

Friday, January 23, 9:00-9:45AM
Plenary Session

Maternal nutrition and birth defects—what's next?

Moderator: Lowell Sever, University of Texas-Houston School of Public Health, Houston, TX

Speaker: Ron Munger, Dept. Nutrition and Food Sciences, Utah State University, Salt Lake City, UT

The discovery that folic acid supplementation can reduce the risk of neural tube defects is a dramatic success story, not unlike the discoveries of the roles of single nutrients in preventing scurvy, beri-beri, and other classical nutritional deficiencies. Further understanding of maternal nutrition and birth defects may follow the more typical course of studies of nutrition and chronic disease—slow, expensive, and with often confusing and contradictory findings. Some cautionary tales from nutritional studies of other reproductive outcomes, cancer, hypertension, and cardiovascular diseases will be discussed. There is no shortage of candidate nutrients for studies of birth defects—animal experiments have implicated a long list of macro- and micronutrients—but their relevance for humans is still uncertain. Causes of maternal (and hence fetal) nutrient deficiencies include primary deficiencies that arise because of low intake of essential nutrients, a problem that is generally more common in developing vs. industrialized countries, and secondary (conditioned) nutrient deficiencies that arise due to genetic factors, nutrient interactions, toxicants including medications and other chemicals, diseases, and physiological stressors (for more discussion of primary and secondary causes and policy implications see Keen, CL et al, (2003) *J. Nutr. Sci.* 133:1597S-1605S). Examples of nutrient deficiencies with broad relevance for birth defects including B-vitamins, vitamin A, and zinc will be discussed from the perspectives of both primary and secondary causes. New methods for nutritional epidemiology are sorely needed, especially in the areas of collecting, processing, and banking biological specimens and high-throughput methods for the analysis of biomarkers of nutritional status. Food frequency questionnaires (FFQs) will likely remain the tool of choice for dietary assessment for large observational studies, with limited possibilities for improvement, but the analyses of FFQs could be enhanced with a broader approach that includes dietary patterns in addition to the sole focus on single derived nutrient scores. The success of studies of folic acid and neural tube defects has had some unintended negative consequences worthy of discussion that include a rather narrow focus on folic acid in subsequent etiologic research on birth defects and in public health interventions in the US and around the globe. A narrow public health policy that focuses on one or a few nutrients may undermine efforts to promote health through diverse and wholesome diets.