

Pesticide and Insecticide Toxicity

Several surveillance systems track acute occupational illness and injury related to pesticides. Two systems are national, and several additional systems cover individual States. The Toxic Exposure Surveillance System (TESS) is maintained by the American Association of Poison Control Centers. Between 1993 and 1996, about 81% of the U.S. population was covered by a participating poison control center. During those years, more than 6,300 pesticide poisonings that occurred in the workplace were documented in TESS. Most of the poisonings were associated with insecticides (Figure 5–37). Among those cases, 41% involved organophosphates, and 29% involved pyrethrins/pyrethroids.

SOII collects information about pesticide poisonings associated with lost workdays. Between 1992 and 1996, the annual number of nonfatal occupational illnesses and injuries related to pesticides ranged from 504 to 914 (Figure 5–38). Most of those illnesses were associated with exposure to insecticides. Because SOII records only cases that result in lost work time, illnesses may be more severe than those recorded by other surveillance systems.

Thirty-one States have reporting requirements for pesticide-related illness and injury, but only eight States conduct surveillance for this condition. In California, Florida, New York, Oregon, and Texas, surveillance activities for acute occupational illness and injury related to pesticides are conducted in a SENSOR program supported in part by the U.S. Environmental Protection Agency (EPA). Besides tabulating case reports, these systems perform in-depth investigations for case confirmation, conduct screening of other workers at a patient's worksite, and develop targeted interventions. Over a 5-year period (1992–1996), the annual number of cases in New York, Oregon, and Texas ranged from 72 to 170 (Figure 5–39). Most cases involved exposures to insecticides. In addition, 33% of the cases involved agricultural exposures, including pesticide mixing, loading, and application.

Pesticide-related illness has been a reportable condition in California since 1971. The California Department of Pesticide Regulation (CDPR) has responsibility for collecting and evaluating these reports. Between 60% and 75% of cases are identified from workers' compensation reports. Most of the remainder are reported by physicians. The annual number of acute occupational illnesses and injuries related to pesticides in California ranged from 656 to 979 (Figure 5–40). Insecticides were responsible for the largest proportion of cases. Among insecticides, insecticide combinations and organophosphates were most commonly responsible (Figure 5–41). More than half of the reported cases occurred in agriculture (56%); services and public administration together contributed 28% (Figure 5–42).

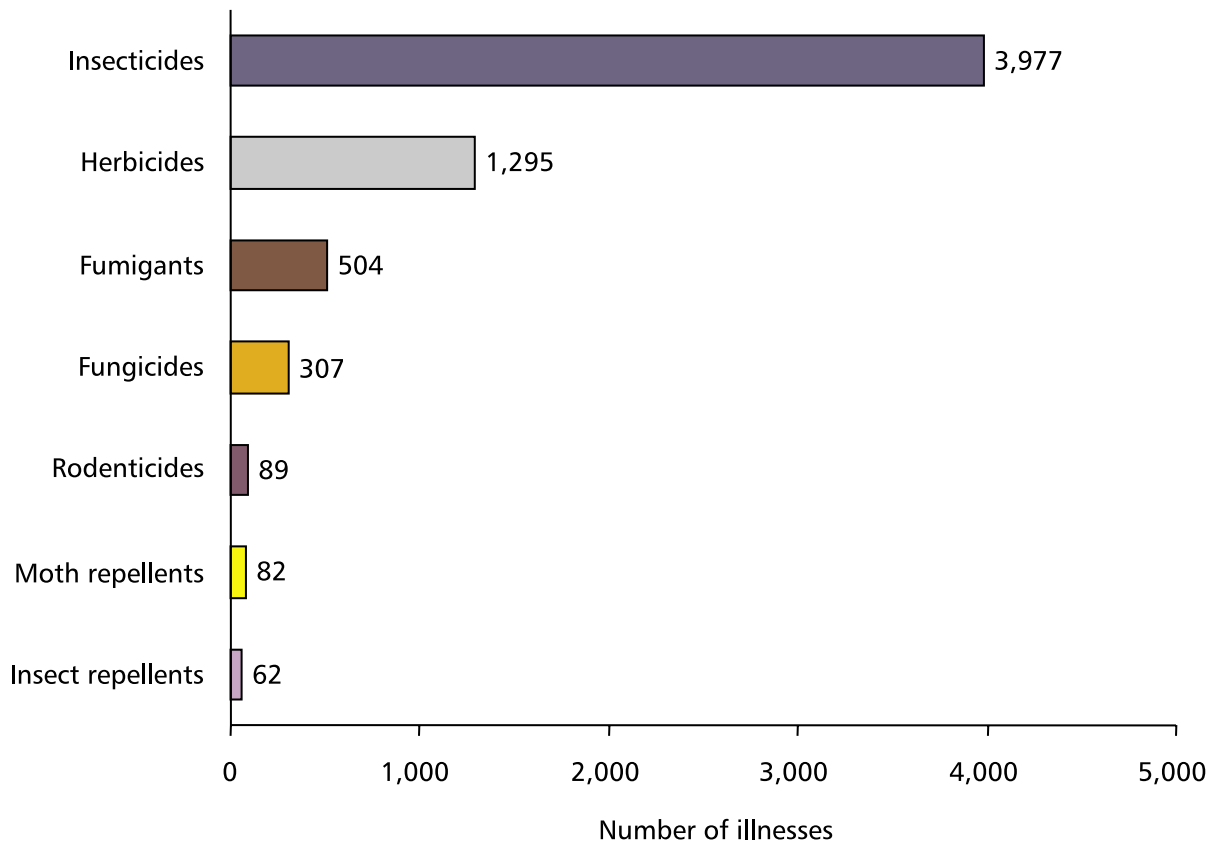


Figure 5–37. Number of acute occupational illnesses related to pesticides by pesticide category (excludes antimicrobials), 1993–1996. (Source: TESS [1998].)

NONFATAL ILLNESS

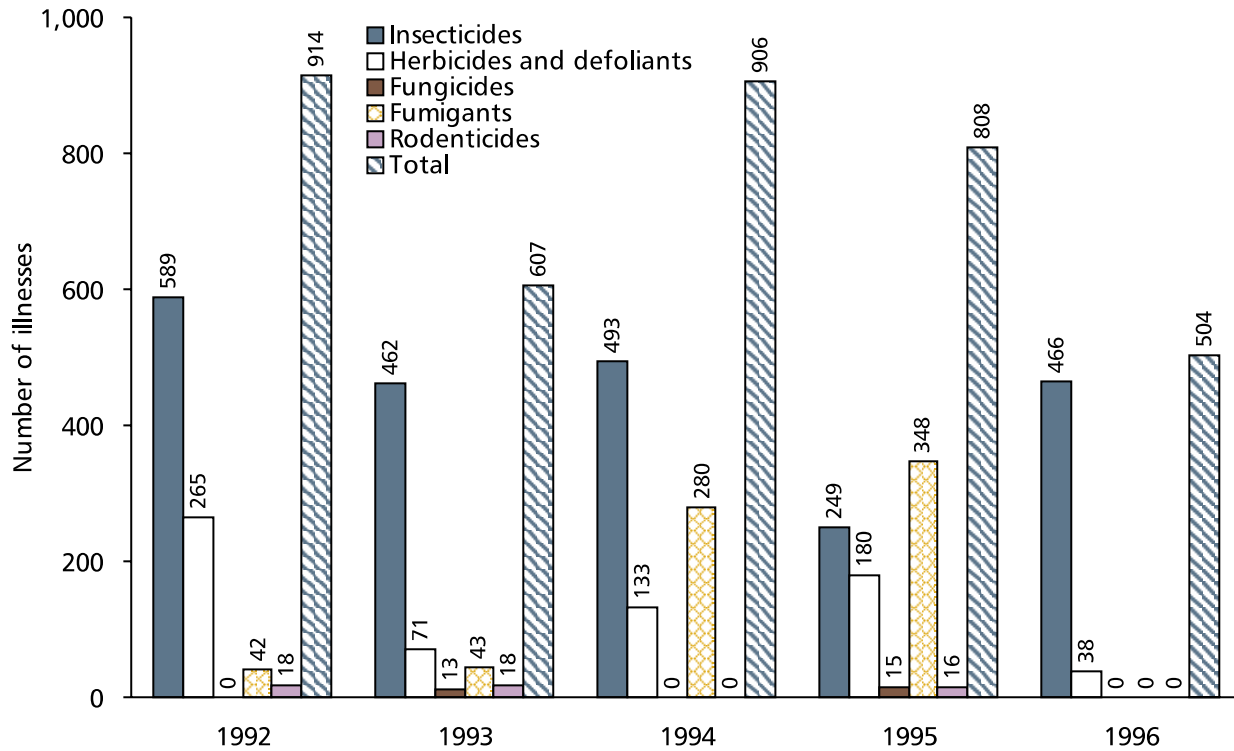


Figure 5–38. Number of occupational pesticide-related illnesses with days away from work in private industry by pesticide category, 1992–1996. (Source: SOII [1999].)

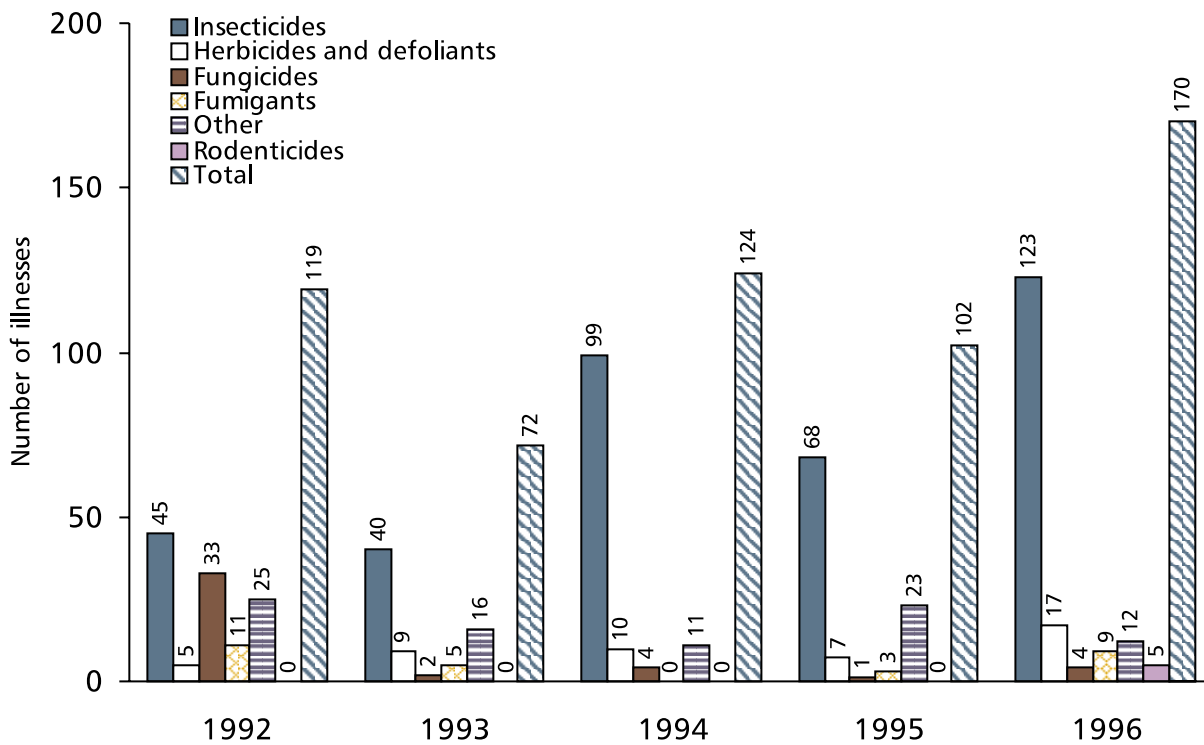


Figure 5–39. Number of occupational illnesses related to pesticides in New York, Oregon, and Texas by pesticide category, 1992–1996. (Source: SENSOR [New York State Department of Health 1999; Oregon Health Division 1999; PEST 1999].)

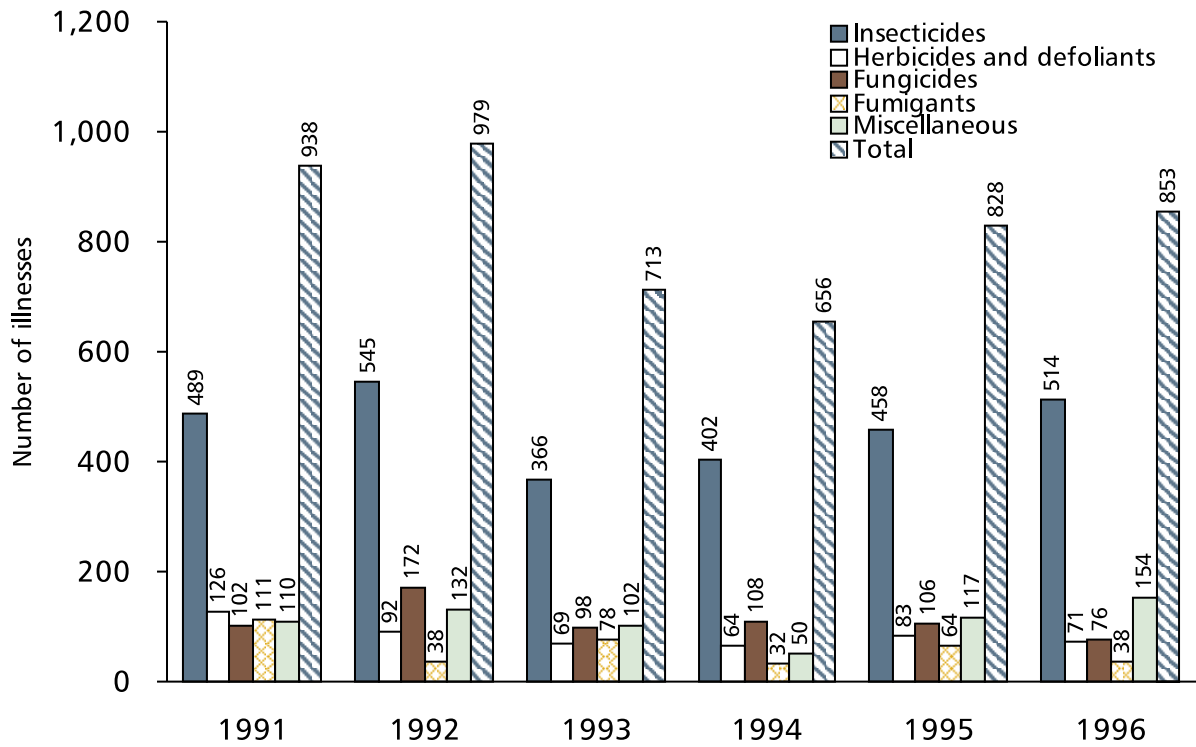


Figure 5-40. Number of occupational illnesses related to pesticides in California by pesticide category (excludes antimicrobials and unknown agents), 1991-1996. (Source: CDPR [1999].)

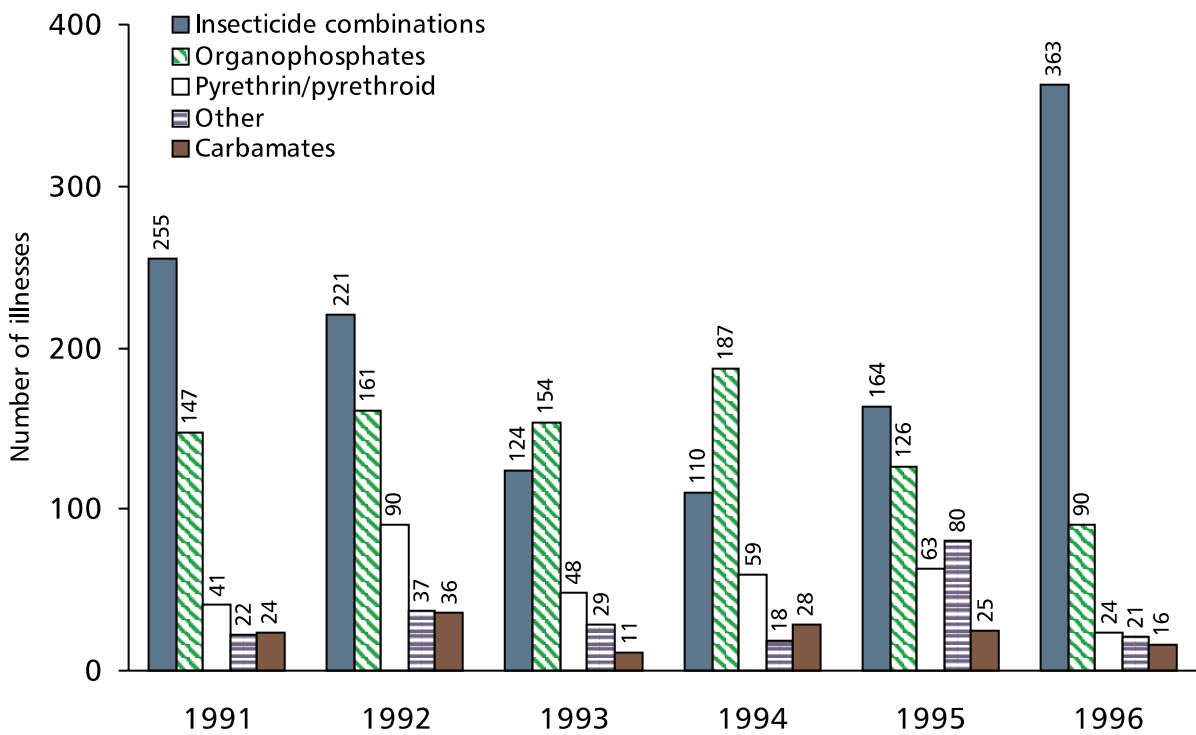


Figure 5-41. Number of occupational illnesses related to insecticides in California by insecticide category, 1991-1996. (Source: CDPR [1999].)

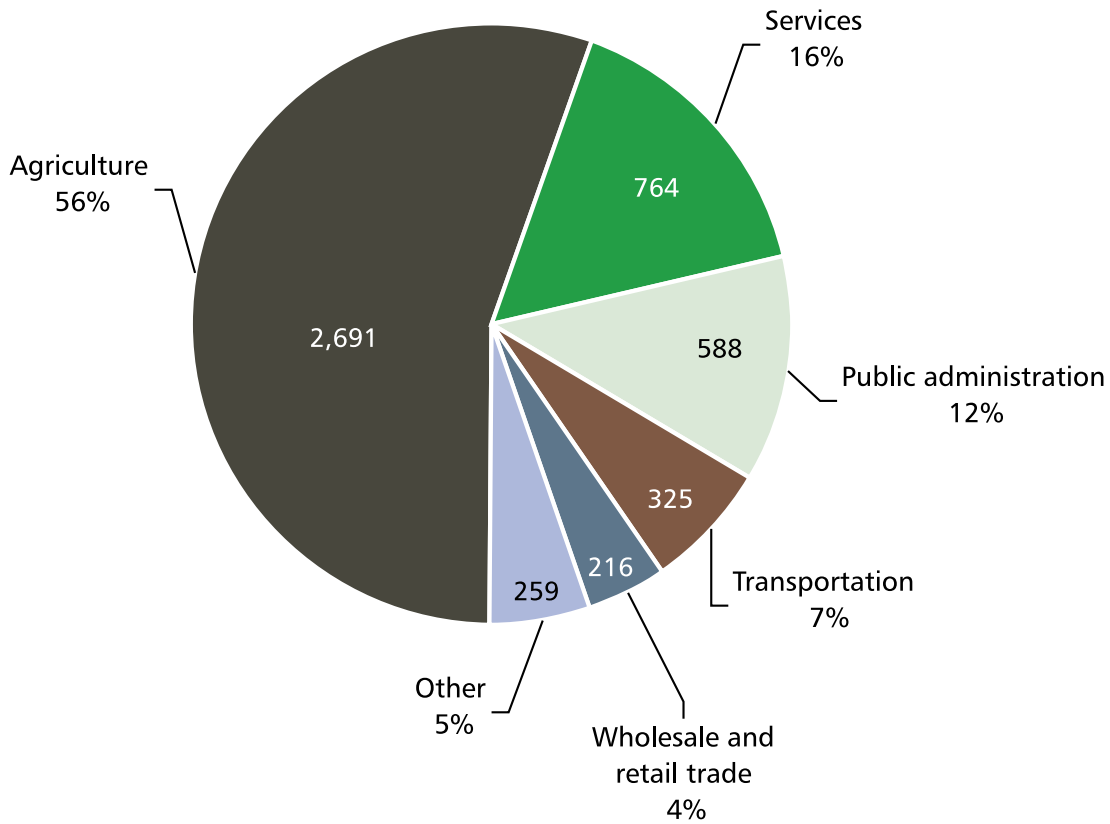


Figure 5–42. Number and distribution of occupational illnesses related to pesticides (excluding antimicrobials and unknown agents) in California, by industry division, 1991–1996. (Source: CDPR [1999].)

Infections in Health Care Workers

The 10 million health care workers in the United States constitute approximately 8% of the workforce. Health care workers can be exposed to a variety of occupational hazards, including repeated trauma, toxins, and a broad range of infectious agents. Surveillance data on infections in these workers are included in four Federal health databases:

- NaSH tracks exposures to and infections from several agents, including TB, vaccine-preventable diseases, and bloodborne pathogens.
- The Viral Hepatitis Surveillance Program (VHSP) and the Sentinel Counties Study of Acute Viral Hepatitis track hepatitis infection.

- Cases of AIDS and HIV infection among health care workers are ascertained from several sources, including the HIV/AIDS Reporting System (HARS), which is maintained by CDC.
- *staffTRAK-TB* is used by health department TB control programs to monitor skin testing in employees of their clinics and affiliated institutions.

Between June 1995 and October 1999, 60 participating NaSH hospitals reported 6,983 cases of exposure to blood or body fluids. Most of these cases occurred in nurses (43%) and physicians (29%) (Figure 5–43). The largest number of exposures to blood or body fluids occurred in inpatient (30%) and operating/procedure room settings (29%) (Figure 5–44). The major route of exposure was percutaneous (puncture/cut injury) (Figure 5–45).

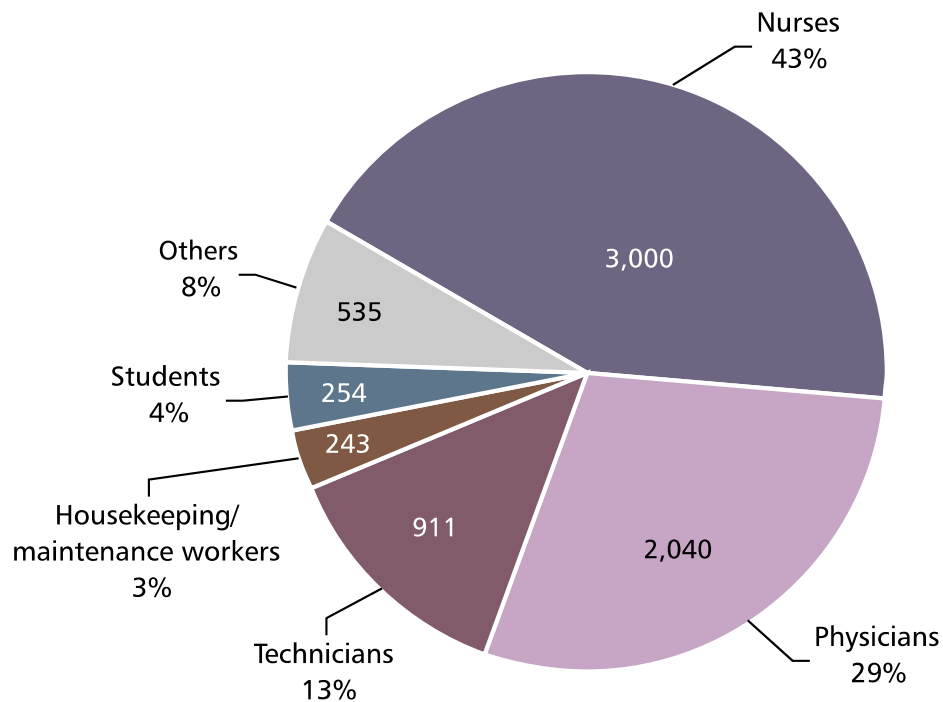


Figure 5–43. Number and distribution of reported health care worker exposures to blood or body fluids in 60 participating hospitals by occupational group, June 1995 to October 1999. (Source: NaSH [1999].)

NONFATAL ILLNESS

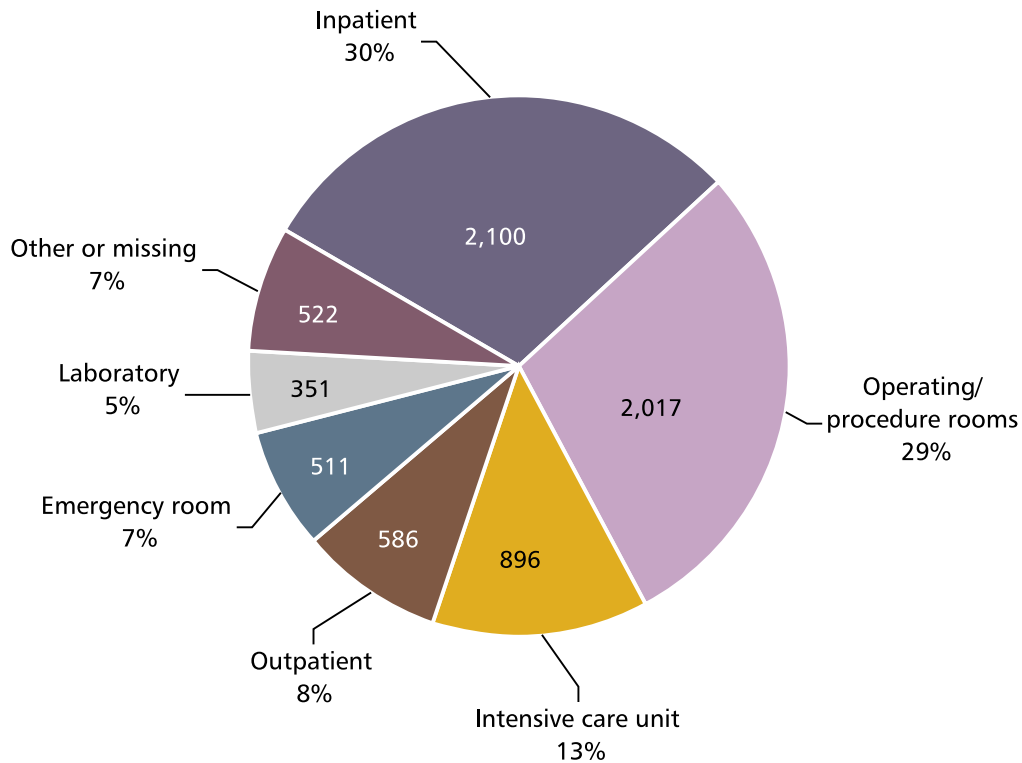


Figure 5-44. Number and distribution of reported health care worker exposures to blood or body fluids in 60 participating hospitals by work location, June 1995 to October 1999. (Source: NaSH [1999].)

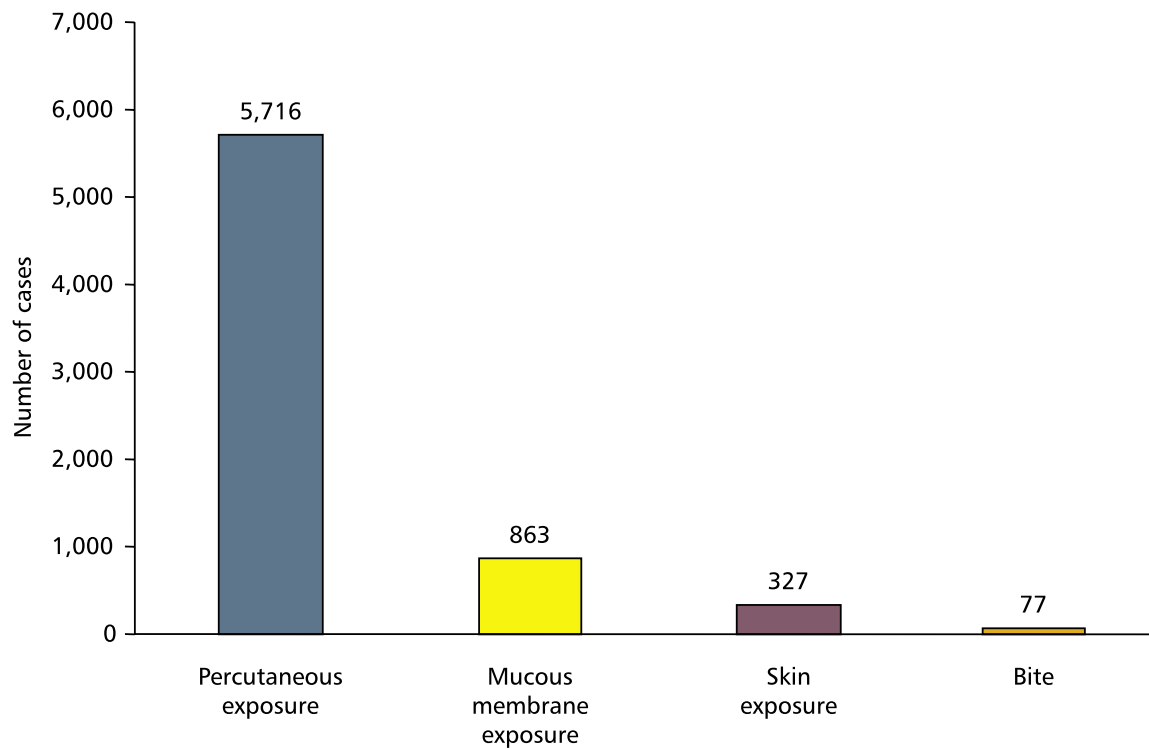


Figure 5-45. Number of reported health care worker exposures to blood or body fluids in 60 participating hospitals by exposure type, June 1995 to October 1999. (Source: NaSH [1999].)

Consequences of Bloodborne Exposures

Hepatitis B Virus

VHSP and the Sentinel Counties Study of Acute Viral Hepatitis indicate a 93% decline in hepatitis B viral infections in health care workers over a 10-year period—from approximately 12,000 cases in 1985 to 800 cases in 1995 (Figure 5–46). Infections also declined among the general population during this time, but not as dramatically. The greater decline among health care workers may be attributed to the adoption of universal precautions against exposure to body fluids and vaccinations against hepatitis B.

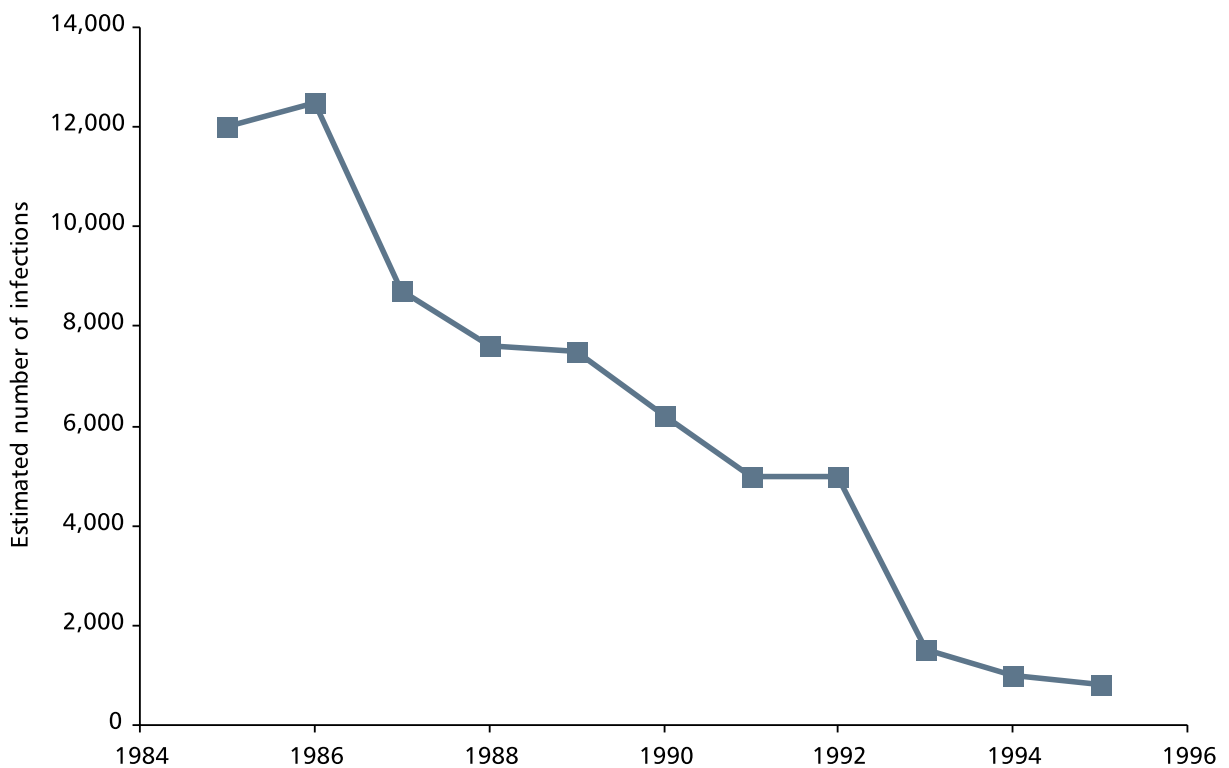


Figure 5–46. Estimated number of hepatitis B infections among U.S. health care workers, 1985–1995. (Source: VHSP [1999]; NCID [1999].)

Hepatitis C Virus

Hepatitis C virus infection is the most common chronic bloodborne infection in the United States. Although the prevalence of hepatitis C virus infection in health care workers is similar to that in the general population (1% to 2%), health care workers have an increased occupational risk from needlestick injuries. The number of health care workers who have acquired hepatitis C infections occupationally is not known. But approximately 2% to 4% of acute infections in the United States occurred among health care workers exposed to blood in the workplace. Most workers exposed to hepatitis C were physicians or nurses (Figure 5–47).

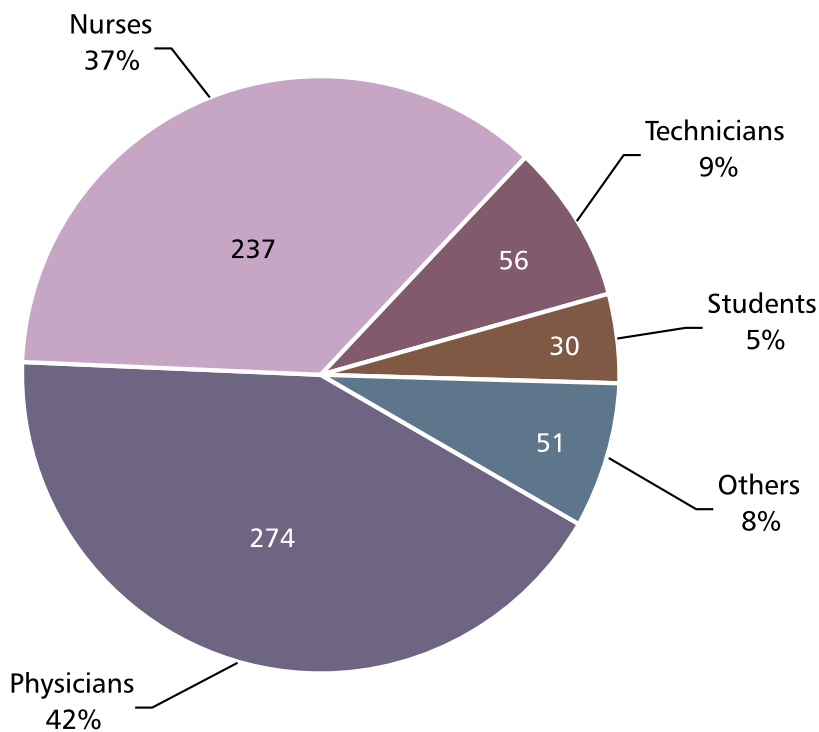


Figure 5–47. Number and distribution of health care workers exposed to hepatitis C virus by occupational group, June 1995 to October 1999. (Source: NaSH [1999].)

Human Immunodeficiency Virus

Fifty-five cases of documented and 136 cases of possible occupational HIV transmission were recorded in HARS through June 1999. Among the documented cases of HIV seroconversion following occupational exposure, 85% resulted from percutaneous exposure and 93% involved exposure to blood or visibly bloody fluid. Most documented cases of occupational HIV transmission occurred among nurses (42%) and laboratory workers (35%) (Figure 5-48).

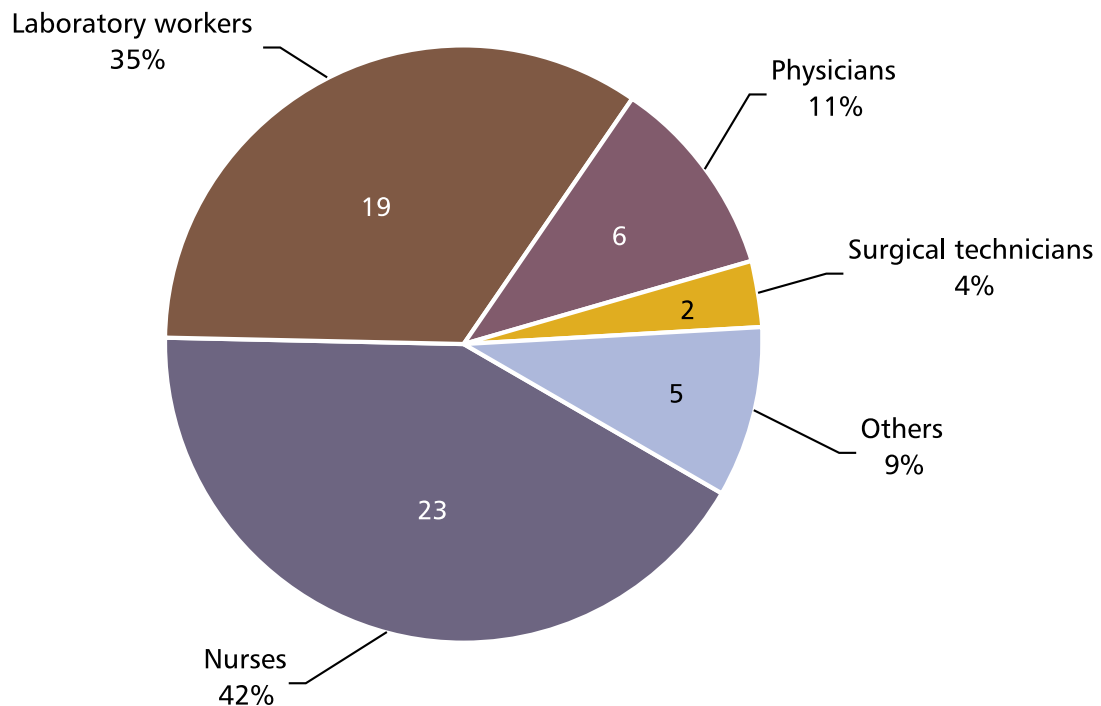


Figure 5-48. Number and distribution of health care worker cases with documented occupational transmission of HIV by occupation through June 1999. (Source: HARS [CDC 1999].)

Tuberculosis (TB)

Health care workers have long been at risk of contracting TB. This risk increased in the 1980s with the resurgence of TB in the United States and the subsequent development of drug-resistant TB bacteria during the AIDS epidemic. From 1994 through 1998, there were 2,732 cases of TB in health care workers reported to the Centers for Disease Control and Prevention (CDC) through *staffTRAK-TB* from the 50 States, the District of Columbia, and Puerto Rico. Incidence rates in health care workers are shown in Figure 5–49 for each year from 1994 through 1998. These rates are not associated specifically with occupational exposure because that information is not available. Cases in health care workers constituted 3% of all TB cases.

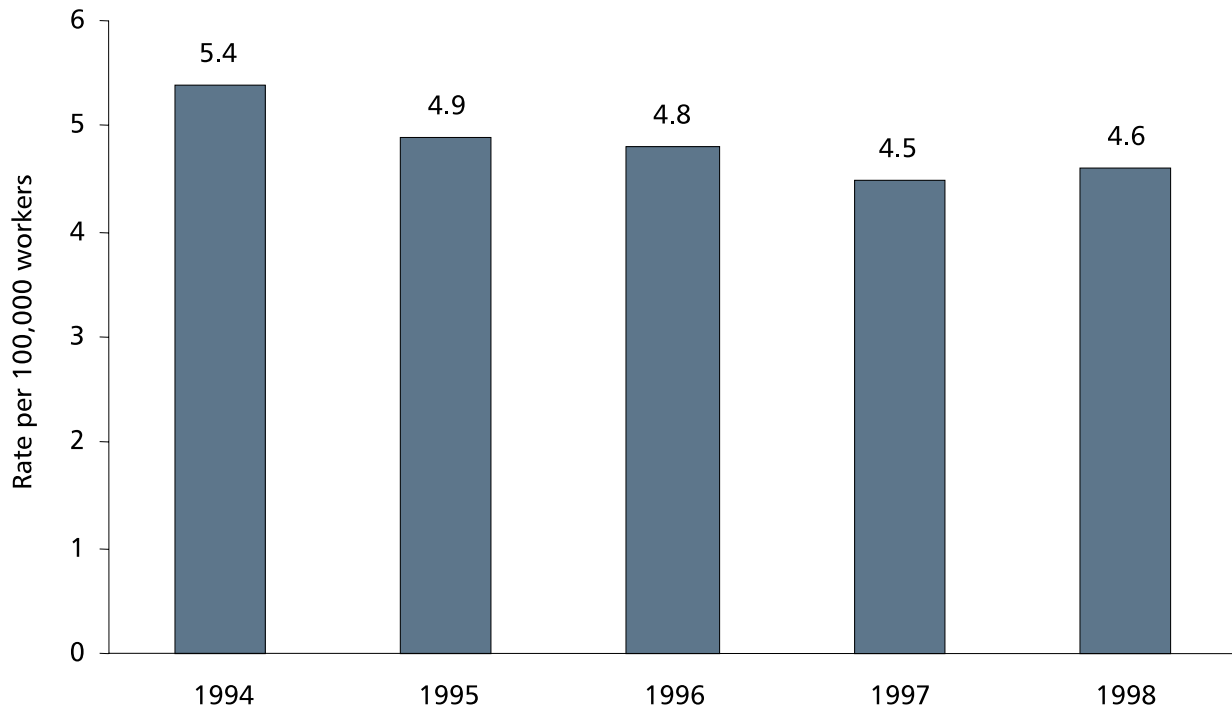


Figure 5–49. Incidence rates of TB in health care workers, 1994–1998. (Source: *staffTRAK-TB* [1999].)