A robust discussion followed the presentation of each paper at the forum. In the sections below we have tried to capture the most salient points raised during the discussion. As a result, many of these points were not considered in the articles that comprise this supplement but are highly relevant to the screening, surveillance, and reporting of BMI.

**MEASURING BODY FAT**

There was general agreement that BMI was a sound epidemiologic tool for the assessment of overweight and obesity in populations, as well as a useful clinical tool. Several limitations with respect to the use of BMI were raised or confirmed. These limitations included use of triceps skinfold measurements to further differentiate children at risk whose BMI was between the 85th and 95th percentiles, additional efforts to clarify BMI measurements beyond the 97th percentile, self- or parent-reported height and weight, and challenges with communication of the meaning of BMI to parents. As Freedman and Sherry\(^1\) indicated, the use of the triceps skinfold does not provide much useful additional information except for children between the 85th and 95th percentiles. In this group, an increased triceps skinfold helps distinguish children who are overweight but not overfat from children who are overweight because of increased body frame or muscle mass. Although 1 published article suggested use of the 99th percentile for the classification of severe obesity, extrapolation of BMI categories beyond the 97th percentile is based on few measurements and, therefore, should be done with caution. Efforts should be made to achieve a consensus on how to classify severely obese children.

Several investigators emphasized the limitations of self- or parent-reported height and weight for calculating BMI. Himes\(^2\) indicated that the direction of biases in parental reports is uncertain. However, staff of the National Center for Health Statistics have noted that BMIs based on parent-reported height and weight classify too many chil-
dren as overweight and obese. Therefore, those who use self- or parent-reported heights and weights must document the reliability and validity of these measures.

**SURVEILLANCE OF CHILDREN’S BMI**

**International Context**

Because child obesity is pandemic, there is a need to address surveillance issues in all countries. Participants felt that because BMI seems to be the most effective means of assessing obesity, it would be suitable for broad-based screening programs in international settings. Although nuances related to the use of BMI need to be considered, they do not negate the use of BMI. However, BMI growth charts from developed countries may not be suitable for use in developing countries. In addition, issues such as BMI and stunting, use of Centers for Disease Control and Prevention versus World Health Organization growth charts, and the development of more specific cutoffs for overweight/obesity for other populations, such as Asians, need further consideration.

**Community Awareness**

Several comments focused on the broad application of the use of BMI as a tool to call a community’s attention to the problem of obesity, stimulate public health problem solving, and assess progress. BMI surveillance can be used to increase community awareness of need and to assess progress in school or community interventions. One suggestion was that the measurement of BMI alone constituted an intervention insofar as it served to focus the attention of the public, schools, and parents on the results.

**CLINICAL USE OF BMI**

The education of providers about what to do after the BMI is measured is an important gap. Most agreed that the use of the term “obesity” with parents should be avoided. Experience from the New York City Research and Improvement Networking Group indicated that in some ethnic groups fat infants are considered healthy. Therefore, discussing excess body weight in a supportive rather than accusatory fashion is an important challenge. A useful tool for conveying risk to parents may be a BMI chart that is divided into red, yellow, and green zones on the basis of BMIs in the obese, overweight, and healthy weight ranges, developed by the Center for Enhanced Child Health at Dartmouth. Consumption of healthful foods and being physically active are strategies that would provide health benefits even if weight could not be reduced.

The limitations of BMI need to be understood by clinicians, parents, and patients. Although body fat is increased in children and adolescents with BMIs at ≥95th percentile, the BMI does not measure body fat directly. However, there are no good standards for cut points based on adiposity that indicate increased risk. Although SD (z) scores are used extensively by researchers, they are of limited utility clinically. However, the group recognized the need for useful and practical measurements that differentiate the degree of obesity among children and adolescents with severe obesity.

Gaps were recognized in the need for clinicians to be able to quickly and reliably assess diet and physical activity. Experience in several managed care plans and clinics has indicated that brief motivational interviewing is a useful tool for engaging families and often leads to a useful discussion about how to change what the child eats or drinks or how much time the child spends watching television. In addition, there was broad recognition of the need to link clinical to public health settings to achieve changes in diet and physical activity. Community health centers, nutritionists, dental hygienists, and school nurses represent potential resources that should be considered and used.

**COMMUNICATING ABOUT CHILDREN’S BMI**

Communicating about BMI results needs to proceed in a thoughtful manner regardless of whether the results are communicated through a clinical setting, through a screening program, or as surveillance information about the extent of the problem in a community. Although there have been few direct studies in the context of children’s BMI, there has been abundant research overall in the areas of health education and risk communication on which to draw. Best practices from these fields can certainly be applied to the case of children’s overweight.

**Communicating With Parents**

Parents often do not realize that their children are overweight or obese, so an important health education goal is simply to make them aware of overweight and its health consequences. Communicating children’s BMI to parents has not been well studied. Focus groups have indicated that some parents may perceive overweight as healthier or better or are reluctant to identify their children as overweight. Furthermore, although the term “obesity” emphasizes the serious implications of excess body fat for the risk of medical complications, concerns were raised with respect to the use of this term with children, adolescents, and parents. When BMI data are provided to parents, they should be coupled with information about dietary intake and physical activity, as well as resources to help parents address these areas.

**Cultural Context**

Participants felt that it was vital to consider cultural differences when conveying information about children’s BMI, both to parents and their commu-
nities. Culture shapes attitudes and perceptions about weight and health, and it also mediates the response to health information. It was felt that parents need to be armed with the knowledge and ability to use BMI information to make informed decisions, and this must be done in culturally appropriate ways. PEN-3 is a model that incorporates positive, existential, and negative factors developed by Collins Airhihenbuwa. The model is based on 3 domains: cultural identity; relationships and expectations; and cultural empowerment. It provides a conceptual framework for designing culturally competent health education for black parents and communities on the issue of childhood obesity. Culturally competent frameworks can also be developed specifically for Latinos, Native Americans, and other ethnic groups with a higher prevalence of childhood obesity.

**SCHOOL-BASED OBESITY-SCREENING PROGRAMS**

**Rationale for Screening Programs**

The Institute of Medicine has recommended school-based screening programs because BMI is not routinely collected and shared with parents in medical care settings. Studies have shown that parents underestimate the weight status of their children, so at a minimum, screening programs can make them aware of children’s actual weight status and health risks. Moreover, the burden of childhood obesity is disproportionately felt in ethnic minority populations; therefore, the health consequences of parents’ misperception in these communities will be worse. The concerns about this rationale relate not so much to need as to execution. Health professionals pose the same questions that usually crop up for community-based screening programs: (1) What is the linkage to medical care? (2) Is the information conveyed effectively? and (3) Are there unanticipated negative consequences? We are beginning to have answers to some of these questions.

**Experience With School-Based Screening to Date**

Reaction to BMI screening and parental notification in Arkansas was generally favorable. Parents are significantly more aware of the risks of increased BMI and more likely to recognize overweight in their own children, especially among those in the black community. Parents have not reacted in ways that raise concerns. Despite concerns raised in other communities, Arkansas saw no increase in students’ eating disorders, the use of diet pills, or starting diets. Physical activity has increased, and purchases from vending machines are decreasing. Political leaders and school officials have been generally supportive. More discussion was focused on what to do with these data. School-based screening data (as opposed to surveillance) will be useful only if there are effective responses on the part of care providers. Nurses might provide an important resource for management, but not all schools have nurses, and not all school nurses are employed by health departments. Model programs that involve school nurses in primary and secondary prevention would be instructive.

Expansion of BMI-measurement programs to other states and school systems faces barriers of time and cost. The most frequent concern raised was the extent to which the human financial resources devoted to screening would compete with and detract from required activities mandated by the No Child Left Behind law. In Arkansas, the costs were approximately $60 per school, but other estimates suggested that these costs might be as high as $500 per school. In West Virginia, some of the logistic problems have been resolved by making BMI screening part of a rural health education partnership that requires all publicly funded universities and health science students to do rural rotations. This approach enables health care students to provide the technical support for measurement of BMI and other health status indicators in schools. Furthermore, the state has provided a line-item appropriation for the measurements.

**Parental Perception Context**

Several issues are important to consider when assessing BMI in schools and reporting the results back to parents. Chief among these are how best to communicate with parents. Important considerations include how best to notify parents in advance as to what the screening will encompass, the consent process, and the option to decline participation. Special challenges arise for non–English-speaking parents and language diversity and translation costs. We are still learning about how best to share screening results with parents. More research is needed on the most effective message content and how the information is framed, the cultural context, and various methods to send the results home, because mailing costs are expensive. The effectiveness and impact of parent-notification programs also need to be assessed.

**Legal and Confidentiality Issues**

Legal and confidentiality issues are important considerations for school BMI screening and reporting programs. It was recommended that legal counsel be incorporated at all stages of BMI program development and implementation. There are privacy and confidentiality concerns underlying data collection, use, and disclosure, including state-based privacy protections for identifiable health data, the Health Insurance Portability and Accountability Act (HIPAA).
Act (HIPAA), which applies to protected health information, and the Family Educational Rights and Privacy Act (FERPA), which applies to educational records. Other issues include limits of state authority and responsibility, the role of informed consent and opt-in and opt-out approaches, and long-term uses of the data. Other considerations are government’s statutory or regulatory authority to require BMI screening. The Arkansas experience has shown clearly that BMI screening is a team effort with input from scientists, policy makers, educators, school administrators, health care providers, technology experts, parents, community leaders, and lawyers.

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Issues and Implications of Screening, Surveillance, and Reporting of Children's BMI

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