MedicalXpress

Widely used public health surveys may underestimate global burden of childhood diarrhea

April 3 2019

Public health surveys used in as many as 90 countries may be missing the number of recent diarrhea episodes among children by asking parents and caregivers to recall events two weeks versus one week out, suggests a study from researchers at Johns Hopkins Bloomberg School of Public Health.

The researchers, whose findings were published March 25 in the *International Journal of Epidemiology*, compared the responses to two large public health surveys that were worded almost identically, and concluded that the survey with a two-week recall period, which has been the standard in the field, is less accurate than the survey with a one-week recall period.

"People asked to recall events over a two-week period may remember significantly less than they would if the recall period were just one week," says study principal investigator Natalie G. Exum, Ph.D., an assistant scientist in the Department of Environmental Health and Engineering at the Bloomberg School. "Understanding the global burden of diarrheal diseases in young children is critical to identifying tools to treat and prevent diarrhea in this vulnerable population."

Diarrhea is a significant global health concern because there are between 1 and 2 billion cases of it every year among children under 5, including about 500,000 fatal cases. In many low- and middle-income countries

diarrheal illness is a leading cause of death among young children.

Researchers commonly estimate the burden of diarrheal illness in countries where it is endemic using large-scale, house-to-house surveys of mothers and other caregivers. The most widely used set of surveys, the Demographic and Health Surveys (DHS) sponsored by the U.S. Agency for International Development, ask respondents to recall cases among children in their care in the previous two weeks. The number of recalled cases in this period, as a proportion of the sampled population, is an estimate of "two-week prevalence:" a snapshot of the overall diarrhea burden that researchers can compare to similar two-week snapshots taken at other times or in other populations.

Human recall is subject to error, however, and prior, smaller studies have hinted that a two-week recall period for diarrhea prevalence surveys may yield less accurate results than shorter recall periods.

A newer set of public health surveys, conducted under the Performance Monitoring and Accountability 2020 (PMA2020) project, are almost identical to DHS surveys but use a one-week recall period instead. Launched in 2013, PMA2020 is sponsored by the Bill & Melinda Gates Foundation with direction and support provided by the Bill & Melinda Gates Institute for Population and Reproductive Health and the Johns Hopkins University Water Institute at the Johns Hopkins Bloomberg School of Public Health.

For this study, Exum and her colleagues compared results from PMA2020 and DHS surveys of similar communities in the same five African countries (Democratic Republic of the Congo, Ethiopia, Ghana, Kenya, and Uganda) from 2013 to 2016. The PMA2020 surveys covered 14,603 households and the DHS surveys 66,717 households.

On average, there should be more diarrhea cases in any two-week period

compared to any one-week period. Thus the two-week prevalence—the percentage of the sampled population that had a bout of diarrhea in the two weeks prior to the survey—should be greater than the one-week prevalence. Yet the researchers found that the DHS surveys yielded a two-week diarrhea prevalence estimate of 16.0 percent, whereas the PMA2020 surveys yielded a one-week diarrhea prevalence estimate that was higher, at 21.4 percent. Moreover, the PMA2020 surveys consistently yielded higher estimates than DHS when compared on a country-by-country basis.

The scales of the surveys and the similarities of their questions and covered populations were such that the difference in outcome was unlikely due to statistical "noise," the researchers note.

The authors are recommending that future versions of the DHS use a one-week recall period instead of the traditional two-week period.

"Comparison of 1-week and 2-week recall periods for caregiver-reported diarrhoeal illness in children, using nationally representative household surveys" was written by Katie Overbey, Kellogg Schwab and Natalie Exum.

Provided by Johns Hopkins University Bloomberg School of Public Health