



Children's
Environmental
Health
Network

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The Honorable Greg Duncan, (Chair) Distinguished Professor of Education, University of California Irvine
Dr. Nancy J. Kirkendall
Panel on the Design of the National Children's Study
and Implications for the Generalizability of Results
Institute of Medicine
Washington, DC

The Children's Environmental Health Network appreciates the opportunity to comment on the design of the National Children's Study (NCS). The Network is a science-based national non-profit created to protect the developing child from environmental health hazards and to promote a healthy environment.

As an organization concerned about the future health and development of U.S. children, we see great potential in the NCS but a potential that will not be met without substantial changes to its design. CEHN still supports the vision of the National Children's Study as it was originally conceived: a study of environmental factors, with a focus on environmental chemical exposures in a child's earliest environments. Unfortunately, the NCS, as currently proposed, will not achieve this goal. We support changes to the NCS study design, as proposed in the August 14, 2013 letter to NCS Director Steve Hirschfeld from the EPA's Office of Children's Health Protection (OCHP).

The NCS, established in the Children's Health Act of 2000, was created to examine the effects of environmental influences on the health and development of U.S. children. The study was to be grounded in basic pediatric facts such as these:

- Children's bodies and behaviors differ from adults. In general, they are more vulnerable than adults to toxic chemicals.
- Children's systems, including their nervous, reproductive, digestive, respiratory and immune systems, are developing. This process of development creates periods of vulnerability when toxic exposures may result in irreversible damage when the same exposure to a mature system may result in little or no damage.
- Children are growing. Pound for pound, children eat more food, drink more water and breathe more air than adults. Thus, they are likely to be more exposed to substances in their environment than are adults. Children have higher metabolic rates than adults and are different from adults in how their bodies absorb, detoxify and excrete toxicants.

- Children behave differently than adults, leading to a different pattern of exposures to the world around them. For example, they exhibit hand-to-mouth behavior, ingesting whatever substances may be on their hands, toys, household items, and floors. Children play and live in a different space than do adults. For example, very young children spend hours close to the ground where there may be more exposure to toxicants in dust, soil, and carpets as well as low-lying vapors such as radon, mercury vapor or pesticides.
- Children have a longer life expectancy than adults; thus they have more time to develop diseases with long latency periods that may be triggered by early environmental exposures, such as cancer or Parkinson's disease.

Emerging research reinforces the importance of better understanding environmental factors, especially chemical exposures.

- The President's Cancer Panel's report *Reducing Environmental Cancer Risk: What We Can Do Now* has not only noted "the growing body of evidence linking environmental exposures to cancer" but also that "the true burden of environmentally induced cancer has been grossly underestimated." The Panel especially identified the harm from prenatal exposures to potential carcinogens: "The American people—even before they are born—are bombarded continually with myriad combinations of these dangerous exposures." Some of the "key issues" impeding control of environmental cancer risks include the "limited research on environmental influences on cancer" and "conflicting or inadequate exposure measurement, assessment, and classification." As the Panel wrote, "the cancer impact of exposures during key "windows of vulnerability" such as the prenatal period, early life, and puberty are not well understood." "Support for large, longitudinal studies to clarify the nature and magnitude of cancer risk attributable to environmental contaminants must continue."
- The American College of Obstetricians and Gynecologists Committee on Health Care for Underserved Women and the American Society for Reproductive Medicine Practice Committee jointly called for timely action to identify and reduce exposure to toxic environmental agents. The groups also noted that "Prenatal exposure to environmental chemicals is linked to various adverse health consequences, . ." and "the effects of low-dose exposure to an environmental contaminant may be quite different based on vulnerabilities. . ." The College and ASRM "fully support rigorous scientific investigation into the causes and prevention of birth defects, including linkages between environmental hazards and adverse reproductive and development health outcomes."
- The American Academy of Pediatrics' recent reports on pesticides have noted "the influences of low-level [pesticide] exposures on child health are of increasing concern" and have called for increased epidemiologic research to better identify and understand health risks associated with children's exposure to pesticides. "Ongoing research describing toxicologic vulnerabilities and exposure factors across the life span are needed to inform regulatory needs and appropriate interventions." "In summary, the true extent and nature of pesticide exposure on adverse fetal growth and birth outcomes is unknown despite suggestive epidemiological studies that link some of the most widely used pesticides to reduced intrauterine growth, fetal death, preterm birth, and congenital anomalies. . . . Studies that examine the timing and extent of exposure to

pesticides and exposure to pesticide mixtures with validated exposure assessment techniques including biological markers are needed.”

These statements reflect the call from science and practice for greater information on the early life exposures to chemicals that our children experience. They reinforce the need for a National Children's Study as it was originally conceived: a study of environmental factors, with a focus on environmental chemical exposures in a child's earliest environments.

We continue to support this vision of the National Children's Study. Unfortunately, the NCS, as currently proposed, is inadequate for achieving this goal.

As the design, structure and data collection of the Study has evolved, its primary purpose of better understanding what chemical/toxicant exposures are experienced by U.S. children and the connections between these exposures and children's health, development, and ability to learn, has been seriously compromised. This erosion ends the ability of the NCS to achieve its original purpose.

Thus, we join with the U.S. Environmental Protection Agency (EPA) in calling for key changes to the current NCS study design. We share a deep concern and we support the agency's observations and recommendations. To quote from the OCHP's August 14, 2013 letter to NCS Director Steve Hirschfeld :

1. *NIH is strongly considering moving from the original prenatal cohort design to one which is primarily a birth cohort.*
2. *NIH is moving away from designing a hypothesis driven study to developing a “data acquisition platform” (see for example – slide #11 <http://www.nationalchildrensstudy.gov/about/organization/advisorycommittee/Pages/Hirschfeld-Overview-NCSAC-January-2012.pdf>).*

For the NCS to fulfill the long term promise of generating the data necessary to understand and inform how early life exposures to environmental, genetic and other factors impact long term health, EPA strongly urges the incorporation of the following three principles in the final design and implementation of the NCS Main Study.

. . . Therefore, we believe it is crucial the following three principles are considered as the NCS moves forward:

EPA's Three Principles:

Principle 1: *The Main Study must have a strong environmental data collection and analyses component that will allow study of potential linkages between exposure sources and pathways, internal dose/biomarkers, and disease development.*

We would like to draw the attention of the IOM panel to the results of the April 2010 EPA-NIH Workshop on Optimizing exposure Metrics For the National Children's Study (http://www.epa.gov/nerl/features/national_childrens_study.html) which we believe should be used as the basis for identifying exposure metrics for use in the NCS (See attached summary table).

Principle 2: *The Main Study must reflect a prenatal cohort design to fully illuminate the impact of early life exposure on disease. As EPA's Children's Health Protection Advisory Committee recommended in a 20-11 letter to the EPA Administrator Regarding Prenatal Exposures and Children's Environmental Health (http://yosemite.epa.gov/ochp/ochpweb.nsf/content/CHPAC_Prenatal_Letter.htm), there is a critical need to "address the prenatal period, key outcomes, and mechanisms in research priorities."*

Principle 3: *To realize the study's long held promise to explore possible links between early life environmental exposures and health effects, the NCS Main Study design needs to allow for the testing of key hypotheses, based on major childhood diseases, without losing the flexibility envisioned by NIH to serve as a platform for testing future, as yet unrecognized hypotheses. The proposed generic data acquisition platform design would limit the adaptability of the NCS for both purposes. Additionally, collection of biomonitoring data alone will not allow an understanding of key sources of exposure necessary to identify a potential problem and ultimately develop mitigation strategies.*

One argument raised for distancing the study from its original intent are the challenges encountered in enrolling participants in the NCS. We would note that other researchers have successfully dealt with this challenge, such as the cohorts created by the EPA/NIEHS-funded research Centers of Excellence in Children's Environmental Health. We believe that such challenges do not justify an unserviceable NCS.

We also strongly urge the NCS staff to establish on-going and authentic communication and collaboration with the Federal partners in this effort, including the National Institute of Environmental Health Sciences, the Centers for Disease Control and Prevention and the U.S. EPA, as well as with key non-governmental public interest stakeholders.

We ask the panel to affirm these recommendations and we look forward to a National Children's Study that is capable of meeting the goals envisioned by its original creators.

Sincerely,



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Board Chair
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