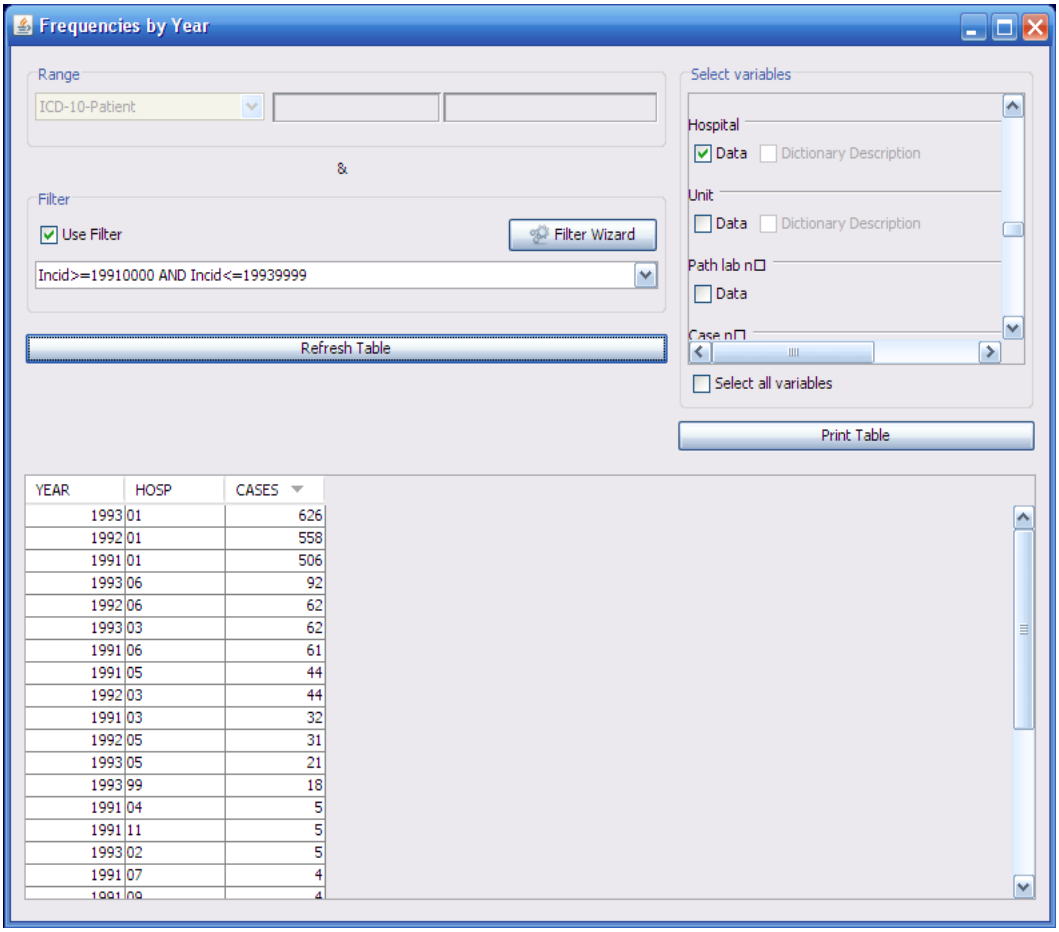
If you click Refresh table with no filter and no selected variables you get a table of cases per year.



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.



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.

Q: When I try to log on to the CanReg server I get the message: "Exception creating connection to: aaa.bbb.ccc.ddd; nested exception is: java.net.SocketException: Malformed reply from SOCKS server"

A: This can be solved using the same procedure as the previous answer.

Q: Is CanReg5 only designed for local networks or does it allow remote registration?

A: CanReg5 is designed for local networks, yes, but traffic is over standard TCP/IP so you can tunnel this through secure channels (SSH/VPN etc) to do remote registration. (This is not "officially" supported, as we haven't been able to test it enough locally (yet).)

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.

Q: In canreg5, how do you clear previous data and import fresh ones from canreg4.

A: To clear the previous data from CanReg5 you need to delete the database files. These can be found in your user folder under .CanRegServer\Database (On my machine it is under C:\Documents and Settings\ervikm\.CanRegServer\Database). Please note that this deletes the dictionaries and population data as well, so you might want to export those prior to deleting this. Then you can relaunch CanReg and the server and the empty database will be rebuilt. It is a good idea to keep a backup of an empty database - just containing dictionaries (and population data) to get back to this state of the database if needed.

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/gs864w32.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.

Q: While importing my data the process brakes down before the end and I get an error message saying that there is something wrong with the file.

A: First of all make sure that you have the latest version of CanReg installed, as some of the earlier versions had a bug that manifested itself while importing files. Then look at the line where the import brakes down and see if you have some unclosed quotes in any of the fields. This will brake down the import as CanReg allows qoutes around strings that contain the separating character, but not unclosed quotes.

A.6 Database design

Q: What is the minimum data set that one would collect?

A: The minimum data set required is up to your registry to define. Please refer to this publication for more information: (Chapter 6, for example.)

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

A: In the **patient** table you store the information about the patient that never changes (or at least very seldom) in the patient table. (That is birth date, sex, names etc.) You also store follow up information in the patient table. (Vital status, current address, etc.) In the **tumour** table you store all data that can potentially differ between two tumours of the same patient. (Topography, morphology, age, address at the time of the tumour (coded) etc.) Finally, in the **source** table you store all information about the sources of information of any given tumour. (Source name (preferably coded), source type, date etc.)

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.

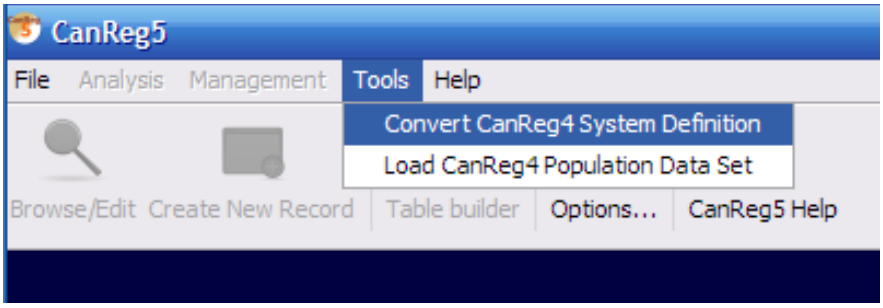
C Migrating from CanReg4 - Step by Step

Install CanReg5.(2)Start CanReg5 and it presents you the Welcome window. Do NOT click anything here just yet.

C.1 Step 1 - Import the variable definitions of CanReg4 to CanReg5

The first step is to import the variables of CanReg4 to CanReg5 - the system definition of CanReg4.)

1. Go to "Tool" in CanReg5 menu and click "Convert system definition".

(a) 

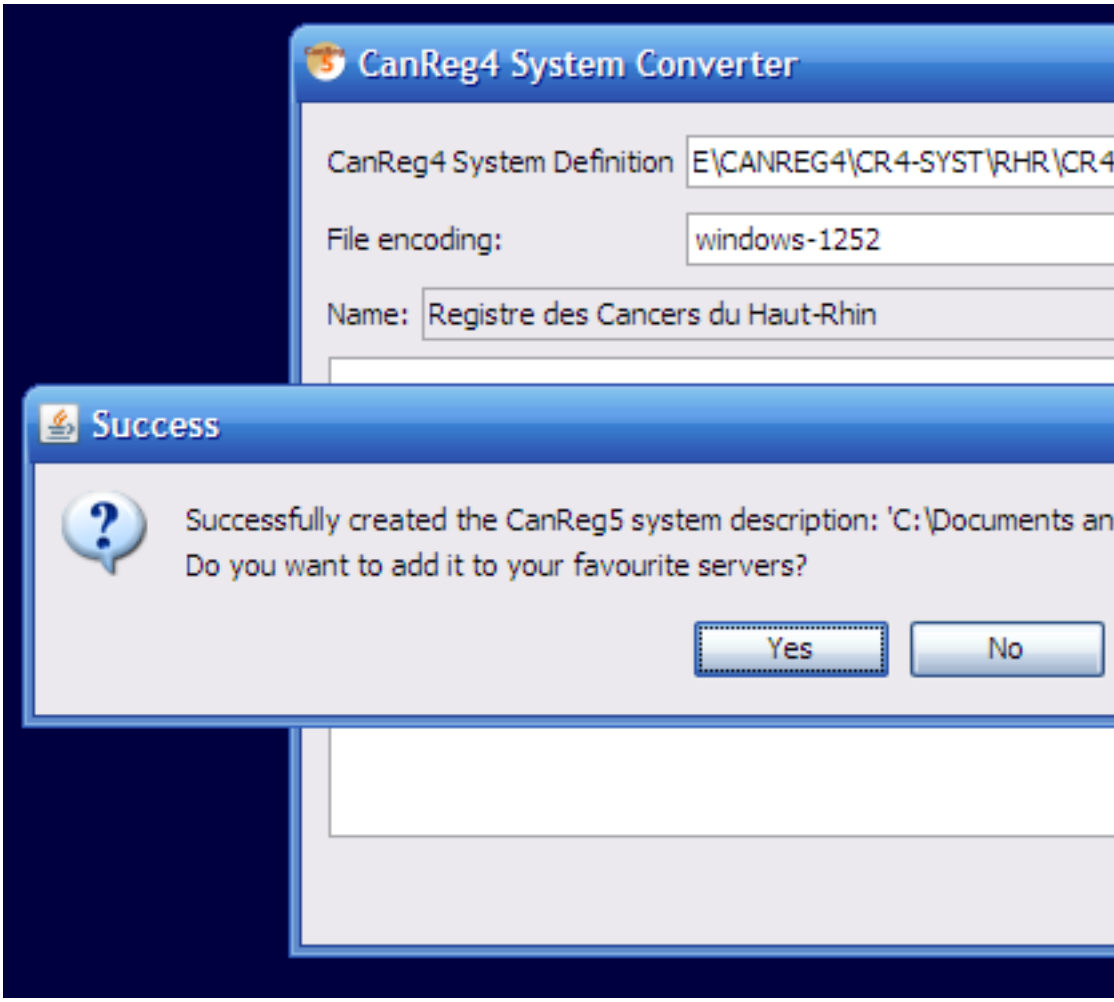
2. Do "Browse" to find your CanReg 4 system definition file. (This is a file located in the folder \CR4SHARE\CANREG4\CR4-SYST\ followed by your 3 letter registry code i.e. TRN whose name is ending in .DEF (i.e. CR4-TRN.DEF).)

3. Select your CanReg4 file and double click it or click "Open".

4. Click "Convert".

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

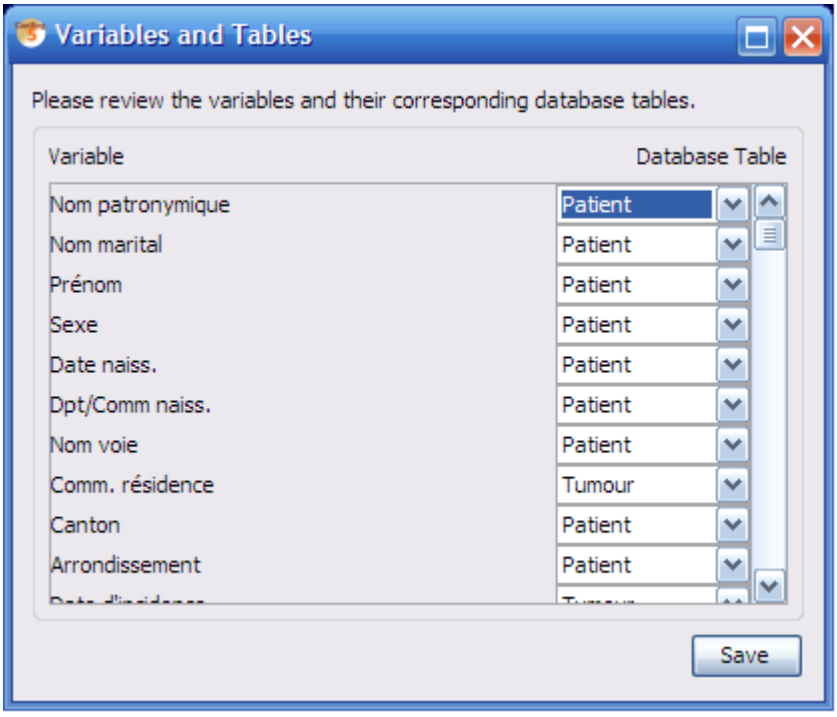
(a)



6. 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, one for patient related information and yet another one for source information(1.1) 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.

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

(a)



8. Click "Save". You have now created an XML file that describes your CanReg5 system.

9. Optional: Before you proceed to the next step and launch the server you can, if you want(!), edit this this XML file you have created. Either using the built in grapical tool in CanReg5 (2.7) or manually 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.)

10. Click "Login".

11. Launch the CanReg server

    (a) Click "Settings"

    (b) Click "Launch Server". (If you get a java firewall query, please confirm that it is OK that java can comunicate through you firewall by clicking "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.

12. Now it is time to log into the system.

(a) Click "System"

(b) Enter username: "morten"

(c) Enter password: "ervik"

(d) Click "Login". The system will now log you onto your CanReg server.

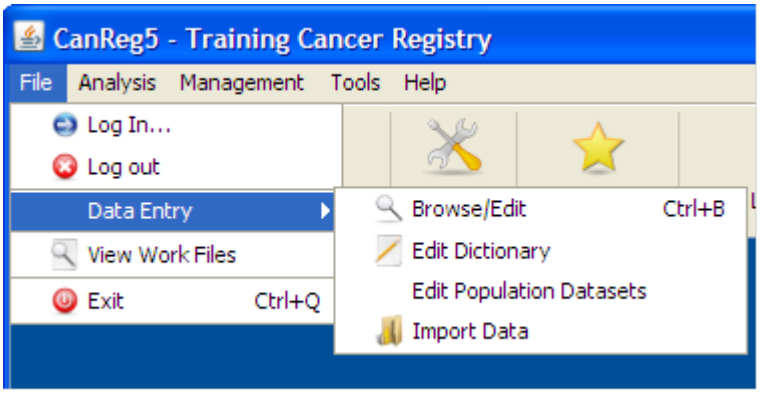
C.2 Step 2 - Import the dictionary from your CanReg4 installation

The thing we want to do now is to import the *dictionary* from your CanReg4 installation or demo system. (Earlier we only imported the description of what variables exist in you canreg4 database.) This is demonstrated in the video called 06-import-dictionary.avi.

1. 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")

2. Go to "File", "Data Entry", "Edit dictionary" in CanReg5

(a)



3. Click on "Import complete dictionary from file".

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

5. Click "Preview" to take a look at the dictionary.

6. Tick "CanReg4 Format" if you are migrating, leave unticked if you are using the demo system or otherwise are importing a CanReg5 formatted dictionary.

7. Click "Import". This might take some time. Please note the bar in the lower right indicating that the program is busy.

8. Afterwards you will receive a message of success imported. Click OK.

9. Go back to "File", "Data Entry", "Edit dictionary" and verify that the dictionaries have been imported.

C.3 Step 3 - Import the data from your CanReg4 installation

The next step is to import the *data* from CanReg4 to CanReg5. This is demoed in the video called 07-import-data.avi.

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

   (a) In CanReg4: "Analysis", "Export data"

   (b) Tick "Export all variables".

   (c) Choose variables names short

   (d) Under "Export File options" choose "Comma separated variables"

   (e) Untick "Format date"

   (f) Untick "Correct Unknown"

   (g) 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".

   (h) Take a look at the data you have now exported and close CanReg4.

   (i) Take a note of the number of records. (This should later match the number of *Tumour records* in your CanReg5 system.)

2. Back in CanReg5 do "File", "Data Entry" and "Import Data".

3. 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).

4. Set "Separating character" to Comma. (Or whatever separating character your file has.)

5. Click Preview to see that the data looks OK.
6. Click "Next" (or select the tab "Associate Variables")
7. 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.
8. Click "Next" (or select the tab "Import File")
9. Click "Import" (leave everything as by default – the import function only works on empty CanReg databases as per now...)
10. Let CanReg5 import the data (this might take a while) and click "OK".
11. Click "Browse/Edit" and "Refresh Table" to see that the data has arrived well. Double click a record to take a look at it.

D Third party tools

Here's a list of useful third party tools to use with CanReg5.

D.1 For data cleaning

D.1.1 Google Refine

Google Refine is a free and open source tool that allows you to standardise and clean your data prior to importing it into CanReg5. Please note that even though you access and manipulate your data using a web browser your data is kept locally on your machine.

More information about it on: http://code.google.com/p/google-refine/

D.1.2 Talend Open Studio

Talend Open Studio is a more heavy duty package to clean and standardise your data before importing it into CanReg. It is free and open source.

More information about it on: http://www.talend.com/

E Changelog

Changelog

5.00.01

- Database: fixed a bug where some filters didn't work when joining two (or more) tables.
- Import: handles better errors when one line does not have enough elements, the apache licenced csvreader now used to parse the infile.
- Database: fixed a memory leak issue, improved efficiency of import function, improved error handling

5.00

- No changes since 4.99.32

4.99.32 (5.0 RC17)

- Fixed some internationalization of the table builders.
- Improved error-messages during login.
- Improved error-messages during analysis.
- Updated the translations.
- Other minor bug fixes

4.99.31 (5.0 RC16)

- Modified the main window to work better on small screens.
- Moved the data entry menu to a menu of it's own.
- Record Editor: Added a toggle patient/tumour view button.

- Hid the "local checks" and "name sex checks" result panel and "add patient record" button for now.

- Generate resultsets are separated from the initiate query part as a start towards possibility to interrupt a query.

- Only one browser per client.

- Updated the welcome screen and the about.html

- PDS updated message box added.

- Refresh button is now not possible to click while waiting for respons from server. Hour glass implemented.

- Started adding the migration guide to the handbook.

- Tidied some code.

4.99.30 (5.0 RC15)

- Found and fixed a bug in the convert to ICD10–part for certain combinations T/M.

- Updated the table of Morphologies.

- Other bugfixes.

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. 'å' 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–O–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 (5.0 RC7)

- 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 (5.0 RC6)

- Access to handbook, possibility to download latest version.
- DatabaseVariableEditor now throws error messages if somethings not right with the variable definition during system setup.
- ICCC3 converter implemented.

4.99.20

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

4.99.19 Build 829 (5.0 RC5)

- 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 (5.0 RC4)

- Better handling of malformed date strings.
- Date of last contact check implemented.
- Better handling of check results.

- AutoFillHelper: auto age calculation implemented...
- RecordEditor and RecordEditorPanel: Improved the way check status is handled.

4.99.17 Build 818 (5.0 RC3)

- 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 (5.0 RC2)

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

4.99.15 Build 804 (5.0 RC1)

- 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 occured if a dictionary had more errors than possible to display.
- QueryGenerator improved.
- Improved the display of variable names (FastFilter, RangeFilter, Browser.)
- SystemDescription: Changes to accomodate the changes in DatabaseListElements, added setters to change the database's doc.
- DateHelper: fixed a bug that occured 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 where defined in the import file.

- FastFilter: reworked the logic and text on screen

- BrowseInternalFrame: Sort by column is now highlighted, layout improved

4.99.13 Build 749

- Source table implemented.

- Sources now imported.

- Proper record locking now implemented.
- Dictionary locking implemented.
- General GUI improvements: Groups are now sorted, more strings are internationalised.
- BrowseInternalFrame now asks you to confirm before creating a new record, enter works to load patient or tumour, now enforces new record IDs to have the correct length, some internationalization done.
- AutofillHelper started and fills in age and behaviour when set to Automatic.
- CanRegDAO now throws database mismatch exceptions if the database structure doesn't match the prepared queries.
- Record editor now shows last update date and user. Improved the layout, internationalized some strings.
- System Definition Converter taking into account source table, better system to put the variables in the right tables, takes into other character sets, standard naming of data entry languages, dictionaries of topography and morphology are flagged as locked by default.
- Login: added message to perform backup if this never has been performed.
- Import: MP patients that are 100% identical as a record already in the database are no longer imported.
- Dictionary Editor: Import Complete dictionary no longer closes the internal window during import. Only dispays the 5000 first codes in each dictionary for performance issues. Export function improved.
- Dictinary importer now checks for duplicate codes, possibility to set characterset of file to import, other improvements.

- TableBuilder: Removed filter tab.

- EditChecks: works now with longer than 4 digits morphology codes.

- SystemDefinitionConverter: If morph code is 5 digits, behaviour should be generated automatically, groups now have a position.

- UserManager now lets the user know if the username is longer than allowed lenght. (16 digits.)

- CanRegClientApp: API extended with a method to get patient records by ID.

- DictionaryHelper: improved stability of Test Dictionary.

- CanRegDAO: first Patient ID is now set to YYYY00...01

- Bugfixes.

4.99.12 Build 707

- PDSEditorInternalFrame: Improved GUI

- Minor changes.

4.99.11 Build 703

- Eliminated a bug where records where set to pending while saving.

- Improved the "Do you really want to close this record" dialog box to appear only when the user has done actual changes to a record.

- PopulationDataSetEditor: cut and paste from general spreadsheets now work.

- PDSEditorInternalFrame: Fixed a bug where the population dataset would not be saved if the name was longer than

40 characters. Now it cuts it at 100.

- Made some more views more compact to fit better smaller screens.

- Updated the about page.

4.99.10 Build 688

- FrequenciesByYear: Fixed a bug where the table did not show up.

- FrequenciesByYear: Printing now works.

- Querygenerator: fixed a bug where numbers where stored as VARCHAR instead of INTEGER in the database.

- Browse, ExportReport, FrequenciesByYear: fixed bug that froze the GUI if an invalid filter was used.

- TableBuilder: Disabled the filter tab.

- Import preview is now shown in a table.

- Updated the about page.

4.99.9 Build 680

- RecordEditor: Hid the tumour record number and patient record number.

- Improved the FastFilterInternalFrame to deal better with keywords BETWEEN and LIKE.

- Tidied the Record Editor.

- Date–related fixes.

- Changed the way certain variables are stored in the database.

- FrequenciesByYear, Fixed a bug where the program froze when the filter was not accepted.

- BrowseInternalFrame, Fixed a bug where the program froze when the filter was not accepted.

- SystemDefinitionConverter, Update-date set to date instead of Number.

- FrequenciesByYear: Table can now be popped out to a separate window.

- Started a system of meta-variables to take care of registries using different coding schemes, like 5 digit morphology...

- Distributed table returns null if a row is for some reason missing.

- Tidied some code.

- Disabled table builder icon when not logged in.

- Distributed table returns null if a row is for some reason missing.

- Tablebuilder: Filter shows up in report. Possibility to change name of table.

- Population Data Set Editor: fixed the bug that did not allow a PDS to be updated (eg the filter).

- Fixed the layout of most windows to fit better on smaller screens.

- Global Person Search: removed "already matched" column.

- Frequencies/export variables selection box re-look

- Frequencies/export variables selection box scrolls faster, variables closer

- TextFields (fields spanning multiple lines) added as

option in record editor

- Range now works properly when making frequency by year tables as well.

- Various bug fixes.

4.99.8 Build 661

- Added functionality to import Population data sets from CanReg4.

- Added functionality to merge patients.

- Fixed memory "leak" occurring when editing/importing dictionaries.

- TableBuilder: max number of population data sets added

- Tables: age specific tables split in number of cases and rates, functionality to see if a population dataset is compatible with a table added.

- RecordEditorPanel: Order of groups now follow the order in the XML file.

- RecordEditor: tidied the GUI.

- Usermanager: obligatory with one supervisor account.

- Minor changes, documentation updated, trn-dictionary improved, TRN.xml improved.

- CanRegServer: person search related changes.

- DatabaseFilter: Range implemented.

- MaxLengthDocument: Fires "changed" events.

- Various bug fixes.

4.99.7 Build 656

- Global person search implemented.
- Range filtering implemented.
- FastFilterInternalFrame: added operators IN and BETWEEN.
- Minor changes, documentation updated, trn-dictionary improved, TRN.xml improved.

4.99.6 Build 648

- Fixed a bug in the way the server addresses were handled on machines with multiple network interfaces.
- Changed default coding schemes for various languages during import of old data to fix bug found by the Jordanian cancer registry on Arabic letters not imported properly.

4.99.5 Build 645

- User manager implemented.
- Migrator function implemented for situations where we need to change database structure between releases of CanReg5.
- Better handling of the menus available for the different users.
- The login module updated. Passwords and user levels now stored in the database.
- ClientView: table builder now starts as a backgroupd task to make GUI more responsive.
- Tables: incidence rates (period), population pyramid implemented, tablebuilder now has a nice file selector that remembers last path

- PDSEditor: delete now possible.
- Common Tools: implemented a method to open files on Mac, Linux and Windows.
- PDS: fixed a bug in the calculation of totals and detection of found age groups.
- Table configs updated. Now states if the engine is implemented or not.
- Automatic resizing of the columns in the Export browser implemented.
- Automatic resizing of the columns in the Browser implemented. Some speed improvements.
- Fixed a bug in the population dataset editor where the last age group, female was sometimes set to 0.
- Table builder GUI implemented. First table almost up and running.
- Synchronized more functions in the database access to resolve some issues with the browser.
- Fixed bug that blocked when "back up every... days" was not set.
- Various fixes.

4.99.4 Build 624

- Fixed bug that flagged all opened cases as pending.
- Started work on detection of changes.
- Fixed bug in person search. Removed check button from Patient. Added error message if tumour record is not found in browser.

- Added classes to deal with unknown dates.
- Multiple primary tests added.
- Age check added.
- Unknown dates handled better.
- Better treatment of dictionaries, default selection
- Compound dictionaries handled better.
- Disabled some buttons not yet implemented.
- Only Supervisor can now confirm rare cases.
- Various small fixes and improvements.

4.99.3 Build 612

- Browser: It should now be possible to sort results on variables with ?.? in the name. (ie. ?RegNo.? or similar).
- Import: Fixed bugs during import of a file. The correct number of records read.
- Import: Log more information when something goes wrong during import.
- Other bug fixes.

4.99.2 Build 607

- Show/hide obsolete records implemented.
- Obsolete–button implemented to toggle obsolete–flag.
- Added GUI–elements to move a tumour from one patient record to another.

- Log information redirected to Logger-object (log-file) for all output.
- Tools: break down line no longer crashes if quotes are not closed at the end of a line.
- Record editor no longer crashes if the record status dictionary has no entries.
- Edit checks now default to "not done".
- Edit checks now color variables that might be inflicted. Person search feedback improved.
- Changed download link.
- Other bug fixes

4.99.1 Build 598

- Improved handling and error reporting of record ids.
- RangeFilterPanel: Tumour table now default table, sort by variables only the ones in the table selected.
- Improvemnts in perfomance of SQL queries. Some other more minor changes.
- Install new system internal frame now checks to see if the file about to be installed is already in the right folder...
- CanReg5 takes into account the CanReg4 fileformat when importing files, thus allowing the import of files of other charactersets.
- Fixed bugs in the record editor. Record status is now saved.
- DictionaryHelper: fails more gracefully if something goes wrong while retreiving the dictionary ID.

- CanRegServerImpl: now handles better when connection to DB fails for some reason...

- SystemDefinitionConverter: Fixed bugs dealing with the length of record IDs different than 8. Added some system variables.

- CanRegDAO: Added functionality to generate next patient record ID. Squashed some bugs.

- QueryGenerator: added functionality to get highest patient record id.

- RecordEditor: Fixed a nullpointer error when "setting active record".

- Record status is only shown if the variable is in the system definition.

- Fixed bug in Frequencies by Year. Didn't redraw table properly.

- Fixed bug #1: Filter with OR not working.

4.99.0 Build 590

- First beta release