Subject: DHS weights and random effects in a GLMM
Posted by Mark_H_22 on Mon, 07 Oct 2024 17:06:03 GMT
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I am part of a group working with DHS data from Senegal, Mauritania and Gambia to investigate the influence of household and women's characteristics (e.g. wealth, women's education) on food consumption and child stunting and wasting.

We have some questions regarding how to model this in R:

1) Is it appropriate to use DHS weights and random effects in the same GLMM? Both appear to be important, however the "survey" package in R does not allow random effects could we use another package that allows weights and random effects? For instance, we can specify weights in "glmmTMB" and "brms", but is it appropriate to use DHS weights in this way?

2) Alternatively, would it be correct to use a mixed effects model without DHS weights to assess these relationships?

3) In a hierarchical model structure (e.g. with a level for country in the hierarchy), can weights from multiple countries can be included in the same model?

Thank you.

Subject: Re: DHS weights and random effects in a GLMM
Posted by Bridgette-DHS on Tue, 08 Oct 2024 14:07:02 GMT
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Following is a response from Senior DHS staff member, Tom Pullum:

This question goes beyond the range of forum questions, but I will make some suggestions.

In general, DHS weights should be included in every analysis. Otherwise, the results are weighted toward the over-sampled subpopulations, which, with the usual DHS sampling design, are the strata with small populations. The estimates will be biased if you omit weights.

Sometimes, with all software, you come up to the edge of what the current version allows. Certain components of a model, such as weights or random effects, may not be available in the current version. You have to make a judgment call about whether to proceed. The write-up should acknowledge the difference between what you wanted to do and what was feasible.

I suggest doing three separate analyses before deciding whether to pool the three countries. If you pool, the effects for just three countries would have to be fixed rather than random. And if you pool you have to decide whether to weight the countries equally or weight them proportional to size. There have been many postings on this issue.