Quantitative Skills
Consultancy for Research and Statistics

SISA

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MsWindows programs
Mostly these programs contain versions of the procedures which are also available on the website. But don't be mistaken, because of the easier programming environment the windows programs are generally faster, more precise, more robust, and with better error trapping. The easier programming also allows for developing more demanding programs in computing terms, and you might find some procedures in these windows programs you will not find anywhere else. On the other hand, the emphasis in developing new things is now on developing the website, and less on developing windows programs. You will therefore find newer ideas primarily on the website. Click procedure name to download program.

Lifetables
Mortality Analysis for Demography and Epidemiology. The program will calculate the life expectancy, including all intermediary statistics, variance an confidence interval for the life expectancy, Potential Gains in Life Expectancy (PGLE), Years of Potential Life Lost (YPLL) and Lifetime Years of Potential Life Lost (LYPLL). YPLL can be calculated adjusted for competing causes of mortality and both YPLL and LYPL can also be discounted. Two populations can be compared using direct and indirect standardization, the SMR and CMF and by comparing two lifetables. Confidence intervals and statistical test are provided. There is an extensive helpfile in which everything is explained. You can find the manual for this program here.

Distributions
SISA-Distributions allows for the analysis of discrete single dimension distributions. The program is based on various manipulations of the poisson, binomial and hypergeometric distribution. Available are the probability of an observed number of cases given a certain null hypothesis, the calculation of exact poisson, binomial or hypergeometric confidence intervals, the exact and approximate size of a population using catch-recatch methodologies, the full analysis of a Poisson

distributed rate ratio, Fieller analysis, and two versions of the negative binomial distribution can be used in various ways. Beside the exact procedures there are also various approximate procedures available. You can find the manual for this program here.

Multinomial

The multinomial program is the exact solution to the Chi-square Goodness of fit test of testing for a difference between an observed and an expected distribution in a one-dimensional array. For example, the test can be used to compare the distribution of diseases in a certain locality with an expected distribution on the basis of national or international experiences using an ICD classification. In a two-category array the multinomial test provides a two-sided solution for the Binomial test. For example, Multinomial {10 20 0.20 0.80} gives the two-sided probability (0.105) for the single sided Binomial {0.20 10 30} probability (0.061). The multinomial allows you to work with empty '0' observation cells although you must have an expectation about a cell. You can find the manual for this program here.

Tables

SISA-Tables is a program for the analysis of tables with up to 2*7 and 3*3 cells. The program allows for exact and approximate statistics to be calculated for traditional, ordinal and agreement tables. Fisher exact, Number Needed to Treat, Proportional Reduction in Error Statistics, Normal Approximations, Four different Chi-squares, Gamma, Odds-ratio, t-tests and Kappa are among the many statistical procedures available. You can find the manual for this program here.

Weighting

Weighting calculates sample weights according to the cell weight procedure. The design factor and the effective sample size for the resulting set of weights is determined. It is possible to specify a value above which extreme weights will be trimmed. The not trimmed weights will be recalculated. You can find the manual for this program here.

Beta Intra correlation

The intra correlation program calculates intra correlations and design effects for clustered samples were the outcome measure is the number of positive responses per cluster. Confidence intervals and other statistics corrected for designeffects can be calculated. It is possible to compare two groups of clusters with a t-test procedure. You can find the manual for this program here.

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Spreadsheets

There are two spreadsheets available, a spreadsheet that does demographic analysis and another spreadsheet for the calculation of intracorrelation coefficients. The spreadsheets are in MsExcel format; if you have set up your computer correctly your computer will start up Excel and load the spreadsheet into Excel automatically after you double click the procedure name. You have to cut and paste your own data into the spreadsheets. Sometimes it is necessary to remove or add a couple of rows to make the spreadsheet fit the data, always be very careful in doing that. Be particularly careful with top and bottom rows. There are no columns to be changed, so dont do that. Quantitative Skills will check if a spreadsheet you changed is correct for a flat fee of $20.- and will customize a spreadsheet, within reasonable limits of our time, for $50.-

Lifetable

The lifetable spreadsheet does a full abridged current life table analysis to obtain the life expectancy of a population. Furthermore, one can calculate Potential Gains in Life Expectancy (PGLE) after removing cause k, considering competing causes of death; the (Premature) Years of Potential Life Lost (YPLL), this is the number of person years added to the total number of person years lived in a population if cause of death k would be removed; the Standardized Mortality Ratio (SMR), standardized numbers per 100,000 and the Comparative Mortality Figure (CMF) can also be calculated. More.....

Discounted YPLL

This spreadsheet contains the procedure to discount the YPLL if you only have mortality by age. It has a very good explanation Here.....

Intracorrelation

The spreadsheet does intra correlation calculations for dichotomous or binary yes/no type outcome variables according to two different methods proposed for the single cluster one by Fleiss and another one by Bennett et.al. A third spreadsheet concerns a method for two clusters by Donner and Klar. You will have to insert your own data by overwriting the tables in the second (total number of positive responses) and third (total number of negative responses) or fourth column (total number). More.....

Distributions

A collection of 22 spreadsheets which demonstrate various statistical distributions

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MsDOS programs

The programs below are for use on MSDOS computers. The procedures are the predecessors of the current SISA programs and the the MsWindows programs above. These procedures are no longer maintained, except for bug fixing, and generally have limited statistical capabilities. The procedures, however, are very fast compared with the HTML/Javascript programs on the Website and are also very small in size. There are a number of procedures which are not available on the website. The general format is simple, if you type the procedure name only after the DOS prompt you get a short description of the procedure. Procedure name plus a number of parameters runs the program. Output is delivered on screen or on file. Click procedure name to download program.

Hypergeometric

This procedure calculates the hypergeometric probability distribution to evaluate hypothesis in relation to sampling without replacing in small populations

Binomial

This procedure calculates probabilities for sampling with replacing in small populations or without replacing in very large populations. Can be used to approximate the hypergeometric distribution. The binomial is probably the best known discrete distribution.

Poisson

Calculates probabilities for samples which are very large in an even larger population. Is used to approximate the binomial distribution, try to compare it with the binomial!
The distribution is more often used in a completely different way, for the analysis of how rare events, such as accidents, cumulate for a single individual. For example, you can use it to estimate your chances of getting one, two, three or more accidents in any one year considering that on average people get 'U' accidents per year.

Negative binomial

Also used to study accidents, is a more general case than the Poison, it considers that the probability of getting accidents if accidents clusters differently in subgroups of the population. However, the theoretical properties of this distribution and the possible relationship to real events are not well known.

Negative binomial

Another version of the negative binomial, this one is used to do the marginal distribution of binomials (try it!). Often used to predict the termination of real time events. An example is the probability of terminating listening to a non-answering phone after n-rings.

Multinomial

Same as the multinomial above, this one for DOS computers.

Fisher

Is used to calculate the exact p-value in 2*2 tables. It is o.k. for one sided testing but not so exact for two sided testing, where there are different theories about how to do it. The sum of small p-values is the most used method, but there does not seem to be a good rationale for that. Use the fisher exact instead of the Chi-square when you have a small value in one cell or a very uneven marginal distribution.

SPRT

This method of analysis is not often used, which is a pity because it is actually quite good. It is based on the case of phenomena being observed, tested, or data collected, sequentially in time. The testing or data collection is stopped as soon as some upper or lower limit is crossed of the proportion positive or negative events or outcomes relative to the total number observed. Was originally developed to keep the costs of 'destructive' testing low. Is sometimes used in medical trials to monitor the amount of negative side effects and to decide if the trial should be stopped because the number of side effect is considered unacceptably high.

Chi-square

Calculates the Chi-square and some other measures for two dimensional tables

Casro

Calculates response rates according to different procedures. The CASRO (Council of American Survey Research Organizations) procedure is the 'accepted' procedure for surveys.

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