April 15, 2019

The Honorable Benjamin Allen
Chair, Senate Committee on Environmental Quality
State Capitol, Room 4076
Sacramento, CA 95814

Re: SB 458 by Senator Durazo. Public Health: Pesticide: Chlorpyrifos.
Scientific Evidence of the Relationship Between Prenatal Exposure to Chlorpyrifos and Neurodevelopmental Harm in Children

Dear Senator Allen,

We are scientists and health professionals with expertise in toxic chemicals that harm the developing brain. Many of us are affiliated with Project TENDR, a collaboration of leading scientists, health professionals, and children's health and environmental advocates who came together out of concern over the substantial evidence linking toxic chemicals to neurodevelopmental disorders, such as autism spectrum disorder, attention deficits, hyperactivity, intellectual disability, and learning disorders.[1]

In 2016, Project TENDR published a consensus statement that reviewed the scientific evidence and identified organophosphate pesticides, such as chlorpyrifos, as prime examples of chemicals that contribute to intellectual impairments and specific neurodevelopmental disorders.[2] There is clear evidence that the continued use of chlorpyrifos is harmful to brain development, with persistent consequences.

Many studies in the United States and other countries, spanning diverse populations in both urban and agricultural settings, have linked low-level exposure to chlorpyrifos and other organophosphates during pregnancy with poorer cognitive, behavioral, and social development in children.[3,4,5] In one review, adverse effects on neurodevelopment were seen in all but one of the 27 studies evaluated.[6]

The toxic effects of organophosphate pesticides include abnormal reflexes in newborns; mental and psychomotor delays in preschoolers; and decreases in working and visual memory, processing speed, verbal comprehension, perceptual reasoning, and IQ in elementary school-age children. These pesticides are associated with symptoms or diagnoses of attention-deficit/hyperactivity disorder (ADHD) and autism spectrum disorder. Studies have identified changes in the brain structure of children exposed to chlorpyrifos in the womb, and these changes are consistent with neurodevelopmental deficits reported previously.[7] In many of these studies, there was no evidence of a threshold or "safe" level of exposure.

In addition to the epidemiologic findings in children, effects on cognition, motor activity, and social behaviors were repeatedly demonstrated in rodents dosed with low levels of chlorpyrifos and other organophosphates in early life.[8,9] The weight of the scientific evidence clearly indicates that chlorpyrifos is a neurodevelopmental toxicant.

Importantly, the developmental toxicity of chlorpyrifos occurs at levels of exposure that do not cause acute poisoning.[10] The absence of poisoning symptoms does *not* mean that neurologic damage has not occurred.[11] As explained above, the developmental effects do not manifest until months or years after prenatal exposure. The evidence therefore indicates that chlorpyrifos can interfere with brain development at levels previously thought to be safe.

In 2016, US EPA concluded that exposure to chlorpyrifos from food or drinking water could lead to unacceptably high exposures and determined that some reproductive-aged women, infants, and children consume levels of chlorpyrifos on food that are substantially above what the agency deemed an acceptable level for these vulnerable life stages.[12] The agency reviewed hundreds of uses of chlorpyrifos and determined that all of them could result in unsafe exposures for agricultural workers.[13]

US EPA concluded that chlorpyrifos does not meet the federal safety standard of a "reasonable certainty of no harm" and proposed banning uses of chlorpyrifos on food crops.[14] This would have eliminated nearly all of the remaining uses of this pesticide. However, in March 2017, despite the overwhelming evidence of harm and US EPA's own conclusions, the Trump administration announced that it would not ban any uses of chlorpyrifos.[15] It is unfortunate that US EPA did not finalize the proposed ban. However, states can act to protect children where the federal government has stalled.

For additional information, please see a review of the scientific evidence that organophosphates harm child neurodevelopment, which was published last year by eight scientists affiliated with Project TENDR.[16] This letter draws primarily from that review. If you have any questions, please contact Maureen Swanson, MPA, Co-Director, Project TENDR and Director, Healthy Children Project at the Learning Disabilities Association of America, at mswanson@ldaamerica.org.

Sincerely,

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