

Indicator 11: Acute Work-Related Pesticide Poisonings Reported to Poison Control Centers

Significanceⁱ

Pesticides (including disinfectants) are chemicals used in the workplace purposely designed to harm certain life forms. The active ingredients in pesticides can pose both acute and chronic exposure risks if not carefully applied. An estimated one billion pounds of pesticides applied as fungicides, fumigants, herbicides, insecticides, repellents and rodenticides are used each year in the United States to protect food and control disease. At least an additional 2.6 billion pounds of pesticide active ingredients are used annually as disinfectants.ⁱⁱ

The Environmental Protection Agency (EPA) has estimated that 10,000-20,000 physician-diagnosed pesticide illnesses and injuries occur among agricultural workers each year in the United States. If workers from the non-agricultural setting are included, for example grounds keepers and janitorial or cleaning staff, this estimate doubles to 20,000 to 40,000 work-related pesticide poisonings each year.ⁱⁱⁱ

Methods

Local poison centers provide guidance and information for cases of work-related pesticide exposure to medical professionals, the public and consumers throughout the United States. The American Association of Poison Control Centers (AAPCC) collects information on all poisonings reported to poison control centers; these data are compiled in the National Poison Data System (NPDS). The Council of State and Territorial Epidemiologists (CSTE) works with the AAPCC to provide NPDS data on aggregate work-related pesticide and disinfectant poisoning exposures to state-based surveillance programs.

Because Colorado's Occupational Health and Safety Surveillance Program has access to both case-level data reported to NPDS by the Rocky Mountain Poison and Drug Center (RMPDC) and aggregate data provided by the CSTE, both sources are currently utilized to monitor work-related pesticide poisoning. However, there are slight differences in applied case definitions, which are further described in Table 11.1 notes.

ⁱ Council of State and Territorial Epidemiologists. *Occupational Health Indicators: A Guide for Tracking Occupational Health Conditions and Their Determinants*. Last updated April 2012.

ⁱⁱ United State Environmental Protection Agency, *Pesticides Industry Sales and Usage Report, 2006-2007*, http://www.epa.gov/opp00001/pestsales/07pestsales/market_estimates2007.pdf (See Tables 3.1 and 3.3)

ⁱⁱⁱ Blondell, J. *Epidemiology of Pesticide Poisonings in the United States, With Special Reference to Occupational Cases*. *Occ Med* 1997; 12:209-220.

Results

Table 11.1 Work-related pesticide poisoning exposures reported to poison centers, Number and rate per 100,000 employed, Colorado and the United States, 2001-2011*

	Colorado Cases from RMPDC reports		Colorado Cases from AAPCC		United States Cases from AAPCC	
	Number	Rate	Number	Rate	Number	Rate
2001	75	3.39	58	2.60	2,492	1.80
2002	58	2.52	46	2.00	2,528	1.90
2003	55	2.36	36	1.60	2,503	1.80
2004	62	2.60	53	2.20	2,476	1.80
2005	59	2.45	51	2.10	2,593	1.80
2006	53	2.10	35	1.40	2,560	1.77
2007	49	1.89	38	1.47	2,458	1.68
2008	65	2.51	41	1.58	2,171	1.50
2009	54	2.14	42	1.66	2,040	1.46
2010	64	2.58	Data not available	Data not available	Data not available	Data not available
2011	57	2.27	Data not available	Data not available	Data not available	Data not available
Average	59	2.44	44	1.85	2,425	1.72

Data include only closed cases, with single-substance exposure. Any changes to previously reported numbers are likely due to updates in case status recorded in NPDS between data extractions.

Numerator: RMPDC case-level data from the NPDS. Includes all Pesticides generic codes for fumigants, fungicides, herbicides, insecticides, miscellaneous pesticides, repellents and rodenticides, all Household Cleaner disinfectants, and select disinfectants from the Swimming Pool/Aquarium and Industrial Cleaner categories (as specified in the CSTE OHI guidance).

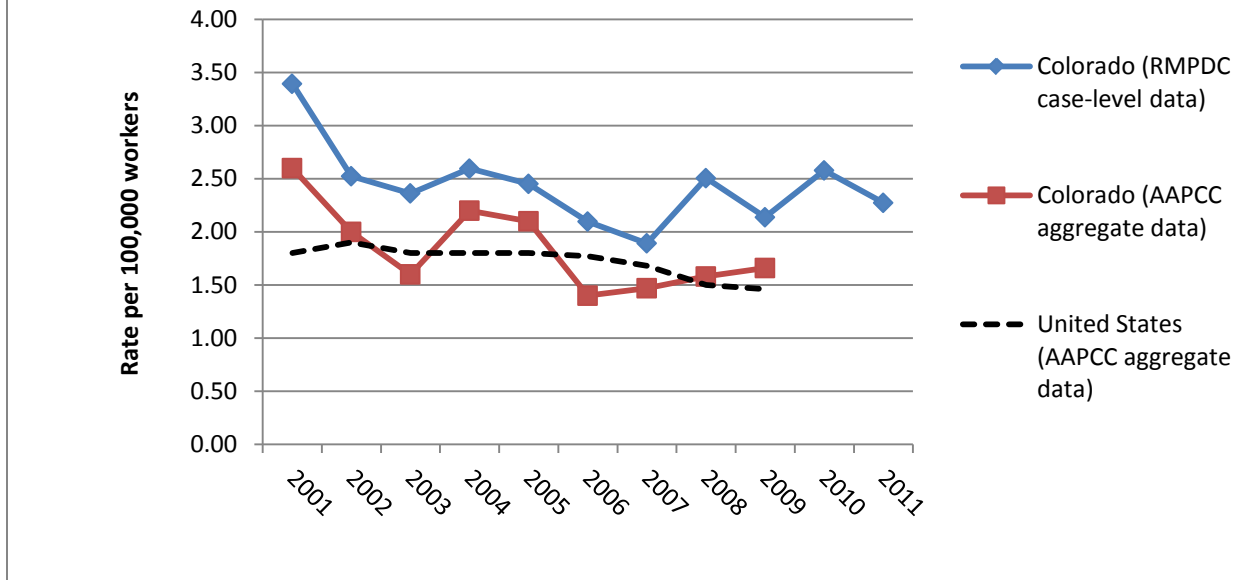
Numerator: AAPCC aggregate data provided by the CSTE for Colorado and the United States. Includes the same generic codes as the RMPDC case-level data, with the following few codes excluded:

- 0201055 (bromine water/shock treatment) in the Swimming Pool/Aquarium Category
- 0201056 (chlorine water/shock treatment) in the Swimming Pool/Aquarium Category
- 0201008 (disinfectant industrial cleaner) in the Industrial Cleaner Category
- 0077562 (Other Type of Insecticide/Pesticide)
- 0077569 (Unknown Type of Insecticide/Pesticide)

Denominators: Employed persons age 16 years or older from the BLS Geographic Profile of Employment and Unemployment (GP) and Current Population Survey (CPS).

**AAPCC aggregate data for Colorado and the United States is not available from the CSTE beyond 2009*

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Limitations

- It is presumed that most work-related pesticide exposures (including disinfectants) reported to poison centers are acute exposures; however, we were not able to quantify the distinction between acute and chronic exposure with the data presently available for this indicator.
- Not all acute work-related pesticide exposures resulting in illness are reported to poison centers; thus, these data likely underestimate the true-burden of acute pesticide poisoning.

- Poison centers capture the types and active ingredients of a pesticide; however, the detailed circumstance, occupation, business and industrial identification associated with a call are generally unknown.
- Poison center staff routinely follow cases to identify a reasonably certain medical outcome and update NPDS records until the case is closed. Thus, any updates to previously reported data are likely reflections of updated case reports captured in the latest analysis.

Accomplishments to Date:

- In 2011, the Occupational Health and Safety Surveillance Program secured direct access to poison center call data for Colorado cases from the RMPDC.
- In 2012, an in-depth analysis of all occupational poisoning exposure data from the RMPDC was completed.^{iv}
- The CDPHE is currently conducting additional analysis of RMPDC data to describe occupational and environmental pesticide poisonings by age, gender, race/ ethnicity, severity and illness outcome. As much as possible, this analysis will describe the different risk factors for pesticide poisonings from agricultural use and pesticide poisonings from non-agricultural use (i.e., disinfectants).

Recommendations and Next Steps

- Pursue opportunities to enhance public health surveillance activities in Colorado for occupational pesticide poisoning with the goals of providing more comprehensive data and evaluating and describing risk factors associated with chronic and acute exposure cases.^v Activities toward these goals may include pursuing physician-diagnosed pesticide poisoning as a reportable condition and applying to participate in the CDC/NIOSH Sentinel Event Notification System for Occupational Risk (SENSOR) Pesticide Surveillance Program during the next grant application cycle.^{vi}
- Conduct a quality assessment of the case-level RMPDC data and aggregate AAPCC data to better understand differences in case numbers and possibly improve consistency in national surveillance efforts.

^{iv} The complete report is published on our program webpage: <http://www.colorado.gov/cs/Satellite/CDPHE-DCEED/CBON/1251610614250>

^v In summer 2012, the Occupational Health and Safety Surveillance Program conducted a survey study of certified pesticide applicators in Colorado. The report of findings is forthcoming.

^{vi} See SENSOR Program overview: www.cdc.gov/niosh/topics/pesticides/overview.html