Commentary: Getting ahead of the childhood obesity curve

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It has become painfully clear that we need to be ahead of the curve with respect to obesity development worldwide, beginning in childhood.\textsuperscript{1} The alternative, to let obesity continue to develop uncontrolled, is to accept the inevitability of an increased global burden of diabetes, cardiovascular disease and other chronic conditions. If there are lessons to be learned from the striking occurrence of Type 2 diabetes in obese children in the United States,\textsuperscript{2} we might also expect an increased burden of obesity-related diseases among children themselves. Unfortunately, however, we are far from where we need to be in making major inroads into coping with this problem. For example, the definition of childhood obesity that can be used cross-culturally is still a ‘work in progress’.\textsuperscript{3} This leads to concerns about overestimating or underestimating the problem in a scenario where either type of error could have serious public health consequences.

When we do identify childhood obesity as a problem, our understanding of what preventive actions to take is still rudimentary. This is due in part to what we know about the etiology of childhood obesity and in part to what we do not know. What we know—because of the recent upward trends in diverse societies—is that childhood obesity reflects economically and culturally driven shifts in dietary practices towards overconsumption of energy concurrent with shifts toward lower levels of physical activity.\textsuperscript{1} We do not yet know how to control these forces to stabilize or decrease the population weight distribution. Nor do we know the potential consequences of making the necessarily major societal changes that will be required. Many societal factors that inadvertently cause increases in obesity prevalence have other, beneficial elements.\textsuperscript{1,4} The issues are especially complex during epidemiological transitions. Undernutrition may remain an important public health problem while obesity emerges and increases in prevalence.\textsuperscript{5}

Gulliford et al.\textsuperscript{6} provide us with a well-timed reminder of the challenges involved in estimating childhood obesity generally and as they apply uniquely to children of African and South Asian descent. These authors report on a nationally-representative anthropometric survey of school-age children in Trinidad and Tobago with attention to ethnic differences and environmental determinants of nutritional problems. They are well versed in anthropometric survey methods and present data that, on the surface, would seem to support a straightforward interpretation. In data for 5688 children, age- and sex-specific comparisons of weight, height, body mass index (BMI), and skinfold data are made with an accepted British standard and also with the recently developed international standard based on pooled data from several countries.\textsuperscript{7} Using these standards, the authors also make age- and sex-specific comparisons across ethnicity (Afro-Trinidadian, Indo-Trinidadian, or mixed) by age (5–6 years and 8–9 years). They conclude that both underweight (Indo-Trinidadian children) and overweight (all children) are prevalent, that underweight is more prevalent than overweight, and that, compared to British children, the Trinidadian children had a relatively central distribution of body fat. However, they also raise numerous methodological questions that hinder a clear interpretation of the data from a public health perspective.

Gulliford et al. use British growth reference values that are mostly based on data from children of European descent but point out in their discussion that children of Asian and African descent may have growth, body composition and maturation patterns that differ from those of European children. For example, ethnic differences in both height and fat patterning were notable in these data. The height differences complicate the interpretation of BMI differences, because BMI is related to height in the age range studied. With respect to fat patterning, it is unclear whether ethnic differences in central fat patterning observed during childhood are conformational, pathological or both.\textsuperscript{7} Nor is it clear that fat patterning tracks similarly from childhood to adulthood in different ethnic groups.\textsuperscript{8,9}

The inherent limitations of comparisons based on the British data were presumably the motivation for also including comparisons with the new international childhood BMI standard. This standard provides BMI cutoffs to define childhood overweight and obesity based on values that correspond to a BMI of 25 and 30 at age 18. Unfortunately, although this standard is clearly an improvement over using a single population, its creators note the questionable applicability to children of Asian descent.\textsuperscript{3} BMI levels of 25 and 30 may underestimate obesity-related risks in adults of Asian-descent populations and are, therefore, probably not the best cutoffs for these populations.\textsuperscript{10}

The issue of possible ethnic differences in tracking from childhood to adulthood is also relevant here. Although small departures from the trajectory embedded within the international standard may not have a large effect on child obesity prevalence estimates, the differences of interest for early identification of excess obesity prevalence may be relatively small (e.g. a change from 2% to 3% would be a 50% increase).

The explorations of BMI determinants included in the Gulliford article support the view that the distribution of childhood BMI in Trinidad reflects social and environmental influences. BMI was directly related to higher maternal education and inversely related to family size and to living in overcrowded conditions. Even though the ethnic differences in BMI

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distributions were not entirely explained by the measured socioeconomic factors, the determinants of BMI appeared to be similar across ethnicity. These findings imply that aside from the ability to address undernutrition, levels of obesity will increase as the standard of living improves unless preventive measures are implemented.

Taking this report by Gulliford et al. as baseline data, regular and frequent monitoring of childhood weight levels would seem prudent. Even when there is uncertainty about what standard to use to define obesity prevalence in absolute terms, valid within-population comparisons of relative changes in obesity prevalence can be made against the same standard over time. As exemplified by Gulliford, such monitoring should use categorical variables to define under- and overnutrition rather than relying solely on mean BMI since it is the tails of the distribution rather than central tendency that are of interest.

The epidemiological transition takes different forms in different places, but there is no reason to believe that Trinidad and Tobago will avoid completely the convergence of obesity-promoting societal changes that already threatens other middle-income countries in the region. Many of these changes are driven by factors that easily cross national borders and impact directly upon individual and family lifestyles. To the extent that the problem of childhood obesity is not yet out of control in Trinidad and Tobago, there appears to be an opportunity for primordial prevention.

References