NUTRISURVEY SOFTWARE – PILOTING REPORT
FAO – FSAU Somalia
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1 INTRODUCTION

NUTRISURVEY software has been developed for use in the analysis of nutrition survey data. The SMART[1] initiative has supported the further development and piloting of the software for improved data entry and management. FAO/FSAU[2] has provided technical support to partners undertaking nutrition surveys in Somalia since year 2000 and promotes the use of standard guidelines during data collection and analysis. FSAU Nutrition project which is managed by the Food and Agriculture Organisation of the United Nation with funding from USAID volunteered to pilot the NUTRISURVEY software to support this initiative of the development of user friendly software.

This report provides the outcome of the NUTRISURVEY piloting done in Nairobi and Somalia. The piloting was one of the stages of the software development process. The piloting was undertaken between 6th October and 10th December 2004.

The main areas explored during the piloting were:

- Down loading the software/Accessing the software from internet
- Testing main components of the software
- Raw data entry capability and comparison with EPI Info 6.04
- Output results accuracy and comparison with EPI Info 6.04
- Ease of results interpretation
- Exportation and importation of data

2 PILOTING METHODOLOGY

The software was piloted in Nairobi using data from surveys in (i) Luuq, (ii) Galgadud and (iii) Jilib in Somalia. Piloting was led by FAO/FSAU senior nutritionist and one external consultant, both well experienced in data entry and analysis, under the supervision of the FAO/FSAU nutrition project coordinator. The testing team included two persons in data entry and analysis, two experienced data entry clerks and three FSAU nutrition monitors with limited experience in spread sheets. Different stages were followed in the piloting process.

Stage One: Down loading and testing NUTRISURVEY components

The piloting was conducted using field data as well as data incorporated in the software. The following steps were followed:

1. Attempts to down load the software from the internet in Nairobi and in Somalia were made by several individuals. These persons were computer internet literate. At Nairobi level, the supervision was done by the senior nutritionist and the consultant who are familiar with down loading of files from the internet.

2. Relating to anthropometric data entry and analysis, FAO/FSAU senior nutritionist and external consultant navigated the NUTRISURVEY and reported any significant weakness or strength in any of

[1] Standardized Methodology for Assessment in Relief and Transition
[2] Food Security Analysis Unit – Somalia

its main components. Sample dataset incorporated in the software and raw data from two nutrition surveys from Somalia (Luuq and Galgadud) were used. Data entry and analysis using EPI Info and NUTRISURVEY was carried out and a comparison made based on the two software data management and analysis mechanisms and capacity.

3. Mortality data was entered and results computed using NUTRISURVEY. The same data was entered using EPI Info and results compared.

4. Importation and exportation of data from MS-Excel and EPI-Info into NUTRISURVEY software vice versa was tested.

5. The outputs from both software (NUTRISURVEY and EPI-Info) were generated and comparison made. Analysis was done to establish possibilities of any significant difference between the results for the different software. In addition comparison on the ease in data analysis and in the interpretation was done.

6. Data cleaning, validation and plausibility check processes within NUTRISURVEY were used while frequency of variables for EPI Info was used and the two outputs compared using the two nutrition survey data sets. The software capacity to identify errors on the data was investigated on.

Stage 2: Feedback to NUTRISURVEY software developer

Experiences of the first stage of the software testing were shared with the software developer for purposes of effecting possible changes. NUTRISURVEY and EPI-Info outputs from the two surveys were also shared and the discrepancies in the results indicated.

Stage 3: Revised NUTRISURVEY software availed

A revised version of the NUTRISURVEY software was availed with most of the changes recommended from the first stage of testing having been incorporated. Future directions of the software development were given.

Stage 4 – Testing of NUTRISURVEY software with fresh set of data

All the steps undertaken in stage one of the piloting were repeated with a fresh data set from Jilib nutrition survey. All software components were tested.

Stage 5 – Report on second testing shared

Stage 6 – Comments added by Juergen Erhardt

4. RESULTS AND RECOMMENDATION

4.1 Accessing the software from internet and the down loading process

The following are the experiences and recommendations of the first and second testing of the NUTRISURVEY software.

Procedure	Outcome & Comments First Testing FSAU, October 2004	Action Taken/Comments (Juergen Erhardt)	Outcome & comments Second Testing (FSAU, November 2004	Comments (Juergen Erhardt, December 2004)
1 Accessing the Website	Different addresses on the following dates (1) 04-10-04 www.NUTRISURVEY.de (2) 08-10-04 www.NUTRISURVEY.de/ena/html (3) 26-10.04 www.NUTRISURVEY.de/ena/ena.zip ***Comment:*** Permanent Address required	In the final version, a ZIP file and a self executing file (.exe) will be available. The executing file will be available for the installation of software from the internet. The permanent address to access the software will be from www.smartindicators.org	Different address noted- www.NUTRISURVEY.de/ena/ena.html	
2. Down loading	Successful:- No problem encountered		As per first testing	
3.Unzipping the file	Persons with little experienced in computer usage did not easily understand function zip or unzipping Comment: If size of the software is not too large, it needs to be presented as uncompressed	Uncompressed is probably not very useful since each file has to be downloaded separately. The self executing .exe file will be the easiest option since it also puts an icon on the desktop.	Simple down load button/window is recommended	A button for easy download will be added.

4.2 Software components

FSAU senior nutritionist and external consultant on data entry and analysis navigated and tested all components of NUTRISURVEY and noted the following:-

Main component	Outcome of First Testing FSAU, October 2004	Action Taken/Comments (Juergen Erhardt)	Outcome of Second Testing (FSAU, November 2004)	Comments (Juergen Erhardt, December 2004)
1. Planning	Software intended for 6-59 months age group. ***Comment***: Consider for the software to be used in planning studies for over 5 years	The z-scores are also calculated for older children but the main focus are children from 6-59 months	Software can calculate z-scores for children less < 6 months and > 59 months	
	Easily determining the sample sizes and clusters selection ***Comment:*** A good property for accurate sample size determination and random cluster selection	This component of the software is maintained	As per first testing	
2. Training	Good component for assisting the evaluation the survey teams ability to achieve quality data ***Comment:*** An important component that needs to be maintained	This component of the software is maintained.	As per first testing	
3.Data entry Anthropometry (valid in both upper and lower data entry screens)	Limited variables allowed ***Comment***: Increase the number of variables accommodated	Number of variables increased to up to 256 variables	Can accommodate 256 variables	
	Entry of dates is a long process When an error is made its difficult to identify e.g. negative ages ***Comment:*** Explore on the possibility of presenting	The pull down menus for the dates is only meant for new users. For experienced users the quickest way to enter dates is with the keyboard by pressing the	Entry of dates is a long process Epi info style more user friendly Day,	Now it is also possible to enter dates without separator e.g. 10199 for

	the dates in an easier way	numbers for the day, months and year and a key to separate the day from the month and the month from the year. There is no better way to enter dates.	months and year are separated automatically	1/1/1999.
	Data entry for a survey cannot be entered using different computer with a later merging of files ***Comment:*** Develop this option to enable data entry in different work station- Issue of copying and pasting of data or data importation	Will be included in a later version. Until now it is only possible to do this via Excel.	As per first testing	Simple copy paste function which works in both directions now integrated. Therefore this is now relatively easy.
	Software accommodating invalid values like 145cm yet its meant for <5 years (for now); also accommodating string values in variables meant to have numeric values ***Comment:*** Height variable accepting non-numeric characters – needs variable validation	If non valid keys for weight or height are entered no z-score is calculated and a red 99.00 appears. This should show users that they have to change the entered value.	A beep is required to indicate occurrence of error	The beep will be integrated when we have decided which range will be used.
	Permanent arrangement of variables and inclusion of variables that are not always used in analysis ***Comment:*** Need liberty to re-arrange or delete the variable/ fieldnames to individual/ researcher's convenience (one may not use team number variable in analysis and may wish to delete it)	For standardization purposes the first 15 columns are fixed. The idea with SMART was to agree on a standard set of variables. If they are not used they can left empty.	As per first testing	
	Reverting some changes: cannot recover a deleted case (by mistake, loss of data) or manually added variables ***Comment:*** Create an undo function for faster recovery of erroneous data loss	An undo function is technically difficult but it is on the plan to be included in a later version.	As per first testing	
	If entry for oedema is upper case "N" or "Y" then	This problem has been solved in	Values erroneously	In the

	weight is sometimes rejected or the software does not recognize the oedema status/prevalence ***Comment:*** Enable the software to recognize both cases signifying oedema status	the current version.	entered to signify oedema status (values other than n or y) is interpreted as edema present in the report. The problem needs to be addressed.	spreadsheet there is now a pull down menu which shows the possible answers. The valid answers are therefore easily visible for the user.
	Can enter inaccurate data without recognizing the errors (errors are identified too late through plausibility check) ***Comment:*** Needs data validation tool/component at this level-to reduce data cleaning burden Needs a customizing tool	Some validation is done now on the entry level e.g. for SEX	Validation available in oedema and sex variables	
3a) Upper data entry screen	Many entries using pull-down menus which is a long process ***Comment:*** Actual data entry preferred over automatic setting through pull down window	The quickest way to enter data is in the lower spreadsheet. It is described in the website but probably a small teaching tutorial would be very helpful. New user usually like pull down menus. Therefore it is still in the software.	As per first testing	In the new version the part for entry of data via fields has been removed since the pull down menus are now integrated in the spreadsheet. The presetting is not to use the pull down menu for the dates since directly entering of dates is much faster. Therefore this shouldn't be anymore a problem.
3b) Lower data entry screen	Easy to enter data ***Comment:*** Sex options taking any entry made	Now corrected	Sex variable accepting only males or females values	

4. Data entry Mortality	Data entry easy but variables are too limited ***Comment:*** Increase the variables (like causes of death) The causes of death option should accommodate multiple deaths in a household	The mortality part will be changed soon	As per first testing	
	Mortality data cannot be exported to another program (like excel) ***Comment:*** Mortality data exportation needs to be possible to facilitate further analysis	Now possible	Exporting mortality data sets to MS-Excel not achieved.	It could be that the button in the upper left corner for the transfer was not so easily visible.
	Limited number of households surveyed for mortality ***Comment:*** Needs to accommodate more than 1999 households	Will be changed together with the other things	As per first testing	
5. Results/ calculations-mortality	CMR and U5 MR can be easily calculated from the data entered CMR and U5MR can be calculated interactively (times when one has the figures on deaths and total population only but not accessing the entire raw data set) ***Comment:*** Very helpful when the available data is just the totals or the summary obtained from the assessment or through focus group discussion or grave counting.	This software property is maintained	As per first testing	

6. Results/ calculations-anthropometric	Anthropometric calculation on the screen is helpful in identifying outliers immediately. But percentage of the median is temporarily available and not exported for further analysis in Excel, if need be. ***Comment:*** Percentage of median temporary available in the data entry module and cannot be exported to other programmes like Excel. This needs to be possible.	For statistical reasons % of Median is not recommended. It is mostly only used in emergency settings to decide if a child has to be included in a feeding program or not. For this purpose the single values are still in the software.	As per first testing	
	Output (results in Luuq and Gagadud results-attached): Numerous tables of results (from two surveys) are generated and results are not consistent ***Comment:*** Consistent data summary needed	Should be consistent now except for the handling of outliers. If they are removed manually there shouldn't be a difference anymore. The z-scores in both programmes are identical.	Output and tables are consistent	
	Table 3.1: Tabulation of surveyed children by sex well presented and the ratios are consistent to EPI Info results ***Comment:*** Good component that needs to be maintained to check for any bias in the sampling	Component is maintained in the software	As per first testing	

	Table 3.2, table 3.4 and table 3.6 (% of median): Inaccurate summary of results presented. All children are considered malnourished on the 1st row of data in each table. Oedema cases excluded in the analysis when using the Oct 2004 NUTRISURVEY software version (Luq survey). However, using the Aug 04 NUTRISURVEY version, oedema cases are considered in the analysis (though there were no oedema identified, pre-testing with this version accurately considers the oedema appropriately.) Accurate Global Malnutrition and severe acute malnutrition rates in these tables desired. ***Comment:*** This summary table gives confusing information	Corrected.	Summary of results are accurate Oedema cases included in the analysis accurately	•
	Tables 3.3 and 3.5: the results exclude oedema cases hence it is inaccurate ***Comment:*** As above	Corrected.	Results include oedema accurately	
	The nutrition survey results by Nutritsurvey and by EPI-Info show slight difference which is not statistically significant ***Comment***: Consistent accurate results desired, irrespective of the software program used	Corrected.	Consistent results obtained	
	Graphical presentation of the nutrition survey results: The shift of the surveyed population vs the reference population is demonstrated. ***Comment:*** Easy exportation of the graphical summary of the data which demonstrated the study population shift from a normal population.	Graphical presentation maintained	As per first testing	

	Excel report: Output not presented in a clear way that could be easily interpreted. ***Comment:*** Clear presentation of the results in Excel format recommended. Organisation of the massive information would increase clarity. The central tendency summaries need to be next to the various categories presented.	The Excel report comes from an earlier version of the program. It will be replaced by the Word report	As per first testing	
	MUAC results: Analysis done independently with no linkages to the other anthropometric output. Only central tendency measures for MUAC are presented without categories ***Comment:*** MUAC analysis using standard categories need to be done and the capacity to link the MUAC analysis with the other anthropometric indicators needs to be enhanced. The MUAC results need to be included in Ms-word report.	Will be included in a later version	As per first testing	
	Limited statistical capacity of the software: no analysis can be done to relate nutrition status with disease, immunization, and other child specific variables ***Comment:*** Need to develop statistical capacity to improve the analytical capability of the software: e.g. simple cross-tabulation.	On the list for inclusion in a later version. Currently the most useful way is to transfer the data to Excel and to do there statistical calculations or to export it further to programs like SPSS.	As per first testing	
	Mortality rates calculation not automatically presented in the Ms-word report ***Comment:*** This should be possible since the data is already entered. Need to link the mortality data summary to the main survey report	Now included	Mortality rate calculations now incorporated in the report	

7. Options	Capable of facilitating analysis of infants nutritional status Age group categories can be altered to the convenience of the researcher/survey team ***Comment:*** A good component facilitating analysis of nutrition status for infants	The software component maintained	As per first testing	
	Minimal validation and customization capabilities ***Comment:*** Include the data validation and customization options		As per first testing	Will be extended in the future
8 Others	**Exportation of files**: data can only be exported to other programs through Excel. ***Comment:*** Compatibility of the NUTRISURVEY software with other 2-3 (at least) statistical packages is recommended	Since this is not done very often the idea was to do it only into one program with which nearly all users are familiar. It is one step more but prevents a lot of possible problems.	The data easily exported to other software programmes through Excel	
	Importing files: The EPI-info option of importing the data from does not work. The one way interaction between NUTRISURVEY and Excel is not appropriate (data from NUTRISURVEY to excel and not from excel to NUTRISURVEY) ***Comment:*** Two-way transfer of data from one program to another and vice versa needs to be possible.	If the EPI info file contains the variables SEX, AGE, WEIGHT and HEIGHT the import should work. If they are not found a message appears now which mentions this. NUTRISURVEY can directly open .txt files which are created in Excel on the basis of an exported file from NUTRISURVEY.	EPI-Info option of importing the data failed and needs to solved Text files can be imported	In the new version there is a simple paste function included which enables copying of columns from Excel to NutriSurvey. Therefore this problem should be solved now.

	Copying and pasting of data either within the NUTRISURVEY or from/to other programs ***Comment:*** Data transfer or exchange between NUTRISURVEY and other programs should be possible.	Technically not easy but planned for a later version.	Same as first testing	Pasting from the clipboard into NutriSurvey is now possible but there is no possibility to copy and paste in a NutriSurvey file. This has still to be done in Excel.
	Software ***help module*** lacking ***Comment:*** The NUTRISURVEY ***help module*** inclusion is necessary to answer queries during program use.	Will be included when the more final version is available	Help Module not yet available	
	Language of instruction incase of an error is not English and many users may not be conversant with the language. For example (a)Das angegebene Dokument auf diesen server nicht gefunden warden" (b) "ist kein gultiger Integerwert ***Comment:*** Instructions on trouble shooting in other more conversant languages like English, French, Arabic, Spanish etc is recommended	This should only be a temporary problem. In the final version this kind of messages in German shouldn't appear.	As per first testing	
	Key issues that should be contained in the report are included and outlined in the sample draft report Comment: A good guide to an exhaustive report	Sample report guide and summary of results available	As per first testing	

6. Comparison between NUTRISURVEY and EPI Info 6.04

Three raw data sets from three anthropometric nutrition surveys (Luuq, Galgadud and Jilib Riverine Districts) in Somalia were entered into NUTRISURVEY and EPI Info 6.04. A comparison was made between the two software programmes on:-

1. Operating System platform
2. Data Entry
3. Computation of z-scores
4. Data cleaning
5. Data analysis
6. Data Exportation and importation
7. Graphic Presentation

	NUTRISURVEY	**EPI 6.04**	**Outcome of First Testing FSAU, October 2004**	**Action Taken/Comments (Juergen Erhardt)**	**Outcome of Second Testing (FSAU, November 2004**	**Comments (Juergen Erhardt, December 04)**
1. Operating System Platform	100% Window based	MS-DOS based	EPI Info commands are type manually. Syntax of commands use is compulsory in EPI-Info		As per first testing	
2. Data Entry	• Anthropometric variables are inbuilt • Anthropometric data entry screen open when software is opened • Validation of data is limited • Customization of data is limited	• Creation of questionnaire required • Data entry screen generated later • Validation of data unlimited • Customization of data is available and decision on the level of customization is made by the software user	• Time spent in data entry in equal number of variables not significantly different • Data validation and data customization in NUTRISURVEY is required	There is no unnecessary keystroke in NUTRISURVEY (this was not correct with the older version) and things like Cluster, ID number are filled out automatically. The focus of NUTRISURVEY is on the anthropometry part. Every additional variable increases the risk that the quality of the anthropometric data is	Limited data validation and customization present in NUTRISURVEY	

				compromised. Therefore NUTRISURVEY enables the use of additional variables but doesn't encourage it. It could be that a later version will have the possibility to manage better these additional variables		
3. Computation of z-scores	• Computed automatically during data entry • Limited indices are generated, if generated not all presented in the report	• A process needed to generated indices • A wide range of nutritional indicators generated at the same time	A significant time is spent generating indices in EPI Info. However, the indices are many in EPI-Info		As per first testing	
4. Data cleaning	• Plausibility check and red marking of z-scores • Limited for additional variables like presence of diarrhea, coughs etc	• A process with several steps	NUTRISURVEY – Develop a component to remove z-scores outliers automatically	Consultation with Prof. Golden to be done	Z-scores outliers still available with NUTRISURVEY	
5. Data analysis	• Data analyzed automatically • Limited analysis • Statistical component to pick other variables (apart from anthropometric data) not available	A process with several steps to be followed Can handle a wide range of statistical demands	• NUTRISURVEY-MUAC data not analyzed by standard categories • NUTRISURVEY – CMR and U5MR not analyzed in the tables automatically	The limitation has the advantage that it is much easier for new users and helps in standardization of evaluations. Since it is very easy to transfer the entered data to Excel it shouldn't be a big disadvantage. CMR and U5MR are now included in the report	• NUTRISURVEY:- MUAC data not analyzed by standard categories • NUTRISURVEY:- CMR AND U5MR included in the report	•

6. Exportation and Importation of data	• Exportation - Data can only be exported to other programs through Excel • Importation – Only data from EPI info 6 is expected to be working (so far not working)	• Exportation – Data can be exported to several programs • Importation – Data can be imported to four different programs	Compatibility of the NUTRISURVEY software data exportation and importation to other 2-3 (at least) statistical and database packages is recommended	The file format which NUTRISURVEY is using can also be directly opened by other programs but the most easiest and reliable way is to use the transfer to Excel. Sometimes additional functions can confuse more than they are helping. The idea of NUTRISURVEY is to use it as a starting point for entering the data and basic evaluation. Therefore the import function is not very developed (only .txt files which have a similar structure can be directly opened)	• Data can be exported to excel and not to other programmes • Text files can be imported to NUTRISURVEY if they have standard variables AGE, SEX, WEIGHT and HEIGHT	•
7. Graphic Presentation	• Limited to z-scores only • Distribution missing distinction by sex (curves for each and all) • Curves are not smooth • Age by sex pyramid not presented	Capable of presenting z-scores and medians	• NUTRISURVEY – Develop a component to show shift of z-scores for boys and girls separately • NUTRISURVEY - Improve on smoothness of the curves • NUTRISURVEY:- Age by sex pyramid required in the report	For statistical reasons % of Median is not recommended. It is mostly only used in emergency settings to decide if a child has to be included in a feeding program or not. For this purpose the single values are still in the software.	• Curves separated for boys and girls • Curves are not smooth • Develop a component to avoid over writing of graph header by curves • Consistent of n is required (see appendix 3 • Incorporate population pyramid in the report	The curves are now smoothed and can also be separated for girls and boys

7. Conclusion

In general the NUTRISURVEY content and structure was found unique and user friendly and with potential for making nutrition data management easier. The latest version of NUTRISURVEY (December 2004) can be used to enter and analyze any rapid nutrition assessment survey data with ease.