

Reviewing the Evidence on Pesticides Exposure, Health and Ecological Impacts

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Webinar to Alberta Health Services

May 16, 2017

Our 2002 Review of Evidence

- “Lawn & Garden Pesticides: A Review of Human Exposure & Health Effects Research” 2002
- Broad, narrative review
- Peer reviewed by Canadian experts
- Summarized (then) current research on:
 - exposure and potential health effects
 - chronic, low level exposure
 - environmental fate and ecotoxicology
- Discussed federal regulatory approaches and gaps in protecting health.



- Insecticides, herbicides, fungicides
- Dermal absorption – accidental contact from mixing, direct application or from residues on treated surfaces, contaminated clothing
- Inhalation – indoor/outdoor spraying, drift
- Ingestion – hand-to-mouth contact, residues on food (including garden produce); breastfeeding
- Transplacental - maternal prenatal exposure

- Experimental/field studies
 - small amounts detected, with direct skin contact (U of Guelph)
- Lawn pesticides can be tracked indoors (U.S.EPA)
- Exposure to some pesticides more prevalent than previously understood (US NHANES, CHMS)
- Biomonitoring cannot determine source or route of exposure or predict health impacts

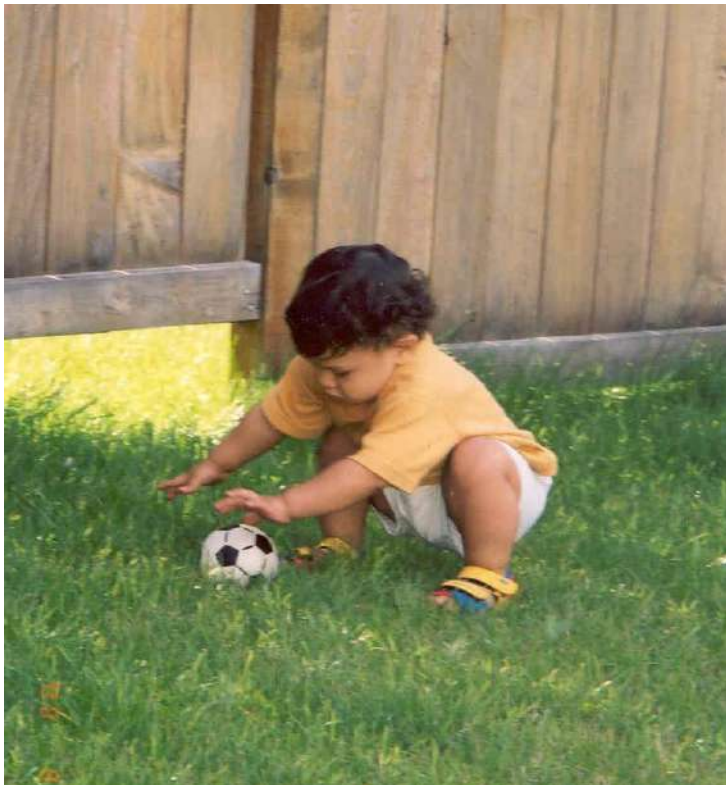


Range of Potential Health Effects Studied

Research (largely occupational studies) shows associations with:

- Birth defects
- Reproductive problems
- Neurobehavioural, cognitive impairment
- Cancer
- Immune system effects
- Altered hormone functioning

State of Research (2002) on Health Effects in the Young



- Associated with increased risks of some childhood cancers and some birth defects
- Neurotoxicity from some insecticides in young animals
- Suggestive, though inconclusive evidence

Research Supports Precaution
to Better Protect the Young

- Four major cohort studies of pregnant women and children (3 urban, 1 agricultural)
- Prenatal and early life exposure increases risks of reproductive and neuro-developmental impacts, childhood leukemias
- Window of vulnerability during pregnancy and early childhood
- Mechanisms unclear (may relate to genetic susceptibility for some health outcomes)
- Supports advice to limit home use of pesticides, especially pre/postnatally and in early childhood⁷

NYC Mothers & Newborns Study (Columbia U)
reported associations b/w prenatal (maternal) exposure
to OP pesticides:

- chlorpyrifos (or diazinon) and lower birth weight, reduced birth length
- weakening of associations with impaired fetal growth with lower exposures (after regulatory action)
(Whyatt RM, et al. 2004. *Environ Health Perspect* 112(10):1125-32)
- lower scores on developmental tests, motor and mental delays at age 3 among most highly exposed to chlorpyrifos
(Rauh V. et al, 2006 *Pediatrics* 118(6): e1845-e1859).

Environmental Fate & Ecotoxicology

- Urban surface waters in Toronto contaminated by lawn care pesticides (OMOE + Environment Can)
- Some levels exceed guidelines to protect aquatic life
- Unknown effects



Source: City of Toronto

Lawn and agricultural use pesticides enter the natural environment

Concern Motivates Precautionary Action

- Risks are uncertain, however, compelling evidence to warn the public of health risks from long term exposure
- In a world of multiple chemical exposures, choosing precaution and prudent avoidance to prevent needless exposures, especially for children, is appropriate

“(W)hen risks to human health are unnecessary or uncertain, the wisest course of action is to substitute safer alternatives and methods, rather than incurring risks that may prove unacceptable in the long run.”

Dr. Sheela Basrur, Medical Officer of Health, City of Toronto

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