

CD

Summary

Contact: 971-673-1111 | cd.summary@state.or.us | www.healthoregon.org/cdsummary**ACUTE PESTICIDE POISONINGS IN OREGON: 2011–2020**

While doing chicken chores, a child handled a tray of rat poison pellets* with his bare hands. The child later proceeded to rub his eyes and eat blueberries, all before handwashing. The child was taken to an urgent care clinic for abdominal pain and burning eyes. He was diagnosed with eye pain from chemical exposure. Medical personnel performed an extended eye flush, which resolved the burning. In another event, an employee at a plant nursery developed a rash on the neck, chest, and back after working with acephate (an organophosphate) and lambda-cyhalothrin (a synthetic pyrethroid) without personal protective equipment. He visited an urgent care center and was diagnosed with irritant contact dermatitis due to chemical exposure to the skin. He was prescribed mupirocin ointment and prednisone and released for work. These are just two of the confirmed pesticide exposures reported to the Oregon Health Authority (OHA) last year.

Pesticide exposures often have broad and nonspecific signs and symptoms (Table). This underscores the need for a thorough history by a clinician or poison control specialist when pesticide exposure is a possibility. In addition, there is a need for a standard protocol for notification in advance of a pesticide application to nearby residents and others who may be affected.

PESTICIDE SYMPTOMS

According to the US Environmental Protection Agency (EPA), fruits and

* Active ingredients: corn gluten meal and sodium chloride. While these ingredients sound benign, corn gluten meal can coat the gastrointestinal villi of rats, disrupting receptors that prompt rodents to drink water. Dehydration ensues, causing a reduction in blood volume and pressure, tissue decay and circulatory arrest. Rats and mice can die within a week of regular intake.¹

Table. Common pesticides and acute symptoms²

PESTICIDE OR PESTICIDE CLASS	ACUTE SYMPTOMS AND EFFECTS
Pyrethrins and pyrethroids (e.g., dimethrin, permethrin)	Dizziness, headache, tremor, ataxia, vomiting, diarrhea, hyperexcitability, tingling, pulmonary edema, seizures, coma.
Carbamate and Organophosphate insecticides (e.g., aldicarb, carbaryl, chlorpyrifos, diazinon, sarin)	Headache, nausea, diarrhea, vomiting, miosis, seizures, loss of consciousness, convulsions, coma
Anticoagulant rodenticides (e.g., warfarin, brodifacoum)	Bleeding nose/gums, hematuria, melena, headache, confusion, loss of consciousness, seizures
Chlorphenoxy herbicides (e.g., 2,4-D, 2,4,5-T, MCPP)	Inhibit taste receptors for sweets, metabolic acidosis, striated muscle injury, peripheral neuropathy.

vegetables grown commercially in the United States are safer than ever to consume.² To achieve this, EPA requires pesticide application consistent with directions on the label to ensure that pesticide residues on fruits and vegetables (organic or conventionally grown) do not exceed federal health-based thresholds. Similarly, pesticide application consistent with label requirements should prevent accidental exposures. However, exposure from occupational or nonoccupational misapplication of pesticides, accidental exposure from mislabeled containers, and intentional harm by self or others could be associated with adverse health effects. The EPA and the Oregon Poison Center (800-222-1222) provide a wealth of information and expertise on identifying and responding to pesticide poisonings.³ Pesticides can be applied as liquids, sprays, powders, granules, or gases. Exposure can result when a pesticide gets onto clothes, equipment, surfaces, hair, eyes, and skin.

The National Institute for Occupational Safety and Health (NIOSH) classifies pesticide exposure cases as

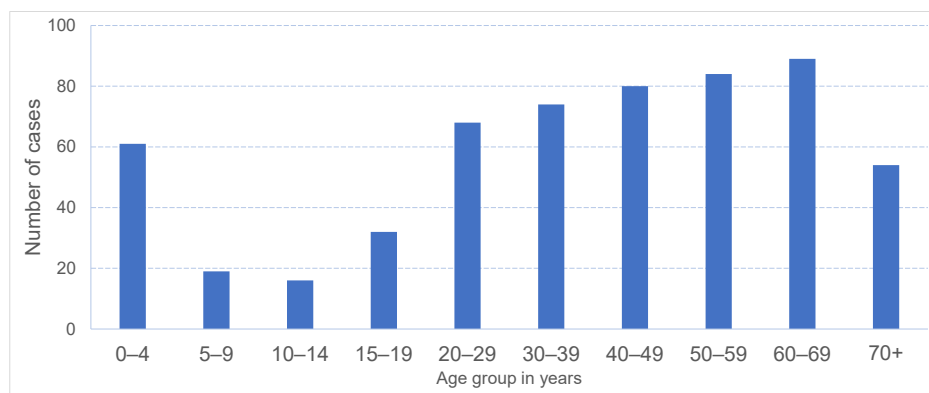
definite, probable, or possible, among other classifications, using a criteria matrix.⁴ The OHA Pesticide Exposure, Safety and Tracking Program (PEST) gathers information on exposures through interviews with those affected, reviews data from other agencies conducting investigations, and reviews medical records. Evidence collected helps PEST determine whether there is a causal relationship between exposure and health effects.

OREGON DATA

From 2011 to 2020, OHA's PEST program received 1,439 pesticide exposure reports of which 992 cases were confirmed as acute pesticide-related illnesses. Of the 992 cases with illness, 138 met definite criteria, 103 probable, and 751 possible, with 49% being female, 48% male, and 3% with no sex or gender information. Age was known for 556 cases. Figure 1 (supra) shows that exposures occurred in all age groups and mostly in those >20 years of age. The single large daycare-associated exposure in 2017 contributed 25 cases, mostly in the <5 years age group.

Of the 992 cases, 137 reports had race data and 130 had ethnicity data; of

Figure 1. Reported Oregon acute pesticide-related illness by age when available, (2011–2020) (n=556)



those, 21.5% identified as Hispanic. People who identify as Hispanic or Latino represented 14% of the general population in Oregon in 2020.⁵ Hispanics are overrepresented among these cases relative to their population size in Oregon.

OHA does not currently have enough data to classify exposures in this population as occurring at home or work. There are anecdotal reports that linguistic, cultural, and traditional values among Hispanic workers and employers create barrier for pesticide safety use and storage. For instance, having a supervisor or manager with limited language proficiency in a worker's native language or dialect can be an obstacle to communication and training. Also, someone apprehensive about approaching governmental agencies to report an exposure might be less likely to report such an exposure or health condition. Immigration status might also affect whether an

exposure is reported. Approximately 77% of farmworkers in the U.S. identify as Hispanic or Latino.⁶ The comparable number for Oregon is not readily available. Nationally, agriculture accounts for 90% of pesticide use in the USA, far more than in non-agricultural sectors (industry, commercial, home and garden).⁷

Most pesticide-related illnesses in Oregon were associated with exposures at home, with work-related exposures coming in second (Figure 2). Among work-related cases, almost half were from drift (the airborne movement of pesticides from an area of application to any unintended site, if you catch our drift) and exposure to residue, while almost a third occurred in those applying pesticides (data not shown).

CLINICIAN'S ROLE

Pesticide poisoning symptoms can mimic acute respiratory illness, acute gastrointestinal illness, allergies, and many other medical conditions. Clini-

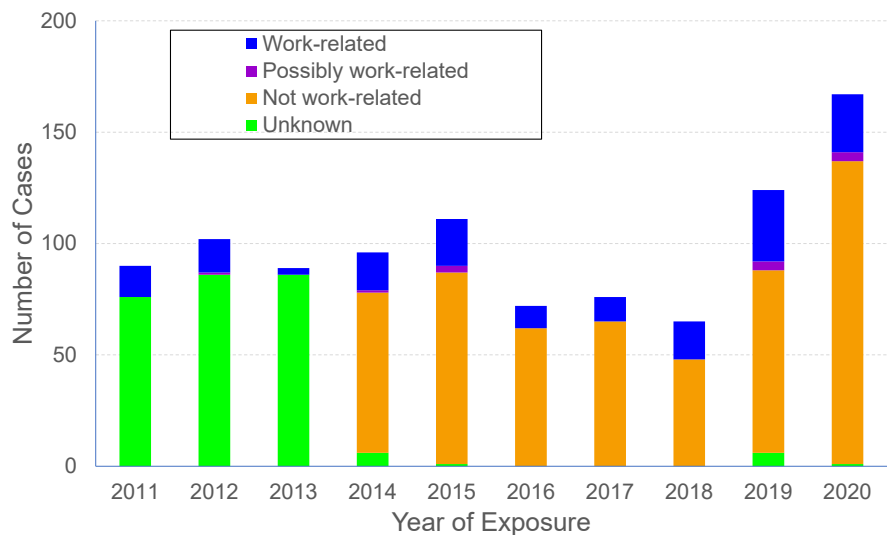
cians can ask patients in what settings they work, where they engage in routine outdoor living activities, and if pesticides are used or stored at home. These questions can assist in identifying possible acute pesticide poisoning. The Oregon Poison Center is an excellent resource for questions on the health effects and management of chemical exposures, including pesticides. In addition, the Pediatric Environmental Health Specialty Units (PEHSU), a national network of experts in pediatric health effects of environmental exposures, provides clinical guidance for identifying, managing, and preventing pesticide poisoning in children.¹⁰

Clinicians can inform patients that there are biological and physical pest control methods. Biological methods for the garden include predators such as spiders, ladybugs, and centipedes. Manual methods include spading, hoeing, and hand-picking and mulching weeds to control pests.

Integrated Pest Management (IPM) practices can reduce or eliminate the need for pesticides in household settings. The U.S. Department of Housing and Urban Development recommends some basic tips such as investigating the type of pests at home, entry points, and noticing the habits related to the pests. For instance, all pests are attracted to food and water. IPM strategies recommend keeping areas sanitized and uncluttered, placing trash in closed containers, fixing any water leaks, and sealing the entrance to the foundation of walls, floor surfaces, roofs, and/or cracks and crevices to building structures.⁷

When handling or storing pesticides, precautionary steps can be taken to keep them out of children's reach such as storing containers in cabinets or sheds, keeping pesticides in their original containers with visible labels intact, and avoiding reuse of pesticide containers. Other steps to reduce exposure include removing boots, shoes, clothing, and other items before entering the home. It is also a good practice to wash or shower before making any physical contact with children, pets, or other household members.^{8,9,10} Following these precautionary measures can be vital in pesticide poisoning prevention.

Figure 2. Reported cases of Oregon acute pesticide-related illness by occupational and non-occupational status of exposure, (2011–2020) (n=992)



PUBLIC HEALTH FOLLOW-UP

Pesticide exposures are a reportable condition. A suspected pesticide poisoning exposure case must be reported to the Public Health Division PEST program online (<http://healthoregon.org/howtoreport>), by phone (971-673-0440), or fax (medical records and patient contact info can be faxed to 971-673-0457).

Acute pesticide poisoning case investigations help educate the public and assist with developing outreach strategies for prevention. One report can lead to discovery of several potential pesticide exposures. Following a report, PEST contacts patients to ask additional questions such as: How were you exposed? What symptoms did you have? What chemical/pesticide was used? Were others involved? Reports are always confidential.

RESOURCES

- Oregon's Pesticide Exposure Safety & Tracking (PEST): healthoregon.org/pesticide
- The National Poison Information Center (NPIC): <http://npic.orst.edu>
- The National Poison Information Center (NPIC) in SPANISH: <http://npic.orst.edu/index.es.html>
- U.S EPA Safety and Health for Occupational Pesticide Use in SPANISH: <https://espanol.epa.gov/seguridad-laboral-al-usar-pesticidas>
- The National Institute for Occupational Safety and Health (NIOSH): www.cdc.gov/niosh/topics/pesticides/

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