



August 2, 2010

Honorable Chairman Amy Klobuchar
Subcommittee on Children's Health
The Senate Environment and Public Works Committee
410 Dirkson Senate Office Building
United States Senate
Washington, DC 20510-6300

RE: State of Research on Potential Environmental Causes of Autism

Dear Chairwoman Klobuchar:

Honorable Chairman Klobuchar and Members of the Senate Health Committee, I am writing to you today to thank you and the Committee for your leadership in holding a Congressional Hearing on the State of Research on Potential Environmental Health Factors with Autism and Related Neurodevelopment Disorders. The CDC's recently released data of December 2009 estimated that the number of children diagnosed with autism is one in 110, equating to 1 in 70 boys born in 1998. With no indication the epidemic has subsided in any way, the United States, in 2010, is estimated to be coping with at least one percent of our children now affected with autism. Autism is growing at an exponential rate and cannot be explained by migration patterns or diagnostic substitution. It is a true epidemic and a nationwide health crisis.

Acknowledgement of this epidemic along with an inability to identify an "autism gene" demands a shift in the focus of autism research away from an exclusively genetic model to one that investigates the role of environmental factors combined with a genetic vulnerability as a potential culprit behind this otherwise unexplained epidemic. The role of the environment was recognized by an NIH expert panel back in 2006 as an understudied research area. A 2007 Institute of Medicine workshop entitled "Autism and the Environment" determined the same. Unfortunately, the bias toward funding for genetic research has continued at NIH. The absence of a well developed environmental research agenda impedes the discovery of etiologic factors responsible for the development of autism and the ability to identify effective treatment strategies.

An EPA research study published in March 2010 found the cumulative incidence of autism spectrum disorders began to increase in the years 1988-1989. The authors suggested that the timing of the increase may help in screening for potential candidate environmental stressors. One environmental agent of interest is mercury. Exposure to

mercury increased dramatically in the late 1980's and early 1990's with the introduction of several new vaccines to the early immunization schedule that contained the mercury based preservative thimerosal. The mercury in thimerosal is known to cross the blood brain barrier in infant primates and resulted in more than double the amount of inorganic mercury deposited in the brain as equal amounts of methyl mercury. Thimerosal is still used in flu vaccines in the United States administered to pregnant women, infants and children and in routine vaccinations in developing countries worldwide. Although some ecologic studies, widely known to be the weakest possible epidemiologic design, have found no relationship between thimerosal exposure and autism, they are unable to rule out a subset of infants who may be more vulnerable to mercury neurotoxicity.

The developing nervous system is a target organ for mercury toxicity, especially in male infants. Epidemiological studies of human infants report gender specific effects on development with males exhibiting greater adverse effects than females. Recent findings document higher concentrations of mercury in infant cord blood compared to the mothers' blood at time of birth. According to NHANES data 15% of women of childbearing age had blood levels at or above EPA safe levels of 3.5 PPB. This equates to 630,000 of the roughly 4 million babies born annually in the United States may be exposed to dangerous levels of mercury in the womb. The latest NHANES data continues to show an upward trend of mercury blood and urine levels in children and the US population.

Mercury is widespread and increasing in our environment. Coal burning in China has almost doubled in the last 15 years resulting in over 1,000 tons of mercury released annually. Research has documented that atmospheric mercury from China reaches the coast of California in approximately 10 days. Recent research comparing rates of mercury and autism in California and Texas reported that for each 1000 lbs. of environmentally released mercury, there were a 43% increase in the rate of special education services, a 61% increase in the rate of autism, and a 50% higher risk of autism associated with the upper quartile of exposure to heavy metals and chlorinated solvents. Mercury, cadmium, nickel, trichloroethylene, and vinyl chloride were the compounds that contributed most to the risk.

Children with autism were found to have a 2.1 fold higher mean level of mercury and 3.1 fold higher median level of mercury in their baby teeth as compared to controls. These results suggest that the autistic patients had higher body burdens of mercury during several years of early development that may have produced the development of the disease. In a retrospective study of 269 subjects, a specific biomarker for heavy metal toxicity, precoproporphyrin, was found to be significantly elevated in autistic patients relative to controls. After application of a chelator to remove heavy metals, the levels of the porphyrin biomarkers subsided. Many recent studies from the U.S. and other countries have found more mercury in the urine, blood, hair and brains of children with autism relative to normally developing controls.

Based on this information it is critically important that much needed environmental research be expanded and expedited. The identification of environmental factors, like mercury, that may be driving a portion of the autism epidemic offers both an opportunity

for developing effective treatments to remove mercury from the developing brain and organ systems and also to prevent injury by reducing exposure.

Thank you again for the hearing and your commitment to helping America's children lead healthy and productive lives. Addressing the environment's role in the autism epidemic is a critical first step in helping hundreds of thousands of children and families. Our hope is that ideas from the hearing will be swiftly utilized to commence research to determine the environmental factors at play in autism. We especially hope that the Children's Centers for Environmental Health and Disease Prevention which focus on autism, like the one at UC-Davis, can continue to be funded and in fact expanded considering the critical need. Please use your committee's influence to hold future hearings to provide research updates, accountability and transparency. As I have mentioned before, please feel free to use SafeMinds as a source. Our organization has devoted itself to research and advocacy on the environment and autism for over 10 years.

Best regards,

A handwritten signature in cursive script that reads "Lyn Redwood". The signature is written in black ink on a white background.

Lyn Redwood RN, MSN
Executive Director, SafeMinds