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Estimated costs of environmental disease in children at \$76.6 billion per year

Experts suggest new policy to reduce toxic chemical exposure and subsequent burden of disease

THE MOUNT SINAI HOSPITAL / MOUNT SINAI SCHOOL OF MEDICINE

In three new studies published in the May issue of the journal *Health Affairs*, Mount Sinai School of Medicine researchers reveal the staggering economic impact of toxic chemicals and air pollutants in the environment, and propose new legislation to mandate testing of new chemicals and also those already on the market.

Leonardo Trasande, MD, Associate Professor of Preventive Medicine and Pediatrics at Mount Sinai School of Medicine, analyzed the costs of conditions - including lead poisoning, childhood cancer, asthma, autism, and attention deficit hyperactivity disorder (ADHD) - associated with exposure to toxic chemicals. Dr. Trasande and his team calculated the annual cost for direct medical care and the indirect costs, such as parents' lost work days, and lost economic productivity caring for their children, of these diseases in children.

The researchers found the annual cost in the United States to be an estimated \$76.6 billion, representing 3.5 percent of all U.S. health care costs in 2008. The breakdown includes: lead poisoning (\$50.9 billion), autism (\$7.9 billion), intellectual disability (\$5.4 billion), exposure to mercury pollution (\$5.1 billion), ADHD (\$5 billion), asthma (\$2.2 billion), and childhood cancer (\$95 million).

"Our findings show that, despite previous efforts to curb their use, toxic chemicals have a major impact on health care costs and childhood morbidity," said Dr. Trasande. "New policy mandates are necessary to reduce the burden of disease associated with environmental toxins. The prevalence of chronic childhood conditions and costs associated with them may continue to rise if this issue is not addressed."

Dr. Trasande also reviewed an earlier study of 1997 data, which was conducted by Philip J. Landrigan, MD, and documented \$54.9 billion in annual costs for childhood diseases associated with environmental toxins in the United States. Reviewing this prior analysis, Dr. Trasande found that while exposure to lead and costs associated with asthma had diminished, new chemicals and new environmentally-induced diseases, like attention deficit hyperactivity disorder, have increased the overall burden of disease. Dr. Landrigan is currently Dean for Global Health, and Professor and Chair of Preventive Medicine, and Professor of Pediatrics, at Mount Sinai School of Medicine.

In a related article also in the current issue of *Health Affairs*, Dr. Landrigan and Lynn R. Goldman, MD, Dean of the School of Public Health at George Washington University, propose a three-pronged approach to reduce the burden of disease and rein in the effects of toxic chemicals in the environment:

- Conduct a requisite examination of chemicals already on the market for potential toxicity, starting with the chemicals in widest use, using new, more efficient toxicity testing technologies.
- Assess all new chemicals for toxicity before they are allowed to enter the marketplace, and maintain strictly-enforced regulation on these chemicals.

- Bolster ongoing research and epidemiologic monitoring to better understand, and subsequently prevent, the health impact of chemicals on children.

"Implementing these proposals would have a significant impact in preventing childhood disease and reducing health costs," said Dr. Landrigan. "Scant legislation has been passed to reduce the risks associated with childhood exposure to toxic chemicals in the environment. Even though only six chemicals have been banned, we have seen dramatic benefits from that action alone. The removal of lead from gasoline and paint is an example of the importance of this type of regulation."

In a separate article in *Health Affairs*, Perry Sheffield, MD, Assistant Professor of Preventive Medicine at Mount Sinai School of Medicine, evaluated the little-studied correlation between air pollution and infectious respiratory illness in children, and the resultant health care costs.

Dr. Sheffield and her team analyzed hospitalization data between 1999 and 2007 for children aged one month to one year who had bronchiolitis - a type of viral lung infection with symptoms similar to asthma - and monitored the air quality surrounding in the hospitals where the patients were treated. They found a statistically significant association between levels of fine particulate matter pollutant surrounding the hospitals, and total charges and costs for infant bronchiolitis hospitalizations.

Her team revealed that as the amount of air pollutants increased, infant bronchiolitis hospitalization costs increased by an average of \$127 per patient. As a result, they concluded that reducing the average level of fine particulate pollutant by just seven percent below the current annual standard could save \$15 million annually in U.S. health care costs.

"While more research is required to understand the full effect of air pollutants on infectious disease severity and health care costs, our findings are indicative of the tremendous impact new legislation on air quality control standards could have on the health of our children," said Dr. Sheffield.

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To access these three articles in *Health Affairs*, please visit www.healthaffairs.org.

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