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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 the acute health effects of pesticides which resulted in symptoms that required medical attention (Calvert et al., 2010). The data include incidents related to both individual pesticides and to mixtures of products (about 12 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) to collect information on all reported exposure cases, referred to here as incidents.

This indicator is based on data from NPDS-published reports for the years 1998 through 2020. During this period, the percent of the U.S. population covered by Poison Control Centers (PCCs) reporting to the national database rose from 80 percent to 100 percent. Annual reports of incidents were divided by the percent of U.S. population served to estimate the total incidents nationwide, then divided by the total U.S. population to develop the incidence rate.

What the Data Show

Between 1998 and 2020, there was an overall 61 percent decline in the rate of reported pesticide incidents in the U.S. (Exhibit 1). Cases involving rodenticides, disinfectants, and fungicides all decreased by more than 60 percent. The single largest decline occurred for the category of organophosphate (OP) insecticides, which saw an 91 percent drop in the rate of reported incidents between 1998 and 2020. 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 incident rates involving other categories of pesticides also decreased during this period with herbicides declining 57 percent, and other pesticides (including fumigants and repellents) declining by 60 percent.

Limitations

- Incidents may be misclassified when they are reported over the phone and are not verified by laboratory tests. For example, a child found holding a pesticide container may not have 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 most of the calls originate from the victim's residence (AAPCC, 2021). 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, as the percent of all reported pesticide incidents with known outcomes declined from 48 percent in 1998 to 36 percent in 2020.
- The data collection process is standardized for PCCs, but it is a passive system.

Under-reporting of incidents is a serious shortcoming.

- 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 percentage of reported outcomes only decreased slightly in the years immediately following the change.
- 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, 1998–2020 (AAPCC, 2021). Reports from 2012–2020 are available from

<u>https://www.aapcc.org/annual-reports/</u>, with older reports available upon request. 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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