

# Commentary on environmental contaminants and pregnancy outcomes

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Respondent for session: "Environmental Contaminants and Pregnancy Outcomes: Exposure Associations with Prematurity, IUGR, Low Birth Weight, Stillbirth"

Drs. Fenster and Windham have done an excellent job summarizing a large body of literature (1). Much epidemiologic data exist in this area, typically more than in topics addressed earlier in the meeting (reproductive and postnatal developmental endpoints and environmental exposures). This is a result of the inherently shorter time frame between key exposure(s) and pregnancy outcomes. Earlier presentations noted the potential for a variety of transgenerational effects of exposure. For example, laboratory animal findings and preliminary human data suggest that maternal prenatal exposure to diethylstilbestrol (DES) is associated with outcomes in her offspring (the grandchildren of the woman who took DES during pregnancy) (2, 3). This emphasizes the importance of taking a longer view of all reproductive and developmental outcomes, including those discussed in this session.

The key to taking this longer view is examination of the continuum of exposures and effects over the life span. Research has highlighted the association of adult conditions with early life exposures. Thus, taking a life-stage approach is critical to a greater understanding of potential effects of toxicants on human health. Exposures before conception to either parent (and possibly grandparent, as noted above), and pre- and postnatal exposures may affect the individual's health both in the short term and as an adult. The importance of critical windows of exposure has been recognized (4), and incorporated into the planning of the research (5), and its use in public health and risk assessment identified (6). This life-stage approach supports the need for and utility of longitudinal studies, specifically studies that measure exposures during a variety of critical windows of exposure within development, and follow the study group through life stages. This could be done with a coordinated, centrally controlled effort, like the National Children's Study (5), or by adding endpoints to existing studies. These endpoints could be added with follow-up examinations or questionnaires, and additional, high-quality exposure data obtained by additional analyses of biologic specimens.

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Banking of biologic and environmental specimens in studies of environmental exposures, while potentially expensive, adds much value to a study of environmental agents. This approach allows examination of exposures of potential concern not recognized at the time of the study, and allows additional measurements as the technology evolves, allowing analysis of a variety of environmental agents with smaller samples (7). Longnecker and his colleagues (8) demonstrated the value of this approach. The investigators were able to assess DDT, and its metabolite DDE, in the Collaborative Perinatal Project. These questions were not identified when the original data were collected from 1959-1965, but could be examined with analysis of banked specimens over 30 years after collection.

Finally, the data presented in this session, and the prior ones, highlight the importance of collaboration among all the groups represented at this meeting: epidemiologists, reproductive and developmental biologists and toxicologists, geneticists, public health specialists, and community representatives. This collaboration will enrich the study, and is key to setting priorities, identifying potential associations, investigating mechanisms, and the use of these data for risk assessment and public health.

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