January 5th, 2016

Comments to EPA
from Environmental Health Scientists and Healthcare Professionals
In support of EPA's Proposal to Revoke Chlorpyrifos
Food Residue Tolerances

Docket ID EPA-HQ-OPP-2015-0653

We, the undersigned, write to express our strong support for EPA's proposal to revoke all food tolerances - the maximum amount of pesticide residue allowed on or in food - for the organophosphate insecticide, chlorpyrifos.[1] We urge EPA to finalize this rule (Document ID EPA-HQ-OPP-2015-0653-0001), which would result in EPA's cancelling all associated food uses of chlorpyrifos. EPA's own Revised Human Health Risk Assessment on Chlorpyrifos (2014) has acknowledged unsafe drinking water contamination.

Chlorpyrifos is a powerful developmental neurotoxicant. Exposures to even very low doses of chlorpyrifos during critical windows of exquisite vulnerability during the nine months of pregnancy and in early postnatal life can cause brain damage to children that is characterized by diminished cognitive ability (lowered IQ), problems with working memory, delays in motor development and disruptions of primitive reflexes. It should be noted that working memory skills in the early elementary school years are a strong predictor of learning outcomes and academic achievement in later years *(*Alloway et al. 2010). These disruptions in children's brain development appear to be permanent, irreversible and lifelong.

Extensive published science from diverse populations correlates pre-natal chlorpyrifos exposure to reduced birth weights, delayed mental and motor development in preschoolers, and reduced IQ and delays in working memory in elementary school children (Rauh et al, 2006, 2011, Whyatt et al 2005). These persistent neurocognitive findings are especially troubling. In addition, in a pilot study of 6-11 year olds, chlorpyrifos concentrations in umbilical cord blood were associated with changes in brain structure measured by magnetic resonance imaging, including cortical thinning and regional specific cortical deformations (Rauh et al, 2012).

A recent study of inner city minority children reported a link between prenatal exposure and mild to moderate arm tremors measured when the children were middle-school aged, suggesting an even broader scope of effects on the nervous system from early life exposures, and potentially latent or long term neurological damage manifesting a decade later or beyond (Rauh et al 2015). Application of chlorpyrifos to agricultural fields within 1.5 km of the home during pregnancy has also been associated with an increased incidence of autism spectrum disorders in a recent study (Shelton et al., 2014).

These epidemiologic results are consistent with data from toxicological studies which found disruption in neuronal development, neurotransmitter systems and synaptic formation as well as behavioral and cognitive impairments in test animals following low-dose perinatal chlorpyrifos exposure (Slotkin 2004; Aldridge et al. 2004, 2005; Slotkin and Seidler, 2005, Levin et al 2001; Roy et al., 2004; Garcia et al., 2002).

Associations in newborns also were seen between prenatal exposures to organophosphate pesticides generally and abnormalities in primitive reflexes, suggesting an impact on the development of the central nervous system (Engel et al, 2007; Young et al, 2005) and in children with reduction in motor function (Eskenazi et al, 2007; Rauh et al 2006; Grandjean et al 2006; Handal et 2008; Harari et al, 2010, Rauh et al, 2015), decreases in working and visual memory, processing speed, verbal comprehensive, perceptual reasoning, and full scale IQ (Bouchard et al. 2011, Engel et al, 2011, Rauh et al, 2011; Handal et al, 2008) and increases in neuropsychological problems including ADHD, pervasive developmental disorder and behaviors typical of the autism spectrum (Rauh et al, 2006, Marks et al., 2010, Furlong et al., 2014). Certain subpopulations demonstrate greater susceptibility including children of farmworkers (Castorina et al, 2010; Engel et al., 2015) and those who have reduced capacity to detoxify the OPs (Engel et al, 2015).

In addition to neurological damage, scientists have found an elevated risk of respiratory symptoms consistent with asthma (exercised-induced coughing) and persistent decreased lung function in children exposed during early-life to organophosphate pesticides (Raanan, Harley et al 2015; Raanan, Balmes et al 2015). These observations are consistent with findings in animal studies that chlorpyrifos and other OP pesticides induced airway hyper-reactivity at doses below those that caused cholinesterase inhibition (Ndlovu et al 2011; Proskocil et al 2013).

In April, 2015, extensive comments were submitted to EPA by Earthjustice, Farmworker Justice, Pesticide Action Network (PAN), Natural Resources Defense Council (NRDC) and United Farm Workers (UFW) that identified serious health concerns linked to chlorpyrifos exposure for farmworkers, their families, and bystanders.[2] Comments submitted to EPA by Professors R. Whyatt, T. Slotkin and D. Hattis provide a detailed analysis of serious weaknesses in EPA's use of a model provided by Dow AgroSciences, which purports to characterize cholinesterase inhibition.[3] Even EPA acknowledges that the observed neurodevelopmental impacts in children from prenatal exposures occur at levels below those that cause cholinesterase inhibition in the pregnant mother.[4]

In November, 2015 EPA acknowledged that it is unable to make a safety finding regarding chlorpyrifos use as required under the Federal Food, Drug, and Cosmetic Act (FFDCA).[5] However, prior to issuing a final rule to cancel chlorpyrifos food tolerances, EPA has said that it "plans to complete its refined drinking water analysis for the entire country as well as update its analysis of the chlorpyrifos hazard to determine whether its current regulatory approach sufficiently addresses the potential for adverse impacts on infants and children." [6] This will lead to more delays, and continued unsafe exposures.

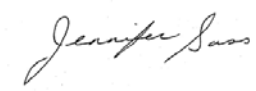
EPA determined 15 years ago that residential uses of chlorpyrifos resulted in exposures to children that exceeded safe levels by orders of magnitude. In 2000 EPA phased out almost all homeowner uses, but failed to extend the same protections to rural children and pregnant women who are often exposed at even higher levels through agricultural uses.[7] Despite the scientific evidence, EPA has continued to leave rural children and the children of farmworkers in harms' way because they are exposed to chlorpyrifos through drift, volatilization, and take-home exposures from farm worker family members (Coronado et al 2011; Bradman et al, 2005; Thompson et al, 2014; Calvert et al, 2008).[8]

During these last 15 years, consumers in the U.S. have also continued to be exposed to chlorpyrifos and other organophosphate pesticides through residues on produce (Bradman et al 2015; Lu et al 2006, Vogt et al 2012).[9] [10] Children experience greater exposure to organophosphate pesticides due to their increased hand-to-mouth action, and relative to adults they eat more fruits and vegetables, drink more, and breathe more.[11] Thus, with each year of delay in cancelling food tolerances and agricultural and other uses of chlorpyrifos, more

children are unnecessarily at elevated risk for problems in learning, social skills, motor function, respiratory health, and other developmental domains.

We strongly urge EPA to finalize this proposal to cancel all food tolerances for chlorpyrifos, and to cancel all remaining uses of chlorpyrifos as expeditiously as possible, given the toll that chlorpyrifos takes on farmworkers, their families and their children – born and unborn, on rural and suburban families who reside near agricultural land treated with chlorpyrifos and on all Americans who consume food that has been treated with chlorpyrifos.

Respectfully,



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[1] EPA proposes to revoke chlorpyrifos food residue tolerances. EPA website. October 30, 2015. http://www.epa.gov/pesticides/epa-proposes-revoke-chlorpyrifos-food-residue-tolerances

[2] See comments by Earthjustice, Farmworker Justice, Natural Resources Defense Council, Pesticide Action Network, California Rural Legal Assistance Foundation, Farm Labor Organizing Committee, Pineros y Campesinos Unidos del Noroeste, United Farm Workers. April, 2015. Docket ID: EPA-HQ-OPP-2008-0850-0848

[3] Comments by RM Whyatt, T Slotkin, D Hattis. Docket ID EPA-HQ-OPP-2008-0850-0510, EPA-HQ-OPP-2008-0850-0100, EPA-HQ-OPP-2008-0850-0092, EPA-HQ-OPP-2008-0850-0089

[4] EPA Revised Human Health Risk Assessment on Chlorpyrifos. December 2014. Docket ID EPA-HQ-OPP-2008-0850 http://www.epa.gov/ingredients-used-pesticide-products/revised-human-health-risk-assessment-chlorpyrifos

[5] EPA 2015. Proposal to revoke chlorpyrifos food residue tolerances. Website updated Nov 9, 2015. http://www2.epa.gov/ingredients-used-pesticide-products/proposal-revoke-chlorpyrifos-food-residue-tolerances

[6] EPA 2015. Proposal to revoke chlorpyrifos food residue tolerances. Website updated Nov 9, 2015. http://www2.epa.gov/ingredients-used-pesticide-products/proposal-revoke-chlorpyrifos-food-residue-tolerances

[7] http://www.epa.gov/ingredients-used-pesticide-products/revised-human-health-risk-assessment-chlorpyrifos

[8] EPA ignored direct pesticide drift onto people even though direct drift poisons people at alarming rates every year. Moreover, EPA relied on only two flawed, unpublished, non-peer-reviewed industry-sponsored studies to completely discount volatilization—a significant threat for which EPA had initially proposed buffers as large as 1000 feet. These harms disproportionately fall on farmworkers and their families, often low-income and people of color.

[9] A dietary intervention study reported a 60% to nearly complete reduction in concentrations of two OP metabolites (malathion dicarboxylic acid (MDA), and 3,5,6-trichlor-2-pyridinol (TCPy), a metabolite of chlorpyrifos) immediately after starting the organic food diet.

[10] Residues and risk associated with imported produce, and other imported specialty crops ranging from herbs and spices to tea and coffee, also account for some of the highest risk servings of food and beverages in the U.S. food supply, yet because of EPA's lack of residue data, these residues and accompanying risk have not been rigorously accounted for in chlorpyrifos dietary risk assessments.

[11] Approximately 75% of the general U.S. population had detectable levels of TCPy in the National Health and Nutrition Examination Survey (NHANES) from 2001-2002. Results also showed children ages 6-11 years had concentrations of TCPy (geometric mean 3.48 μg/g creatinine) two times the concentrations detected in adults (geometric mean 1.49 μg/g creatinine) (DHHS 2009) Women living in an agricultural area of California (81% had a family member who was a farmworker) had significantly higher six dialkyl phosphate (DAP) concentrations than the levels for women of similar age in the NHANES population (Bradman et al 2005)