CENTER FOR CHILDREN'S HEALTH AND THE ENVIRONMENT

MOUNT SINAI SCHOOL OF MEDICINE

CONSEQUENCES OF METHYLMERCURY TOXICITY FOR THE HEALTH AND ECONOMIC SECURITY OF OUR NATION

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Mercury Briefing

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Senators Jeffords, Leahy, Lieberman, Lautenberg, Boxer, and Kerry, I am pleased to appear before you today to discuss the impact of mercury pollution upon the health of our nation's children.

My name is Dr. Leonardo Trasande. I am Assistant Professor of Community and Preventive Medicine and of Pediatrics at the Mount Sinai School of Medicine. I am also the Assistant Director of the Center for Children's Health and the Environment (CCHE), our nation's first academic research and policy center focused on understanding the links between exposure to toxic pollutants and children's health.

My colleagues and I have recently published the first peer-reviewed analysis describing the danger mercury pollution poses to the health of our nation's children. Before describing our findings, let me provide some background about brain development so that you can appreciate the *magnitude* and *urgency* of this problem.

Human brain development is among the most complex processes in nature – and exquisitely sensitive to the environment. Long before birth, brain cells, or neurons, actively form the connections that determine lifetime intelligence. Thanks to sound government regulation, pregnant women know to avoid cigarette smoke and alcohol during this critical time in their baby's development. But hidden in our environment are neurotoxicants such as lead, polychlorinated biphenyls (PCBs) and certain pesticides, which pose a high risk of permanent and irreversible dysfunction. The consequences of these exposures can include loss of intelligence (IQ), disruption of behavior, increased risk of attention deficit disorder and heightened risk of autism.

Methyl mercury is among the most potent neurotoxicants.

When a pregnant woman eats mercury-contaminated fish, the methylmercury from the fish enters the mother's blood stream. From the mother's bloodstream, the methylmercury can move directly across the placenta to enter her child's body. The placenta poses no barrier to the passage of methylmercury. Once in the child, the methylmercury accumulates in and *irreversibly* damages the developing brain. In 2000, the National Academy of Sciences reviewed three large-scale, prospective epidemiologic studies – one in the Seychelles Islands in the Indian Ocean, another in New Zealand and a third in the Faroe Islands of Denmark – and found strong evidence for the toxicity of methyl mercury to children's developing brains, even at *low* levels of exposure.

What are we here in the United States doing about methylmercury toxicity?

Throughout the 1990s, the Environmental Protection Agency proactively responded to the scientific evidence of methylmercury's toxicity, and made steady progress in reducing mercury emissions from man-made sources. EPA regulated medical waste and municipal incinerators and reduced total mercury emissions significantly – by about 80 tons per year – from 1990 to 1999. The Clean Air Act, which required reductions in mercury emissions from power plants to five tons by 2008, was the right course for the health of our children.

In January 2003, however, the EPA reversed course and announced a proposal to relax controls on emissions of mercury from coal-fired power plants.

What are the consequences of this sudden reversal? The technical analyses used by the EPA emphasized that power plants would avoid paying the high costs of installing flue gas filters that control mercury emissions more stringently. Let's put this cost on one side of the scale and let me detail for you the other side of the scale.

The technical analyses the EPA used to promote its Mercury Rule failed to incorporate or quantify consideration of the health impacts resulting from increased mercury emissions. My colleagues and I at the Mount Sinai Center for Children's Heath and the Environment put into perspective the costs of controlling mercury emissions by estimating the impact of methylmercury toxicity on America's children.

We found that between 316,000 and 637,000 children each year are born with enough methylmercury to cause brain damage. Let me emphasize that this impact is permanent and irreversible. Even low levels of exposure can result in lost IQ, and we found that some children may suffer IQ loss as high as 24.4 IQ points.

But there is far more on this side of the scale. Methylmercury toxicity threatens our economic security. Lost intelligence leads to lost economic productivity, and methylmercury toxicity costs our nation at least $2.2 billion, and as much as $43.8 billion each year. Mercury emitted by coal-fired power plants alone costs $1.3 billion in lost economic productivity – *each year*. These costs will recur year after year after year with each new birth cohort so long as mercury emissions are not controlled. By contrast, the cost of installing stack filters to control atmospheric mercury emissions is a *one-time expense*. Putting aside for the moment the unconscionable act of exposing our children to neurotoxins, the economic impact alone is startling.

The EPA has emphasized an effort to improve fish advisories instead as a way to protect children from the effects of methylmercury toxicity. Advisories are an important tool but they fail to deal with the underlying problem – mercury emissions. If mercury emissions are allowed to remain at high levels, generations of our nation's children will suffer lost cognitive faculties and other health impacts. These losses cost more in the long run than any savings now from failing, for example, to install filters at power plants.

The impact of methylmercury toxicity may be even more profound. Our group is currently estimating the extent of mental retardation associated with methylmercury exposure. Mental retardation is defined as an IQ of 70 or lower and methylmercury exposure may propel children with normal intelligence into mental retardation.

Unfortunately, despite new knowledge about methylmercury toxicity, the EPA has chosen to proceed with the Mercury Utility Rule without considering the profound and devastating impact this Rule could have on our nation's children. My colleagues and I at the Center for Children's Health and the Environment are working to compare the human

and economic cost of the Mercury Utility Rule with previous regulations under the Clean Air Act.

We are here today to urge you to block implementation of the Mercury Utility Rule until the health of our children is considered in the debate on mercury controls. Ladies and gentlemen, if economics are going to be a deciding factor, then the public should decide whether it is worth it to spend more on electricity if it means that investment results in smarter and more productive children.

I thank you for the opportunity to speak before you today and would be happy to answer your questions.