Reviewer's report

Title: Household and community socioeconomic and environmental determinants of child nutritional status in Cameroon

Version: 2 Date: 31 May 2005

Reviewer: Colleen Doak

Reviewer's report:

General

This article relates to an extremely important topic, namely the high and rising conditions of under-five (childhood) malnutrition in Cameroon at a time of economic stress. The conditions in Cameroon, as described by the authors, is of particular interest because the pattern is the opposite of what has been occurring in many other developing countries. Many developing countries are experiencing economic growth and, thus, a pattern of rising obesity and chronic disease (see work by Popkin et al related to the nutrition transition). Clearly, the experience of Cameroon between 1991-1998 was the opposite. The fact that Cameroon did experience a worsening in childhood stunting and overweight between 1991 and 1998 sets it apart from the experience of other countries and this is clearly explained as being related to the economic conditions, as described by the authors. Overall, I would say that this is a quality paper showing some very important results but the paper could be made easier to read with some reorganization, some additional explanation, and with a few changes to in the way results are presented.

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

1. The whole paper needs to be placed in the broader context of current global patterns i.e. the trends in Cameroon that are opposite to the nutrition transition experienced elsewhere. Clearly, the Cameroon experience is different and this difference was already explained by authors as being related to the worsening economic trends that distinguish the experience of Cameroon vis a vis other countries. However, as it stands, the results of this study are not presented in relation to the global context, which weakens the paper.

2. A number of community and household level variables were selected for analysis. Some of these choices were very clearly explained (such as the model developed by Ferguson) but not all of the choices for inclusion have been so clearly explained. Please describe the theoretical basis for all variables chosen. Specific examples and issues related to community and household level variables are given below.

2A. On page 5 the authors describe individual and household level variables, described as level one. However, it is not clear why individual and household level variables lumped into the same level rather than split into separate levels. Are household level variables, described here (economic status, source of drinking water etc.) considered to be individual level determinants? Further explanation is necessary.

2B. Page 6 describes household economic status and maternal health-seeking behavior as index variables based on Ferguson et al. Are these still level 1 variables? Is this a further explanation for the variables previously introduced on page 5 under the Variables paragraph, or is this a distinct
description including additional, new, variables that have not already been introduced?

2C. A clear explanation for the use of assets as a measure of economic status using observed and unobserved predictors is given on page 6. The model postulates if this were presented earlier it would be easier to understand the justification for the choice of variables that are related to economic status. However, if I understand this right, socio-demographic characteristics that are used to predict economic status also include factors related to mothers characteristics. Further clarification is needed to explain the level 1 variables related to mothers characteristics, household variables and child characteristics. Which of these predictors (also listed in Table 2) are used to predict economic status? What is the basis for including other level 1 variables (not related to household economic status) and what is the motivation for their inclusion?

3. Given the focus of the paper, the contribution of community-level variables to childhood health must be emphasized and explained very clearly and in more detail. Why these variables? Some of the variables seem to be level 1 variables (such as an electric stove or gas as cooking fuel or having an unfinished floor). What is the basis of the inclusion of such variables? If a child lives in a household with a finished floor will he/she does it affect THAT child’s health if other households have unfinished floors? If so, what is the basis for such a supposition?

4. The model(s) entered in the multilevel linear regression are not clear. Was a single multilevel model entered, including all variables, for 1991 and then run again for the 1998 data? It is not clear how the differences between results in 1991 and 1998 are being interpreted. If the result is not significant in 1991 but significant in 1998, what does this mean? What if the opposite were true? How was that interpreted?

4A. The basis for determining statistical significance in the bivariate models are stated clearly, but what is the basis of determining statistical significance for the multilevel models? This should be stated clearly in the methods?

4B. The basis for interpreting the multilevel models when the results differ between 1991 and 1998 is also not clear. The criteria for interpreting the comparison between 1991 and 1998, for the multi-level models results, should be stated clearly in the methods.

4C The p-values are not shown in the Tables and this limits the ability of the reader to draw conclusions about the results or to interpret Table 3. Please include the p-values or if the p-values or explain why they are absent. If the motivation of the multi-level modeling was to assist in the interpretation of the bivariate results, this should be explained clearly.

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

1. Table 1 is hard to read. Is this just a listing of sample sizes? I assume that the label Clusters refers to sample clusters but as it stands the label is confusing. The title should be changed to reflect the information, i.e. if the purpose of this Table is to show Regional distribution, the word Regional should be used to replace Geographical. The word Country is confusing in this case, as there is only one country (Cameroon), can this be replaced by Total Sample Size? Can percentages be given also to indicate what percent of clusters/households/children come from each region. Why are Yaounde/Doula presented separately from other cities/towns? Can you indicate this in the table by marking Yaounde/Doula as Large Cities with a footnote indicating specific cities and Other cities/towns as Intermediate Cities?

2. Table 3 would be easier to read/interpret if the reader could easily scan the table and see which variables are statistically significant. A symbol marking the variables that are statistically significant would help. As it stands the reader has to read the 95% confidence interval and make notations themselves to remember which variables are significant.

3. In Table 3 After the reference group it would be helpful to say (Reference) rather than (R) or explain the meaning of (R) at the end of the table.
Discretionary Revisions (which the author can choose to ignore)

1. A brief explanation of why the authors have chosen to use WAZ and why it is included in the model as linear would be helpful. I have worked primarily with an older age group, therefore I am accustomed to using categorical measures of nutritional well being, at least for the purpose of presenting prevalences. I understand that using WAZ in the model as linear for statistical power. However, is there a measure of undernutrition based on WAZ that is equivalent to stunted (-2 HAZ) or wasted (-2 WHZ) that could be used? It would be helpful to know the change in prevalence of composite undernutrition over the period of the study, to illustrate the trends.

2. Page 11 Average weight-for-age z-score fell from 0.70 SD to 0.83 below the reference median this sentence would be easier to read if the numbers were given as negative fell from -0.70 SD to -0.83 SD otherwise at first glance it looks like there is an increase in average WAZ when in fact it is really a decrease.

3. In the introduction it is stated that Studies combining both individual and community factors in a single analytical framework are still needed to provide reliable information for policy and program design. Given that you have made this point and the information that you have presented in the results, more could be said in the discussion and conclusion regarding policy implications related to the results found here.

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No

Declaration of competing interests:

I declare that I have no competing interests.