SMART

Emergency Nutrition Assessment for Standardized Monitoring and Assessment of Relief and Transitions (ENA for SMART)

Software User Manual

ENA 2011
(Version 2011, July 31st, 2012)

Final Version August 2012

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ACKNOWLEDGEMENTS

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INTRODUCTION

Standardized Monitoring and Assessment of Relief and Transitions (SMART) is a survey methodology that was developed to improve the quality of anthropometric and mortality survey data collected in humanitarian and development contexts (however, SMART has been increasingly used in developmental settings). The aim of SMART is to assist decision-makers to carry out, analyse, interpret, and report on survey findings in a standardized manner while maintaining the reliability of the data. In order to assist field workers to carry out surveys using the SMART methodology, several tools have been developed. These tools include, a SMART survey manual (April 2006), an accompanying computer software programme namely Emergency Nutrition Assessment (ENA), a Standardised Training Package (STP[1]), and a sampling guide.

ENA is a computer software programme that was developed to facilitate the planning, data collection, analysis, and reporting of anthropometric, mortality, and food security survey data in a standardised and simplified manner. ENA software, which originally came out as NutriSurvey for SMART Emergency Nutrition Assessment has gone through several updates based on user feedback and best practises in the field and the current edition of the software is ENA 2011 (Version 2011, July 31st, 2012).

This ENA software user manual has been developed to guide the ENA 2011 (Version 2011, July 31st, 2012) users. The main purpose of the manual is to provide users with an understanding of various functionalities of the ENA 2011 software so that they will be able to use the software to plan and implement surveys and analyse survey data. This manual does not describe the theories behind the functionalities used in the software or the SMART methodology itself. The manual should be used along with the SMART manual (April 2006), the STP, and the sampling guide to get a better understanding of the various concepts used in the software.

Although a food security module is included in the ENA 2011 software, this manual does not include information about how to use the food security module in the software as guidance on how to carry out food security surveys are still being finalised. It is hoped that this manual will be revised as the ENA software is updated.

Additional information about the ENA software can be found on: www.nutrisurvey.de/ena2011. For further information on the SMART methodology, please visit: www.smartmethodology.org.

[1]Standardised Training Package (STP) is a set of Microsoft PowerPoint presentations that has been developed by ACF Canada to help organise and deliver training on the SMART methodology. The STP has been tested and peer-reviewed and can be found on: http://www.smartmethodology.org/index.php/article/index/capacity_building_toolbox/stp Reference is made to various STP modules throughout this manual.

1. GETTING STARTED

1.1 Installation of the Software

The ENA 2011 (Version 2011, July 31st, 2012) software can be downloaded for free from the following web page: http://www.smartmethodology.org/ (by clicking on the **ENA Software** which can be found on the right hand side of the Capacity building toolbox section) or from this web link: http://www.nutrisurvey.de/ena2011/[2]. Alternatively, a ZIP file with the ***ena.exe*** file can be downloaded from the following web link: www.nutrisurvey.net/ena2011/ena2011.zip and ENA software can be installed by running the ***ena.exe*** in the ZIP file.

The default installation directory for the ***ena.exe*** file is set to be the c: directory (i.e. c:/ena2011). This should work in most cases. Once the installation is complete, an icon (see below) will be displayed on the computer desktop.

ENA 2011 software icon as it appears on the computer desktop

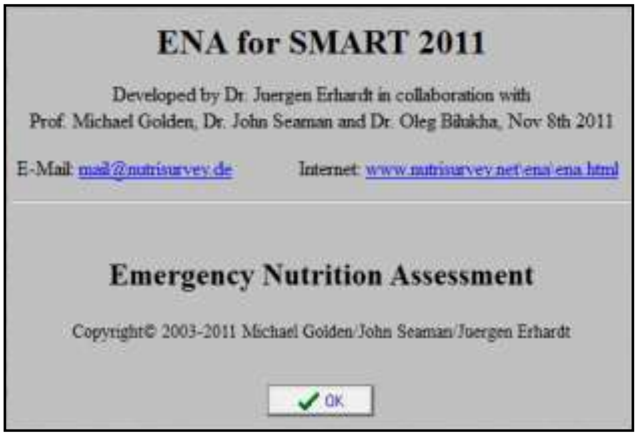
During the installation of the software, a folder named **ena2011** will be automatically created in the c:/ drive and all the ENA 2011 software programme related files will be stored in this folder. The **ena2011** folder will also act as the default folder for saving the survey data files (i.e. when files are saved for the first time, **ena2011** folder will be selected for saving the files). If an ENA 2011 file needs to be saved in another folder, it should be manually selected while saving the file. The file extension used in ENA 2011 data files is ***.as***.

There should not be any space in the folder name **ena2011** (i.e. no space between the word 'ena' and the number '2011') as this space may cause problems either with installations or proper functioning of the software. If there is a space, make sure to manually remove it during the installation.

In some cases, if the Microsoft Office 2010 version is installed in the computer after ena2011 was installed, this may also affect the smooth functionality of the ena2011 software. In these situations, uninstall the ena2011 software and reinstall it in the computer's **Programme files** after Microsoft Office 2010 installation is complete.

[2] This web link can also be used to download older versions of the software such as ENA 2007 and ENA2008.

1.2 Opening the Software

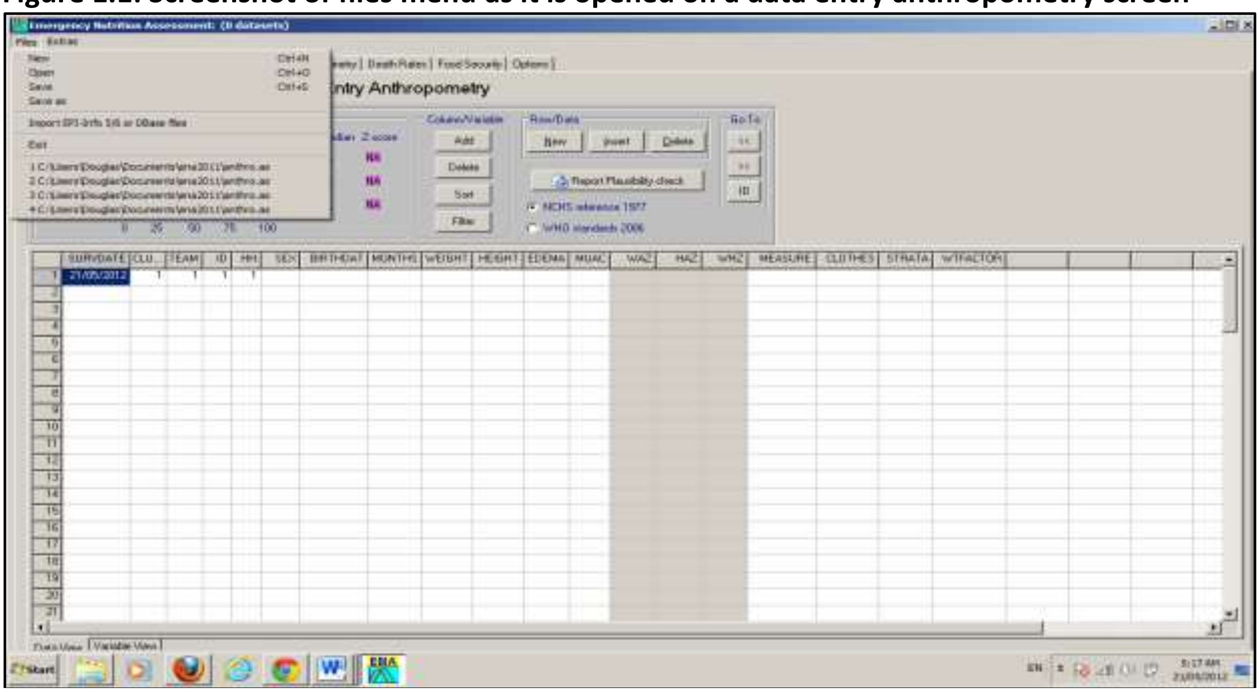


The software can be accessed by double clicking on the '*ENA for SMART*' icon on the desktop or by clicking on the <**Start**> menu and selecting the ENA for SMART programme under <**All Programmes**>.

When opening the software, the software will first open with the box displaying the names of the individuals who designed the software along with what version of the software – e.g. July 31, 2012. It is recommended that the latest version is always used as it will always have the most advanced features; the latest version currently is ENA 2011 (July 31, 2012). The box will also show an email contact where feedback and queries can be sent to and the link to the web page where the software is housed. Note that feedback can also be sent to the SMART forum on: www.smartmethodology.org web page. When ready to go into the software, click on <**OK**> to proceed.

1.3 Getting to Know the Software

Figure 1.1: Screenshot of files menu as it is opened on a data entry anthropometry screen



When the software is opened, it automatically opens up with the *Date Entry Anthropometry* screen (see section 4 below). However, the software also has other screens such as *planning, Training, **Results Anthropometry**, **Death Rates**, **Food Security**,* and ***Options***, which are arranged in an order following the steps of a typical SMART survey. Additionally, there is a menu bar for ***Files*** and ***Extras*** with further commands. The ***Files*** and ***Extras*** menu are described here and each screen (except ***food security*** screen) is illustrated below in the subsequent sections.

1.3.1 Files

The ***Files*** menu consists of 6 *commands* grouped into 3 sections. Some of these commands are also available in the shortcuts on data entry anthropometry screen (e.g. *New*, *Open*, and *Save*) and death rate survey screen (e.g. *Save*) – see respective sections below for details. The *Files* menu also has the names and paths of up to 4 files that have recently been used (note: when the software is opened and used for the first time, this information will not be available). The functionality of each command in the *Files* menu is described below.

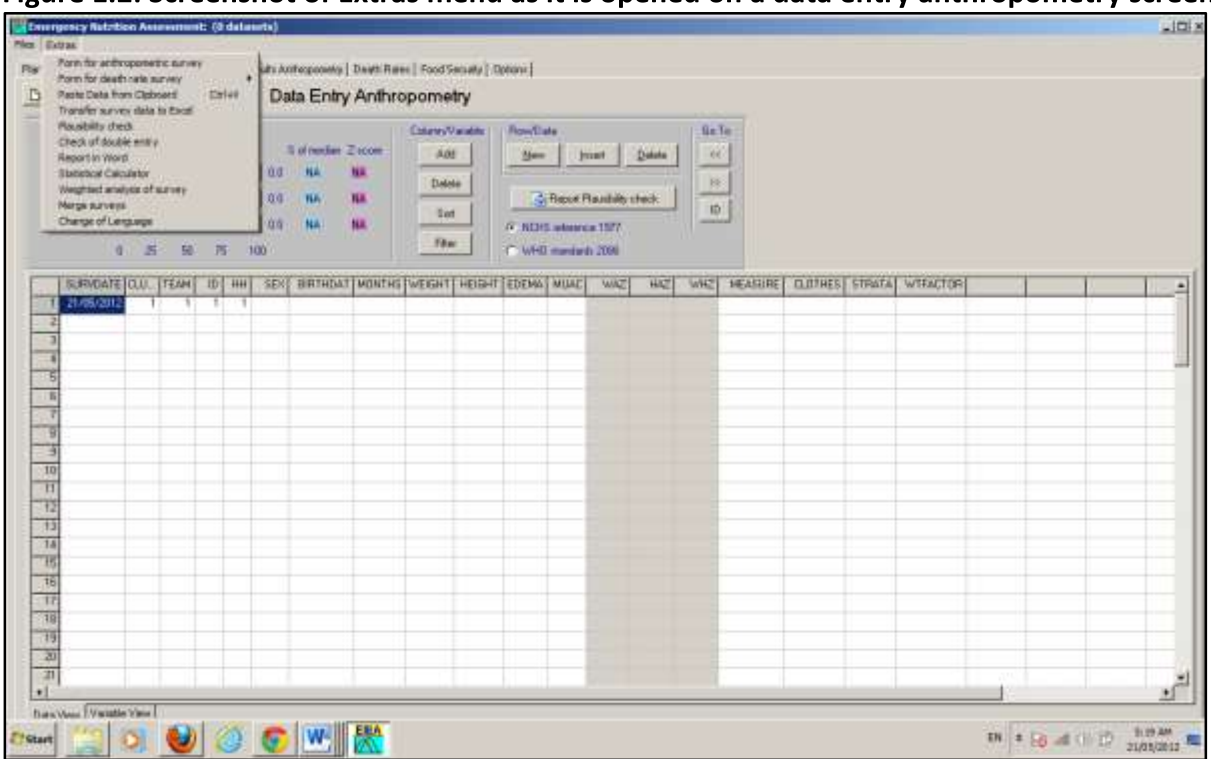
Table 1.1: Functions of commands in the *Files* menu

Command	Function	Remarks
New	Opens a new file in ***.as*** format	Regardless of the screen on display when this command is clicked, the software will always open up a new Data Entry Anthropometry screen. If there is unsaved data when this command is selected, the software will ask whether the data needs to be saved. If the (unsaved) data doesn't need to be saved, click on <**No**> and a new file will open up. If the data needs to be saved, click <**Yes**>. If a file has already been created, the data will be saved in the file and a new file will be opened. If no file has been previously created, a new window will appear showing the recommended file name format. If the data needs to be saved, click <**OK**> and save the data in the recommended file name format (see below). Once the file is saved, a new file will be opened.
Open	Opens an existing ***.as*** file	A new window will be opened displaying the contents of the ena2011 folder. When a file is open, the path to the file is displayed on the top of the screen. If there is unsaved data when this command is selected, the software will ask whether the data needs to be saved. Follow the instructions above under the command <**New**> to save the data.
Save	Saves the actual file in ***.as*** format	If a file has already been created, the data will be saved in the file. If the data is saved for the first time, a new window with the recommended file name format will appear. Click <**OK**> to proceed. Save the file based on the recommended file name format (see below).
Save as	Saves file .as with a chosen name	A new window with the recommended file name format will appear. Click <**OK**> to proceed. Save the file based on the recommended file name format (see below).

Import EPI-Info 5/6 or DBase files	Imports files .rec EPI-Info (.rec) 5/6 or DBase (.dbf) file	This function was included to facilitate the import and analysis of data in ***.rec*** and ***.dbf*** file formats. As Windows versions of EPI-info are increasingly used, this functionality maybe removed in the next version of ENA. To import a ***.rec*** or ***.dbf*** file, click on the command and select the file to be imported from the window that is displayed. Click on <**OK**>.
Exit	Closes the software	If there is unsaved data, a new window asking whether to save the data will appear when **<Exit>** is clicked. Click <**Yes**> if the data needs to be saved. If not, click <**Cancel**>. If <**Yes**> is selected, a new window will appear showing the recommended file name format. Select <**Yes**> and save the file in the recommended file name format (see below). If <**Cancel**> is selected at this stage, the software will close and all unsaved data will be lost!

1.3.2 Extras

Figure 1.2: Screenshot of Extras menu as it is opened on a data entry anthropometry screen



The ***Extras*** menu has 11 commands some of which are also available in the shortcuts in the training data entry anthropometry and death rate screens. Each of the command is briefly described below. For additional information, refer to the respective sections indicated.

Table 1.2: Functions of commands in the Extras menu

Command	Function
Form for anthropometric survey	Opens an anthropometric survey questionnaire in Microsoft Word format; the form is identical to the Data Entry Anthropometry screen (see below). This is a very basic form designed to collect anthropometric data quickly in an emergency situation. The form structured in a way that data from children in an entire cluster can be collected in one form. If additional data are to be collected, this form should be adapted. It may also be useful to design the form in a format that can capture information from each household, including anthropometry, separately (i.e. one form per household). See STP module 1 or contact the SMART forum for additional details on questionnaire design.
Form for death rate survey	Provides options for 2 types of death rate survey forms: 1) SMART standard form and 2) Simple form (one sheet/cluster). Both of these forms have shortcomings and their use is discouraged. *For the form that is currently recommended for use in a death rate survey, see annex 1.*
Paste Data from Clipboard	Pastes data that was copied last into the spread sheet on Data Entry Anthropometry screen. This function is similar to *paste* function in Microsoft Office packages and can also be executed by pressing <**Ctrl**> + <**V**> keys together on the keyboard (data will be pasted on the highlighted cell in the data entry anthropometry screen) however, pasting by right-clicking the mouse and selecting paste option does not work in ENA. To paste data onto a specific screen, the shortcut button for paste on the specific screen needs to be selected (see below). For example, to paste data onto training screen, the shortcut button for paste on the training screen needs to be clicked.
Transfer survey data to Excel	The data in the Data Entry Anthropometry will be exported to Excel along with column headings (see section on Data Entry Anthropometry). To transfer data on a specific screen, the shortcut button for transfer on the specific screen needs to be selected (see below). For example, to transfer data on death rate survey screen, the shortcut button for paste on the death rate survey screen needs to be clicked. Note that although the data is transferred to a Excel template, the file format used in ENA 2011 is a text (***.txt***). It is recommended that the transferred file is saved in Microsoft Workbook (***.xls***) file format. To do this, follow the standards procedure for saving a document. In the small window that appears, type the file name and from the dropdown button for 'save as type' select <**Excel Workbook**>.
Plausibility check	Opens plausibility report in Microsoft Word format (see section on

	Data Entry Anthropometry).
Check of double entry	Compares two data files and check if they are similar. It is used in data entry to make sure the survey data was entered correctly (see section on Data Entry Anthropometry).
Report in Word	Generates a sample report template with standard tables that are automatically filled with anthropometric and death rate survey data.
Statistical calculator	Allows further analysis and cross-tabulation of variables (see section on Results Anthropometry)
Weighted analysis of survey	Facilitates analysis of survey data where weighing needs to be taken into account because of unequal probability of selection for different elements in the sample (see section on Data Entry Anthropometry). This is typically done when combining 2 or more surveys.
Merge surveys	Enables 2 different datasets to be merged into one dataset (see section on Data Entry Anthropometry)
Change of language	Changes the software between English and French. To change language, select the <**Change of language**> command in the <**Extras**> menu. A box will appear with 2 language options (english.Ing and French.Ing). Select the language and press <**OK**>. Once the language is changed the software must be restarted to effect the changes. ENA in other languages may also be made available to users upon request – please post the request on the SMART forum on www.smartmethodology.org.

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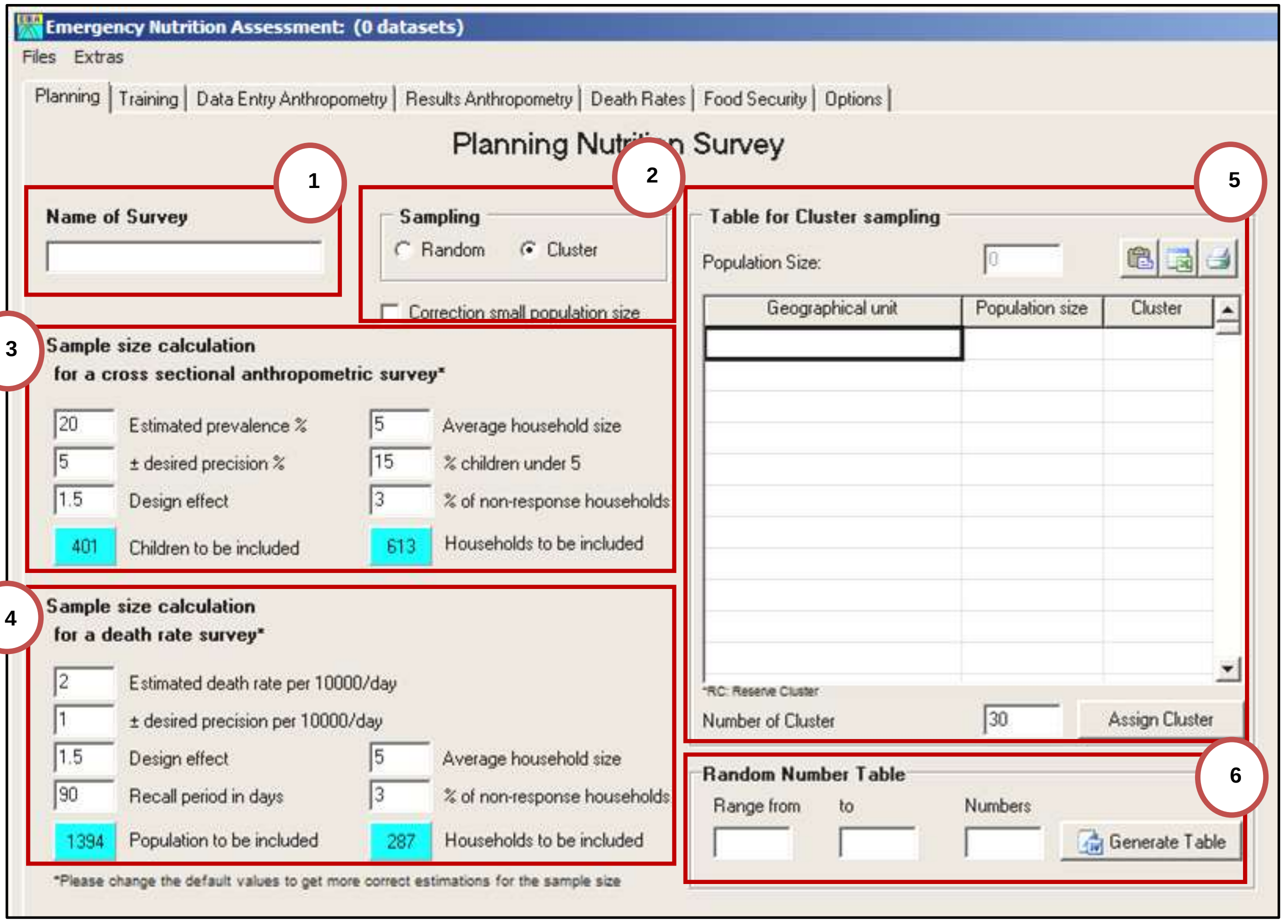
2. PLANNING

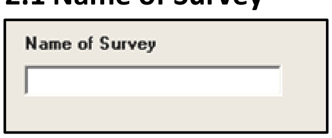
The ***Planning*** section of the software is used to calculate sample sizes for anthropometric and death rate surveys and, in a cluster survey, is used to assign clusters. The planning screen can also be used to generate random number tables.

Figure 2.1: Screenshot of ENA 2011 planning screen



For illustration purposes, the planning screen has been divided into following 6 sections: 1) Name of survey, 2) Sampling, 3) Sample size calculation for a cross sectional anthropometric survey, 4) Sample size calculation for a death rate survey, 5) Table for cluster sampling, and 6) Random number table. Each section is described in detail below.

2.1 Name of Survey



This section allows one to give a name for the survey. It is important that each survey is identified by a unique name and all files and directories associated with the survey are named consistently so that it can be easily recognized by any of the team members.

It is recommended that the file name starts with the 3 letter country code (e.g., SUD for Sudan, ZAM for Zambia, ANG for Angola, etc.), followed by the date of the survey in YYMM format. It may also be useful to include the following information: the region, type of population (refugee, IDP, resident), and the agency involved. It is also useful to include the type of file (REP for report, DAT for the data file, etc.) when saving files.

Example 2.1:
A file named <LIB_0408_IDP_Buchanan_AAH> would be the name of a survey conducted by Action Against Hunger among the IDPs in Buchanan, Liberia in September 2004. Similarly, a file named <LIB_0408_IDP_Buchanan_AAH_dat.xls> would be the data file of the above mentioned survey conducted by Action Against Hunger among the IDPs in Buchanan, Liberia in September 2004.

Exercise 2.1:
A SMART survey was conducted by ACF in Dadu district of Pakistan in Oct. 2010. As the Survey Manager how would you:

a) Name the survey?____

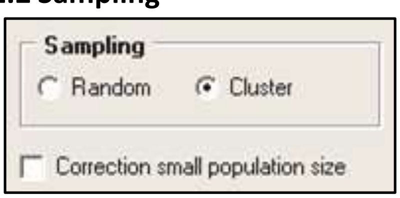
b) Name the ENA (i.e. ***.as***) file?____________________________________

c) Name the survey report?______________________________________

Compare your answers with the answers in Annex 3.

Note that the name that is given on the *Planning* screen (i.e. section no 1 above) is the survey name that will be unique to each survey. The information entered in the ENA software needs to be saved separately as an ***.as*** file[3]. It is recommended that planning and training data related to one survey is saved in the same file along with anthropometric (and death rate survey data, if applicable).

2.2 Sampling



This section in the ***Planning*** screen helps specify what type of sampling is to be used in the survey and whether a correction factor (required for small population size) needs to be applied. The default setting is always *cluster* but this needs to be changed to *random* if the survey is going to use simple random sampling method as this has implications in the sample size calculations (see below).

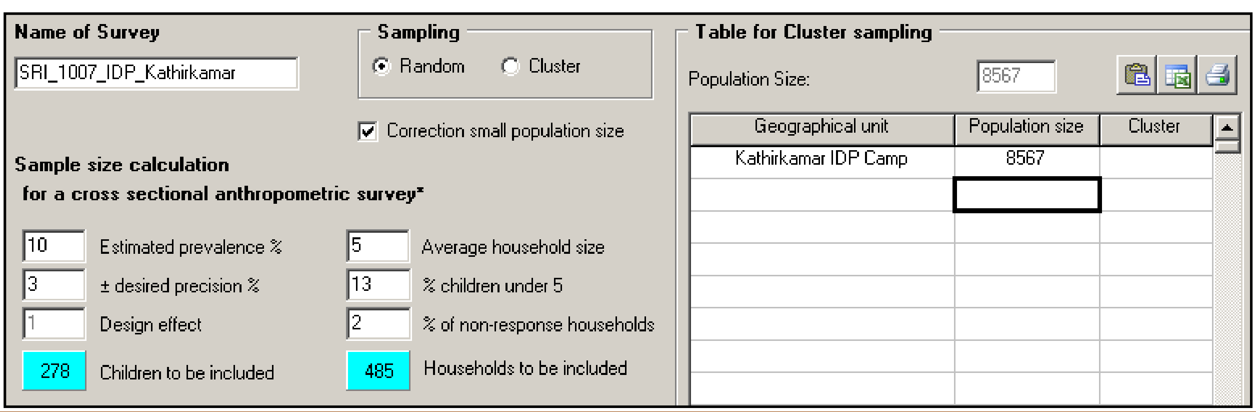
[3] To save a data file, click on the <**Save as**> command in the <**Files**> menu and save the file using the recommended file name format

Based on the total **target population** in the survey area, a correction factor may also need to be applied. If the total target population is less than 10,000 individuals (i.e. children between 6 to 59 months for anthropometric surveys or total number of people in a survey area for death rate surveys) in the survey area, the correction factor should be applied by ticking the box. Otherwise, no correction factor is needed.

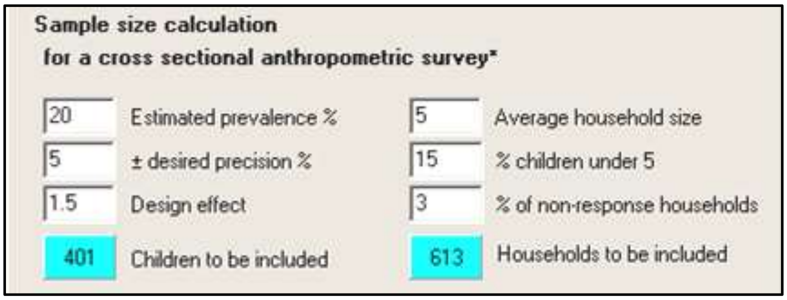
In order for the software to apply the correction factor, the total population size must be available in the box named *population size* located above the spread sheet on the *table for cluster sampling* (see section 2.5 below for details). This is of particular importance when the correction factor needs to be applied for a survey using simple random sampling as the cluster assignment is not done in these situations (note that if the cluster assignment is performed using the table for cluster sampling, the total sample size is automatically calculated and displayed in the box for population size so in these cases correction for small population can be applied by just ticking the correction for small population box above). When calculating sample size for a survey using simple random sampling where correction factor needs to be applied, calculate the total surveyed population size separately and enter it in the table for cluster sampling so that this will be displayed in the population size above and taken into account by the software when the sample size is calculated (see example 2.2 below).

Note that when correction for small population size is applied in the sample size calculation for an anthropometric survey (children 6-59 months), the software calculates the target population using the figures available in the box for total population size and the % of children under 5 and uses it to adjust for small population size. For death rate surveys, the figure shown in the box for population size is used directly when correction factor is applied.

Example 2.2:
The screenshot below shows a hypothetical example of a sample size calculated for an anthropometric survey using simple random sampling in the Kathirkamar IDP camp in Sri Lanka with a population of 8,567 individuals



2.3 Sample Size Calculation for a Cross Sectional Anthropometric Survey



The sample size calculation in ENA can be described in 2 parts:

1) **the left hand side** that is used to calculate the number of subjects (i.e. sample size)

2) **the right hand side** that is used to calculate the number of households to visit in view to meet the calculated number of subjects, taking into account the average household size, percentage of survey subjects in a household, and the expected non-response rate.

In a SMART anthropometric survey, the survey subjects are children between 6-59 months and the survey units are households. Thus, the sample size is first calculated in number of children, which is then converted into number of households.

Note that the sample size calculation (left hand side) in ENA is similar to any categorical variable (and thus can be used to calculate sample size for any variable with a proportion). For example the left hand side of the sample size calculator can be used to calculate sample sizes for IYCF indicators. **However, the <u>calculated number of households</u> is only applicable to <u>children 6-59 months</u>.** If the sample size calculation is performed for children aged 0-59 months, the calculated number of households has to be multiplied by 0.9. The same applies when the right hand side of the calculator is used to convert the sample size into number of households for other age groups or target population (e.g. women of childbearing age).

In order to calculate the sample size, information about 5-6 factors (depending on the type of sampling method used) are needed (see STP module 3 for details). **Note that the values included in the planning page are for illustration purposes only. These values will vary from survey to survey and must be adjusted depending on the survey objectives.**

Once the survey is named, type of sampling is specified, and decision about correction factor is made (and applied as relevant), proceed according to the following steps to calculate the sample size.

Steps to follow

- ✓ **Enter the estimated prevalence %**
  - Enter the estimated GAM
  - When deciding about GAM, always use a plausible range of values rather than a single one (see STP module 3 for details) and use the higest plausible value in the calculation
- ✓ **Enter the ± desired precision %**
  - The first consideration is the minimum precision needed to meet the objectives of the survey (see STP module 3 for details).
- ✓ **Enter the design effect (if cluster survey)**
  - If it is a random sampling survey, then the design effect will always be 1 and this cannot be changed in the software!
  - The design effect for GAM is around 1.5 in most cluster surveys conducted in emergency contexts (See STP module 3 for details)

Important to know:
The sample size calculated by ENA 2011 is identical to the results obtained from the older versions of ENA and also from other software packages for simple random sampling methodology. However, when sample sizes for cluster surveys are calculated, the results given by ENA 2011 may be slightly different. This is because, in ENA 2011, t-distribution is used instead of the z-distribution that is used in the older versions of ENA and some other statistical software packages (see sampling paper[4] for details). Nevertheless, the differences between the sample sizes calculated using t-distribution and z-distribution are quite small.

Upon entering the above information into the software, ENA will automatically calculate and display the number of children to be surveyed (i.e. the sample size). This sample size needs to be converted into number of households as the survey units in a SMART survey is households. There are various methods to calculate the total number of households required for the survey from the total sample size. The method that is used in the ENA software is based on the information that is usually most commonly available, which are: average household size, % children under 5, and % of non-response households (see annex 2 details and an example). Follow the steps outlined in the below table to convert the sample size in number of children to households.

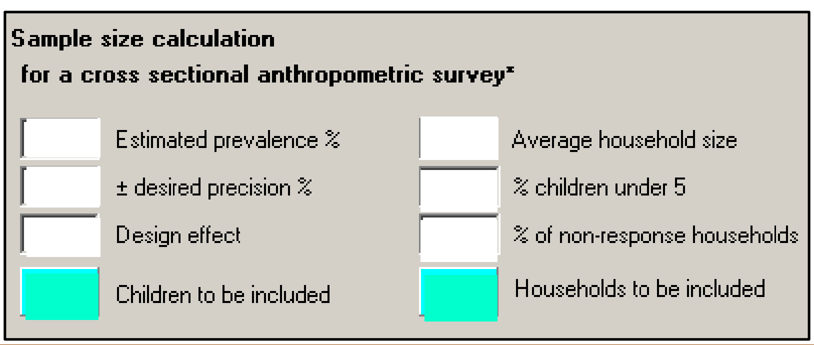
[4] The sampling paper can be found on:
http://www.smartmethodology.org/documents/sampling/Sampling_Paper_June_2012.pdf

Steps to follow

- ✓ **Enter average household size**
  - This information may be obtained from census data, previous survey reports from the area, national level surveys (MICS, DHS, etc.), etc.
  - If there is no such information available, talk to the people in the area and estimate the average household size.
- ✓ **Enter % children under 5**[5]
  - This information may also be obtained from sources mentioned above.
- ✓ **Enter % of non-response households**
  - Although is is usually 3-5% in most contexts, this needs to be carefully looked at in the context of the survey area and adjusted accordingly.
  - This information can be found from previous surveys as well as from key informats.

Once all the above information is entered, the software will automatically calculate the number of households that need to be visited for the particular survey.

Exercise 2.2:
An anthropometric survey is planned for Moyale district of Kenya which has a population of approximately 100,000 individuals of which 18% are estimated to be children below 5 years of age. The average household size in the district is 6. It is estimated that the prevalence of Global Acute Malnutrition (GAM) may be between 9 – 12%. The NGO that is planning the survey want to get a precision of 3 and the design effect from the last survey was 1.6. Calculate the sample size in number of children and the number of households to survey. Note that the percentage of non-response households in the district is around 5.
Plug the numbers in the screen capture below and then on the software. Compare your answers with the answers in annex 3.



[5] Since the survey subjects in SMART anthropometry surveys are children between 6-59 months, this should be included in the calculation of number of households to survey. However, this information is not readily available in most situations. The most commonly available proportion is children under 5. The ENA 2011 software calculates the percentage of children between 6-59 months from the under 5 population figure and uses it to calculate number of households to include in the survey (see annex 2 for details).

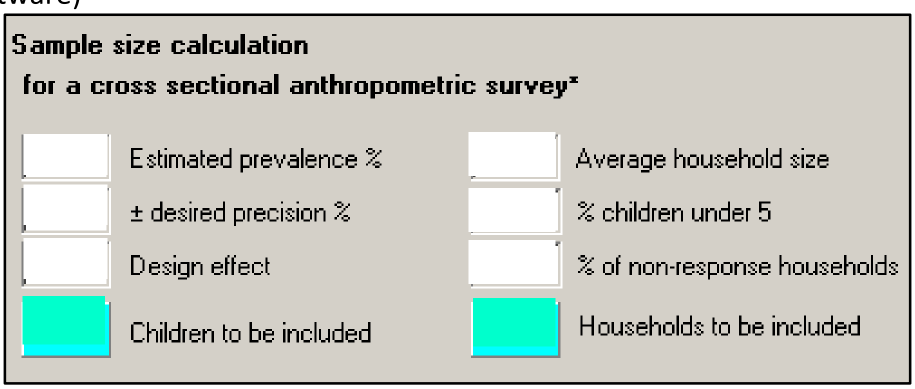
Notes:

Exercise 2.3:

Praville, an IDP camp in Haïti, has an estimated population of approximately 2,000 individuals of which about 21% is children below 5 years of age. The average family size is around 5.1 individuals. An anthropometric survey has been planned to estimate the GAM prevalence among children between 6-59 months in the camp. The estimated GAM prevalence according to some key-informants is between 13 and 17%. The precision desired is ±4 and the expected percentage of non-response households is about 4%. Based on this information, answer the following 2 question:

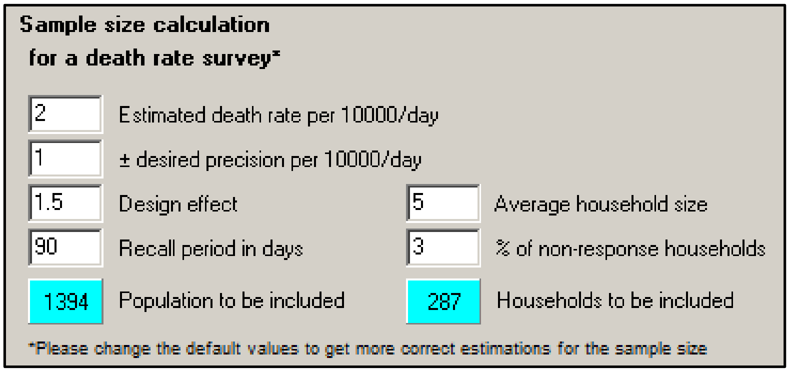
a) What precaution do you need to take while computing your sample size?

b) What is the sample size? (first plug the numbers in the screenshot below and then on the software)



Notes:

2.4 Sample Size Calculation for a Death Rate Survey



Calculating the sample size for death rate survey is similar to an anthropometric survey. However, death rate being a rate rather than a percentage, there is one additional factor that needs to be considered: recall period.

Recall period is the interval of time during which the deaths are calculated. Additionally, since death rate takes into account everyone in the survey population, the entire population is included in the sample size calculation (rather than, for example, only under 5 children in the case of anthropometric survey sample calculation above).

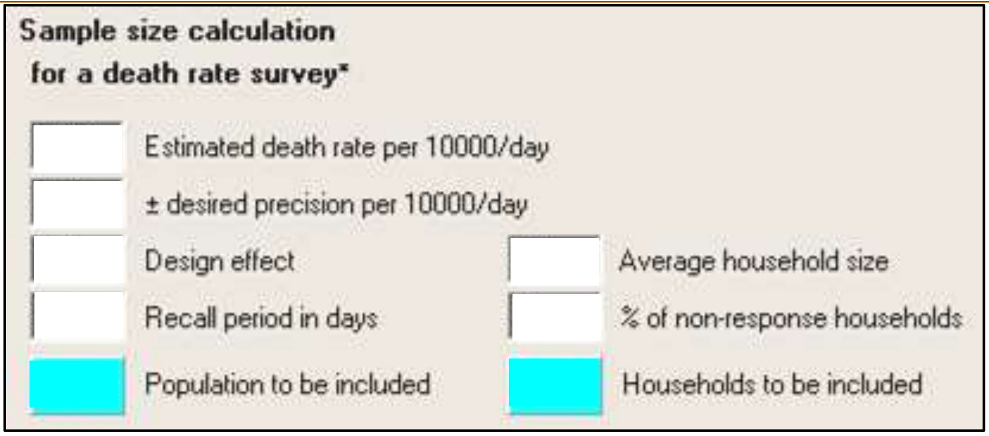
Steps to follow

- ✓ **Enter the estimated death rate per 10,000/day**
- ✓ **Enter the ± desired precision per 10,000/day**
  - It is generally not possible to achieve a precision much greater than 0.4 deaths/10,000 persons/day with a survey of a resonable size and a three-month recall period
- ✓ **Enter the design effect**
  - The recommended value to use for design effect for sample size calculation for death rate is 1.5, which is sufficient in most contexts, especially if violence-related deaths are limited in the survey area (refer to STP module 8)
- ✓ **Enter the chosen recall period in days**
- ✓ **Enter the average household size**
- ✓ **Enter % of non-response households**

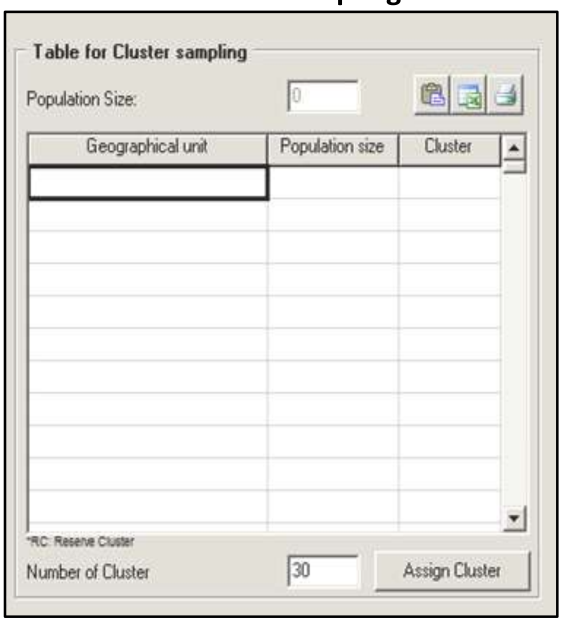
Exercise 2.4:

A death rate survey is planned in northern Kenya. The estimated death rate per 10,000/day is 1.6 and the design effect for death rate from a previous survey is 1.3. The average household size in the survey area is 6. The NGO that is planning the survey wants to get a precision of 0.5 and the recall period is set to be 95 days. Calculate the sample size in number of children and the number of households to survey. Note that the percentage of non-response households in the survey area is 4%.

Plug the numbers first in the screenshot below and then on the software. Compare your answers with the answers in annex 3.



2.5 Table for Cluster Sampling



The table for cluster sampling is used to assign clusters to geographical areas such as villages, departments, etc. The key is to use the smallest geographical units in the survey area for which population figures are available. A population figure for each geographic unit that will be included in the survey must be entered in the '*table for cluster sampling*' to assign clusters.

Prior to assigning clusters, it is necessary to determine the number of clusters that is to be included in the survey. To do this, first, the average number of households that can be visited in one day should be decided. The total number of household calculated above is then be divided by the average number of households that can be visited in one day to determine the number of clusters to survey. It is recommended that the total number of clusters do not fall below 25 (see STP module 3 and 4 for details).

Steps to follow

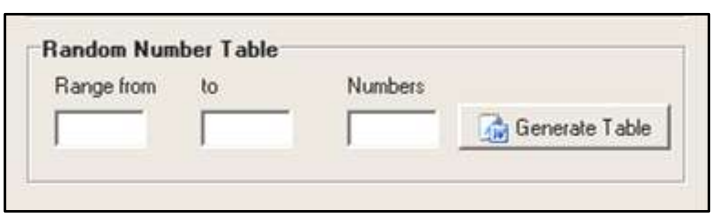
- ✓ **Enter name of the smallest geographical unit (i.e.village) and the population**
  - This can be manually entered or copied and pasted from a Microsoft Office document (make sure the headings are excluded when copying) using the past icon above
- ✓ **Enter the number of clusters needed in the box provided for number of clusters (refer to the previous section for details on calculating the number of clusters)**
- ✓ **Click <u>ONCE</u> on assign cluster**
  - Click on the Excel icon to get the selected file on Excel file
  - Click on the Print icon to print the assigned clusters

Note that as the population figures are entered, the software will automatically compute the total population size and display it in the box located above the table (see below).

Screenshot of the box where total population size is displayed

The software will assign clusters using the probability proportional to size (PPS) principle (see STP module 3 for details) to assign clusters. In addition to the specified number of clusters some additional clusters will also be assigned and noted as RC (Reserve Clusters). ENA calculates the number of RCs by taking 10% of the total number of clusters specified and rounding it up to the next whole number. For example, for any number of clusters specified between 30 and 39, the software will add 4 RCs and for clusters specified between 40 and 49, the total number of RCs will be 5. The RCs are surveyed only when data from more than 10% of the assigned clusters are not collected. In these situations, all the RCs will be surveyed.

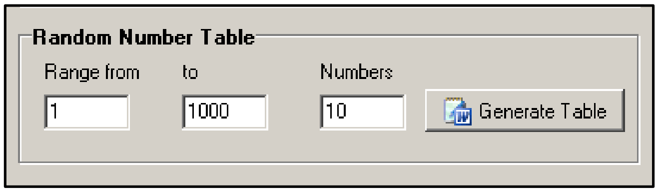
2.6 Random Number Table



Random number table option in ENA is used to generate random number tables or random numbers within a specified range. To generate random numbers within a range, specify the range by entering the lowest value of the range against the box ‘from’ and the highest value in the box, ‘to’ and then enter the number of random numbers required within the specified range in the box ‘numbers’. Click on <**Generate Table**>. A Microsoft Word document will open with the random numbers and the range specified (see below).

Random number tables are generated in similar way however, when the ‘number’ is specified, the upper value of the range is entered. For example, to generate a 4-digit random number table, 1 and 1000 should be entered in the ‘from’ and ‘to’ range respectively and 1000 should be entered in the box under ‘numbers’. Single digit, double digit, triple digit, etc. random number tables can also be generated using this option.

Example 2.3:
The screenshot of 10 random numbers generated by ENA for numbers between 1 and 1,000

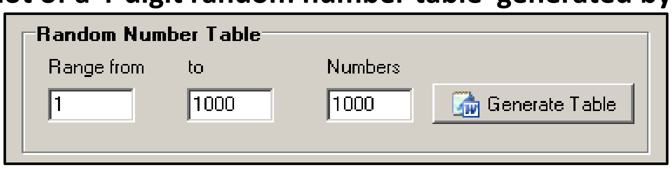


Random Number table

Range: 1 to 1000, Number: 10

973	71	442	814	77	703	59	721	357	571

Example 2.4:
A part of the screenshot of a 4-digit random number table generated by ENA



Random Number table

Range: 1 to 1000, Number: 1000

83	82	225	31	404	680	928	731	956	410	900	655	178
	930	552	217	683	783	748	203	436	722	592	611	637
	541	801	502	663	236	682	785	526	922	110	809	32
	681	289	887	671	732	915	286	45	620	106	303	892
	84	545	30	881	218	808	300	113	597	619	441	959
	15	13	720	843	465	840	730	425	224	355	220	59
	654	22	985	474	790	523	213	280	469	693	626	614
	734	607	772	747	296	312	511	596	640	376	6	967
	483	53	281	666	923	630	305	873	308	848	612	122
	359	327	52	231	757	148	186	462	861	142	118	882
	482	461	824	183	896	315	262	426	506	976	817	450
	830	400	874	931	94	573	326	89	73	28	187	266
	20	577	571	141	10	542	536	413	662	996	272	818

Exercise 2.5:

Open the Excel file named **ETH_1107_DessieZuria** that comes with this user manual and go to spread sheet no. 1 named planning. Copy the geographical areas and the population figure and paste them onto the ENA software in Table for Cluster Sampling.

a) Assign 45 clusters.
b) Transfer the assigned clusters to a Microsoft Excel file, and sort the column named, Cluster, in assending order, and safe the file using the recommended file name.

Notes:____

Exercise 2.6:

Generate a 3 digit random number table.

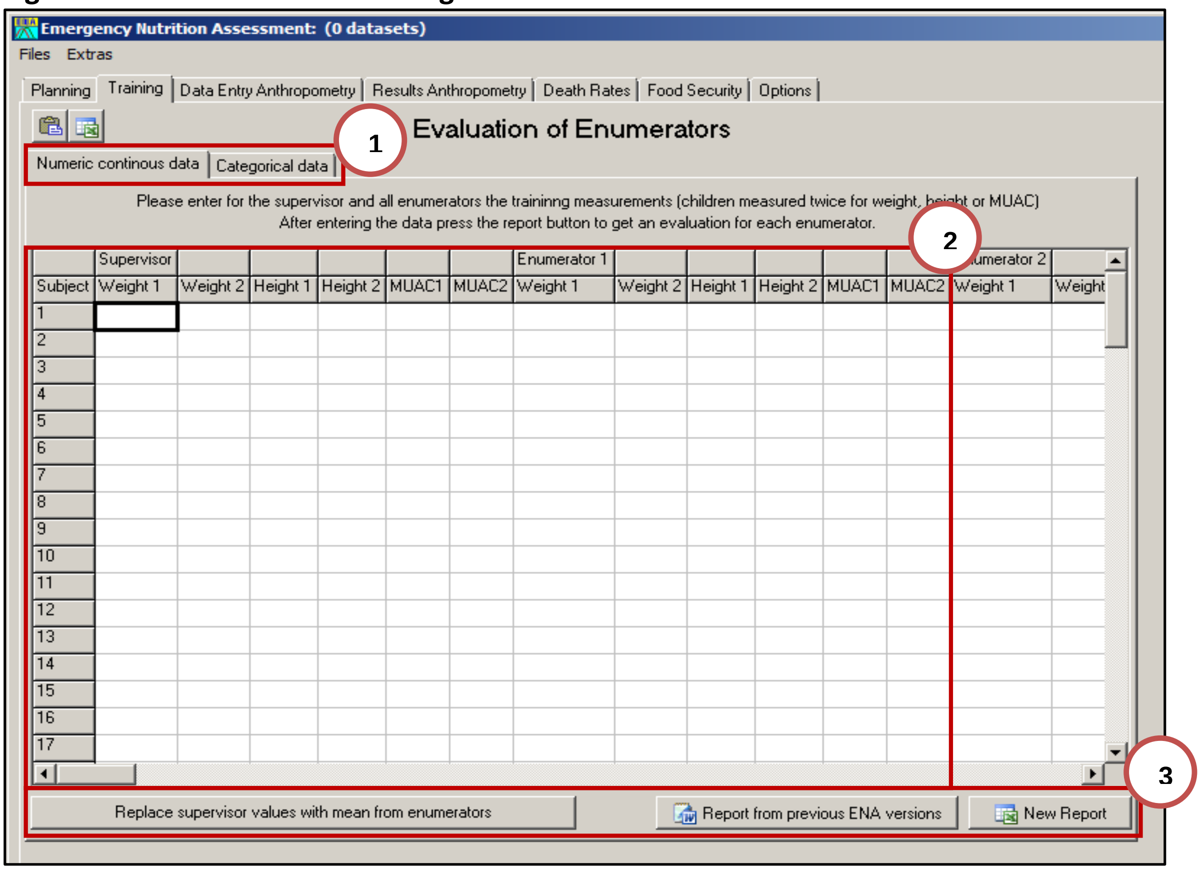
Generate 12 random numbers between 1 and 98.

Notes:____

3. TRAINING

The ***Training screen*** of the software helps analyse the results of the standardisation test carried out on survey enumerators to assess their capacity to take accurate and precise measurements. For detailed explanation on how to organise a standardisation test refer to the STP module 6. A video[6] is also available on conduction standardisation test on the SMART web page.

Figure 3.1: Screenshots of training screen



The *training screen* is described below in the following order: 1) type of data, 2) data entry, and 3) data analysis and reporting.

3.1 Type of data:

Both numeric continuous data[7] (i.e. weight, height, and MUAC) and categorical data[8] (e.g. yes/no, green/yellow/red for MUAC, etc.) can be entered and analysed in the *training screen*. Depending on the type of data, different analyses are performed and different types of reports are generated.

[6] http://www.smartmethodology.org/index.php/article/index/capacity_building_toolbox#

[7] Data that are measured on a continuous scale

[8] Data that that comes in distinct categories

3.2 Data entry

Data can either be entered manually or copied and pasted from a Microsoft Word or an Excel document, which is in the same format, by selecting the <**Paste**> button located just above the type of data on the training screen. Measurement values of 100 subjects from 20 enumerators and 1 supervisor can be entered or copied and pasted at a time.

While the height and weight data are entered in 0.1 cm and 0.1 kg respectively, MUAC data must always be entered in millimetre (mm). The software will still produce results even if a different unit is used (e.g. cm) but the results will be wrong. The data on the training screen can be exported to a Microsoft Excel document by clicking on the Microsoft Excel icon that is next to the *paste* button on the training screen.

3.3 Data analysis and reporting

For categorical data, the enumerator's data are always compared with the supervisor's values when analysis is performed. However, the enumerators' numeric continuous data can be compared either with the supervisor's values or the mean value of the enumerators by clicking on the appropriate button at the bottom of the screen (see below).

For numeric continuous data, two types of reports can be generated from the software. The report that is generated by clicking the '*Report from previous ENA versions*' is identical to the reports generated by the previous versions of ENA. The '*New Report'* is a new feature that has been recently added to the software. The report will be generated in a Microsoft Excel format when the '*New Report*' button is clicked. Although references are available at the end of the report, detailed guidance on how to interpret the '*New Report'* results are not available at present.

For categorical data, the report will be generated in Microsoft Word format when the Report Word button is clicked.

Important to know:

In the event that only enumerators' data are available, data can still be analysed by using the *'replace supervisor value with mean from enumerators'* button. In these situations, click on the *'replace supervisor value with mean from enumerators'* button first before the report is generated (note: as this is performed, mean values will be automatically calculated).

All the reports generated after the '*replace supervisor value with mean from enumerators*' is clicked, will only compare the individual enumerator values with the mean value of the enumerators. If the enumerator data needs to be compared again, the existing file needs to be closed and opened again.

Steps to follow

- ✓ **Select the tab according to the type of data (numerical or categorical) to be analysed**
  - ➢ In a SMART survey, the numeric continious data (weight, height, and MUAC) are most commonly used; the categorical data may be more useful in other situations – e.g. CMAM programmes
- ✓ **Enter the supervisor and enumerator values in the spreadsheet (manually or by copying and pasting)**
  - ➢ MUAC data must always be entered in millimetres (mm)
- ✓ **Generate the report: numeric continuous data**
  - ➢ If the enumerator values are to be compared with the mean value of enumerators, click on 'replace supervisor value with mean from enumerators' before generating the report
- ✓ **Generate the report: categorical data**
  - ➢ Click on Report Word

Example 3.1: A part of the screenshot: report of evaluation of enumerators

Report for Evaluation of Enumerators

Weight:

	Precision: Sum of Square [W2-W1]	Accuracy: Sum of Square [Superv.(W1+W2)-Enum.(W1+W2)]
Supervisor	0.19	
Enumerator 1	0.04 OK	0.15 OK
Enumerator 2	0.10 OK	0.09 OK
Enumerator 3	0.02 OK	0.21 OK
Enumerator 4	0.08 OK	0.21 OK
Enumerator 5	0.35 OK	0.18 OK
Enumerator 6	0.60 POOR	1.03 POOR
Enumerator 7	0.26 OK	0.15 OK
Enumerator 8	0.20 OK	0.23 OK
Enumerator 9	0.01 OK	0.12 OK
Enumerator 10	0.01 OK	0.04 OK
Enumerator 11	0.00 OK	0.27 OK

Note: See STP module 4 for details on how to interpret these results.

Exercise 3.1:

Open the Excel file named **ETH_1107_DessieZuria** that comes with this user manual and go to spread sheet no. 2 called training. Copy both supervisor and enumerator data and paste them onto the ***Training*** screen. Generate the standardisation test report using the '*report from previous ENA versions*'.

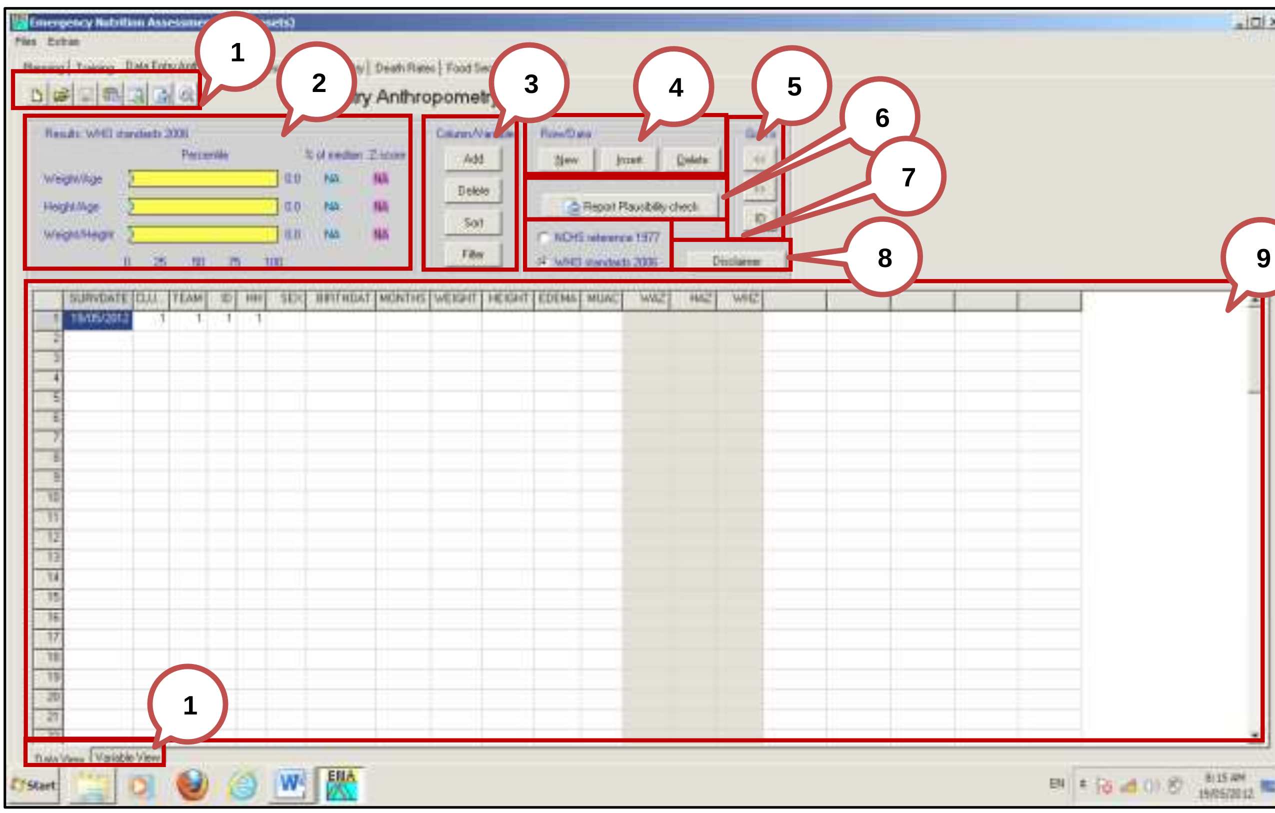
Notes:____

4. DATA ENTRY ANTHROPOMETRY

The ***Data Entry Anthropometry*** screen is used to enter/edit data and generate the survey report. The *Data Entry Anthropometry* contains 2 screens (called views) such as, Data View and Variable View, both of which are described in detail below.

IMPORTANT: The options screen and the variable view of the Data Entry Anthropometry screen must be visited and ranges must be set before data entry is started.

Figure 4.1: Screenshot of ENA Data Entry Anthropometry Screen

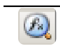


The ***Data Entry Anthropometry* screen** has several icons and tabs and a spread sheet with some pre-defined names. For illustration purposes, the functions of these icons, tabs, menu, and spread sheet are divided into 10 sections and described below: 1) Shortcuts, 2) Individual results, 3) Column /variable, 4) Row/data, 5) Go to (selecting records), 6) Report plausibility check, 7) NCHS reference and WHO standards, 8) Disclaimer 9) Data entry screen, 10) Variable views. **Note that there is <u>NO</u> 'undo' button in ENA.**

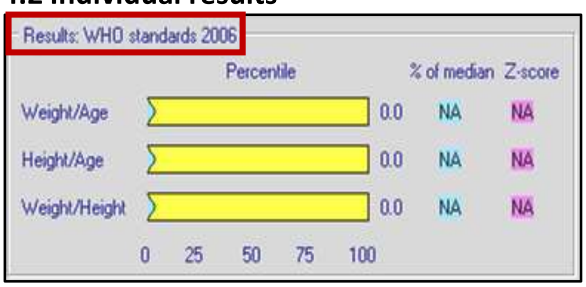
4.1 Shortcuts

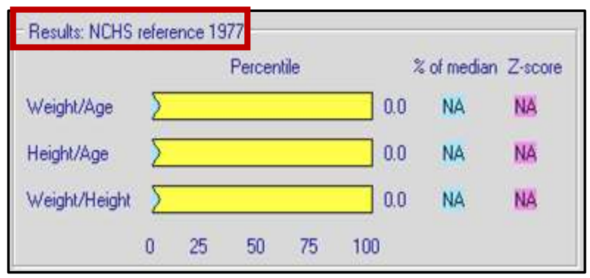
Note that the first 3 icon (*New*, *Open survey*, and *Save*) are the same as the first 3 commands in the file menu. There are similar commands in the extras menu for the other 4 icons (see section 1.3.2 for details).

Table 4.1: Functions of shortcut icons in the data entry anthropometry screen

Icon	Command	Function
	*New survey*	Opens a new file in ***.as*** format
	*Open survey*	Opens an existing ***.as*** file
	*Save survey*	Saves the actual**.as** file
	*Paste data from clipboard*	Pastes last copied data being worked on
	*Transfer data to excel*	Opens data in Microsoft Excel format as ***.txt*** file (see section 1.3.1 for details)
	*Report word*	Generates sample survey report in Microsoft Word format as ***.txt*** file (see section 1.3.1 for details)
	*Statistical calculator*	Allows further analysis and cross-tabulation of variables (see section on Results Anthropometry)

4.2 Individual results





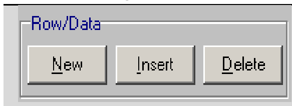
Nutrition indices such as percentiles, percentage of median (for NCHS based standards only), and z-scores for a child highlighted or selected in the data entry screen is displayed here. The results will be based on the type of reference population (i.e. NCHS or WHO reference) that is chosen (see below).

4.3 Column variable

Table 1.2: Functionalities of commands in the Extras menu

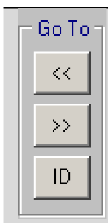
Function	Steps to follow
Add: Includes a new variable column[9]	Highlight any cell after the 19th column and click on <**Add**>. A box will appear. Enter the name of the extra column that should be entered (e.g. Measles). Click on <**OK**> or <**Enter**>.
Delete: deletes the highlighted column[10]	Highlight any of the columns with a newly created variable that needs to be deleted and click on <**Delete**>. A box will appear asking for confirmation. Click on <**Yes**> or <**Enter**>.
Sort: Sort a variable in an ascending or descending order	Click on <**Sort**>. A box will appear requesting to specify the name of the variable to be sorted. Specify the variable and click on <**Yes**> or <**Enter**>.
Filter: filters selected variables based on the conditions specified	Click on <**Filter**>. A box will appear asking you to define the variable and the condition for filtering. Select the variable and condition (range) and click <**OK**>. This procedure can be repeated to filter already filtered variables and results. Click on the icon <**Original file**> to return to the full dataset.

4.4 Row/Data



Function	Steps to follow
Add: adds a new row at the end of the dataset	Click on <**Add**>.
Insert: adds a new row in between rows	Highlight the cell before which a new row needs to be added and click on <**Insert**>.
Delete: deletes an entire row	Highlight the row to be deleted and click on <**delete**>.

4.5 Go To (Selecting records)



Function	Steps to follow
<<: Brings to the first row (ID No. 1) of the column that's highlighted	Click on <<. The first row of the highlighted column will be displayed
>>: Brings to the last row (last subject) of the column that's highlighted	Click on >>. The last row of the highlighted column will be displayed
ID: Brings to the ID specified	Click on <**ID**>. A box will appear requesting the ID. Enter the ID of the record and press <**OK**>.

4.6 Report plausibility check report

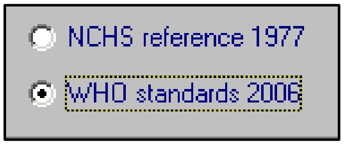
Click on the '*Report plausibility check*' button will generate the plausibility check report that will open up in a Microsoft Word format. It is essential that the option screen is set accordingly before the plausibility check is generated – see options screen below for details.

---

[9] The first 19 columns are predefined and a new column variable cannot be added in between; a new column variable can only be added as the 20th columns

[10] The first 19 columns are predefined and cannot be deleted; only the newly added columns can be deleted

4.7 NCHS reference and WHO standards



This function allows the calculation of nutrition indices against both NCHS reference and WHO standards. As the required reference is chosen by clicking on the respective reference, the indices will be calculated and displayed.

4.8 Disclaimer

For WHO standards, a disclaimer has been included. Click on the button to get additional details, which will disappear when the disclaimer button is clicked on again.

4.9 Data entry screen

	SURVDATE	CLU...	TEAM	ID	HH	SEX	BIRTHDAT	MONTHS	WEIGHT	HEIGHT	EDEMA	MUAC	WAZ	HAZ	WHZ	HSHLOC...	HEMOGL...
1	01/06/1998	1	1	1	1	m		42	9.6	72.5	n	141	-3.760	-6.898	0.603	1	104
2	01/06/1998	1	1	2	2	m		34	9.2	85.6	n	147	-3.494	-2.535	-3.206	2	
3	01/06/1998	1	1	3	3	m		20	9	76.8	n	130	-2.065	-2.632	-1.114	3	
4	31/05/1998	1	1	4	4	m		15	6	86	n	155	-4.603	2.702	-7.485	4	
5	31/05/1998	1	1	5	5	m		28	9.7	89	n	159	-2.476	-0.427	-3.427	5	
6	01/06/1998	1	1	6	6	f		48	9.6	89	n	144	-3.890	-3.188	-3.017	6	101
7	31/05/1998	1	1	7	7	m		36	12	88.8	n	121	-1.482	-1.966	-0.613	7	
8	01/06/1998	1	1	8	8	m		44	12.2	93	n	139	-2.029	-1.987	-1.367	1	
9	31/05/1998	1	1	9	9	m		36	9.9	83	n	116	-3.093	-3.531	-1.529	1	82
10	01/06/1998	1	1	10	10	m		45	12.6	97.4	n	134	-1.845	-1.035	-1.912	2	
11	01/06/1998	1	1	11	11	m		36	11.7	92	n	154	-1.694	-1.103	-1.687	2	
12	01/06/1998	1	1	12	11	f		54	13	101.1	n	137	-2.026	-1.120	-2.029	3	109
13	31/05/1998	2	1	13	12	f		10	6.6	64.5	n	138	-2.092	-2.824	-0.598	3	111
14	31/05/1998	2	1	14	13	m		59	12.1	97.5	n	144	-3.107	-2.593	-2.463	4	101
15	31/05/1998	2	1	15	14	f		11	4.8	64	n	136	-4.749	-3.482	-4.038	4	
16	31/05/1998	2	1	16	14	f		11	5.8	64.3	n	145	-3.417	-3.363	-2.002	5	
17	02/06/1998	2	1	17	15	m		50	11	92	n	146	-3.287	-2.917	-2.501	5	
18	02/06/1998	2	1	18	16	m		8	7.2	69.3	y	112		-0.599		6	
19	31/05/1998	2	1	19	17	m		36	11.5	90.9	n	133	-1.838	-1.400	-1.658	6	
20	02/06/1998	2	1	20	18	m		30	11.3	89.5	y	121		-0.714		7	120
21	02/06/1998	2	1	21	19	m		42	13.2	98	y	150		-0.465		7	

The data entry screen, designed as a spread sheet with columns and rows, helps enter data into the software. The first 19 columns are predefined and cannot be changed. In a default setting only 15 of the 19 columns are visible. The small check box next to the '*showing columns for measure, cloths, and weighing variables*' in the *options* screen needs to be checked if all the 19 columns need to be visible on the data entry anthropometry screen (see section 7.4 for more details).

Additional variables can be added and data can be entered into the software by following the procedure described above in section 4.3. Note that although any additional data can be entered, only anthropometric and death rate survey data are automatically analysed and included in the report. Additional data however can be analysed in the ENA-EPI INFO hybrid version of the software (see 'ENA for EPI INFO user manual' for details).

As the anthropometric data are entered, nutrition indices such as percentiles, z-scores, and percentage of median (for NCHS references) are automatically calculated and displayed based on the reference selected. Any data that is beyond the limit of the values set in the variable view (see below) will be displayed as **flags** with the cell highlighted in pink colour.

IMPORTANT:
The software recognises the difference between data from simple random survey and cluster survey by using the numbers entered in the column, '*cluster*'. In cluster surveys, the column '*cluster*' will have different numbers for different clusters but in simple random surveys, there will be only one number, 1.

4.10 Variable view

Name	Type (n,c,d)	Label	Values	Range Low	Range High
SURVDATE	date				
CLUSTER	numeric			1	999
TEAM	numeric			1	20
ID	numeric				
HH	numeric				
SEX	character				
BIRTHDAT	date				
MONTHS	numeric			6	59.99
WEIGHT	numeric			3	31
HEIGHT	numeric			54	124
EDEMA	character				
MUAC	numeric				
WAZ	numeric			-6	5
HAZ	numeric			-6	6
WHZ	numeric			-5	5
MEASURE	character				
CLOTHES	character				
STRATA	numeric				
WTFACTOR	numeric				

Data View | Variable View

The variable view is used to define the accepted values for variables in the data view. There are 3 types of variables that are defined in the software such as numeric, character and date. Although ranges and accepted values can be set for all 3 types of variables, the software does not recognise the range set for dates. As a result, date, even if they are outside the range set in the variable view, will not be flagged in the data view.

All the 19 variables which are predefined in the software have default values. While most of these default values can be changed (e.g. months, weight, height, etc.) some of them cannot be changed (e.g. sex, cloths, measure, etc.). **Each pre-defined range that could be changed should be looked at in the context of the survey and changed accordingly. To change a pre-defined**

value, click on the value, delete the pre-defined value using the <Delete> Key in the computer keyboard, and enter the new value.

To ensure quality of data, it is recommended that limits are set for all additional variables entered in the data view.

Steps to follow

- ✓ **Follow the procedure in 4.3 and create a variable from the data view.**
  - o Once the variable is created in the data view, it will automatically appear in the variable view
- ✓ **Specify the type of the value (i.e. date, numeric, or character)**
- ✓ **Enter the low range and high range**

IMPORTANT: It may be required to switch between data view and variable view a few times before the software incorporate changes and/or additions and reflects it in the data view as flags.

Additional options for data entry from Extras menu

Some additional commands are available under the extras menu to help facilitate the data entry and quality check process. Each of this command is described below.

Check of double entry		
	The '*check of double entry*' command helps examine if there are differences between two files which have been entered independently – for example, whether the same data entered by 2 different individuals varies.	To check double entry: click on the <**Extras**> menu and select <**Check of double entry**>. A box will appear asking to specify the 2 files that need to be checked. Note that the box will open with the default folder (**ena2011**) selected; if the files are saved in another directory, the correct path for the file needs to be selected. Select the file and click on <**OK**>. A Microsoft Word document will open. If there are no discrepancies between the 2 files, the Word document will indicate so. If there are discrepancies, the Word document will provide details.

Weighted analysis of survey

'*Weighted analysis of survey*' option helps analyse 2 different datasets which were collected from populations of different sizes (i.e. there is unequal probability of selection).

To carry out weighted analysis, weights need to be assigned to each record in the dataset (see *options* screen for details). Once weights are assigned and the command is clicked, a Microsoft Excel document will open with the results and sex and age disaggregated data will be displayed for all 3 nutrition indices. The required reference (NCHS reference or WHO standards) must be selected (from *data entry anthropometry* or *results anthropometry* screens) before the weighted analysis of survey option is selected.

Merge Surveys

'*Merge surveys*' option helps to merge 2 or more datasets. In order to merge datasets, all the datasets that are to be merged needs to be saved in one folder and in ***.as*** format.

To merge surveys: save the datasets in one folder (e.g. **ena2011**) and select the <**merge surveys**> command from the <**extras**>. A box will appear asking to select the files to be merged. Press <**Ctrl**> and select the files to be merged. A new data entry anthropometry screen will open with the merged data. Select <**Save as**> command and save the data with the recommended file name.

Exercise 4.1:

Open the Excel file named **ETH_1107_DessieZuria** that comes with this user manual and go to spread sheet no. 3 called nutrition survey data. Copy the first 12 columns (up to MUAC) and paste them onto the data entry anthropometry screen. Answer the following questions.

a) How many records are in the dataset?

____

b) How many children between 6-12 months are included in the dataset? Out of them how many have a WHZ<-2 based on the WHO 2006 standards?

____

c) How many clusters did Team number 2 collect data from?

____

d) How many oedema case(s) are in the dataset and which team found the case(s)?

____

e) How many record(s) are flagged? Why is(are) the data flagged? With what reference the data is/are flagged?

____

f) What are the lowest and highest readings of MUAC?

____

g) What is the age range in the dataset?

____

h) Add a new column for CHILD IN PROGRAMME

____

i) Save the file in the recommended file name format

____

Notes: ____

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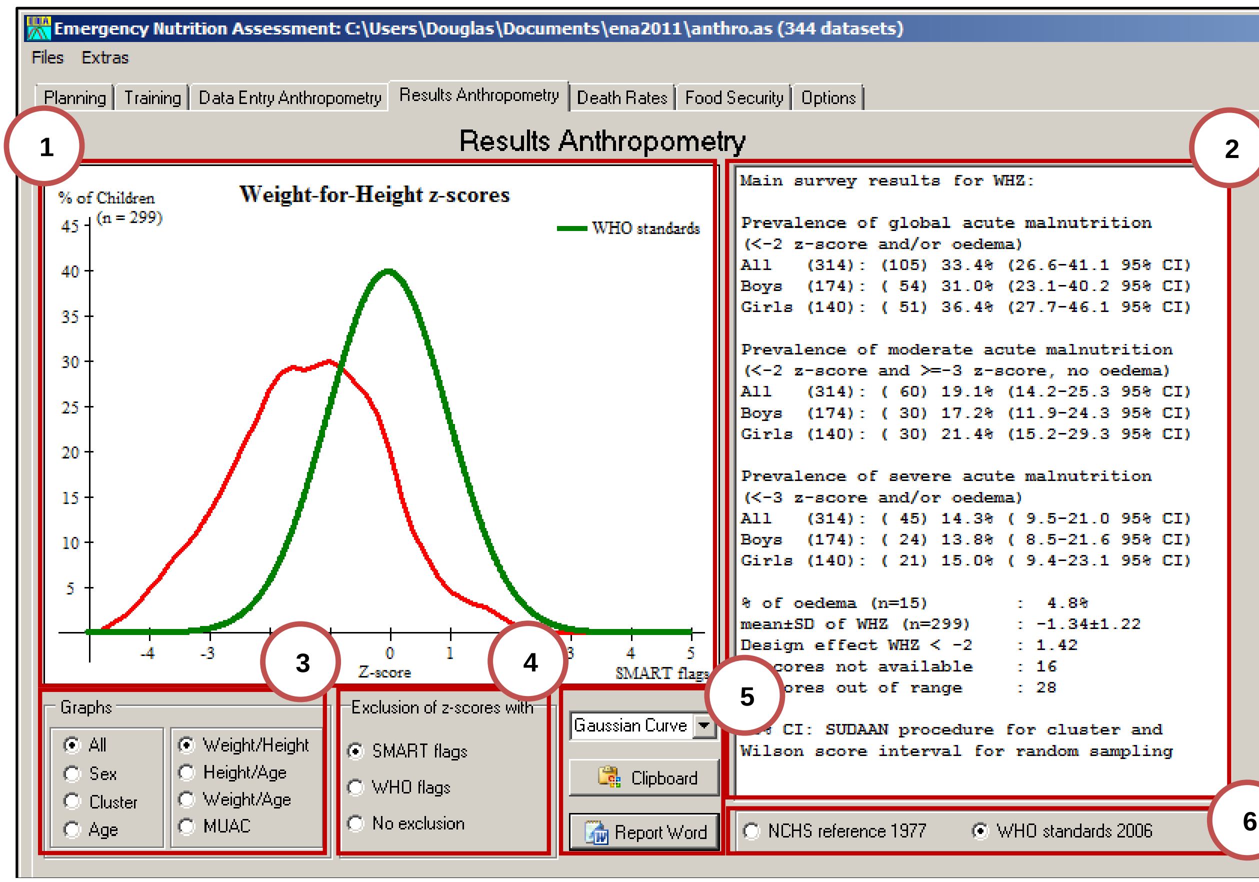
5. RESULTS ANTHROPOMETRY

The ***Results Anthropometry*** **screen** of the software displays the results of the anthropometric data based on nutrition indices, internationally agreed cut-offs, theoretical distributions, and different exclusion criteria. The results are depicted in diagrams and graphs (which can be copied onto the clipboard and pasted onto reports and other documents) as well as actual numbers. Nutrition indices can be further disaggregated into various categories such as sex, cluster, age, etc. The results can be obtained based on WHO standards or NCHS reference by selecting the appropriate options. The results anthropometry also enables users to produce a sample report.

IMPORTANT: The options screen must be visited and the limits must be set under *Reports* section of the *Options* screen before any anthropometric data analysis is carried out.

Figure 5.1: Screenshot of a Results Anthropometry screen



The left hand side of the screen displays the results of the survey data graphically and the right hand side of the screen show the results numerically. The bottom of the screen is used to specify different criteria that are used to derive the results. For illustration purposes, the entire results anthropometry screen is divided into 6 sections and numbered, and briefly described below. Examples of different graphs that can be generated from the results anthropometry screen are then provided and discussed.

The results anthropometry section allows obtaining results against both NCHS reference and WHO standards (by selecting the appropriate reference population in box no. 6). The results can also be attained based on SMART flags, WHO flags, or without exclusion of any data (select the appropriate option in the box no. 4).

Once the reference population is chosen and the required flag criterion is applied, results can be obtained for all the 3 nutrition indices and MUAC (by selecting the necessary index or MUAC in the box no. 3). Nutrition indices and MUAC can be further segregated by other factors such as sex, cluster, and age (using the options in the box no. 3) as well as other options in the dropdown menu (shown with Gaussian curve on display in box no. 5) such as Gaussian (normal) curve, cumulative distribution, and probability plot. Additionally, when the nutrition indices are analysed by cluster, the dropdown menu will provide further options for various distributions such as distribution of SAM, GAM, Oedema, etc.

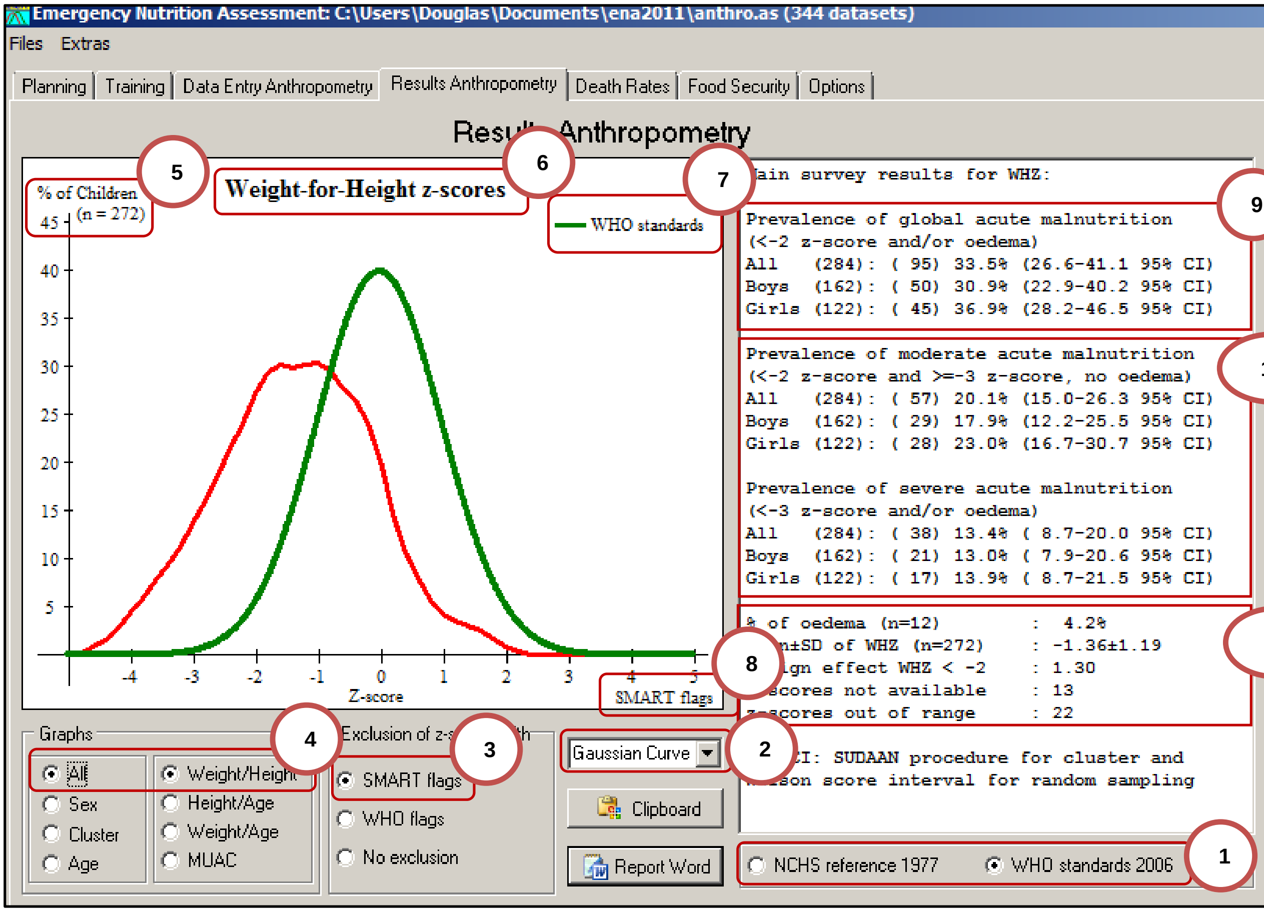
Based on the options specified above, the results will be displayed graphically (see box no. 1) and numerically (see box no. 2). The graphical results can be copied using the <**Clipboard**> command (see box no. 5). Clicking on the <**Report Word**> will generate a sample report template with anthropometric and death rate survey results automatically filled into standard tables (if death rate survey data is included in the file). The report will open in Microsoft Word.

Steps to follow

- ✓ **Go to *Options* screen and specify the criteria for report**
    - E.g. Specify whether age or height should be used as the criteria for selecting records for analysis/report
    - E.g. Check the MUAC cutoff and make changes as necessary
- ✓ **Choose the reference population**
- ✓ **Select the type of flag to be automatically excluded from the final analysis**
- ✓ **Select the nutrition index to be analysed**
- ✓ **Analyse the data by**
    - Selecting the appropriate categories such as All, Sex, Cluster, and Age
    - Selecting the type of graph from the drop down menu (if cluster is selected above, distribution of cases can also be analysed)
- ✓ **Copy graph to clipboard and use it in report as appropriate**

The functions of the results anthropometry screen described above are explained below with an example using an anthropometric survey dataset. Note that for illustration and practical purposes, the weight-for-height index and MUAC results are explained in detail here. However, similar results can be obtained for the other 2 indices as well.

Example 5.1: Screenshot of a Results Anthropometry screen



This is the results screen of an anthropometric survey data with WHO standards selected (box no. 1) and SMART flags applied (box no.3). From the dropdown menu, Gaussian curve is selected (box no.2). The weight-for-height nutrition index is displayed for all the data (with SMART exclusion) in the dataset (box no. 4). **Note that, although not shown here, prior to the analysis, *Options* screen was visited and age 6-59 was selected for anthropometric data analysis.**

On the left hand side above, the results are displayed graphically while the right hand side of the results screen shows the results numerically. In the graphical display of the results, notice the following:

- **Number of children on the top right (box no. 5)**
  (e.g. 272 children)
- **Type of the nutrion index on display in the top centre (box no. 6)**

(e.g. Weight-for-Height z-score)

- **The reference used on the top right hand side (box no. 7)**
  (e.g. WHO standards)
- **Type of flag applied on the bottom right (box no. 8)**
  (e.g. SMART flags)

Note that by selecting different options from the dropdown menu, different graphs can be obtained for the same data (see example 5.2 below).

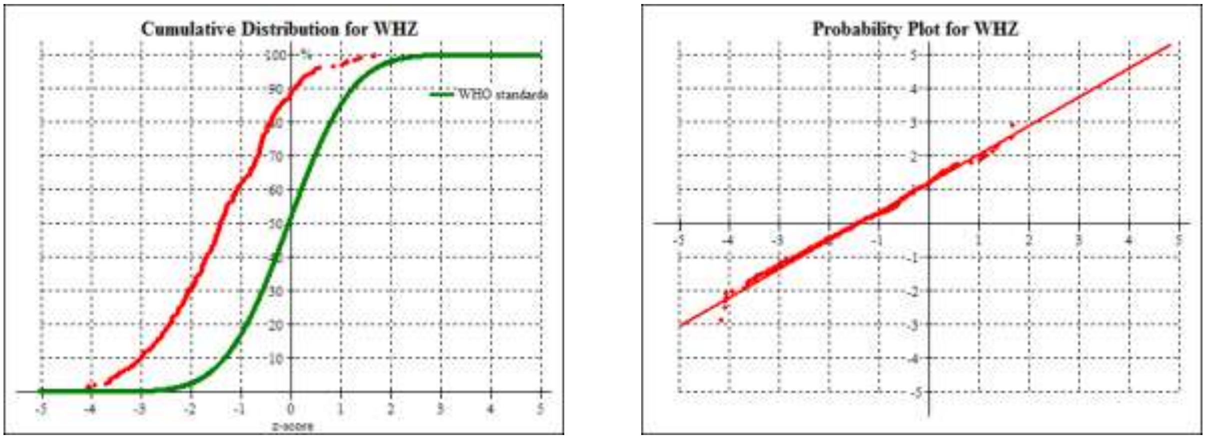
In the results that are displayed numerically on the right hand side, notice the following:

- **Prevalence of global acute malnutrition by sex and combined (box no. 9)**
  (e.g. out of the 284 children in the dataset, 95 are classified as GAM cases. This result is presented in percentage (33.5%) and with 95% CI (26.6-41.1; similarly, the same results are given for boys and girls)
- **Prevalence of moderate acute malnutition and severe acute malnutrition by sex and combined (box no. 10)**
  (e.g. out of the 122 girls in the sample, 28 are moderately malnourished, which is 23.0% (95% CI: 16.6-30.7)
- **% of oedema, mean±SD of WHZ, and design effect WHZ < -2 (box no. 11)**
  (e.g. out of the 284 children in the dataset, 15 showed signs of oedema, which in percentage is approximately 4.2%; design effect for WHZ<-2 is 1.30; in addition, this section also provides info on how many z-scores are out of range and how many z-scores are not available)

Important to know:
Note that while the data set has 284 records of children between 6-59 months, the graphical display only includes 272 records. This is because the oedema cases are not included in the graphical display (note: out of the 284 records 12 showed signs of oedema)

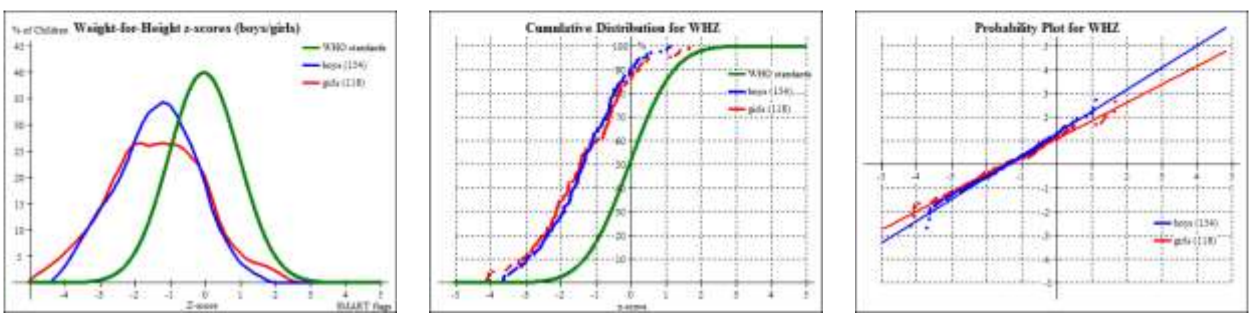
The same results can be graphically displayed using the cumulative distribution and probability plot using options in box no. 2 (see example 5.2 below). However, note that the numerical display on the right hand side remains unchanged.

Example 5.2: Graphical display of data with cumulative distribution and probability plot



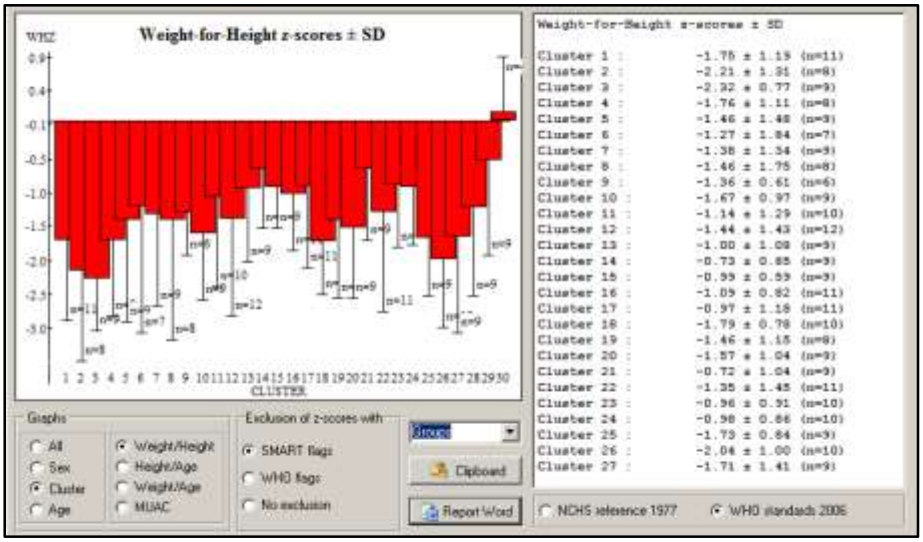
Similarly, the same results can be graphically displayed with Gaussian curve, cumulative distribution and probability plot (see example 5.3 below):

Example 5.3: The graphical display of weight-for-height z-score by sex and with Gaussian curve, cumulative distribution and probability plot



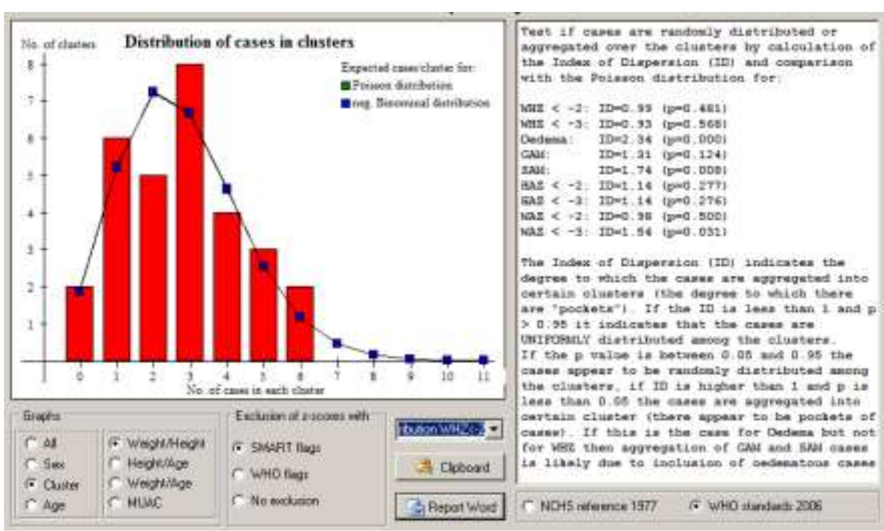
ENA also enables users to look at the mean z-score and SD by cluster. This can be seen by selecting the nutrition index and then selecting the cluster. See example 5.4 below where the mean z-score for weight/height is displayed by cluster (with WHO standards selected and SMART flags applied). Note that the numerical values are displayed in the right hand of the screen.

Example 5.4: The graphical display of mean weight-for-height z-score along with SD by cluster



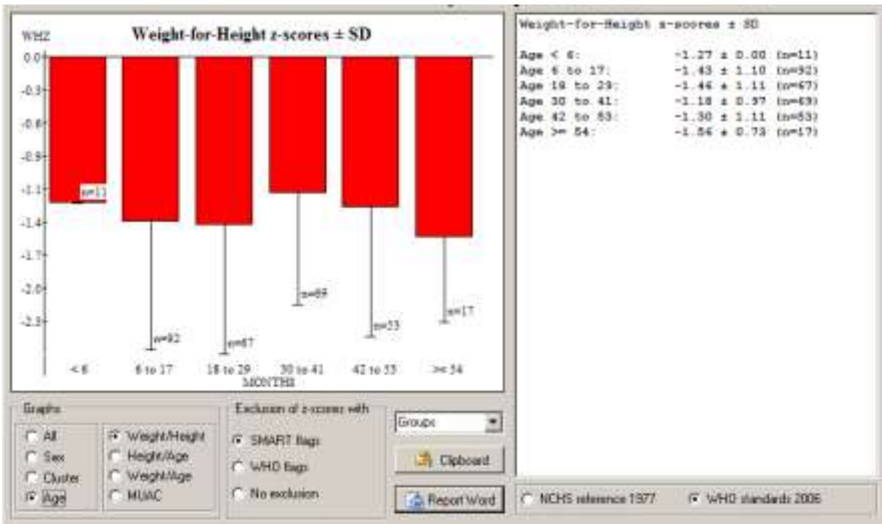
Additionally, the distribution of cases (i.e. cases with WHZ<-2, WHZ<-3, Oedema, GAM and SAM for weight/height; HAZ<-2 and HAZ<-3 for height/age; WA<-2 and WAZ<-3 for weight/age) can also be obtained by selecting cluster and the required case definition from the dropdown menu – see example 5.5 below. Note that the index of dispersion with values now displayed in the right hand side of the screen.

Example 5.5: Distribution of cases (WHZ<-2)



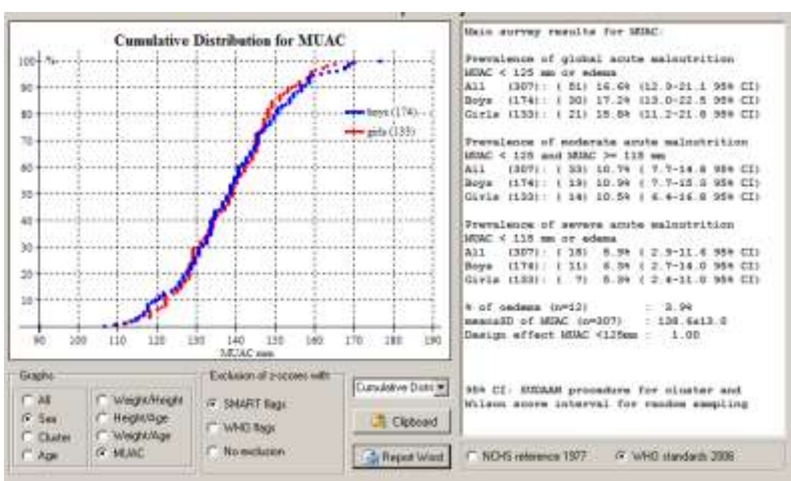
The results (the mean z-score±SD) can also be obtained by age group by selecting the nutrition index to be analysed along with ‘age’. See example 5.6 where weight/height z-score is displayed by age groups. Note that the results are displayed numerically on the right hand side of the screen.

Example 5.6: The graphical display of weight/height by age groups



MUAC is displayed graphically as cumulative curve, which can also be disaggregated by sex. See example 5.7 below for details.

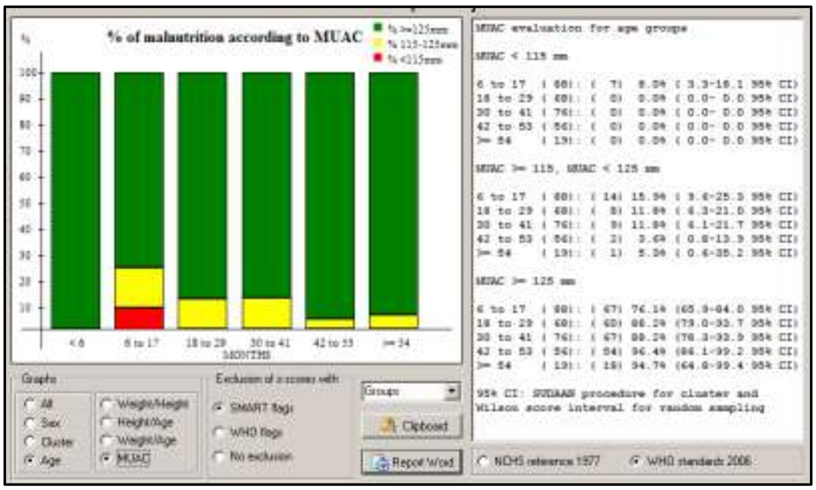
Example 5.7: Display of MUAC by age



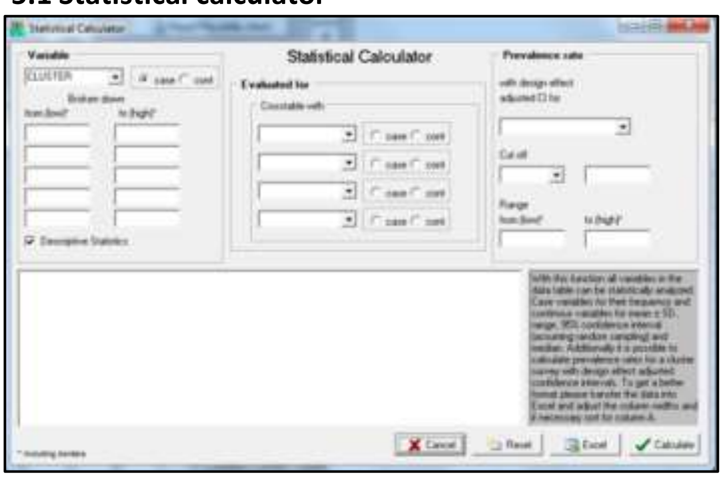
Note that the numerical results for MUAC are given on the right hand side of the screen. For example, it can be read from the screen that out of the 307 children between 6-59 months, for whom MUAC results are available, 51 of them have MUAC <125mm (16.6%, 95%CI: 12.9-21.1)

The MUAC results by cluster and age can also be obtained. When MUAC by age is selected mean MUAC by cluster along with SD and number of children is provided. When MUAC is analysed by age group, number and percentage of children classified into different MUAC categories (as per the *Options* screen settings) are displayed both graphically and numerically – see example 5.8 below.

Example 5.8: The graphical display of MUAC by age groups



5.1 Statistical calculator



The ***statistical calculator*** provides an additional option to analyse data. Although any survey data entered in the ***Data Entry Anthropometry*** screen can be analysed using the statistical calculator, the calculator is particularly useful for analysing non-anthropometric and non-death rate survey data as they are not automatically analysed by the software.

Both categorical and continuous variables can be analysed using the calculator. For categorical variables (denoted as ***case***), frequencies are calculated, and for continuous variables (referred to as ***cont***) mean, standard deviation, range, 95% confidence interval and median are computed. These results can be further broken down by selected cut offs or by ranges and variables can also be cross tabulated. Additionally, for cluster survey data, prevalence estimates, design effect, 95% confidence intervals adjusted for cluster design can also be obtained.

*The procedure for analysing data with the statistical calculator is described below using the data in the Excel file named **ETH_1107_DessieZuria** that comes with this user manual. Open the Excel file and go to spread sheet no. 3 called nutrition survey data. Copy the entire data and paste them onto a Data Entry Anthropometry screen.*

Note that you will need to copy and paste the data in 2 parts:
a) Copy and paste the anthropometric data (columns up to MUAC)
*b) Add additional columns (i.e. column names) in **Data Entry Anthropometry** screen (see section 4.3 above for details on how to add columns) for the other variables before copying and pasting them – for ease of reference, use the same names.*

*Click on the **Extras** menu and select **Statistical Calculator** (alternatively, you can also open the **Statistical Calculator** by clicking on the last shortcut button on the top of the **Data Entry Anthropometry** screen).*

5.1.1 Analysing a single variable

To analyse a variable, select the variable from the dropdown menu, which is under ***Variable*** and specify if it is a categorical (i.e. case) or continuous (i.e. cont) variable. Check the small box for ***Descriptive Statistics*** and click on ***Calculate***. The results will be displayed in the white box at the bottom of the calculator. Analysing a single variable is described below in example 5.9

Example 5.9:
Suppose you want to find out the proportion of children who have got BCG vaccination.
Select BCG from the dropdown menu on the left hand side of the calculator under ***Variable*** and click on ***case*** to indicate it is a categorical variable.
Check the small box for ***Descriptive Statistics*** and click on ***Calculate***.
This will be shown in the white box below as follows:
Results:
Descriptive statistics BCG (n=358); n] (n= 197) 55.0 %; y] (n= 161) 45.0 %;

That is, out of the 358 children who have BCG information, 197 (55%) did not get BCG vaccination and 161 (45%) get the BCG vaccination.

Note that continuous variables can be further disaggregated using the ***Broken down*** option (i.e. by specifying ranges). This is illustrated in example 5.10.

Example 5.10:
Suppose you want to find out the mean MUAC value for all mothers (with MUAC data) as well as for those with MUAC <210mm.
Select MOTH MUA from the dropdown menu under ***Variable*** and click on ***cont*** to indicate it is a continuous variable.
Under the ***Broken down***, enter 188 in the box for ***from (low)*** – note that the lowest MUAC in the dataset and since it is a plausible value, it is chosen here).
Under the box for ***to (high)*** enter 209 (note that the value entered is also taken into account in the calculation. So, you must not enter the cut off value – i.e. 210 here)
Check the small box for ***Descriptive Statistics*** and click on ***Calculate***.
The will be shown in the white box below as follows:

Results:
Descriptive statistics MOTH MUA (all): (n=277); mean±SD: 227.43 ± 18.33; range: (188.00 - 294.00); 95% CI: (225.27 - 229.59) ; median: 226.00
Descriptive statistics MOTH MUA (188 to 209): (n=42); mean±SD: 201.90 ± 5.41; range: (188.00 - 208.00); 95% CI: (200.27 - 203.54) ; median: 202.00

The mean MUAC for all mothers (227.43mm) is given in the first row of results under the **Descriptive statistics MOTH MUA (all)** and the mean MUAC for those malnourished (201.90) is given in the 2nd row under **Descriptive statistics MOTH MUA (188 to 209)**. Note other variables such as standard deviation, range, 95% CI, and median are also given in addition to the mean.

5.1.2 Analysing variables using crossable

To analyse variables using cross table option, the first variable should be selected using the procedures described in section 5.1.1. The other variables (up to 4 at a time) can be selected from the boxes in the ***Crosstable with*** section under ***Evaluation for***. The use of cross table is explained in example 5.11.

Example 5.11:
Suppose you want to find out the proportion of male and female children who got BCG vaccination.
Select BCG as described in the example 5.9.
Select sex from the dropdown menu in the ***Crosstable with*** section under ***Evaluation for***.
Click on ***Calculate***.
The results will be shown as follows

Results:
Cross table BCG with SEX
n (n=197); f] (n= 101) 51.3 %; m] (n= 96) 48.7 %;
y (n=161); f] (n= 89) 55.3 %; m] (n= 72) 44.7 %;

That is, for example, out of the 161 children who got BCG, 89 of them (55.3%) are girls and 72 of them (44.7%) are boys.

5.1.3 Calculating prevalence estimates with design effect and adjusted confidence intervals

To calculate the prevalence estimate for an indicator, select the indicator from the dropdown menu under ***with design effect adjusted CI for*** in ***Prevalence rate*** section. A cut off can be specified if the selected variable is a continuous variable and a range can also be specified if the selected variable is a categorical variable. This is illustrated in example 5.12.

Example 5.12:

Suppose you want to find out the proportion of children who have got measles vaccination with 95% confidence interval.

Select MEASLES from the dropdown menu under ***with design effect adjusted CI for*** in ***Prevalence rate*** section

Click on ***Calculate***

The results will be sown as follows:

Results:
Prevalence rate MEASLES=0: 16.8 % (60 of 358); 95% confidence interval: (12.7 - 21.8); Design Effect: 1.30
Prevalence rate MEASLES=2: 56.7 % (203 of 358); 95% confidence interval: (51.6 - 61.7); Design Effect: 1.00
Prevalence rate MEASLES=1: 26.5 % (95 of 358); 95% confidence interval: (21.6 - 32.1); Design Effect: 1.25

(note: 0=no; 1=yes; 2=unknown)

That is, for example, out of the 358 children, 95 f them (26.5%) received measles vaccination. The 95% confidence interval is 21.6-32.1)

Note that design effect is also provided.

Exercise 5.1:

Open the Excel file named **ETH_1107_DessieZuria** that comes with this user manual and go to spread sheet no. 3 called nutrition survey data. Copy the first 12 columns (up to MUAC) and paste them onto the data entry anthropometry screen. Go to the '*Results Anthropometry*' screen and review the results.

a) What is the first recommended step you need to take before looking at the results?

____

b) What is the GAM prevalence among boys when WHO standards are selected and SMART flags applied? What is the change in GAM prevalance when WHO standards is changed to NCHS reference?

____

c) What is the stunting prevalence among children 6-59 months when WHO 2006 standards are selected and SMART flags applied?

____

d) What is the mean WHZ and SD when WHO 2006 standards are selected and SMART flags applied? How does it change when different exclusion criteria is used?

____

e) What is the design effect for WHZ<-2 when WHO 2006 standards are selected and SMART flags applied?

____

f) What is the Index of Dispersion and p-value for oedema when WHO 2006 standards are selected and SMART flags applied?

____

g) What is the mean WHZ and standards deviation for the age group 6-17 months when WHO 2006 standards are selected and SMART flags applied?

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h) Generate the sample survey report and save it using the recommended file name.

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Notes: ____

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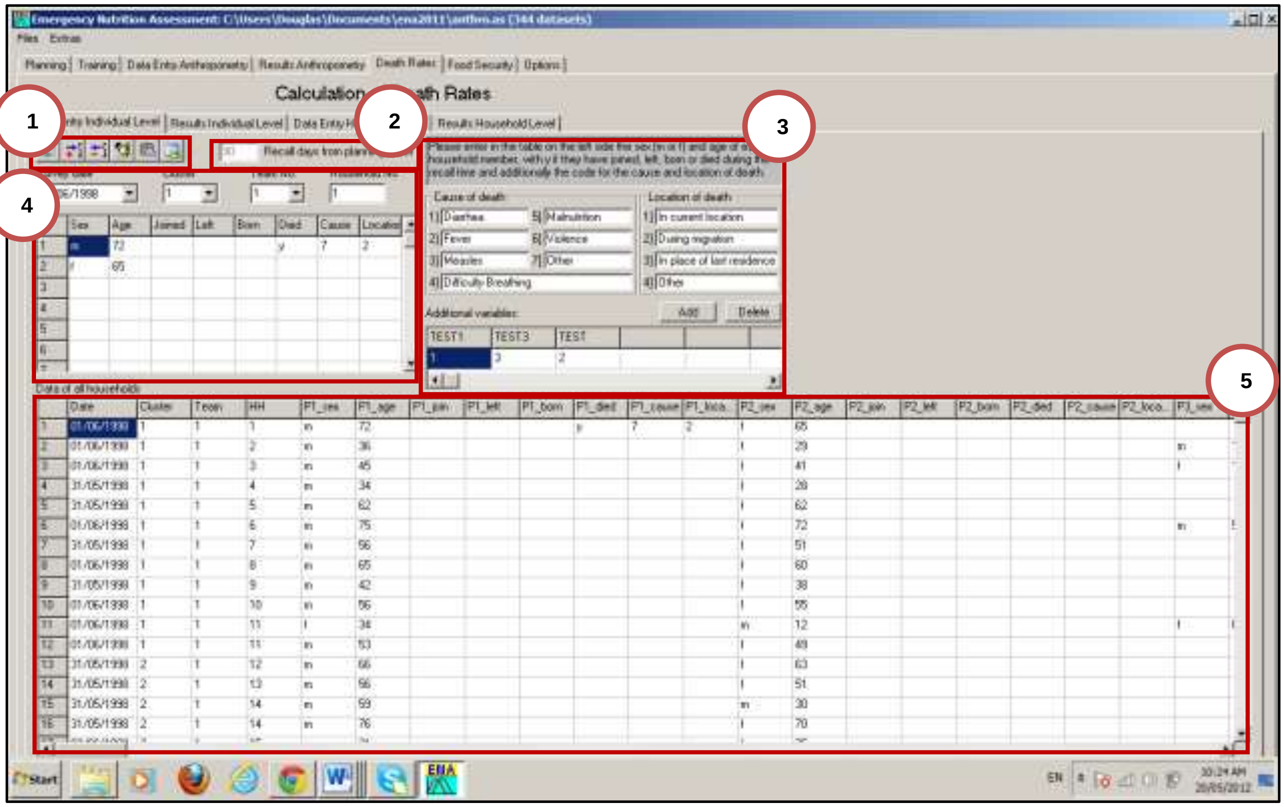
6. DEATH RATES

The *Death Rates* screen of the software is used to enter and analyse death rate survey data. It comes with 4 screens namely, 1) Data Entry Individual Level, 2) Results Individual Level, 3) Data Entry Household Level, and 4) Results Household Level.

6.1 Data Entry Individual Level

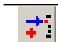
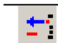
Figure 6.1: Screenshot of death rates screen: data entry individual level



The data entry individual level screen is designed for entering individual data. The screen has been divided into 5 sections such as 1) Shortcuts, 2) Recall days, 3) Cause and location of death, 4) Data entry, and 5) Data of all households.

6.1.1 Shortcuts

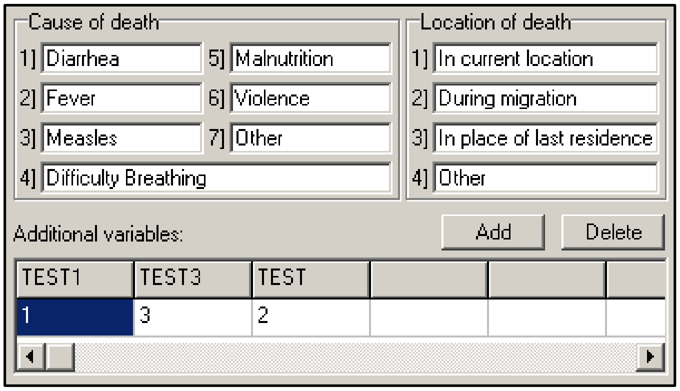
Table 6.1: Functions of icons on death rates screen

Icon	Command	Function	Steps to follow
	***Save survey***	Saves the actual file ***.as***	Click on the icon. If the data is saved for the first time, a box will appear with recommendation for file format. Save the file according to the recommended format. Once the file is created, the data will be saved automatically onto the file when this icon is clicked
	***Insert row***	A new row is added just above the highlighted cell in the data for all households section	Highlight the cell above which the row needs to be created and click on the icon.
	***Delete row***	An entire row of a highlighted cell is deleted in the data for all households section	Highlight one cell the row that needs to be deleted and click on the icon.
	***Takeover of HH + cluster numbers***	Date, cluster, team and household and cluster numbers from data entry anthropometry screen will be copied and pasted here	Click on the icon. A box will appear asking for confirmation for copying the information from data entry anthropometry screen. Click on <**OK**>. The date, cluster, team and household and cluster numbers information will appear.
	***Paste data from clipboard***	Pastes last copied data	Highlight the cell on which data needs to be pasted and click on the icon. The last copied data will be pasted on the highlighted cell.
	***Transfer data to excel***	Opens data in Microsoft Excel format	Click on the icon and the entire dataset will be transferred to Excel.

6.1.2 Recall days

The figure displayed in the box named '*recall days from planning sheet*' on the *data entry individual level* screen (and also the *data entry household level* screen) corresponds to the number of recall days that was used to calculate the sample size (note that since the default setting is used in the illustration here, the default setting of the 90 day recall period appears here but this will vary from survey to survey. This must be decided separately for each survey based on the survey objectives). The number of recall days cannot be entered here. If the sample size for the death rate is not calculated in the same file that is used for entering death rate survey data or due to any other reason where the planning screen doesn't have the same recall period that the survey used, it is important to change this in the *planning* screen.

6.1.3 Cause and location of death

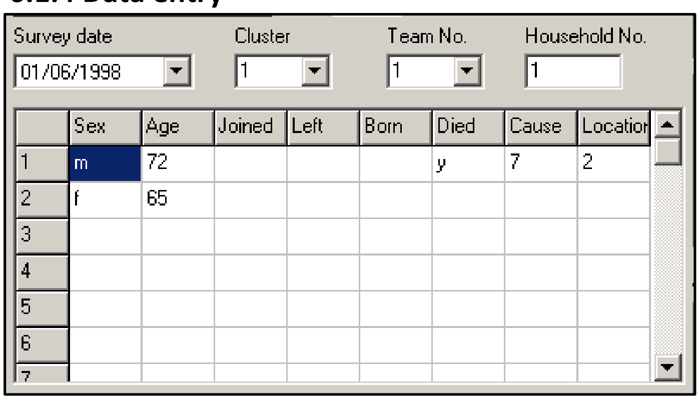


The cause and location of death are specified and coded here to facilitate the data entry and analysis. The default entries displayed here can be modified (but not deleted) and new variables can be added (and deleted). Note that investigating into cause of death is done with caution as surveys are not usually trained on verbal autopsy during the training.

To modify the default entry: click on the entry to be modified, delete it using the computer keyboard, and enter the new entry.

To add a new variable: click on <**Add**>. A box will appear requesting the name of new variable. Type the new variable and press <**OK**>. The new variable will appear on the spread sheet below the additional variables (e.g. TEST1 in the screenshot above). Type a unique code for the variable under the newly created variable (e.g. 1 in the screenshot above).

6.1.4 Data entry

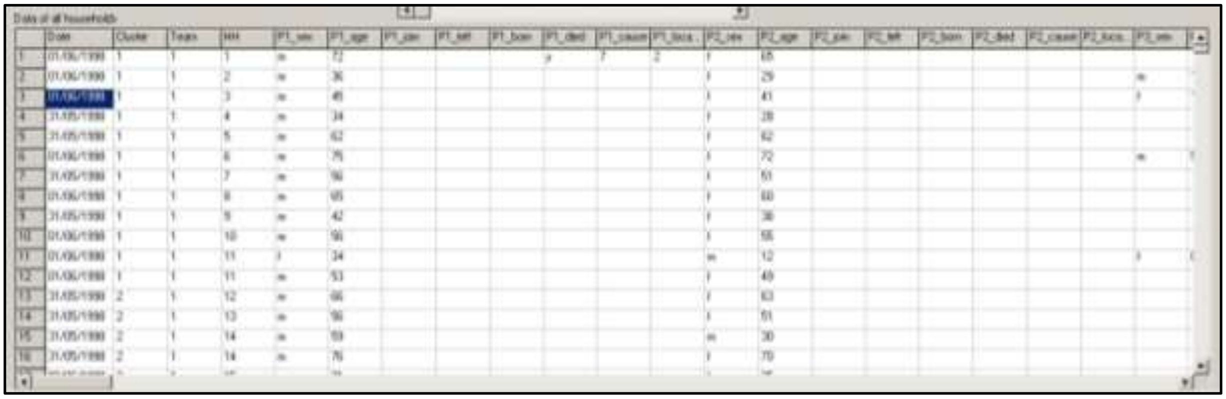


This section of the screen is used to enter individual level data into the software. It starts with the survey date, followed by cluster, team number, and household number. Date, cluster, and team number can be either entered directly or selected from the drop down menu (note that if date is to be entered manually, date, month, and year need to be individually selected and changed). Household number must be entered manually.

If the data entry for anthropometric survey data is completed on the file that is used to enter the death rate survey data the survey date, cluster, team number, and household number information in the anthropometric data entry screen can be copied and pasted here by selecting the 'takeover of HH + cluster numbers' (see section 6.1.1 above). In this case, only the rest of the information needs to be entered. In order to avoid confusion and data mix up, the household data in anthropometry data entry should be assorted before this command is executed.

Except for age and cause and location of death, all other variables are pre-coded. Only “m” and “f” are accepted under the variable sex and only the letter “y” can be entered under the variables joined, left, and born. If not joined, not left, or not born, it must be left blank for the record.

6.1.5 Data of all household



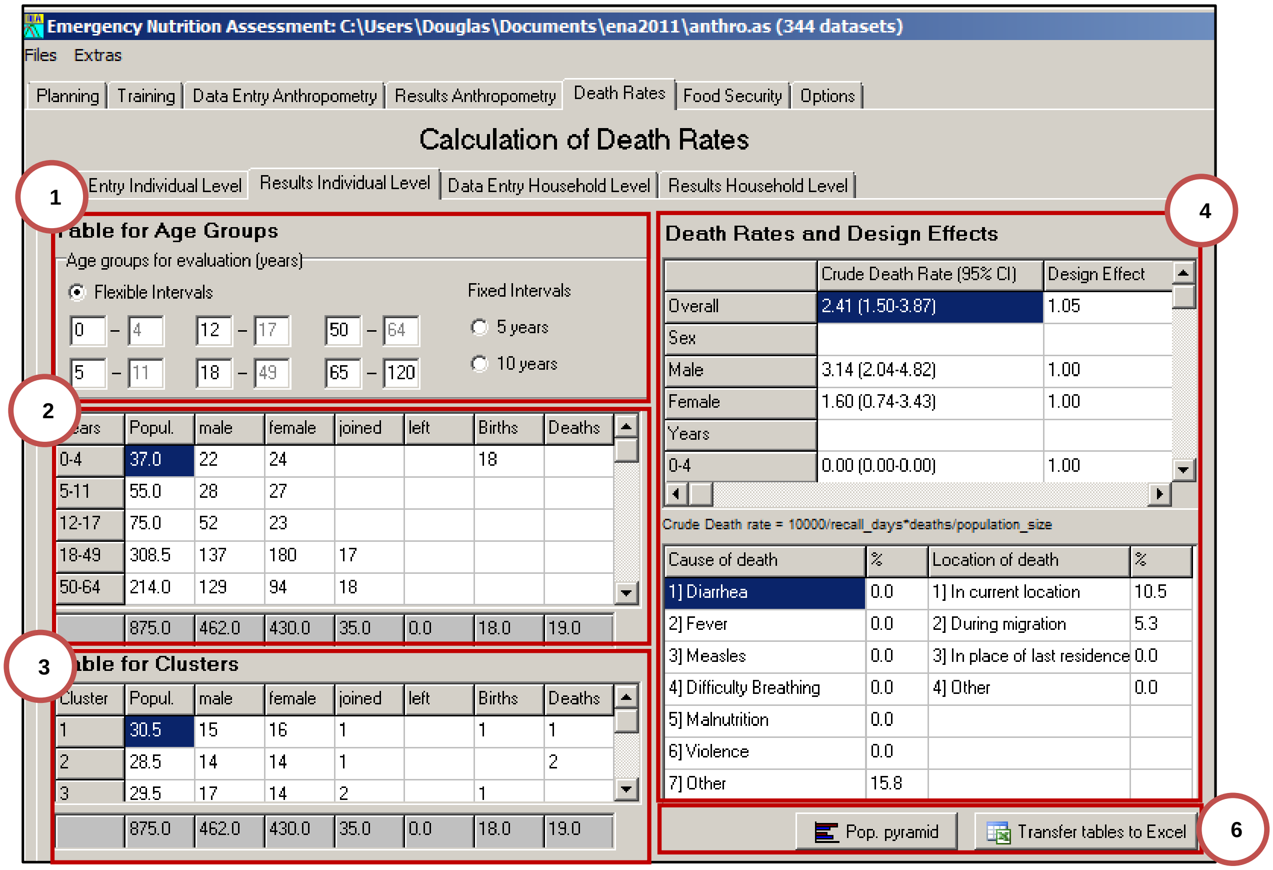
As the data is entered in the data entry section, the data will appear on the data of all household section of the screen. Each line represents a household. Note that if the data from the anthropometric data entry screen is copied and pasted here, each household must be individually selected on the ‘*data of all household*’ screen before the rest of the information for that household is entered. As the household is selected on the ‘*data of all household*’ screen, the survey date, cluster, team number, and household number are automatically displayed in the respective cells in the data entry section above.

Steps to follow

- ✓ **Modify/add cause and location of death to make it identical to the questionnaire**
  - o If this information is not collected in the survey, ignore this
- ✓ If information from anthropometry data entry is not copied and pasted here, enter data from death rate survey questionnaire starting with survey date
- ✓ If information from anthropometry data entry is to be copied and pasted here, follow the instructions in section 6.1.1 and copy and paste the information here
- ✓ Continue to enter the rest of the information.
  - o Ensure that the relevant household is selected before the rest of the information is entered

6.2 Results individual level

Figure 6.2: Screenshot of death rate: Results Individual Level



The results individual level screen displays the results of the death rate survey data at the individual level. The left side of the screen (table for age groups) provides a summary of the survey data in the specified age categories while the right hand side of the screen (death rates and design effects) gives the death rates and design effects along with the details of causes and location of deaths. The screen has been divided into 5 sections and described below.

Exercise 6.1:
From the figure 6.2 answer the following questions:

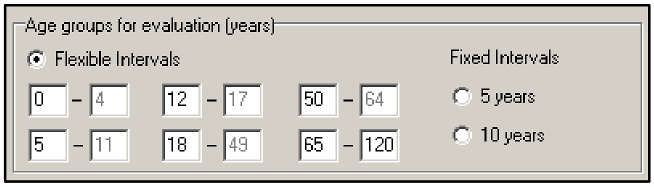
a) How many births have occurred during the recall period?______________________________

b) What is the crude death rate (and 95% CI) among females?_____________________________

c) What percentage of deaths occurred during migration?________________________________

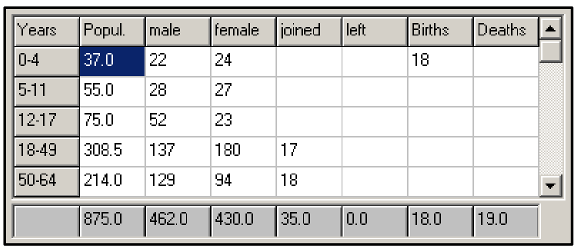
d) What percentage of deaths occurred due to fever?___________________________________

6.2.1 Age groups for evaluation (years)



The age group for evaluation specifies the age groups that are of interest. The age groups can be made at fixed intervals of 5 and 10 years or it can be any other intervals. If it is a fixed interval, the software will automatically arrange the age in a specified interval once the appropriate option is selected (i.e. 5 years or 10 years). If the results are needed by other intervals, it needs to be specified by ticking the 'flexible intervals' and then manually entering the ages. Note that only the lower limits of the age intervals can be changed in the boxes given; once the lower limit is provided, the software will automatically calculate the upper limit and display them. As the age intervals are entered, they will be displayed in the summary table for age groups (see below).

6.2.2 Summary table for age groups



Years	Popul.	male	female	joined	left	Births	Deaths
0-4	37.0	22	24			18	
5-11	55.0	28	27				
12-17	75.0	52	23				
18-49	308.5	137	180	17			
50-64	214.0	129	94	18			
	875.0	462.0	430.0	35.0	0.0	18.0	19.0

This section provides the summary of death rate data by age group (see the bottom row of the spread sheet). The data is also summarised by population, male, female, joined, left, births and deaths.

6.2.3 Summary table for clusters

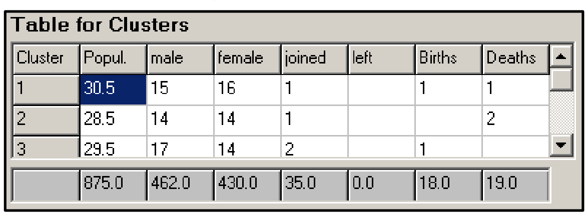


Table for Clusters

Cluster	Popul.	male	female	joined	left	Births	Deaths
1	30.5	15	16	1		1	1
2	28.5	14	14	1			2
3	29.5	17	14	2		1	
	875.0	462.0	430.0	35.0	0.0	18.0	19.0

The death rate survey data is summarised by clusters here. Like in the summary table for age groups (above), the data is further disaggregated by the population, male, female, joined, left, births and deaths.

6.2.4 Death rates and design effects

The death rates and design effects section provides overall as well as sex disaggregated and age disaggregated (based on the age groups specified) death rates and design effects.

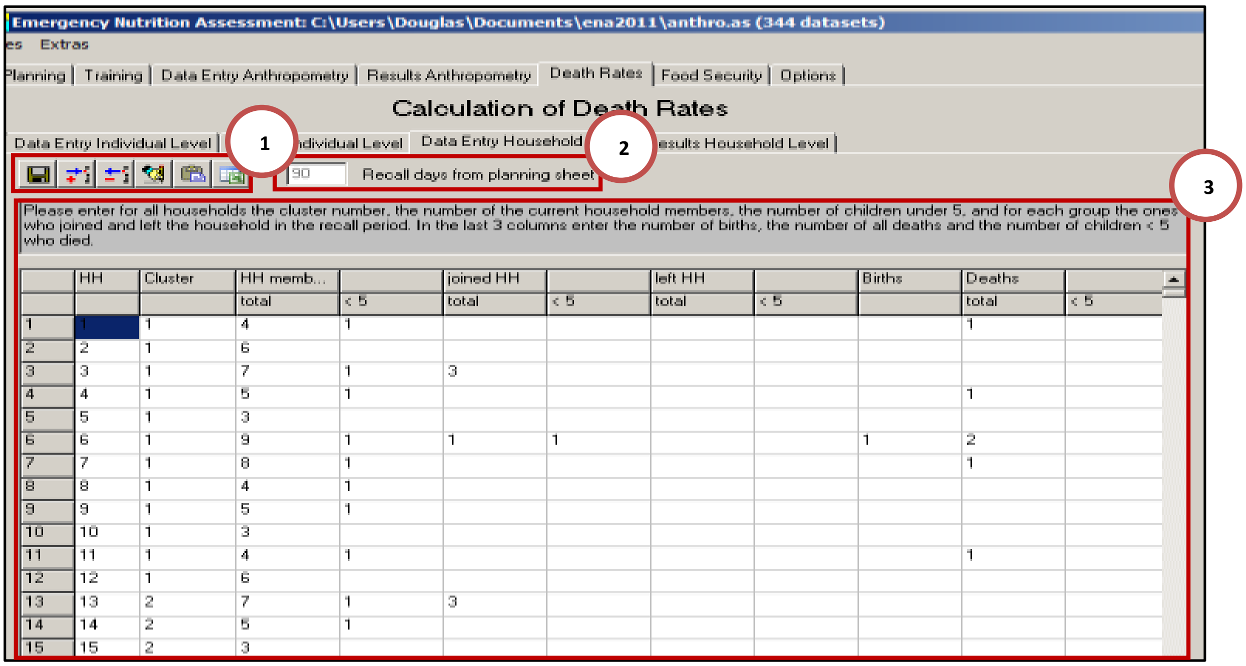
If data is available, this section also provides cause of death and location of death in percentages for the categories specified in the data entry individual level screen.

6.2.5 Population pyramid and transfer table to Excel

The population pyramid displays the data graphically in population pyramid. A small window that opens up when the <**Pop. pyramid**> tab is clicked can be printed or copied to the clipboard for use in the report or other documents by clicking the appropriate options. Regardless of the age range specified in the age group for evaluation, the population pyramid is always displayed in 5 year intervals.

6.3 Data entry household level

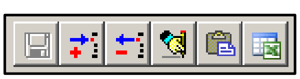
Figure 6.3: Screenshot of death rate screen: data entry household level



	HH	Cluster	HH memb...		joined HH		left HH		Births	Deaths	
			total	< 5	total	< 5	total	< 5		total	< 5
1	1	1	4	1						1	
2	2	1	6								
3	3	1	7	1	3						
4	4	1	5	1						1	
5	5	1	3								
6	6	1	9	1	1	1			1	2	
7	7	1	8	1						1	
8	8	1	4	1							
9	9	1	5	1							
10	10	1	3								
11	11	1	4	1						1	
12	12	1	6								
13	13	2	7	1	3						
14	14	2	5	1							
15	15	2	3								

Data entry household level screen is designed to enter household level death rate survey data. The screen has some shortcut buttons, a box linking the recall days specified in the planning screen, and a spread sheet for data entry, which are described in detail below.

6.3.1 Shortcuts



The shortcuts on the data entry household level screen are identical to the shortcuts on the data entry individual level screen. Please refer to section 6.1.1 for detailed description of the functions of these shortcuts. Note that, unlike data entry individual level, only household and cluster information is copied and pasted when the command 'takeover of HH + cluster number' is selected.

6.3.2 Recall days from planning sheet

The recall days from planning sheet on the data entry household level screen is identical to the recall days from planning sheet on the data entry individual level screen. Please refer to section 6.1.2 for detailed description.

6.3.3 Spread sheet for data entry

The spread sheet is used to enter household level death rate survey data. The summary data for households are entered starting with the household number. The data is disaggregated by only one criterion, age (under 5 years and over 5 years).

Steps to follow

- ✓ If information from anthropometry data entry is not copied and pasted here, enter data from death rate survey questionnaire starting with household number
  - o Note that only household and cluster number from anthropometry data will be pasted
- ✓ If information from anthropometry data entry is to be copied and pasted here, follow the instructions in section 6.1.1 and copy and paste the information

Notes: ____

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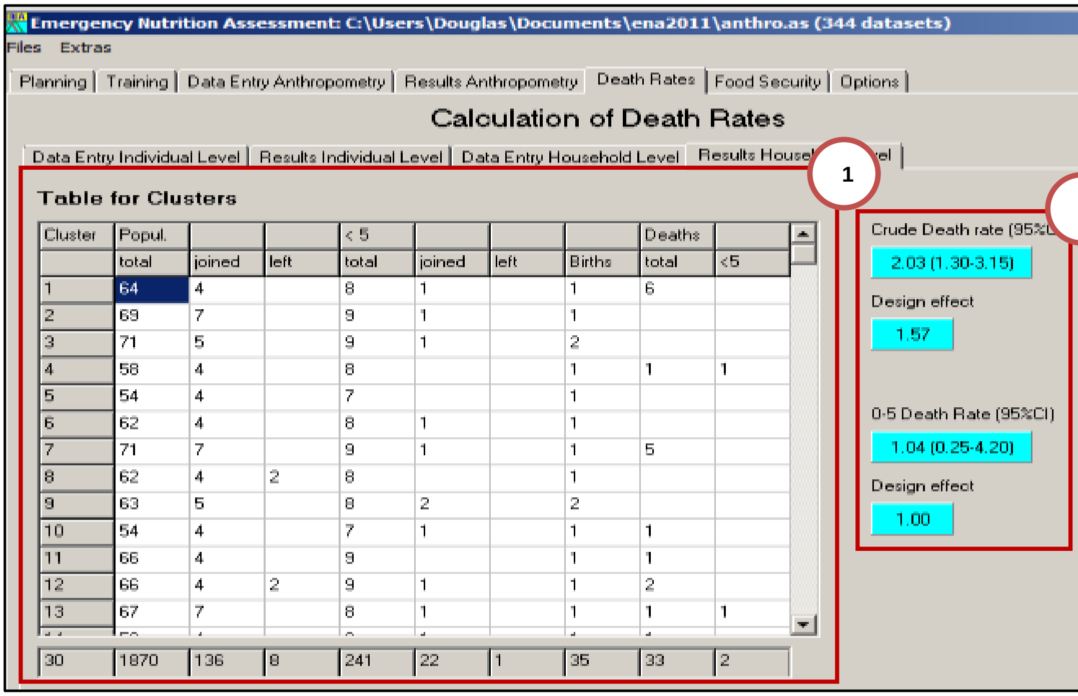
6.4 Results household level

Figure 6.4: Screenshot of death rate screen: results household level



The results household level screen provides the results of household level data entered in data entry household level screen.

Overall summary of the household level death survey data as well as the death rate survey data by cluster are displayed on the left hand side of the results household level screen (see no. 1 on the screenshot above). The crude death rates (with 95% confidence intervals) and design effect are provided on the right hand side of the table (see no. 2 on the screenshot above). The death rates are provided in 2 categories: 1) crude death rate and 2) 0-5 death rate.

Exercise 6.2:
Open the Excel file named **ETH_1107_DessieZuria** that comes with this user manual and go to spread sheet no. 4 death rate survey data. Copy the data and paste it onto the '*Death Rate: Data Entry Household Level*' screen. Go to Death Rate: Results Household Level' screen and answer the following questions

a) What is the crude death rate? Report it with 95% CI.________________________________

b) What is the design effect for 0-5 death rate?____

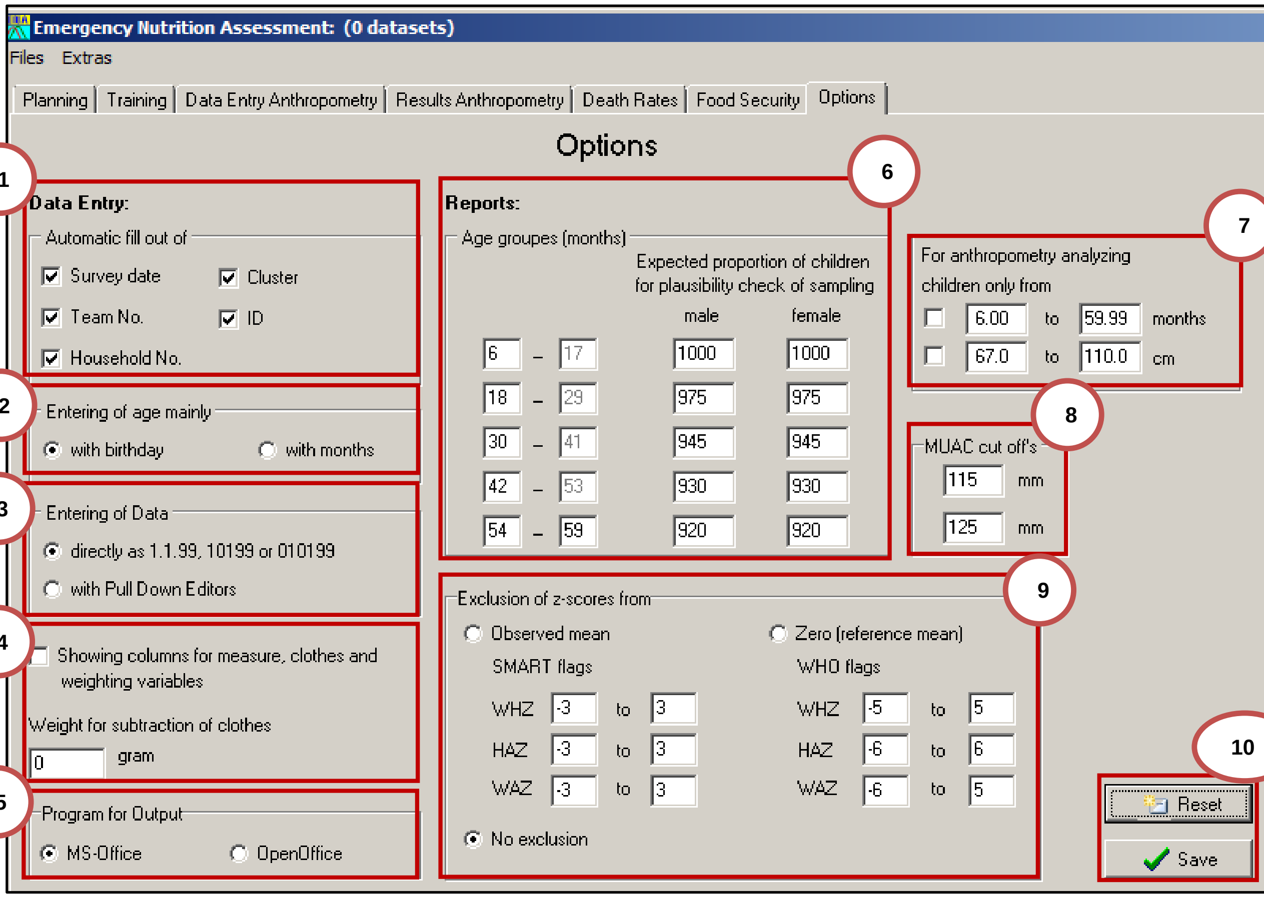
c) How many deaths among children under 5 have occured?_____________________________

Notes: ____

7. OPTIONS

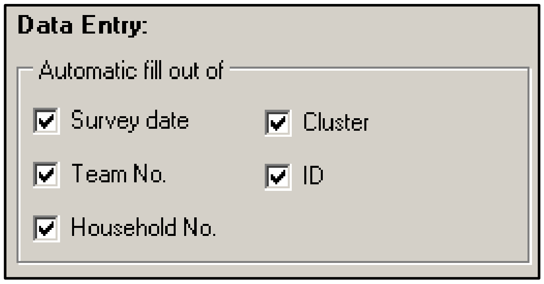
The ***Options*** screen helps define some of the column variables, including expanding or shrinking the date entry screen, and set ranges to some analysis criteria such as age, z-score, and criteria for anthropometric data analysis. The ***Options*** screen thus helps the data entry process and analysis of data.

IMPORTANT: The options screen must be visited and the limits must be set to variables before data is entered and analysis is carried out.



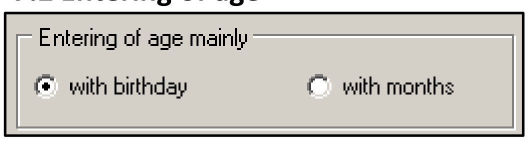
Options screen functions are grouped into 2 broad categories: data entry (on the left hand side) and 2) reports (on the right hand side). Both groups have been further divided into sub sections and described below. For illustration purposes, the entire options screen is divided into 10 sections and described below.

7.1 Automatic fill out



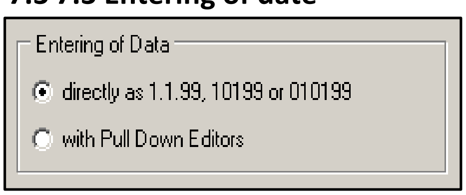
Automatic fill out refers to some data entry fields being filled out automatically when data is entered. This option is available for anthropometric data entry. A total of 5 columns namely survey date, cluster, team number, ID, and household number (i.e. the first 5 columns in the anthropometric data entry screen) will be filled out automatically if the small boxes against them in the options screen are ticked. Although automatic fill out generally speeds up the data entry process, checking the household box for automatic fill out needs to be carefully thought through as it may cause confusion. For example, if there are 2 or more children included in the survey from a particular household, they all need to be given the same household ID. If automatic fill out is activated for household, they will all be automatically assigned different household numbers.

7.2 Entering of age



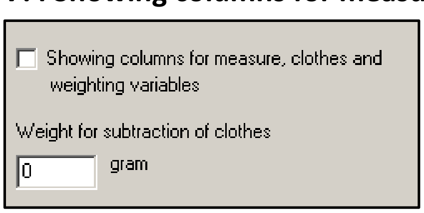
Age can be entered directly in months or indirectly as date of birth so that the software will calculate and display the actual date by comparing the date of birth with the survey date. If the 'with birthday' option is selected as the main option for entering age, after the sex data is entered and <**Tab**> or **<Enter>** key is pressed, it'll go to the BIRTHDAT column. If the 'with month' option is activated as the main option for entering age, after the sex data is entered and <**Tab**> or **<Enter>** key is pressed, it'll jump to the MONTHS column. If most surveyed children have known dates of birth, it is recommended to select the 'with birthday' option. If not, selecting 'with month' option is recommended.

7.3 7.3 Entering of date



When date is entered in the data entry anthropometry screen, it can be entered manually in ddmmyy or d.m.yy or d.mm.yy format or it can be chosen from a calendar with a pull down editor. Although selecting date from a pull down editor likely to reduce errors, select the format that the data entry staff is mostly familiar with.

7.4 Showing columns for measure, cloths, and weighing variables



Checking this box will add 4 additional columns in the data entry anthropometry screen with the following names: MEASURE, CLOTHES, STRATA, WTFACTOR. Note that all of these columns are pre-defined as follows: MEASURE: l/h;

CLOTHES: y/n; and STRATA and WTFACTOR: numeric value with optional decimal separator.

MEASURE: according to the protocol, length should be measured (lying down position) for all children below the age of 2 and height measurement (standing up position) should be made for older children. If for any unavoidable circumstances, the only length measurement could be taken on a child who is older than 2 years or only height measurement could be possible on a child who is less than 2 years of age, the enumerators should do the measurement accordingly and make a special note on the questionnaire. Note that if height is used as admission criteria, 87 cm will be the deciding point – i.e. length measurement on all children below 87 cm and height measurement on children more than 87 cm should be taken. If children less than 87cm were measured standing up or children more than 87 cm were measured lying down, enumerators should make a special note on the questionnaire.

When these cases are entered into the software, these should be specified so that the software will apply a correction factor and correct nutrition indices accordingly. If a child that is supposed to be measured lying down (e.g. 13 month old child) is measured standing up, under the MEASURE column, the letter 'h' (meaning 'height') should be entered. Similarly, if a child that is supposed to be measured standing up (e.g. 33 month old child) is measured lying down, under the MEASURE column, the letter 'l' (meaning 'length') should be entered.

CLOTHES: Children should be weighed naked. If for any reason it is not possible to measure them naked, they should be weighed with clothes and the approximate weight of clothes should be taken and noted on the questionnaire.

Before the data entry, the average weight of clothes should be entered in the space provided under the 'weight for subtraction of clothes' in the options screen in grams. When the data of children who were weighed with clothes are entered, the letter 'y' (meaning yes) should be entered into the CLOTHES column for these children. The software will subtract the weight of the clothes from the total weight entered for the child before calculating nutrition indices. For those children who were measured without clothes, it is not necessary to enter the letter 'n' (meaning no) in the column, CLOTHES.

STRATA: STRATA refers to stratification. In certain surveys, the entire population is divided into different strata (sub-groups) before sampling is carried out. In these surveys, stratification also needs to be taken into account when data is analysed. The column STRATA is included for this purpose. However, its functionality is still being tested at present and therefore no further guidance is given as to how to use this functionality.

WTFACTOR: WTFACTOR stands for weight factor – i.e. weights applied to records. Weights need to be assigned to survey samples when the probability of selection is not equal to all subjects. In a single SMART survey with no stratification, all subjects in the survey population have equal probability of getting selected into the sample. In this case there is no need to apply for weights. However, when 2 or more SMART surveys from different population sizes are merged, the probability is not equal in the pooled sample. In this case, weights need to be applied. This is illustrated with an example below.

Example 7.1: Applying WTFACTOR

Survey	Survey area	Total population	Under 5 population	Sample size	Sampling fraction	WTFACTOR
1	A	100,000	20,000	800	800/20,000	20,000/800 = 25
2	B	500,000	75,000	600	600/75,000	75,000/600 =125

In survey area A, the sample of 800 represents 20,000 children but in survey area B, 75,000 children are represented by 600 children. Although the children in each individual surveys have the equal chances of being selected, the condition of equal probability does not hold when both surveys are merged and a pooled estimate is calculated. Therefore, weights need to be applied. Weights are calculated by numerator and denominator in the sampling fraction. In the above example, for survey 1, the sampling fraction of 800/20,000 is thus rearranged to 20,000/800 when weights are calculated. The weights must be applied to all the records in the dataset. For the survey 1 dataset in the previous example, WTFACTOR 25 needs to be entered under the WTFACTOR column for all the records. Similarly, for the survey 2 data set, WTFACTOR 125 needs to be entered in the WTFACTOR column for all the records.

Note that WTFACTOR can also be converted into a standardised WTFACTOR, which can then be entered into the WTFACTOR column. From the WTFACTOR, the standardised WTFACTOR can be obtained by following 2 additional steps, which are described below using the same example:
Step 1: Calculate the average weight by taking the sum of the WTFACTORS calculated and dividing it by the total number of surveys

In the example above, average weight: (25 + 125)/2 = 75

Step 2: Calculate the standardised WTFACTOR for each survey by dividing the WTFATOR for the survey by the average weight calculated in step 1:

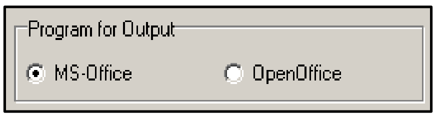
Standardised WTFACTOR for Survey 1: 25/75 = 0.3333

Standardised WTFACTOR for Survey2: 125/75 = 1.6666

Standardised WTFACTOR of 0.3333 should then be entered into the WTFACTOR column for all subjects of survey 1. Similarly, Standardised WTFACTOR of 1.6666 will be entered into the column, WTFACTOR, against all subjects in the survey 2. Note that at the end of the process, the sum of the standardised WTFACTOR will always be 1 – i.e. the weighted sample size is equal to the un-weighted sample size.

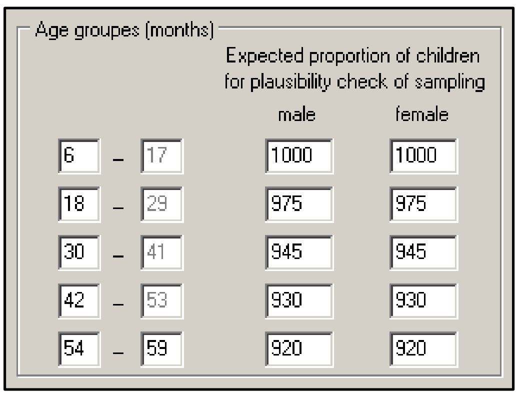
Stratification is another instance where weighing may need to be applied. Although not discussed further in detail here, the process of calculating and applying weight is similar in stratified surveys.

7.5 Program for output



Although the default is the MS Office and for most users this is the preferred option, Open Office can also be used when dealing with reports and exporting data. Click on <**OpenOffice**> and the tab <**Save**> (see below) to use OpenOffice program.

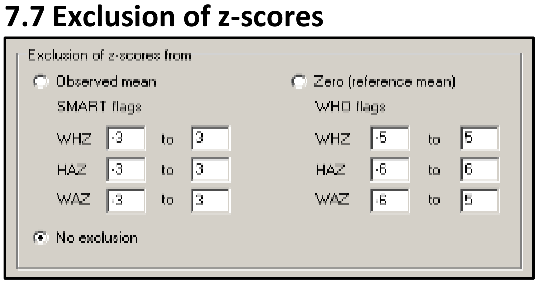
7.6 Age groups



The age groups section shows the age groups and the expected proportion of children in each age bracket, which is used as the basis for analysing age distribution in the plausibility check report. The expected proportion of children under each age groups used here has been developed based on the demography in developing countries and **should not be changed arbitrarily**. If there is reason to believe that these proportions do not reflect the actual situation in a survey area, help from a demographer should be sought.

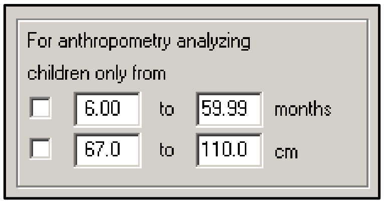
The age groups can be changed (by changing the lower value of the range) and this change will be reflected in the survey report. When the age groups are changed, the expected proportions of children in each bracket will be recalculated based on the age group change. Although the *options* screen does not show the recalculated proportions of children based on the new age brackets, it will be taken into account when the plausibility check is run.

7.7 Exclusion of z-scores



The type of z-scores (i.e. flags) that should be excluded when running the plausibility check report is set here. Although the default set up is no exclusion, the option 'observed mean' is selected in most survey analysis. For further information, refer to STP module 9.

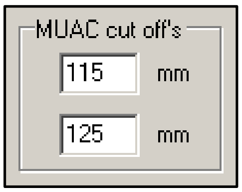
7.8 Anthropometry analysing criteria



Anthropometric data analysis can be based on age (usually 6-59 months) or height. However, the decision about inclusion criteria is usually made at the planning stage of a survey.

Although the default settings have pre-set values for both age and height ranges these can be changed. For example if a survey includes children from 0-59 months, the default settings should be changed to 0-59.

7.9 MUAC cut-off



The cut-off for MUAC data analysis is set here. The report will also reflect the values set here. The default values can be changed to reflect any programmatic need.

7.10 Reset and save

Reset: brings all values in the options screen to the default settings.
Save: save the changes made to the options screen. It is recommended that each time a change is made to the options screen the change is saved, even after <**Reset**> button is clicked on to effect changes.

Annex 1: Death Rate Survey Form

FSAU/FAO SOMALIA: MODIFIED MORTALITY SURVEY QUESTIONNAIRE

Enumerator's Name:___________________ Team No: ______________ Date: _______________

Household No: __________ Cluster No: _________ District: _______________ Village: _____________

No.	**1**: Name	**2**: Sex	**3**: Age (yrs)	**4**: Born since _____ (insert the start of the recall period)	**5**: Arrived since _____ (insert the start of the recall period)	**6**: Cause of death	**7**: Location of death
a) How many members are present in this household now? List them.							
b) How many members have left this household (out migrants) since _____ (insert the start of the recall period)? List them							
c) Do you have any member of the household who has died since _____ (insert the start of the recall period)? List them							

Summary

	U5	Total
Current HH Members		
Arrivals during the Recall period		
Number who have left during Recall period		
Births during recall		
Deaths during recall period		

Annex 2: Converting sample size from children to households

$$\boldsymbol{Number\ of\ households\ to\ be\ visited} = \frac{\boldsymbol{Sample\ size\ calculated\ in\ no.\ of\ children\ 6{-}59}}{\boldsymbol{Average\ household\ size\ x\ percentage\ of\ children\ under\ 5\ X\ 0.9}}$$

Example:

When the sample size for an anthropometric survey among children between 6-59 months was calculated in ENA, a sample size of 483 children was obtained. Convert the number of children into households. According to the recent DHS survey, the average household size in the survey area is 5.5 and percentage of children under five is 18%.

Answer:

Note that Sample size in children 6-59 months can be converted into households by applying required figures directly in the formula above. For illustration purposes, however, the answer is shown in multiple steps below.

Step 1: Calculate the average under 5 children per household by multiplying the average household size by the % of children under five

Average under 5 children per household = Average household size x % of children under 5
= 5.5 x 18/100
= 0.99

(This means that each household has 0.99 under 5 children; in other words, if you visit 100 households you will get approximately 99 children)

Step 2: Calculate the average number of children between 6-59 months per household by multiplying average under 5 children by 0.9

Note that the under 5 population can be broken down into 10 equal parts of 6-month brackets (i.e. 0-5, 6-12, 13-18 … 44-50) and children 6-59 month includes 9 of these age brackets (i.e. 9/10=0.9). Assuming that the proportion of children in each of these age bracket is the same, the under 5 population is multiplied by 0.9 to obtain the total number of children 6-59 months. Similarly, multiplying the under 5 population by 0.4 would give the approximate number of children under 2.

Average number of children between 6-59 months per HH = average under 5 children x 0.9
= 0.99 x 0.9
= 0.891

(This means that each household has 0.891 children 6-59 months; in other words, if you visit 100 households you will get approximately 89 children6-59 months)

Step 3: Calculate the number of households to be visited by dividing the sample size by the average number of children between 6-59 months per household

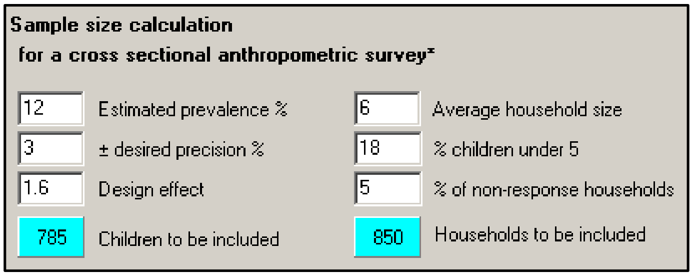
Total no. of HH = Total sample size of children 6-59/Average no. of children 6-59 per HH
= 483/0.891
= 542

Annex 3: Answers to exercises

Answer to exercise 2.1:

a) PAK_1010_Dadu_ACF
b) PAK_1010_Dadu_ACF_dat.as
c) PAK_1010_Dadu_ACF_rep

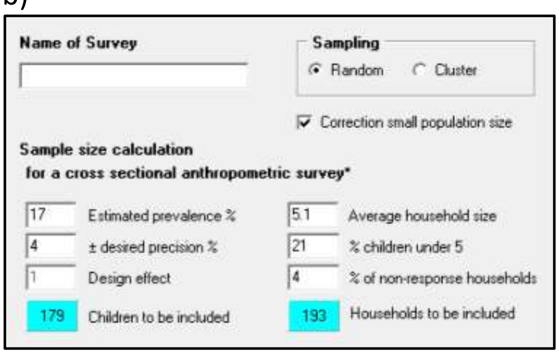
Answer to the exercise 2.2:



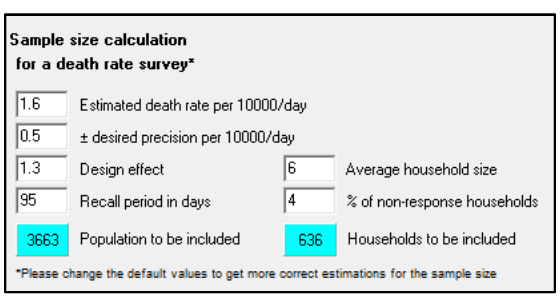
Answer to the exercise 2.3:

a) Since the population size is <10,000, a correction factor needs to be applied in calculating sample size. adididonally, the ***Ranom*** should be selected under Sampling section.
Note: Since the population size is small and it is a camp setting, a survey using random sampling method is planed (a list of all households in the camp either exists or can be developped).

b)



Answer to the exercise 2.4:



Answer to exercise 2.5:

a) The table for cluster sampling in the Planning screen should look like the fllowing once the geographical units are copied and pasted onto the, the number of clusters specified as 45 and the ‘Assign Custer’ button is clicked:

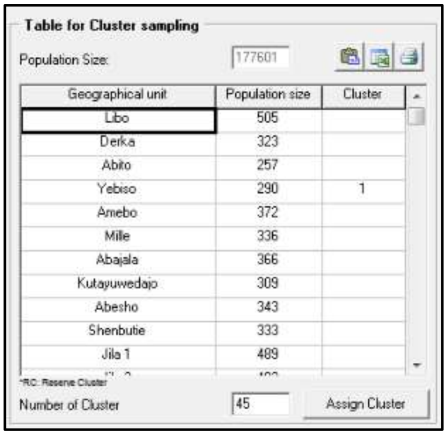


Table for Cluster sampling

Population Size: 177601

Geographical unit	Population size	Cluster
Libo	505	
Derka	323	
Abito	257	
Yebiso	290	1
Amebo	372	
Mille	336	
Abajala	366	
Kutayuwedajo	309	
Abesho	343	
Shenbutie	333	
Jila 1	489	

*RC: Reserve Cluster

Number of Cluster: 45 — Assign Cluster

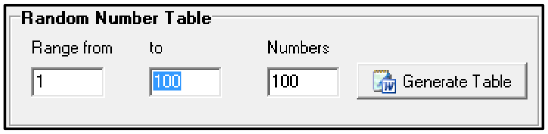
b) The Microsoft Excel file, whch contain the transferred data, should look like the following once the Clusters are sorted (note that the clusters selected will vary as the first village is selected randomly):

Geographical unit	Population size	Cluster
Yebiso	290	1
Ayata 1	576	2
Mayan mamedo 1	683	3
Alekodayo	643	4
Berara tuwate tsehay	871	5
Genfot 1	437	6
Jerjero 2	535	7
Meyane 1	533	8
Golbo	624	9
Kermemie	662	10
Guassa 1	677	11
Weltu 2	521	12
Temsase	518	13
Gobeya	709	14
Erkoche	861	15
Werebecho	779	16
Tidegebeya 2	786	17
Jimetit	724	18
Jema	732	19
Wereruga	301	20
Eshetie Ager	556	21
Kurach Ager 1	559	22
Abaweldiye	414	23
Tigaja	766	24
Doyo Ager	376	25
Matebo	668	26
Yegof	842	27
Chorka Mender 2	526	28
Abachufa	486	29
Abecho	733	30
Kurkur	495	31
Jegolasitaya	890	32
Gobeya	799	33
Mendebona feto	816	34
Gena Memcha	476	35
Abiagerna Betoager	595	36
Dedibona Geferssa	738	37
Tach kelad	600	38
Enessana	799	39
Goshign	671	40
Bikeru	552	41
Amboasa	442	42
Tatessa	590	43
Endulti	581	44
Gero	728	45
Buko Ager	666	RC
Neftegna	486	RC
Yinale	614	RC
Sereser	457	RC
Kilkilo	528	RC

The file should be named as ETH_1107_DessieZuria_AssignedClusters_xls

Answer to exercise 2.6:

a) The range and the numbers under the Random Number Table section of the ***Planning*** screen must be specified as follows:



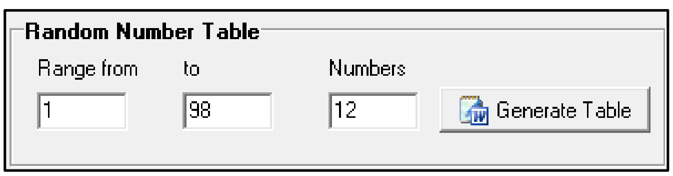
The 3 digit random number table should like the following (note that the exact sequence of number will vary from one table to another as the numbers are generated randomly):

Random Number table

Range: 1 to 100, Number: 100

55	73	21	29	68	43	22	63	27	26	100	57	37
	91	78	70	65	45	95	42	81	33	12	10	54
	77	94	50	23	92	8	25	84	97	86	49	46
	72	90	74	66	53	13	14	19	40	9	4	87
	24	64	16	52	60	83	88	44	69	1	71	98
	47	58	2	35	32	79	30	62	38	76	80	93
	15	36	75	85	41	67	82	11	51	56	28	61
	34	89	31	99	3	39	48	20	17	6	59	96
	5	18	7									

b) The range and the numbers under the Random Number Table section of the ***Planning*** screen must be specified as follows:



The random numbers generated by ENA should like the following (note that the exact numbers will vary as the numbers are generated randomly):

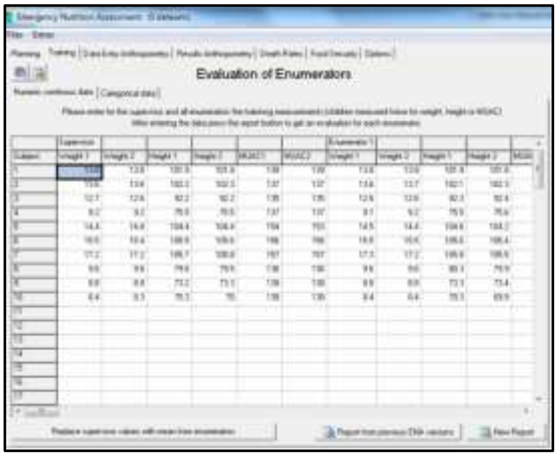
Random Number table

Range: 1 to 98, Number: 12

87	31	35	27	48	3	24	21	96	29	4	86

Answer to exercise 3.1:

Once the data is copied and pasted, the ENA training screen should look like the following:



The output should be like the following when the *report from previous ENA versions* button is clicked (note that only part of the output is displayed here):

Report for Evaluation of Enumerators

Weight:

	Precision: Sum of Square [W2-W1]	Accuracy: Sum of Square [Superv.(W1+W2)-Enum.(W1+W2]	No. +/- Precision	No. +/- Accuracy
Supervisor	0.19		3/1	
Enumerator 1	0.04 OK	0.15 OK	2/2	4/3
Enumerator 2	0.10 OK	0.09 OK	5/2	2/5
Enumerator 3	0.02 OK	0.21 OK	1/1	3/4
Enumerator 4	0.08 OK	0.21 OK	1/4	5/2
Enumerator 5	0.35 OK	0.18 OK	6/2	3/4
Enumerator 6	0.60 POOR	1.03 POOR	6/2	7/3
Enumerator 7	0.26 OK	0.15 OK	5/2	2/4
Enumerator 8	0.20 OK	0.23 OK	4/1	3/2
Enumerator 9	0.01 OK	0.12 OK	0/1	4/2
Enumerator 10	0.01 OK	0.04 OK	1/0	4/1
Enumerator 11	0.00 OK	0.27 OK	0/0	4/4

Answer to exercise 4.1:

a) 359
b) Children between 6-12 months included in the dataset = 41; number of children 6-12 months who have WHZ<-2=2 a WHZ<-2?
c) 7 (cluster numbers: 9, 17, 31, 34, 38, 41, and 44)
d) 1; team no 2
e) 1; The particular reacord is flagged because it's is outside of the SMART flag range (the mean value for WHZ is -0.86 so, any WHZ value ±3 of the mean value will be flagged as abnormal). The data is flagged when WHO standards are selected and SMART flags applied.
f) Lowest reading of MUAC = 96 mm; Highest readings of MUAC = 170 mm
g) 6-59 months
h) The column heading should appear something like this: 

i) ETH_1107_DessieZuria_data.as

Answer to exercise 5.1:

a) Go to ***Options*** screen and set the ranges
b) The GAM prevalence among boys when WHO standards are selected and SMART flags applied is 14.4% (95% CI: 9.8-20.5). The GAM prevalance reduces to 12.0% (7.6-18.3 95% CI) when WHO standards is changed to NCHS reference.
c) 43.2% (95% CI: 38.6-48.0)
d) -0.86±0.96; It increases to -1.02±0.81 when WHO flags are applied but there is no change between WHO flags and no exclusion.
e) 1.55
f) ID=1.00 (p=0.473)
g) -1.18±0.95
h) ETH_1107_DessieZuria_rep

Answer to exercise 6.1:

a) 18
b) 1.60 (95% CI: 0.74-3.43)
c) 5.3%
d) 0%

Answer to exercise 6.2:

a) 0.29 (95% CI: 0.17-0.51)
b) 1.01
c) 1