

# HEALTH EFFECTS OF PESTICIDES: State of Knowledge Review

Victoria Derr, Environmental Studies Program

*Prepared for the Non-Toxic Pacific Grove working group of  
Communities for Sustainable Monterey County*

No. 3

-----

August 2017

ENVIRONMENTAL STUDIES PROGRAM

WORKING PAPER SERIES



California State University  
**MONTEREY BAY**

## ENVIRONMENTAL STUDIES WORKING PAPER SERIES



# HEALTH EFFECTS OF PESTICIDES: State of Knowledge Review

---

Dr. Victoria Derr  
Assistant Professor  
Environmental Studies

No. 3 | August 2017

For more information contact  
Victoria Derr  
Environmental Studies  
California State University,  
Monterey Bay  
100 Campus Center  
Seaside, California 93955

[vderr@csumb.edu](mailto:vderr@csumb.edu)

# HEALTH EFFECTS OF PESTICIDES: State of Knowledge Review

## Designed to Kill

Pesticides are a large group of chemicals that include Insecticides, Herbicides, Rodenticides, Fungicides, and Fumigants. Together, they include more than 20 classes of chemicals, many of which have not been tested prior to their widespread usage in the environment (AAP, 2012). A wide range of pesticides are known endocrine disruptors (Mnif et al., 2012) and carcinogens (Dich et al., 1997). Like the harmful effects of DDT in our recent past, these chemicals have been shown to have a wide range of impacts beyond their intended uses in landscape maintenance and agriculture, including negative effects on wildlife and human health (Mnif et al., 2012).

## The Hidden Costs

Both the American College of Obstetricians and Gynecologists (ACOG) and the American Academy of Pediatrics (AAP) have issued policy statements explaining the negative health effects of pesticides for children, pregnant women, and humans through their life course. While we cannot always see or smell pesticides, chronic exposure carries serious health consequences. Exposure is linked to cancers; endocrine, immune and reproductive disorders; and Parkinson's disease (President's Cancer Panel, 2010; Sanborn et al., 2004). The ACOG notes that the scientific evidence from the past 15 years shows profound reproductive effects from exposure to environmental agents since World War II that is beyond any potential genetic changes in humans. These effects result from both preconception and prenatal exposures (ACOG, 2013).

## Vulnerable Populations

Adults and children are all impacted by exposure to pesticides. Children and pregnant women are particularly vulnerable to the effects of these chemicals (AAP, 2012). Children encounter pesticides daily, and are uniquely susceptible to these chemicals. Pregnant women similarly are susceptible to these chemicals, through their effects on developing fetuses: prenatal exposures can have lifelong consequences for both males and females (ACOG, 2013; Endocrine Society, 2005). Prenatal and childhood exposure to pesticides is significant for a variety of reasons (Table 1).

<b>Table 1. Prenatal and Childhood Exposure to Pesticides</b>	
<b>Exposure</b>	<b>Effects</b>
Because children have significantly more hand-to-mouth movements and often play closer to the ground, they are more susceptible to ingesting pesticides	Prenatal exposure to pesticides is associated with increased risk of pediatric cancers
Children are more exposed to chemicals through air, food, drinks, and skin contact relative to their body weight than are adults	Prenatal exposure to pesticides adversely affects male genital development and fertility
Because children’s bodies are still developing, their organs and immune systems are less able to detoxify contaminants from their bodies	Pesticide exposure is linked to pediatric cancers
Children and adolescents often spend many hours in parks and on lawns and athletic fields	Pesticide exposure is linked to reductions in IQ, attention/hyperactivity disorder, and autism
	Pesticide exposure can interfere with lifelong reproductive function in females, including puberty, menstruation, fertility, and menopause.

In addition, the ACOG notes that pesticide exposure is an environmental justice issue, with many low-income, minority communities experiencing greater exposure to harmful chemicals. Low-wage immigrant populations often work in positions that require higher levels of occupational exposure, putting themselves and their families at greater risk for negative health outcomes, whether through direct exposure, or the negative health impacts to a loved one.

## **Recommendations**

The American Academy of Pediatrics recommends that “the wide range of consequences of pesticide use on children and families should be considered” when considering existing or new government policies. Among their suggested recommendations are to:

- Promote community right-to-know procedures
- Increase labeling in both English and Spanish language
- Promote practices that minimize children’s exposure, such as bait stations
- Increase incentives for the use of IPM

The ACOG similarly advocates that “the evidence that links exposure to toxic environmental agents and adverse reproductive health outcomes is sufficiently robust” to join leading scientists and clinical practitioners in a call for “timely action to identify and reduce exposure to toxic agents” (ACOG, 2013, 1). They note that individuals alone can do little to limit exposure to toxins in the air and water, and as perpetuated through poverty. They call for the implementation of the Precautionary Principle, which states that even without scientific consensus, “when an activity raises threats of harm to human health, precautionary measures should be taken” (ACOG, 2013, 3). This position has similarly been advocated by the Endocrine Society and American Thyroid Association (Endocrine Society, 2005).

## References

AAP (American Academy of Pediatricians). 2012. Policy Statement: Pesticide Exposure in Children. *Pediatrics* 150(6): e1757-e1763.

ACOG (American College of Obstetrics and Gynecology). 2013. Committee Opinion Number 575: Exposure to Toxic Agents. The American College of Obstetrics and Gynecologists Committee on Health Care for Underserved Women, American Society for Reproductive Medicine Practice Committee, The University of California San Francisco Program on Reproductive Health and the Environment. Pp. 1-5.

Dich, J., Zahm, S.H., Hanberg, A., & Adami, H. O. (1997). Pesticides and cancer. *Cancer Causes Control*, 8 (3), 420-443.

The Endocrine Society. (2005). Studies find mother’s exposure to endocrine disrupting chemicals adversely affect male development/fertility. Accessed from <http://www.endocrine.org/news-room/press-release-archives/2005/endoskinnerswan>.

Mnif, W., Hassine, A. I. H., Bouaziz, A., Bartegi, A., Thomas, O., & Roig, B. (2011). Effect of Endocrine Disruptor Pesticides: A Review. *International Journal of Environmental Research and Public Health*, 8(6), 2265–2303.

President’s Cancer Panel. (2010). Reducing Environmental Cancer Risk. Bethesda, MD: National Cancer Institute.

Sanborn, M., Cole, D., Kerr, K., Vakil, C., Sanin, L. H. & Bassil, K. (2004). Pesticides Literature Review, also OCFP 2012 Pesticides Review update. Toronto: Ontario College of Family Physicians, [www.ocfp.on.ca](http://www.ocfp.on.ca); The Endocrine Disruption Exchange, [www.endocrinedisruption.org](http://www.endocrinedisruption.org).

ENVIRONMENTAL STUDIES PROGRAM  
WORKING PAPER SERIES

- No. 1 INFLUENCING BEHAVIOR CHANGE through Outdoor Programming and Environmental Education: A State of Knowledge Review, 2017
- No. 2 A CONTINUUM OF PLACE: the Fort Ord Public History Project, 2017
- No. 3 HEALTH EFFECTS OF PESTICIDES: State of Knowledge Review, 2017
- No. 4 BIOPHILIC DESIGN AT CSUMB: Report of Findings from a Campus Photovoice Assessment, Stakeholder Interviews, and Focus Group, 2017



California State University  
**MONTEREY BAY**

No. 3

-----

August 2017

ENVIRONMENTAL STUDIES PROGRAM  
WORKING PAPER SERIES

The mission of the Environmental Studies Program at California State University Monterey Bay is to develop students and communities with the knowledge, skills, and compassion to promote social and environmental justice and sustainable communities.