Testimony of Deborah Hirtz M.D.

Senate Committee on Health and Welfare

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Good morning, Chair Ayer and members of the committee. Thank you for the opportunity to testify today.

My name is Deborah Hirtz. I am a pediatric neurologist, a doctor for children with various brain and developmental disorders, including autism, attention deficit disorders, and developmental and behavior problems. I am currently on the faculty of UVM but before that, I retired from a long career as a program director at the National Institute of Neurological Diseases and Stroke at the NIH, where I was involved in scientific policy and clinical research that included epidemiology of development disorders and childhood neurological conditions. I participated in the ACT 154 Chemical Use working group that developed the policy recommendations this committee is considering.

Today I would like to support passage of the Bill S.103. I believe that this bill will help protect Vermont citizens. Action within Vermont is especially important today, when, in spite of the passage in 2016 of updates to the Federal Toxic Substances Control Act, the EPA has refused to ban a chemical as clearly toxic to children as the pesticide chlorpyrifos, even when its own safety experts believe that it should be outlawed.

The main points I will cover briefly are the following: 1. There are environmental toxins that increase the risk for development disorders, some of which are known, and others for which data is still emerging. 2. It is important to protect our children, and it makes economic sense to reduce exposure to these chemicals in the fetus, infant, and child.

Multiple factors interact in complex ways during brain development. Internal factors include heredity, genetic traits and susceptibilities. External factors include exposure to toxins, nutrition, and social environment. Children have relatively greater exposure and increased susceptibilities to toxic exposures. Relative to pound of body weight, children have larger intakes of food and water, and young children explore the world through mouthing behaviors, and frequently crawl or play on floors where chemical residues can settle. In addition, increased susceptibility during early years can be intensified by immature chemical detoxifying enzyme systems.

Therefore chemicals can cause permanent brain injury in children at low levels of exposure that would not affect an adult. The placenta does not block the passage from the mother to the fetus. Given the fact that the rate of brain development in the fetus is astounding- on average, 250,000 new neurons are formed per minute- and brain development continues throughout childhood and adolescence, the opportunities to disrupt normal brain pathways and seriously alter brain development from environmental exposures are abundant.

Examples of toxic chemicals and pollutants that increase children's risks for neurodevelopmental disorders include chemicals that are used extensively in consumer products and that have become widespread in the environment. Some are chemicals to which children and pregnant women are regularly exposed, and they are detected in the bodies of virtually all Americans in national surveys conducted by the U.S. Centers for Disease Control and Prevention. The vast majority of chemicals in industrial and consumer products undergo almost no testing for developmental neurotoxicity or other health effects.

Some environmental agents that can increase the risk of neurodevelopmental disorders include Lead and Mercury, endocrine disrupters such as bisphenol –A (BPA), phthalates, polybrominated diphenyl ethers (PBDEs), DDT, and dioxins; and organophosphates such as chlorpyriphos. Air pollution creates exposure to other toxic agents,

including diesel particulate matter, and polycylic aromatic hydrocarbons (PAH).

Thyroid hormone that regulates metabolic rate in adults is very important to brain development, and its disruption is one way the PBDEs, phthalates, or BPA – all of which are on the current Act 188 list of Chemicals of High Concern to Children – can cause brain damage. Studies have found associations between PBDE concentrations in maternal blood during pregnancy and cognitive impairment or behavioral problems in the children. PBDEs are used as flame retardant in electronics, building insulation, wire and cable, some baby products, and polyurethane foam. They persist in the environment and can settle into household dust where babies, through their hand to mouth behaviors, can be exposed. As of 2014, flame retardants are no longer required, but can still be used. Pthalates are used in plasticizers, toys, and personal care products (listed as fragrance). Some pthlalates have been provisionally banned. BPA exposure today is primarily through ingestion of canned food and from plastic food containers and water bottles. Both pthalates and BPA have been associated with behavior problems, ADHD, and development impairment.

Organophosphates may directly damage the nervous system, and the fetus and young child have lower levels of detoxifying proteins. These chemicals are banned for indoor use, but residues on food and agricultural drift still provide sources of exposure. Exposure during fetal development has been associated with higher risk in childhood of intellectual deficits, motor and memory problems, and hyperactivity, and in a few studies with Autism.

The CDC reports that learning, developmental, or intellectual disabilities affect one in six children (17%) between the ages of 3 and 17, and that one in sixty-eight (1.5%) have an autism spectrum disorder. Developmental disorders such as Autism and Attention Deficit Disorder are increasing in prevalence and the reasons are multifactorial. Increases may be substantially attributed to greater awareness, but this does not completely account for the increase.

Clearly, emotional costs to the impaired individuals and their families are very high. But in addition, developmental disorders take a tremendous toll economically, in school, and throughout the lifetime. And medical costs are typically higher. In a few cases, toxic exposures are egregious and clearly damaging to health, for example with lead or mercury. However, I would like to be clear that in general, exposure to toxic chemicals is a contributing factor rather than a direct cause of developmental disability. Reduction of exposures may decrease the risk, therefore the numbers of children, who develop these disorders. This is very important from a public health perspective.

The cost of special education Grades K-12 in Vermont for FY 17 was $320,066,909. On average, it is twice as expensive to provide special education per pupil. These costs vary widely, for example, a child with severe autism requires a one- on -one specially trained teacher at least 20 hours per week. Reduction in toxic environment exposures may be one way to help reduce these costs or keep them from increasing.

The State of Vermont has a history of taking action to try to protect its citizens from some of these toxic exposures, for example, flame retardants, toxic phthalates, bisphenol A, and mercury and lead. That is wonderful. But only a minority of chemicals has been evaluated for neurotoxic effects in adults and even fewer have been evaluated for potential effects on brain development in children. Further, toxicological studies and regulatory evaluation seldom address combined effects of chemical mixtures, despite evidence that all people are exposed to dozens of chemicals at any given time. More chemicals that are toxic are still in use and we must be cognizant that substitute or replacement chemicals require close scrutiny and may have significant health impacts. Examples include the following: Many of the replacement flame retardants are similar in structure to other neurotoxic chemicals but have not undergone adequate assessment of their effects on developing brains. When the federal government banned some specific phthalates in children's products, the chemical industry responded by replacing the banned chemicals with structurally similar new phthalates.

These replacements are now under investigation for disrupting the endocrine system.

Therefore it is crucial to remain vigilant by implementing a system of monitoring scientific evidence as it arises.

I would request that the committee pass S.103. As a member of the Chemical Use Working Group last fall, we discussed and I supported a range of recommendations to reduce Vermonters' exposure to toxic chemicals. These include improving the Toxics Use Reduction program and updating Act 188, the reporting program for chemicals of high concern in children's products.

I support the language in S.103 passed by the House, which includes (1) creating an intergovernmental committee to better track chemicals used in the state and make recommendations to improve chemical policies, (2) requiring new drinking water wells be tested for certain contaminants, and (3) making improvements to Act 188.

I wanted to speak briefly to the Act 188 changes in particular.

Determining the "weight" of scientific evidence would involve developing criteria and process that are time consuming and complex. With the resources available to the Vermont Department of Health, we would be better served making decisions based on available unbiased and independent, peer-reviewed scientific research.

Further, I support changing "will" be exposed to children "may" be exposed, and deleting the language ~~(B) there is a probability that, due to the degree of exposure or frequency of exposure of a child to a chemical of high concern to children in a children's product, exposure could cause or contribute to one or more of the adverse health impacts listed under subdivision (b)(1) of this section.~~

The revised language in S.103 will facilitate the work of the

Commissioner of Health and stakeholder group as they consider the regulation of toxic chemicals in children's products.

Overall, I encourage you to support S.103 and other policy ideas suggested by the Chemical Use Working Group to reduce the risks to Vermonters' health posed by toxic chemicals and save the state and Vermont families from the burden and costs of increased developmental disorders.

Thank you very much for allowing me the time to present this testimony, and I'd be happy to answer any questions.