

Assessing the Prevalence and Trends in Obesity: Navigating the Evidence Q&A

On December 5, NCCOR hosted a Connect & Explore webinar on Assessing Prevalence and Trends in Obesity: Navigating the Evidence. A consensus committee convened by the National Academies of Sciences, Engineering, and Medicine recently explored how reports on obesity prevalence and trends differ and what these differences mean for interpretation and application. During the webinar, speakers presented insights from the resulting National Academies report and provided an overview of the various data collection and analysis approaches that have been used in developing reports on the prevalence and trends in obesity across population groups, but particularly as they relate to children and adolescents. Speakers included Shari L. Barkin, M.D., M.S.H.S. (Chair), William K. Warren Foundation Chair and Professor of Pediatrics, Director of Pediatric Obesity Research in the Diabetes Center, and Chief of General Pediatrics at Vanderbilt University School of Medicine; Lynn Blewett, Ph.D., Professor, Division of Health Policy and Management, School of Public Health, Director, State Health Access Data Assistance Center (SHADAC); Jackson P. Sekhobo, Ph.D., M.P.A., Director of Evaluation, Research, and Surveillance in the Division of Nutrition of the New York State Department of Health; and Cynthia L. Ogden, Ph.D, M.R.P., NHANES Analysis Branch Chief/Epidemiologist, National Center for Health Statistics, Centers for Disease Control and Prevention.

The presentations generated many thoughtful questions, some of which the presenters were unable to answer due to time constraints. As a follow-up to this webinar, the presenters have answered all the questions the audience posed during the webinar. Below are those answers.

1. Can you describe how you assess for disparities in the obesity prevalence data?

Dr. Lynn Blewett: Many of the major surveys, such as NHANES and BRFSS, often oversample different population groups. It's important to check with your state on their sampling methodology.

Dr. Shari Barkin: To understand and assess disparities you have to be really clear about how you're defining disparities and then consider the interaction among those variables in terms of age, sex, gender, socioeconomic status, and race/ethnicity. It seems like it should be a straightforward question, but it isn't. You can look at those samples that have larger sample sizes, such as NHANES and BRFSS, because they oversample with the hopes of answering more of those questions.

2. Will there be a discussion of how to derive synthetic estimates by geographic area (state, county, city) and trends over time with the rolling averages?

Dr. Lynn Blewett: This CDC report (https://www.cdc.gov/pcd/issues/2016/15_0480.htm) is really excellent in terms of the methods they use with BRFSS to do small area estimates.

Dr. Cynthia Ogden: It is preferable to use as many data points as possible when doing trend analysis but the "best" point estimate for a subgroup in NHANES may be based on combined survey periods. One concern about using rolling averages is that the estimates aren't independent so a trend test would need to handle covariance.

3. Is there a recommended way to exclude Biologically Implausible Values (BIVs) without affecting the representativeness of the population? Namely, is there a way to parse out which BIVs are erroneous vs. which are true values?

Dr. Jackson Sekhobo: Previously, the CDC had established cutoff points by using the 2000 CDC reference population. Those have recently been updated, to reflect those children whose height and weight value track a higher BMI. We now have newly established cutoff points, which now go up to eight for some of the values, where previously it was up to a discord of five. The report does have a specific table outlining the lower cutoff points, as well as the upper cutoff points for discords for the WHO. There are also references available for the CDC cutoff points.

Dr. Cynthia Ogden: Another option is to compare values to the maximum value in NHANES because we know that those are pretty clean.

4. Is there a recommended method for handling missing data or incomplete data sets with childhood obesity prevalence data?

Dr. Jackson Sekhobo: There are different ways to handling missing data, but for the purpose of the report, the focus is on emphasizing the need to think about how missing values were handled in those studies that may be of relevance for comparison in the future. In terms of end users, what is important is to really ensure consistency in how the missing values are handled. Obviously in some cases, there can be multiple implications—this is where basically the observed values are used to estimate values for those responses that are missing—and then in some cases, the missing values may be excluded entirely if the number of missing values doesn't necessarily represent a significant proportion of the overall sample. The message for end users is really to ensure consistency in terms of the analytical approach that was used to handle missing values because that will ensure that there is comparability across reports or across a particular study and those of relevance in a particular geographic area. Related to the question on synthetic estimates, again it's the same approach because whether you're using synthetic estimates that are generated using prevalence data for adjacent counties or adjacent census tracts, the idea is to make sure the methods used are consistent to facilitate comparison. Part of the challenge is being able to assess whether or not trends are changing in a particular direction—if they are decreasing or increasing in certain geographic areas.

Dr. Cynthia Ogden: Sometimes if it's a complex survey you can reweight the data. If you have a lot of missing data, it's another thing to think about.

5. Can you give some examples for how to publicly interpret findings from different sources (e.g., BRFSS and YRBS [or other state surveys]) against NHANES?

Dr. Lynn Blewett: Typically, at the state level, it's based on self-report or proxy self-report and there is quite a bit of evidence that people respond differently to a self-report about their weight and height. For example, in the Youth Risk Behavior Survey (YRBS), students tended to underestimate their weight by about 3.5 pounds and overestimate their height by about 2.7 inches and that's different depending on whether it's a male or female. It's important to understand that the self-report is not going to be completely accurate. However, it is a source of information that's useful and available and is often used in advocacy and education and is really an important part of the framework of monitoring and assessing obesity.

Dr. Cynthia Ogden: You can also have differences in reporting depending on the method of reporting. If it's a telephone survey vs. an in-person survey, the reporting can be different. One of the interesting things about NHANES is that there are questions about reporting weight and height. But those questions, when you look at self-report in NHANES, actually doesn't match that closely to other self-reported surveys and that's partly because people know that they are going to be measured later. You can have over the phone, in person, in person knowing you'll be measured later so you would have different results, but they all provide some information, it's just different, it's what people think or people are reporting.

Dr. Shari Barkin: It depends on what you're looking for. For example, when you want to understand how you interpret the finding, let's say you're interested in a certain race or ethnicity or socioeconomic status, looking at just the overall summary of the report often doesn't give you those granular details, but typically if you're looking specifically to answer that question you're going to be able to reach into the data that are presented so that you can utilize them to answer questions that are important to you. It was for that reason that we, as part of our task from the committee, designed something called the APT framework which is assessing prevalence and trends in obesity to help people answer those questions in a systematic way.

6. Am I correct in saying that severe obesity in children and adolescents has increased over the years?

Dr. Cynthia Ogden: It depends on what age group you're talking about and it depends on over what time period. If you look at over the last 25 years, it's been increasing particularly in teenagers. Over the last 10 years, we've seen no significant changes because among teenagers the changes have been very small.

7. Where can HEDIS values be obtained? Do those data include demographics (like PPN in public programs, income, geography/census tract)?

- *Dr. Lynn Blewett:* Here is the National Committee for Quality Assurance's (NCQA) list and report of HEDIS measures for health plans: <http://www.ncqa.org/report-cards/health-plans/state-of-health-care-quality/2016-table-of-contents>
- Here is the list of health plans and their rankings using the HEDIS measures: <http://healthinsuranceratings.ncqa.org/2016/Default.aspx>
- Here is information on which states are using the HEDIS measures for their Medicaid programs: <http://www.ncqa.org/public-policy/working-with-states>

8. Does the report or another have the lay person version of what to do when trying to collect heights and weights on various ages of children so that there is uniform guidance on how "practical projects that are collecting data" can ensure that the data is accurately collected and then analyzed?

Dr. Shari Barkin and Dr. Jackson Sekhobo: Appendix D, Tables D-1, D-2, and D-3 in the report provide an overview of how height and weight measurement protocols differ across a collection of studies. These tables highlight considerations such as the equipment used, precision of measurement, number of repetitions, training of the data collector, and the data entry method. The report does not offer a single prescriptive measurement protocol, as resources and circumstances vary across the wide range of data

sources. The characteristics highlighted in Appendix D, however, highlight key considerations that can be applied to data collection protocols.

Regardless of the protocol used, it is important that it be used consistently across the study subjects whose height and weight are being measured to ensure the internal validity (or accuracy) of the obesity prevalence estimate. Similarly, to facilitate comparisons of prevalence estimates from a single study with those from previous reports of obesity prevalence in the same population subgroup or geographic region, the protocol that is used to measure height and weight should be similar to those used in studies that the research team will use for comparisons.

9. How important or not is it to use WHO vs. CDC standards for children birth to 2? Do you have a recommendation for Head Start programs required to assess height and weight?

Dr. Shari Barkin and Dr. Jackson Sekhobo: The WHO and CDC growth charts for young children highlight the difference between a growth standard and a growth reference. A growth standard is considered prescriptive, describing how children should grow with optimal nutrition, health, and environmental exposures. Growth references provide a comparison to a source population, but do not necessarily describe how children should grow.

The primary difference between a growth standard and a growth reference is the characteristics of the children who contributed data. The WHO growth charts for young children are considered growth standards because the study participants had to meet strict inclusion criteria to ensure growth was not constrained. The CDC growth charts, in contrast, are considered growth references because data used to develop the charts were from several cycles of a cross-sectional, nationally representative survey in which children were not selected based on health and nutrition status. The CDC recommends use of the WHO growth standards for children 0 to 2 years of age, and the use of the CDC growth charts thereafter.

Dr. Cynthia Ogden: Methodological differences between CDC and WHO in creating growth curves for ages 24–59 months were minor.

10. For adults, is overweight and obesity increasing, (e.g., prevalence of normal weight decreasing)? What about different population segments (as above) and for children, again by different demographics?

Dr. Cynthia Ogden: Analyses of recent trends in obesity among youth and adults have been published in the following publications.

Ogden CL, Carroll MD, Lawman HG, Fryar CD, Kruszon-Moran D, Kit BK, Flegal KM. Trends in Obesity Prevalence Among Children and Adolescents in the United States, 1988-1994 Through 2013-2014. *JAMA*. 2016 Jun 7;315(21):2292-9. doi: 10.1001/jama.2016.6361. PubMed PMID: 27272581.

Flegal KM, Kruszon-Moran D, Carroll MD, Fryar CD, Ogden CL. Trends in Obesity Among Adults in the United States, 2005 to 2014. *JAMA*. 2016 Jun 7;315(21):2284-91. doi: 10.1001/jama.2016.6458. PubMed PMID: 27272580.

In the Flegal article see: “Adjusting for age group, education, and smoking status, there were significant positive linear trends among non-Hispanic white women (P=.03), non-Hispanic black women (P=.008) and Mexican American women (P=.03). Adjusting for race/Hispanic origin, educational status, and

smoking status, there were significant positive linear trends for the age group 20 to 39 years (P=.02) and also for 60 years and older (P=.03) but not for the age group 40 to 59 years (P=.20). Adjusting for age group, education, and race/Hispanic origin, there were significant positive linear trends for never smokers (P=.03) and for current smokers (P=.01) but not for former smokers (P=.41). Because of the limitations of subgroup analyses ^{20,21}, these results should be interpreted cautiously".

Although there are no statistical tests of trends, estimates by various demographics can be found here:

https://www.cdc.gov/nchs/data/hestat/obesity_adult_13_14/obesity_adult_13_14.htm

https://www.cdc.gov/nchs/data/hestat/obesity_child_13_14/obesity_child_13_14.htm

<https://www.cdc.gov/nchs/hsu/healthrisk.htm#overweight>

11. Are the racial disparities greater in SEVERE obesity (>120% Obese or >140% Obese) in teens (NHANES) than just obesity in US Teens (NHANES)?

Dr. Cynthia Ogden: See the following:

Ogden CL, Carroll MD, Lawman HG, Fryar CD, Kruszon-Moran D, Kit BK, Flegal KM. Trends in Obesity Prevalence Among Children and Adolescents in the United States, 1988-1994 Through 2013-2014. JAMA. 2016 Jun 7;315(21):2292-9. doi: 10.1001/jama.2016.6361. PubMed PMID: 27272581.

Table 2 has prevalence of obesity and extreme obesity in youth and eTable2 has tests for demographic differences in obesity and extreme obesity among youth.

In particular, see estimates below:

Prevalence of obesity and extreme obesity (120% of 95th percentile) and adjusted odds ratios, 2011-2014

	%	OR (95% CI)	%	OR (95% CI)
Non-Hispanic white	19.6%	ref	6.7%	ref
Non-Hispanic black	22.6%	1.34 (1.03-1.75)	11.6%	1.95 (1.32-2.88)
Non-Hispanic Asian	9.4%	0.57 (0.39-0.82)	2.0%	0.31 (0.14-0.71)
Hispanic	22.8%	1.48 (1.23-1.78)	8.8%	1.59 (1.05-2.39)

12. Does the report draw any conclusions about trends by age and different demographic factors?

Dr. Cynthia Ogden: I think it is important to mention here that subgroup analyses should be interpreted with caution since the more tests that are run outside of the main hypothesis test the more likely that there will be a false positive.

Any additional questions can be directed to NCCOR at nccor@fhi360.org