

**Testimony of Tracey J. Woodruff, PhD, MPH
U.S. Senate Committee on Environment and Public Works on**

“Current Science on Public Exposures to Toxic Chemicals”

**Thursday, February 4, 2010
Dirksen Senate Office Building, Washington DC**

**Senator Frank R. Lautenberg, Chairman
Senator James M. Inhofe, Ranking Member**

Good morning, Chairman Lautenberg, Senator Inhofe, committee members and guests. I am Dr. Tracey Woodruff, Associate Professor and Director of the Program on Reproductive Health and the Environment, Department of Obstetrics, Gynecology, and Reproductive Sciences at the University of California, San Francisco. Thank you for the opportunity to testify at this important hearing. The Program on Reproductive Health and the Environment is dedicated to creating a healthier environment for human reproduction and development by advancing scientific inquiry, clinical care and health policies that prevent exposures to harmful chemicals in our environment. Today I shall focus on concerning trends in reproductive health and development, current chemical exposures and policy needs.

Trends. There are numerous concerning trends in the developmental health of the United States population, which have been reported in the scientific literature [1, 2]. These include:

- **More women in the U.S., particularly women under the age 25, the time of peak fertility, are reporting difficulty conceiving and maintaining their pregnancies.** Between 1982-2002, the percent of women reporting that they had difficulty in conceiving and maintaining pregnancy, doubled from 4.3% to 8.3% in a national survey conducted by the National Center for Health Statistics [3, 4].
- **Increasing numbers of babies are born too early – before the 37th week of gestation – putting them at greater risk for death, learning and behavior problems, and developmental delays [5].** One out of every eight babies is born prematurely, a rate that has increased 36% since the early 1980s [6].
- **Birth weights are declining, even among normal, healthy, full-term infants, putting more infants at risk for short and long-term health complications and chronic disease [7].** A new study reports that U.S. birth weights declined 1.5% between 1990 and 2005, a drop that was not explained by maternal and neonatal risk factors or obstetrics practices. During the same period, the number of infants born small for gestational age increased by nearly 1% [8].
- In my own state of California, gastroschisis, a birth defect where the abdominal wall does not form completely and the intestines protrude outside of the body, has increased by over 300% between 1987 and 2003 [9].

- Increasing rates of childhood diseases, including autism [10], certain childhood cancers [11], and obesity [12].

These are among a number of adverse trends in health outcomes that have been summarized in “The Health Case for Reforming the Toxic Substances Control Act,” a new report highlighting the growing concern about chemicals and increases in adverse health effects in the population [13].

We also have growing scientific evidence that environmental contaminants can impact early development, particularly if exposures occur prior to conception, during pregnancy or early in life -- periods of development that are more vulnerable to disruption by environmental chemicals [14]. In particular, disruptions during the prenatal period can increase the risk of effects during the immediate, short and long term. Some examples:

- immediate term: birth defects, pre-term birth, low birth-weight
- short term: learning disabilities and childhood cancers
- long term: diabetes, cardiovascular disease, and cancers as adults.

Chemical Exposures and policy needs: Since World War II, chemical production in the U.S. has increased more than twenty-fold [15]. As of 2006, there are over 80,000 chemical substances registered for use in U.S. commerce, and about 3,000 chemicals manufactured or imported in excess of 1 million pounds each [16]. Environmental contaminants are ubiquitous in our air, water, food and drink, personal care products, pesticides and everyday household items.

Biomonitoring – a growing area of research that measures the types and levels of chemicals in our bodies – now demonstrates irrefutably that these chemicals are contaminating our bodies in addition to our environments. For example, the National Health and Nutrition Examination Survey, an annual nationally based representative survey of the U.S. population, consistently finds measurable amounts of hundreds of environmental contaminants in people’s bodies. For example, over 75% of people have triclosan in their body, up to 100% of people have some type of PCB measured in their body, over 98% of people have polyfluoroalkyl chemicals, and over 90% of people have measureable levels of bisphenol A [17]. Many of these exposures come from the everyday use of products in our lives – such as personal care products, cookware and containers – sources that most people consider to be inert.

Such high frequencies of chemical detection mean that, as a population, we are exposed to a multitude of chemicals simultaneously. As a population, we also vary in our biological susceptibility to harm by chemical exposure. This susceptibility can be due to age (prenatal, infant, child, puberty or elderly), health status (pre-existing health conditions such as immune compromise, diabetes, asthma), or socioeconomic stressors.

Therefore, when we consider the risk of adverse health effects from exposure to any *one* chemical reported through biomonitoring studies, the National Academy of Sciences recommends that we consider this exposure in the context of the existing chemical exposures and biological susceptibilities of the U.S. population. Given the lack of data on the impacts of

cumulative exposure to chemicals, the National Academy of Sciences also concludes that we should not assume that there is a safe level of exposure to any individual chemical unless proven otherwise [18].

Thyroid hormones and thyroid disrupting chemicals illustrate reasons to be concerned about the pattern of chemical exposure that biomonitoring studies reveal. Thyroid hormones are essential for fetal brain development during pregnancy [19]. Even small reductions in maternal thyroid hormone levels are associated with neurological deficits in the children [20, 21]. In addition, there already are conditions in the U.S. population that put pregnant women at risk for perturbations of thyroid hormone levels: 16% of U.S. women report having any thyroid disease [22] and about 1/3 of U.S. pregnant women have insufficient iodine intake [23], which is critical to maintaining sufficient levels of thyroid hormones.

Biomonitoring studies are, for the first time, demonstrating that women of childbearing age are carrying a body burden of multiple chemicals which have been shown to disrupt the thyroid system, including PCBs, perfluorinated compounds, perchlorate and triclosan. Body burdens of these chemicals can be at least 300 to 1,500 times higher than the levels of thyroid hormone circulating in our bodies, indicating that our current interactions with our environment are exposing us to biologically relevant levels of chemicals. Indeed, separate studies have found a relationship between PCBs and perchlorate and thyroid hormone levels [24, 25].

But, the value of biomonitoring is not just in the observations of exposure. Biomonitoring studies also indicate where our chemicals policies have failed to protect us from exposures that can put us at risk of reproductive and developmental effects.

What to do.

Our current approach of using biomonitoring data as a demonstration of a problem means that it is potentially too late for those people who have already been exposed.

There are many chemicals with sufficient scientific data for the government to take action to reduce exposures. And, for the many more chemicals for which we have insufficient information, we need policies that require chemical manufacturers to provide sufficient evidence that the chemicals they want to produce do not pose undue health risks to our population.

The scientific data clearly show that every child in the U.S. is born with a burden of multiple chemicals in their body that can impact their future health. By acting now, we can improve our health and the health of generations to come.

Thank you

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