

# Are we underestimating childhood malnutrition?

A mathematical model to examine current methods of estimating prevalence in surveys.

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**35%** of child deaths and **11%** of total global disease burden can be attributed to nutrition-related factors.

*Childhood malnutrition is central to the UCL Grand Challenge of Global Health*

## Background

Population surveys are used to estimate and monitor **malnutrition prevalence**, which guides resource allocation for treatment programmes. **Cleaning criteria** are applied to raw survey data to exclude extreme values that might represent measurement or data errors. However, these are **not standardised** and their impact on prevalence estimates is unknown. It is therefore possible that childhood malnutrition is being underestimated, giving us an inaccurate understanding of the prevalence of the issue.

## Aims and objectives

**Aim:** To inform nutrition-related decision-making in global health research and policy.

### Objectives:

- To develop a mathematical tool for quantifying the impact of cleaning criteria on malnutrition prevalence estimates.
- To demonstrate how much malnutrition prevalence varies under different cleaning criteria in an existing set of survey data.

## Cross disciplinary approach

Through this project, enabled by the Small Grants Award, we have demonstrated a **synergy between mathematics and health** in informing global health and nutrition research and policy. We have also been able to create a collaborative research team that will **go on to address other issues** in this field where mathematics could bring insight.

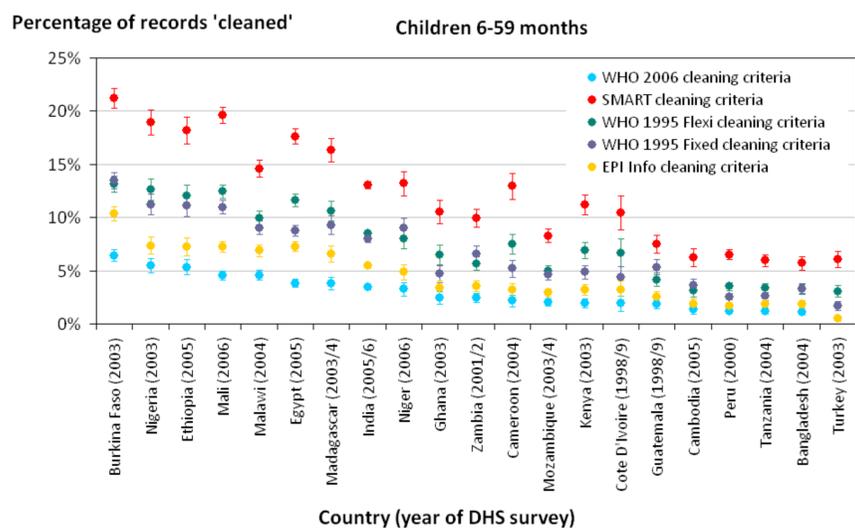


Figure 1: Percentage of records 'cleaned', by country (children aged 6-59 months)

## Activities

Starting in February 2012, we have:

- established a fertile **cross-disciplinary dialogue**;
  - created a simple **computer tool** for quantifying the implications of using different data cleaning criteria;
  - analysed 21 Demographic Health Service datasets using the tool;
  - successfully submitted an abstract for a **poster presentation** at the 2012 Royal Society of Tropical Medicine and Health biennial meeting.
- In progress: expand abstract into a paper for peer-review publication.*

## Outputs and impacts

We have created an Excel-based tool for estimating the impact of different cleaning criteria on malnutrition prevalence. This has been used with existing survey data to **demonstrate the scale of this problem**. See Figures 1 and 2 for preliminary results.

Through dissemination of our findings in relevant policy fora, we intend to **stimulate discussion and debate on this issue**, leading to greater standardisation and harmonisation of nutrition survey methodology and analysis.

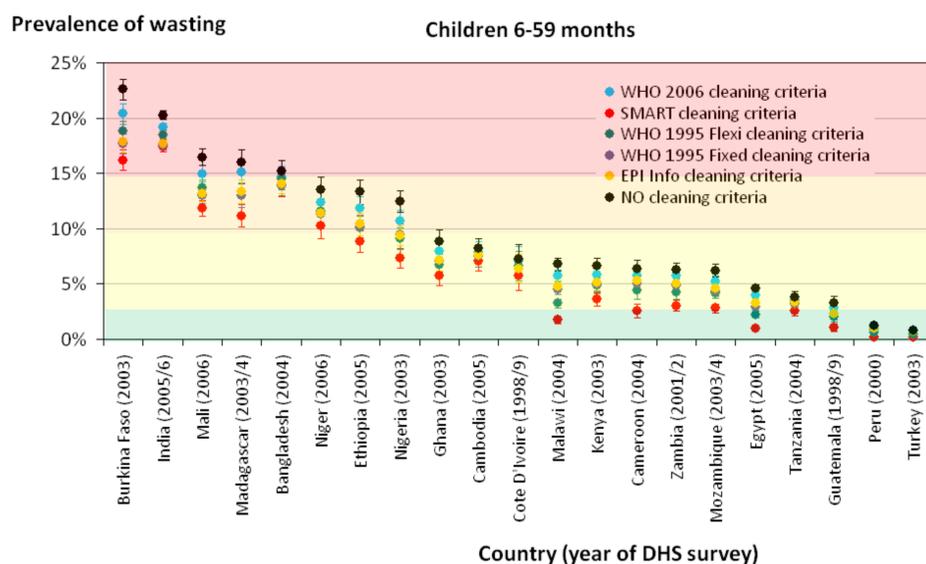


Figure 2: Prevalence of wasting in children aged 6-60 months, by country.

## Conclusions

We have demonstrated that nutrition survey **cleaning criteria have an important impact on prevalence estimates**. Quantifying their influence on malnutrition statistics could **facilitate improved decision-making** when surveys or trends analysed using different criteria are compared.

## Further work

A number of related research questions have arisen during this project and we intend to apply for funding to explore these further.

This UCL Grand Challenges Small Grants Project has:

*“... demonstrated a synergy between mathematics and health in informing global health and nutrition research and policy.”*

