

Pesticide Incidents

Although pesticides play a role in protecting human health, food, and crops, they pose a risk of poisoning when not used and/or stored properly. The American Association of Poison Control Centers (AAPCC) collects statistics on poisonings and represents the single largest source of information on acute health effects of pesticides resulting in symptoms and requiring health care (Calvert et al., 2001). The data include incidents related to individual pesticides and to mixtures of products (about 8 percent of reports). The data also include intentional exposures such as suicide attempts and malicious use. The AAPCC uses the National Poison Data System (NPDS), formerly the Toxic Exposure Surveillance System, to collect information on all reported incidents.

This indicator is based on data from NPDS-published reports for the years 1998 through 2014. During this period, more than 80 percent of the U.S. population was covered by Poison Control Centers (PCCs) reporting to the national database. Annual reports of incidents were divided by the percent of U.S. population served to estimate the total incidents nationwide, and divided by the total U.S. population to develop the incidence rate.

What the Data Show

Between 1998 and 2014, there was an overall 57 percent decline in the rate of reported pesticide incidents in the U.S. (Exhibit 1). Cases involving disinfectants, fungicides, and rodenticides decreased by at least 70 percent. The single largest decline occurred for the category of organophosphate (OP) insecticides, which saw an 87 percent drop in the rate of reported incidents between 1998 and 2014. Part of the decline in reported OP-related incidents may be due to the substitution of other, less toxic insecticides for some of the OPs over time. Reported incidents involving other categories of pesticides also decreased during this time period, including insecticides (29 percent), herbicides (53 percent), and other pesticides, including fumigants and repellents (54 percent).

Limitations

- Incidents may be misclassified when they are reported over the phone but are not verified by laboratory tests. For example, a child found holding a pesticide container may not have actually been exposed, but if a PCC poison specialist receives a call and determines that the reported symptoms are consistent with the toxicology, dose, and timing of the incident, the call is registered as an incident. About 21 percent of calls to PCCs arise from health care facilities, but the majority of calls are from victims or their relatives or caretakers. Although some misclassification can be expected, it is assumed to be non-differential among the different types of pesticides.
- Only calls with known outcomes are reported in this indicator. This may introduce some bias because the proportion of all reported pesticide incidents with known outcomes declined from 48 percent in 1998 to 38 percent in 2014.
- The data collection process is standardized for PCCs, but it is a passive system. Under-reporting of incidents is a serious shortcoming. Studies show that medical facilities generally report between 24 and 33 percent of incidents from all substances to PCCs (Chafee-Bahamon et al., 1983; Harchelroad et al., 1990; Veltri et al., 1987).

- In 2006, the methodology for identifying exposures and outcomes changed, potentially making comparison of these data with the data in previous AAPCC Annual Reports problematic. The extent to which the changes affect the numbers of exposures and reported outcomes is unclear from the published report, and generally the data do not significantly fluctuate during the 2004–2006 reporting period.
- Data are collected by multiple PCCs, with follow-up likely performed in different ways.

Data Sources

This indicator is based on summary data from annual reports published by NPDS, 1998–2014 (AAPCC, 2016) (available from <http://www.aapcc.org/annual-reports/>). Annual data from these reports are presented and incidence rates were calculated from the population served by participating PCCs; population figures can also be found in the annual reports. Only summary data are publicly available; raw data from individual cases are considered confidential.

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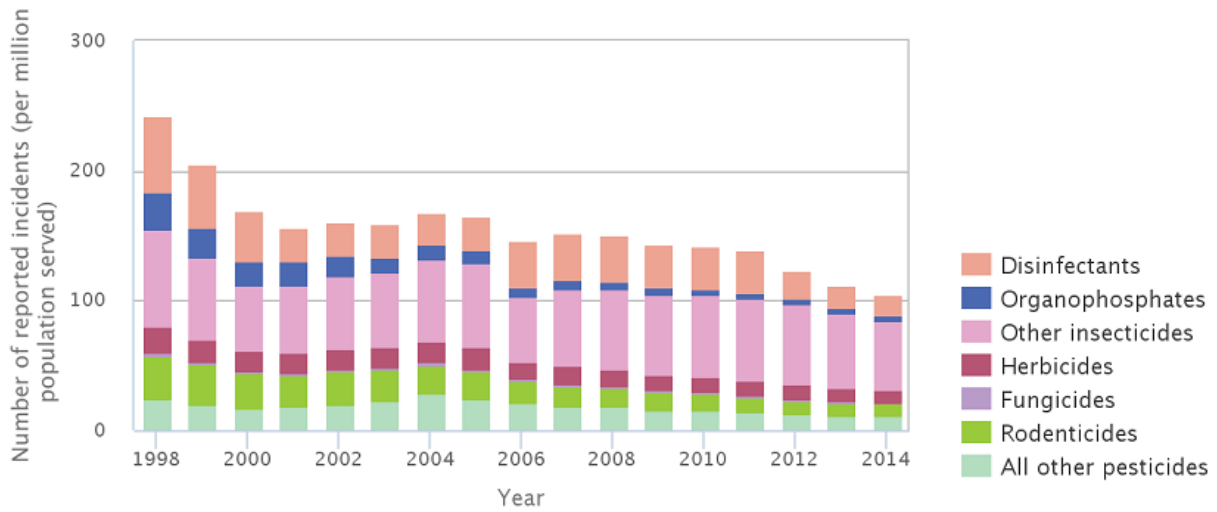
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Exhibit 1. Reported pesticide incidents per million U.S. population by type of pesticide, 1998–2014



This indicator tracks pesticide incidents reported to poison control centers (PCCs) that report to the AAPCC national database. The rate of reported incidents is calculated based on the population served by these PCCs.

Information on the statistical significance of the trends in this exhibit is not currently available. For more information about uncertainty, variability, and statistical analysis, view the technical documentation for this indicator.

Data source: AAPCC, 2016