
Subject: Anthropometric variables

Posted by [baremma2002](#) on Mon, 21 Oct 2013 12:54:35 GMT

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I'm working with Cote d'Ivoire 1998-99 and 2011-12 DHS data. In the Child's Recode file (CIKR61FL), the HW1 and HW3 variables are Child's age (in months) and height (in cm, 1 dec). The HW4 variable shows the Height/Age percentile, HW5 the Height/Age standard deviation and HW6 the Height/Age percentile of reference median.

My questions are then:

- 1) How are those three variables HW4, HW5 and HW6 computed?
- 2) How can I compute the chronic malnutrition prevalence (30%) among children under 5 years (DHS 2011-2012)
- 3) How to deal with the missing values? Are they to be dropped or imputed? Why the missing values when measuring height? Was the age not known by the child's mother?
- 4) There is a DHS cluster (cluster 149) located in the Atlantic ocean and in the North-East. Is it possible?

Thank you very much for your answers.

Emmanuel BARANKANIRA

Subject: Re: Anthropometric variables

Posted by [Trevor-DHS](#) on Wed, 30 Oct 2013 19:21:18 GMT

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In answer to your questions:

- 1) First it is important to be aware that there are several sets of variables related to anthropometry in the DHS datasets, with variations due to a) changes from the WHO/CDC/NCHS Anthropometric Reference to the newer WHO Growth Standards, and b) a change due to changing the unit of analysis from children aged under 5 of interviewed women to all children under age 5 living in the household. With the combination of these we thus have 4 groups of variables, as follows:
 - a. In the KR file, HW4-HW13 for children under age 5 of interviewed women using the older WHO/CDC/NCHS reference.
 - b. In the KR file, HW70-HW72 for children under age 5 of interviewed women using the newer WHO Growth Standards.
 - c. In the PR file, HC4-HC13 for all children under age 5 living in the household using the older WHO/CDC/NCHS reference.
 - d. In the PR file, HC70-HC72 for all children under age 5 living in the household using the newer WHO Growth Standards.

The algorithms for the calculation of the Z-scores for the older WHO/NCHS/CDC reference and the newer WHO Growth Standards are both quite complicated. For information about the older WHO/NCHS/CDC reference, see <http://www.who.int/nutgrowthdb/about/introduction/en/index3.html> for some general information.

For the newer WHO Growth Standards see <http://www.who.int/childgrowth/en/>. This page and the pages under it provide the details of the WHO Growth Standards and the calculations. If you want to see code for calculating the z-scores, look at the Software page for examples. Of particular benefit on the Software page is the link labeled "Special SPSS" which links to a page that contains code for calculating the Growth Standards based on DHS data.

Depending on the date of the survey and the approach used at the time of the survey, some or all of these variables may not be available. In particular, prior to the switch to measuring height and weight of all children under age 5 living in the household, the data were collected as part of the women's interview and in that case variables HC4-HC13 and HC70-72 do not exist in the PR file.

Also, for most surveys conducted prior to the introduction of the WHO Growth Standards, variables HW70-72 and HC70-72 do not exist in the KR and PR files. However, DHS has calculated these variables later and they can be found in separate datasets that can be linked to the KR and PR files respectively. These datasets are called the HW files. For example, for Cote D'Ivoire 1998-99 they are contained in the CIHW3A?? files that can be downloaded from the web site (see http://www.measuredhs.com/data/dataset/Cote-d-Ivoire_Standar-d-DHS_1998.cfm?flag=0 for the datasets for Cote D'Ivoire).

DHS now uses the PR file and variables HC70-72 when reporting the nutritional status of children to report estimates for all children under 5 using the newer WHO growth standards.

2) For chronic malnutrition prevalence, DHS usually reports the percentage of children below -2 standard deviations of height for age (stunting). DHS first selects the children to include in the tabulation, using the PR dataset. From this, children under the age of 5 years ($HC1 < 60$ months) who slept in the household the previous night ($HV103 = 1$) and who have anthropometric Z-scores calculated ($HC70$ is not missing and $HC70 \leq 9990$ see notes below on why scores may be missing or flagged) are selected. Within this denominator, the percentage of children with a Z-score below -2SD ($HC70/100 < -2$ [$HC70$ has two implied decimal places], or alternatively $HC2 < -200$).

3) Missing values and flagged cases are dropped from the numerator and denominator. Children may have missing or flagged values for several reasons:

- a) The child was not measured as the child refused to be measured, the parent(s) refused to allow the child to be measured, or the child was not present in the household at the time of the interviews,
- b) The measurements for the child were outside of the minimum and maximum possible ranges for a child of that age and sex,
- c) The combination of height, weight and age are impossible together (for example, the height and weight may be within range individually, the child may be in the 1st percentile for height for age and the 99th percentile of weight for age, or vice versa (these are examples, the exact

combinations are given on the WHO web site referenced above, in terms of combinations of Z-scores),

d) The date of birth of the child was not reported to the month. If the age of the child is known in years only, this is not sufficient to calculate the anthropometric Z-scores accurately. Ideally, day, month and year of birth are needed, however DHS imputes the day of birth if it is not given, but the month and year are required to be reported. For the variables in the KR file, children who have died obviously could not be measured and they do not have anthropometric measurements.

4) Cluster 149 from the 2011-12 GPS dataset is listed as missing since we were unable to verify the location. All missing clusters are recorded with coordinates of 0,0 and are listed as "MIS" in the SOURCE field. The coordinates 0,0 is at the intersection of the equator and the prime meridian and will show up on a map as being in the Atlantic Ocean (Try entering the location 0,0 into google maps and you see that it is a point south of Ghana in the ocean.) You can refer to the existing thread on points with coordinates 0,0 for more information on this topic: <http://userforum.measuredhs.com/index.php?t=msg&th=71&start=0&>.

Regards. Trevor
