

Poisoning and Toxicity

Poisoning

Poisoning represented 1% (5,100) of all nonfatal occupational illness cases recorded in SOII in 1997. Poisoning cases include exposures to heavy metals (including lead), toxic gases (such as carbon monoxide and hydrogen sulfide), organic solvents, pesticides, and other substances (such as formaldehyde). Manufacturing accounted for 55% of poisoning cases reported in private industry (Figure 5–33). The highest incidence rates occurred in the production of storage batteries (120 cases per 10,000 workers) and costume jewelry (78 cases per 10,000 workers), and in the secondary smelting and refining of nonferrous metals (62 cases per 10,000 workers).

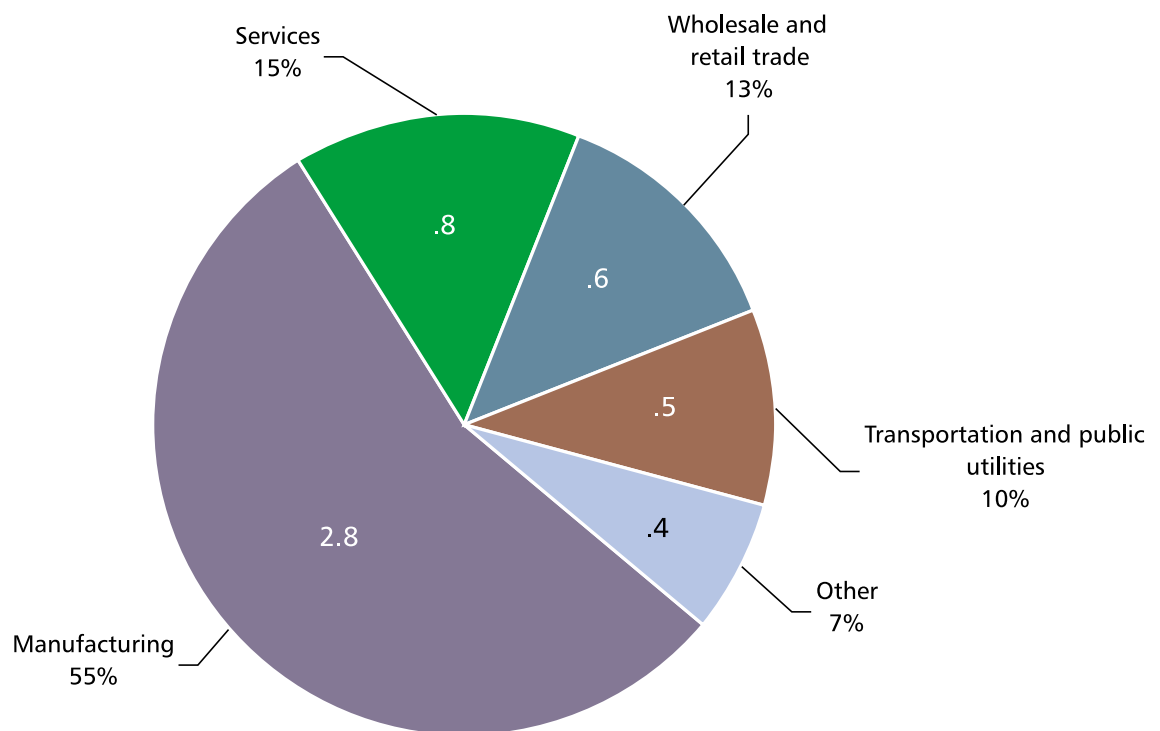


Figure 5–33. Number (thousands) and distribution of poisoning cases in private industry by major industry division, 1997. (Source: SOII [1999].)

Lead Toxicity

ABLES monitors elevated blood lead levels (BLLs) in adults (persons aged 16 and older). Twenty-seven States participated in this program in 1998 by collecting BLLs from local health departments, private health care professionals, and private and State reporting laboratories (Figure 5–34). During that year, a total of 10,501 adults in 25 of those States were reported to have BLLs of 25 $\mu\text{g}/\text{dL}$ or greater. Prevalence rates for BLLs of 25 $\mu\text{g}/\text{dL}$ or greater (based on all persons reported in a given year) do not reveal an obvious trend for the period 1993 through 1998, nor do the incidence rates (based on new cases reported in a given year) (Figure 5–35). However, prevalence and incidence rates for BLLs of 50 $\mu\text{g}/\text{dL}$ or greater in 10 ABLES States decreased from 1993 to 1998 (Figure 5–36).

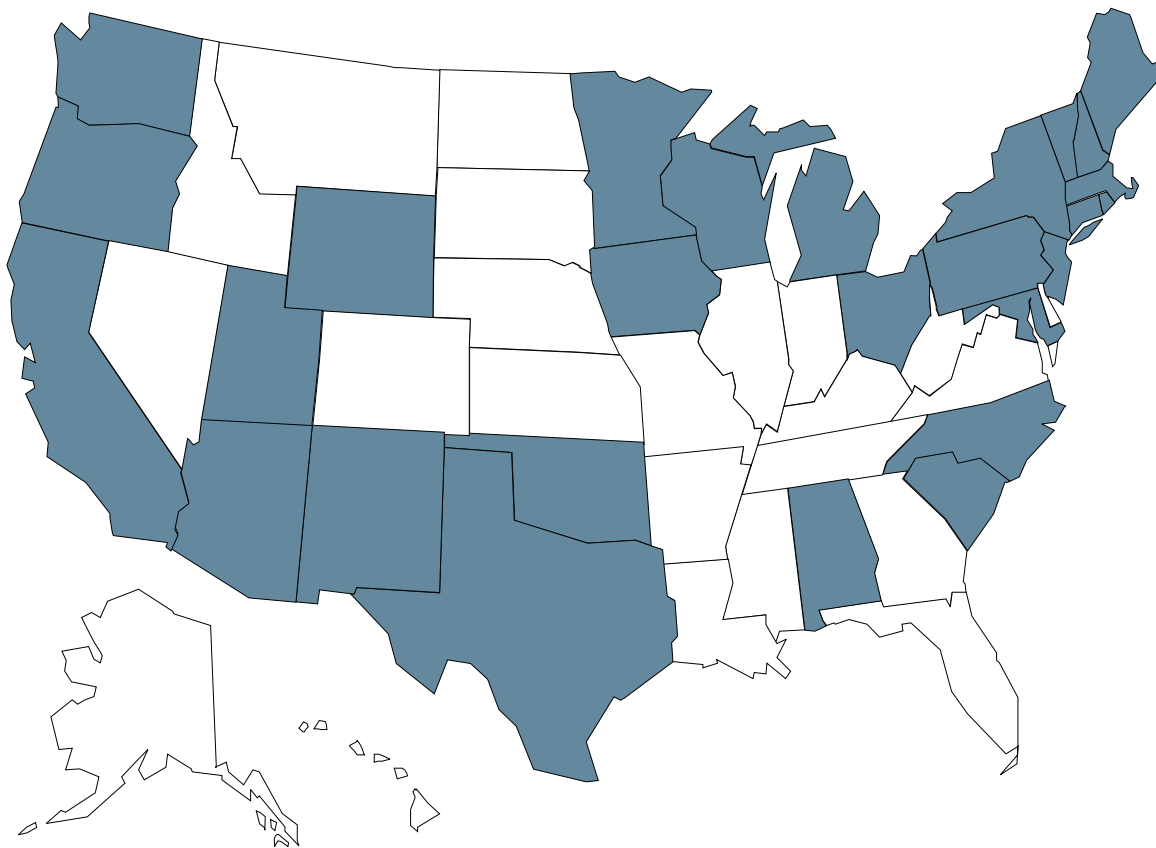


Figure 5–34. States (shaded) participating in the ABLES program in 1998. (Source: ABLES [1999].)

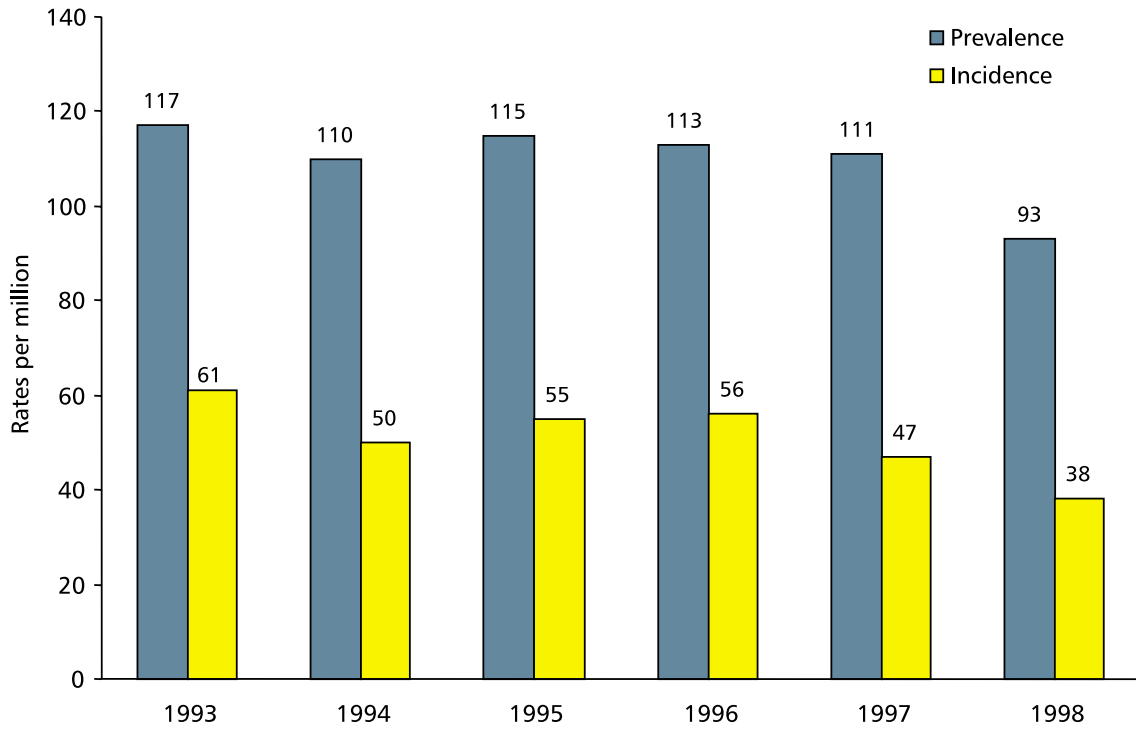


Figure 5–35. Prevalence and incidence rates of adults aged 16 to 64 with BLLs greater than 25 µg/dL, 1993–1998. (Source: ABLES [1999].)

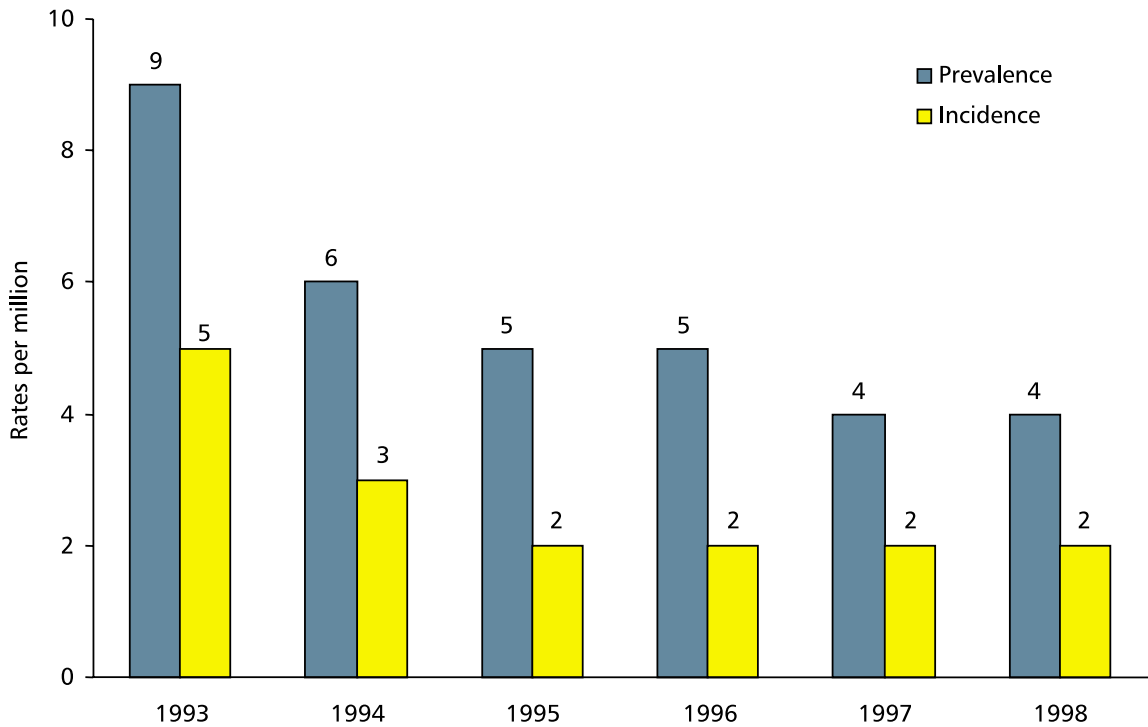


Figure 5–36. Prevalence and incidence rates for BLLs equal to or greater than 50 µg/dL in adults aged 16 to 64 from 10 States (California, Connecticut, Iowa, Maryland, Massachusetts, New Jersey, New York, Oregon, Texas, Utah), 1993–1998. (Source: ABLES [1999].)

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).

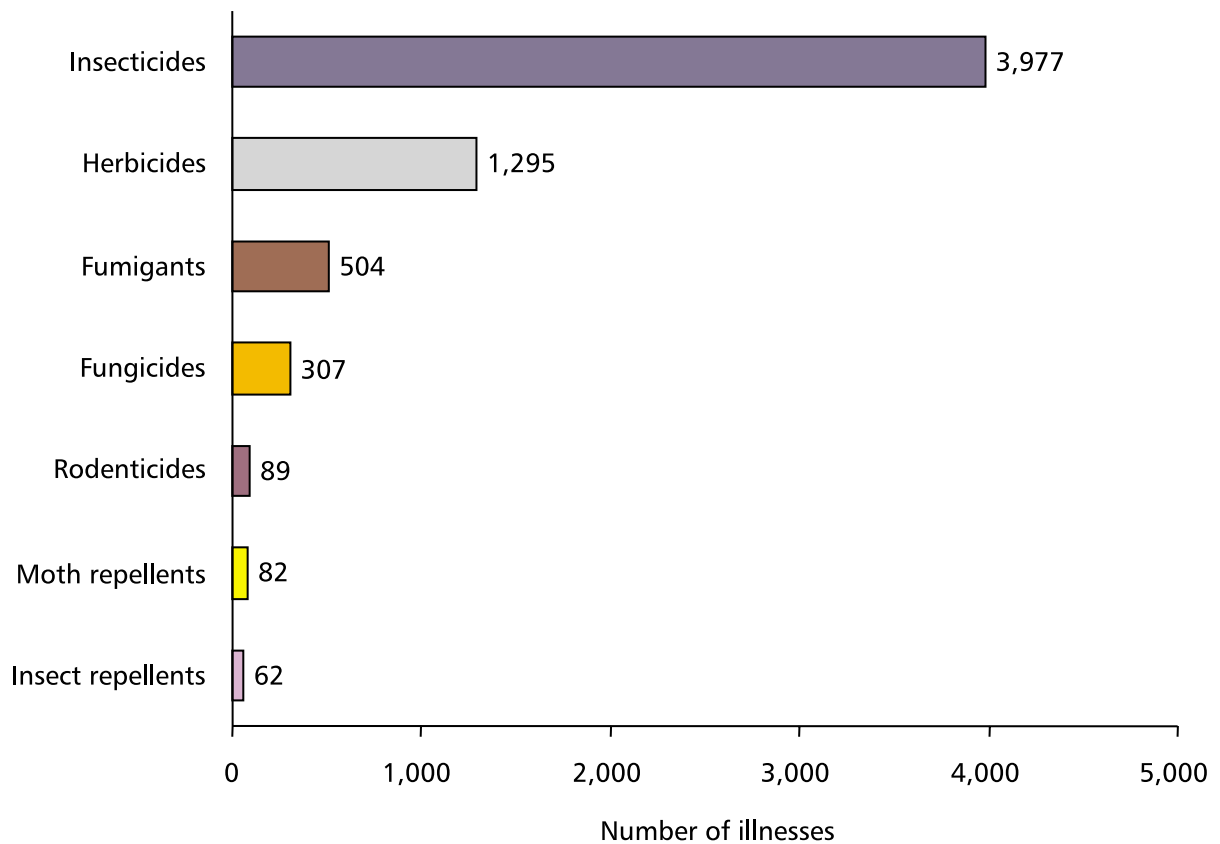


Figure 5-37. Number of acute occupational illnesses related to pesticides by pesticide category (excludes antimicrobials), 1993–1996. (Source: TESS [1998].)

NONFATAL ILLNESS

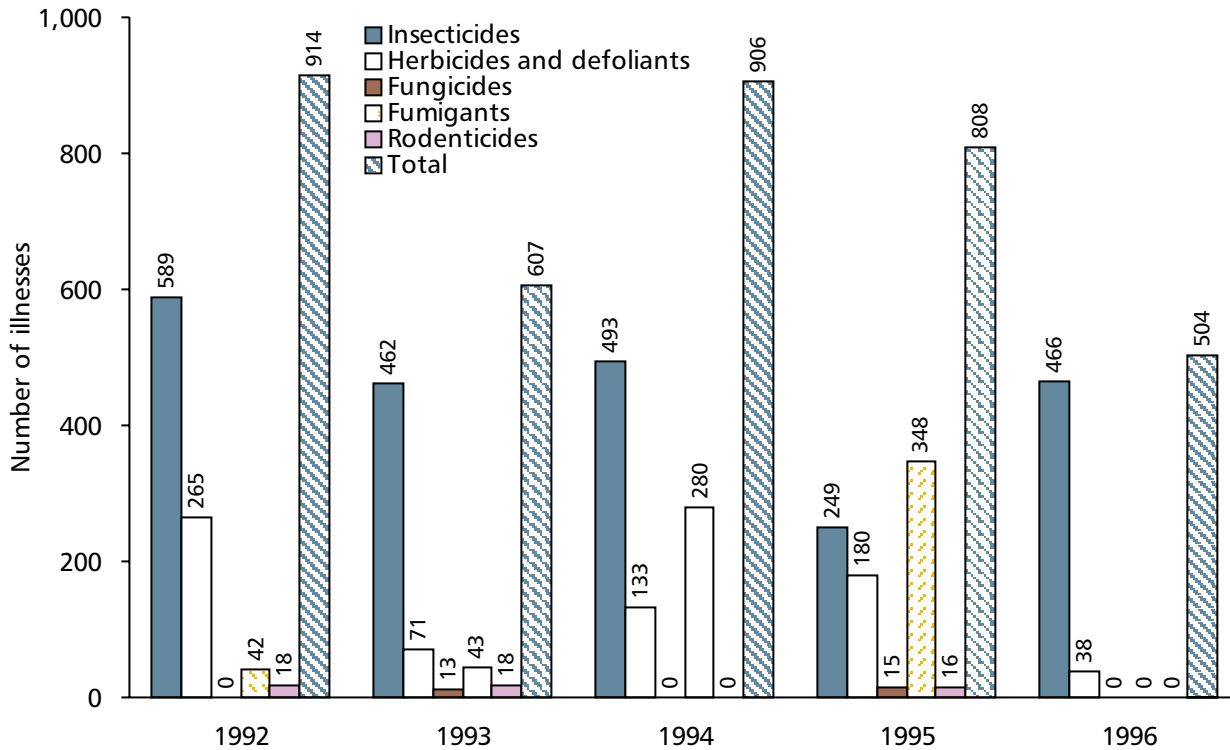


Figure 5–38. Number of occupational pesticide-related illnesses with days away from work in private industry by pesticide category, 1992–1996. (Source: SOII [1999].)

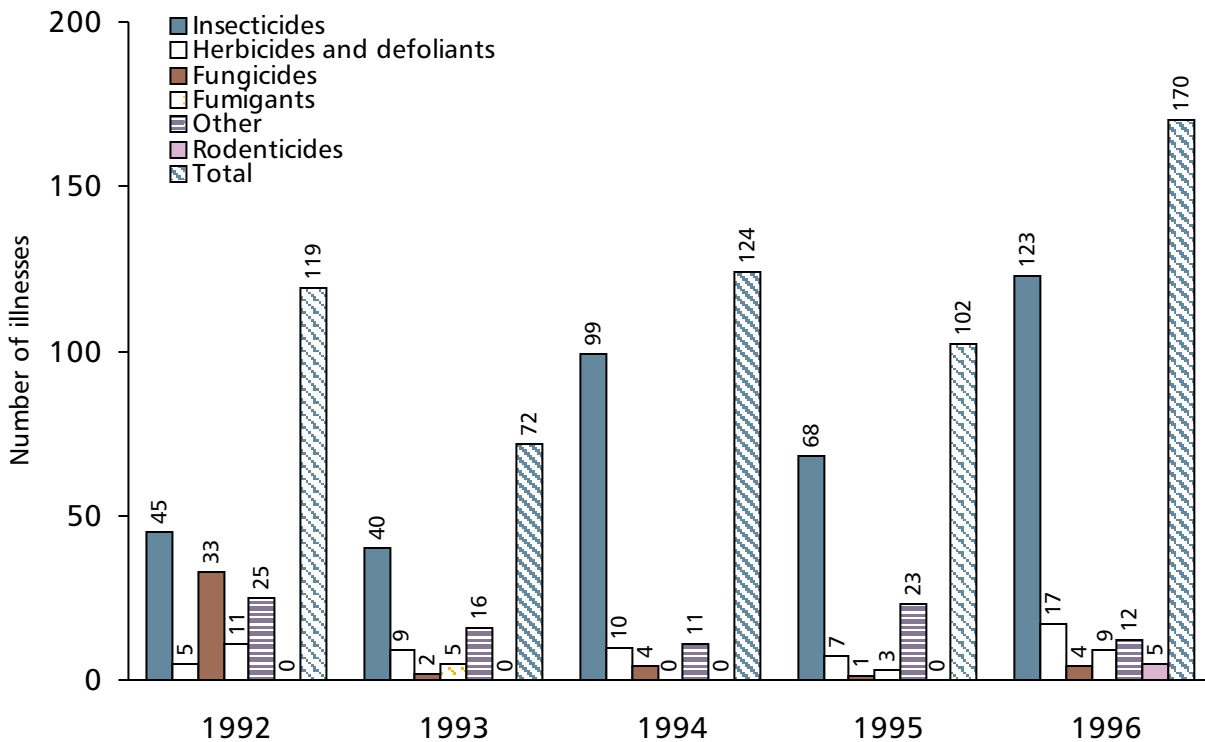


Figure 5–39. Number of occupational illnesses related to pesticides in New York, Oregon, and Texas by pesticide category, 1992–1996. (Source: SENSOR [New York State Department of Health, 1999; Oregon Health Division, 1999; PEST, 1999].)

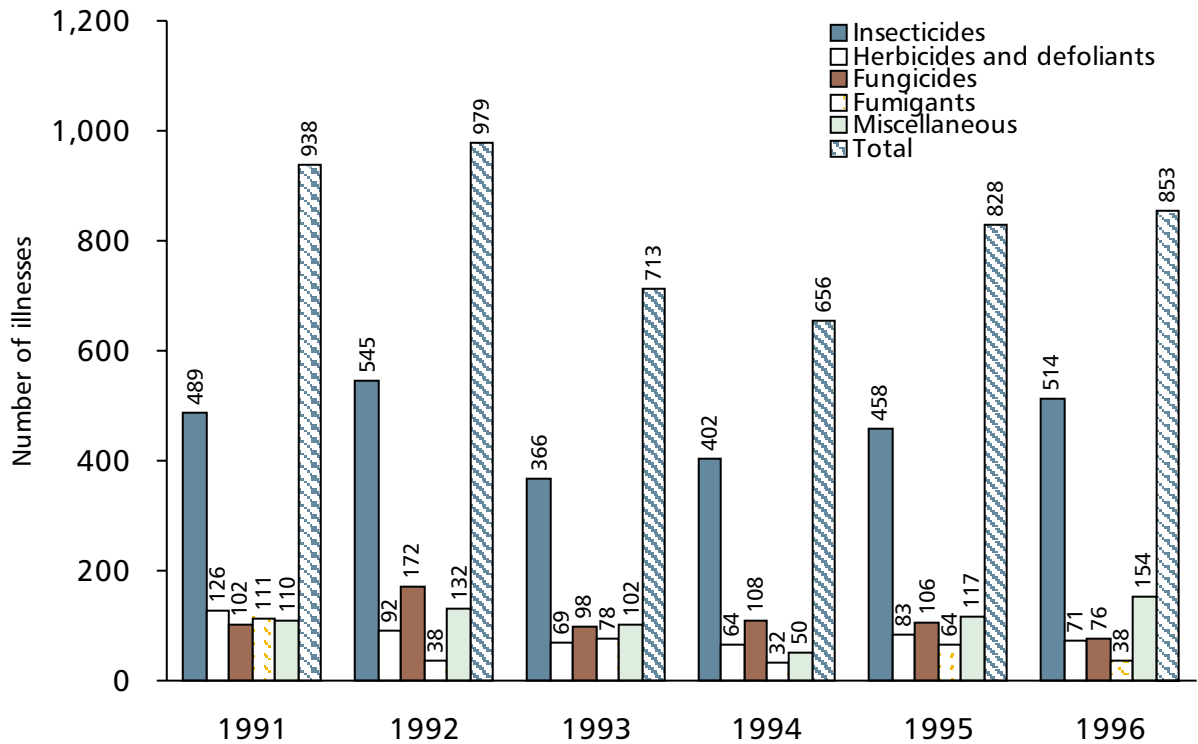


Figure 5–40. Number of occupational illnesses related to pesticides in California by pesticide category (excludes antimicrobials and unknown agents), 1991–1996. (Source: CDPR [1999].)

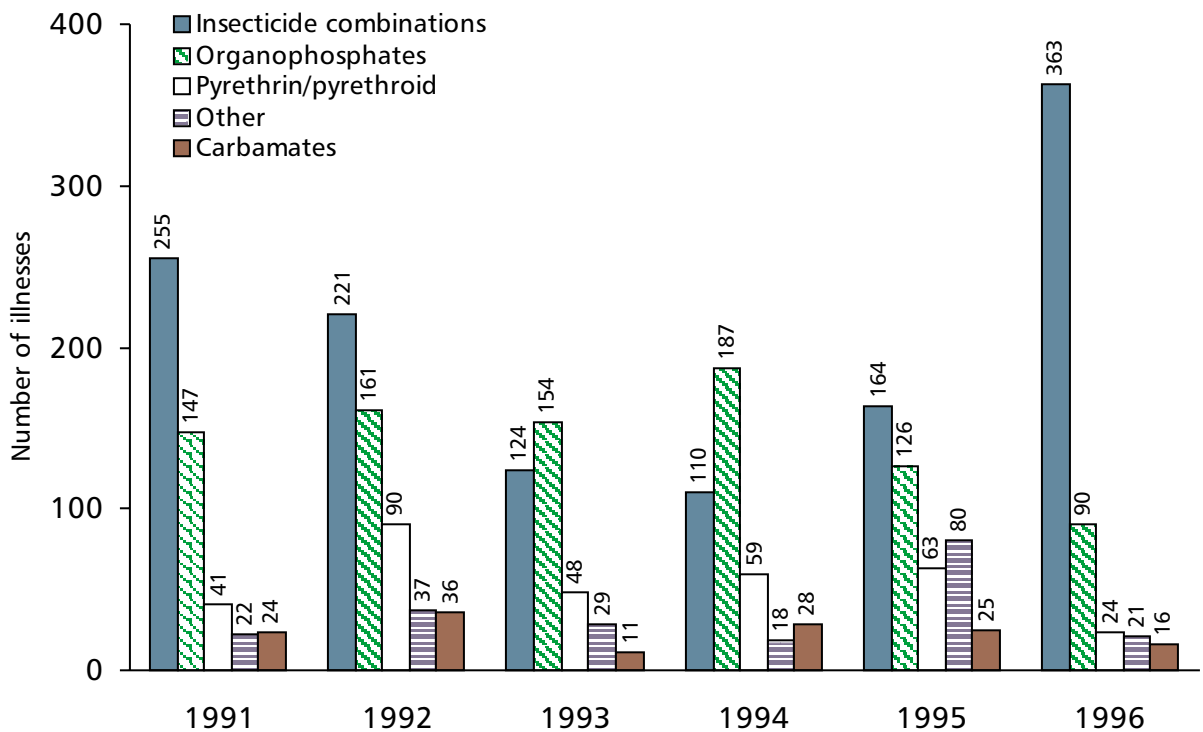


Figure 5–41. Number of occupational illnesses related to insecticides in California by insecticide category, 1991–1996. (Source: CDPR [1999].)

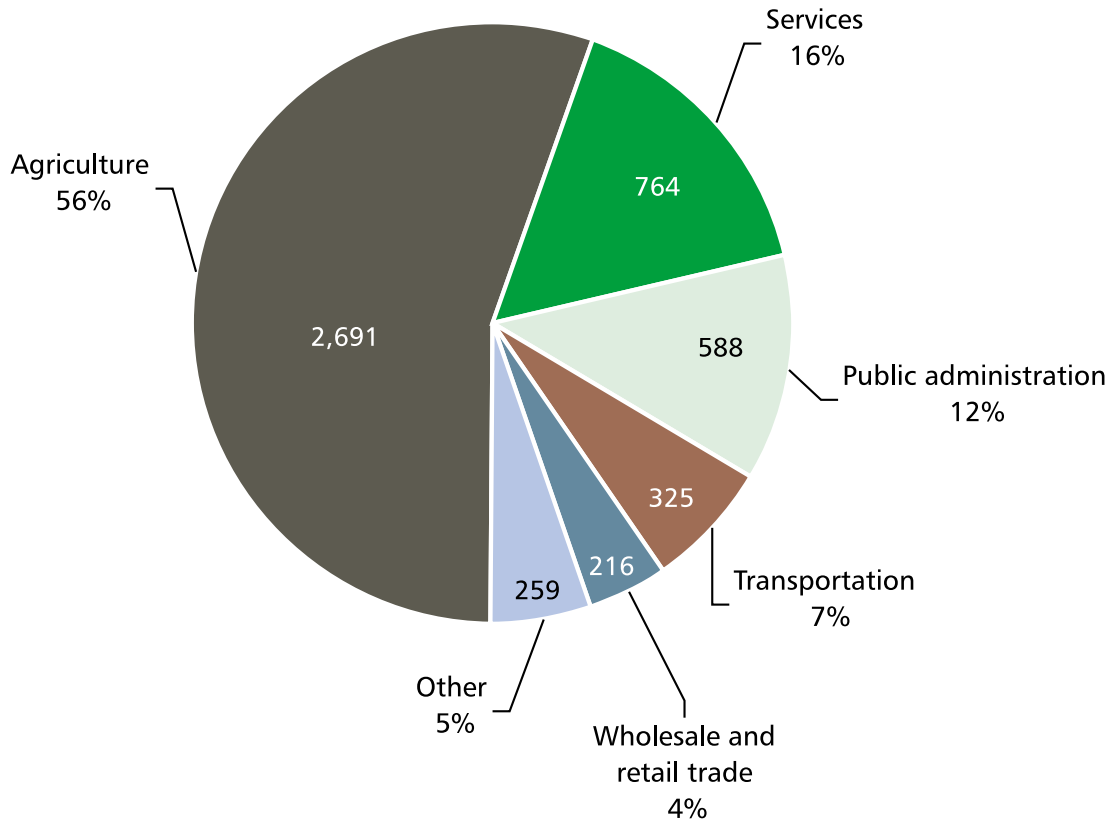


Figure 5–42. Number and distribution of occupational illnesses related to pesticides (excluding antimicrobials and unknown agents) in California, by industry division, 1991–1996. (Source: CDPR [1999].)

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).

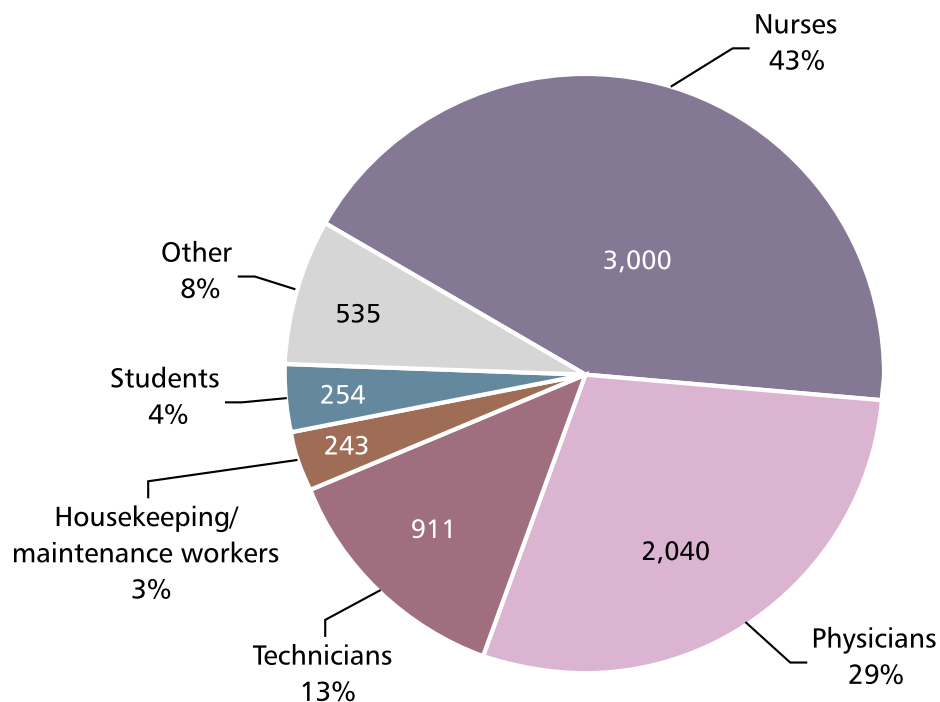


Figure 5–43. Number and distribution of reported health care worker exposures to blood or body fluids in 60 participating hospitals by occupational group, June 1995 to October 1999. (Source: NaSH [1999].)

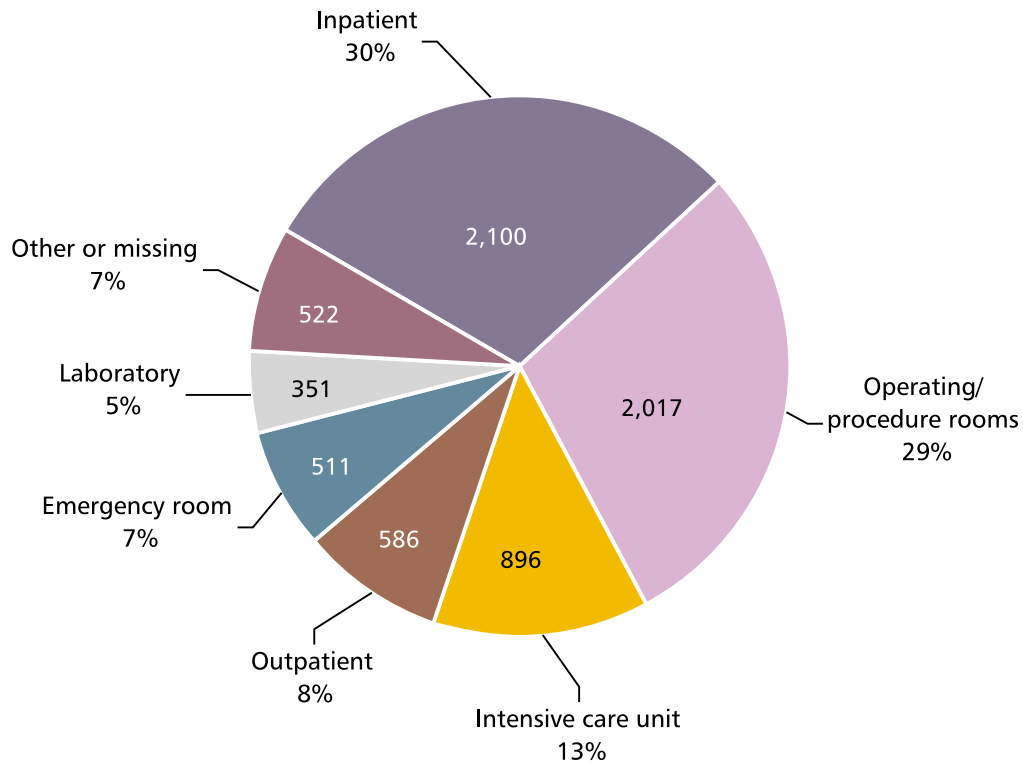


Figure 5-44. Number and distribution of reported health care worker exposures to blood or body fluids in 60 participating hospitals by work location, June 1995 to October 1999. (Source: NaSH [1999].)

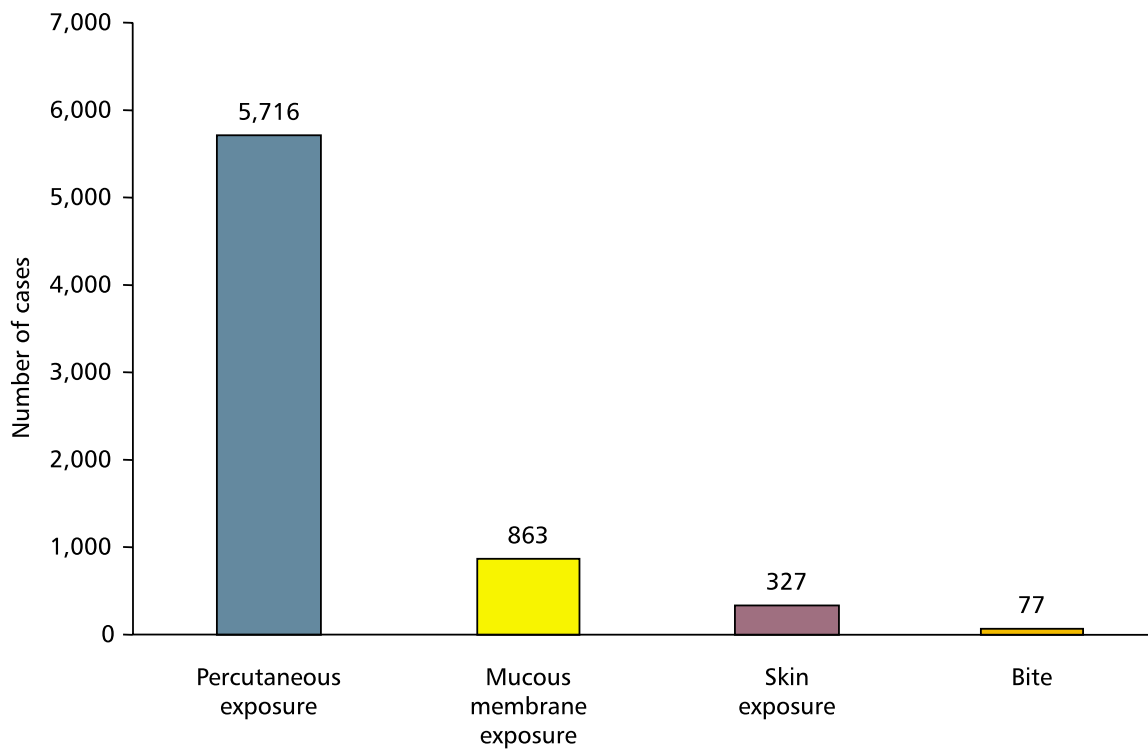


Figure 5-45. Number of reported health care worker exposures to blood or body fluids in 60 participating hospitals by exposure type, June 1995 to October 1999. (Source: NaSH [1999].)

The major route of exposure was percutaneous (puncture/cut injury) (Figure 5–45).

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

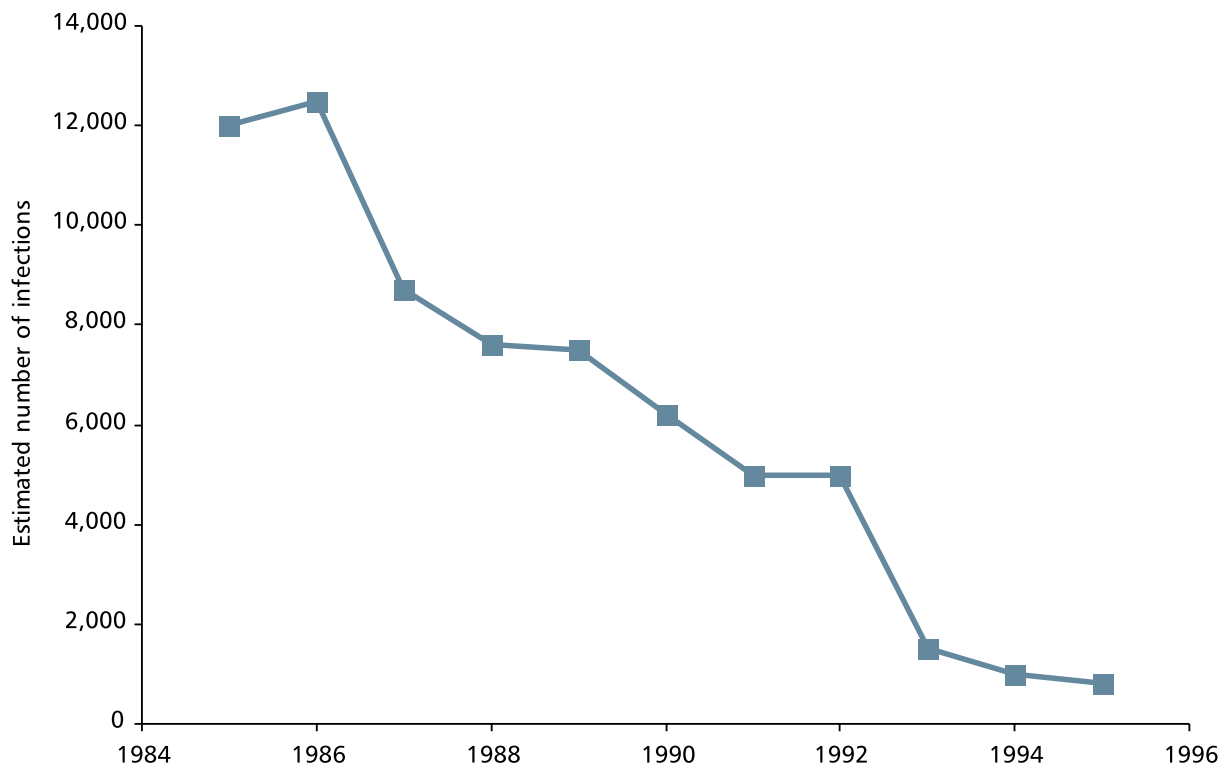


Figure 5–46. Estimated number of hepatitis B infections among U.S. health care workers, 1985–1995. (Source: VHSP [1999]; NCID [1999].)

precautions against exposure to body fluids and vaccinations against hepatitis B.

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

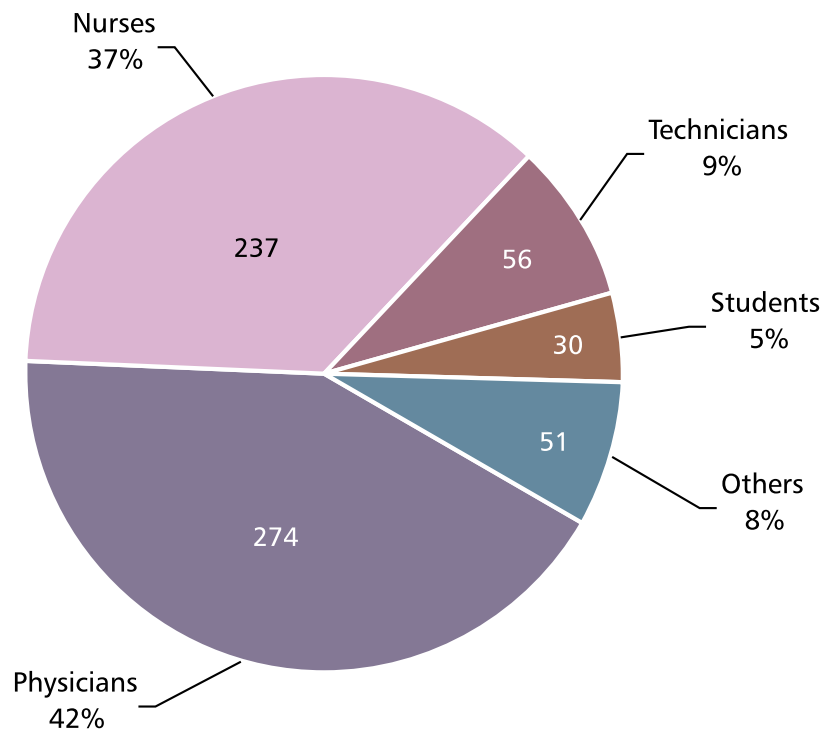


Figure 5-47. Number and distribution of health care workers exposed to hepatitis C virus by occupational group, June 1995 to October 1999. (Source: NaSH [1999].)

occurred among health care workers exposed to blood in the workplace. Most workers exposed to hepatitis C were physicians or nurses (Figure 5-47).

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

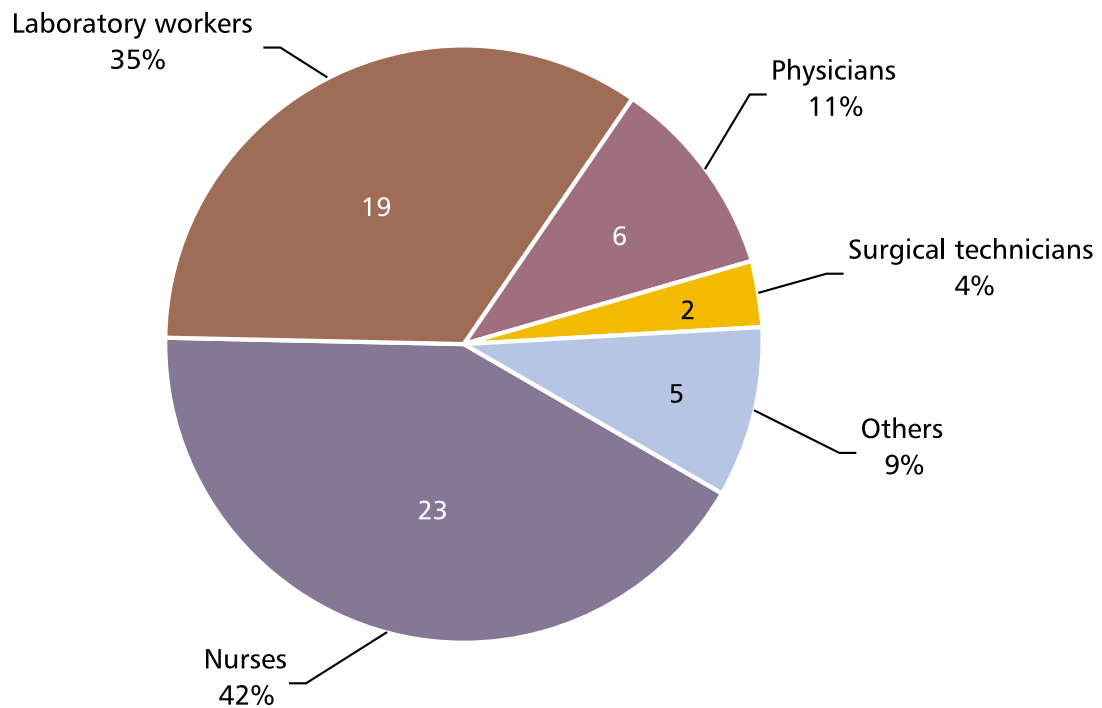


Figure 5-48. Number and distribution of health care worker cases with documented occupational transmission of HIV by occupation through June 1999. (Source: HARS [CDC 1999].)

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).

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

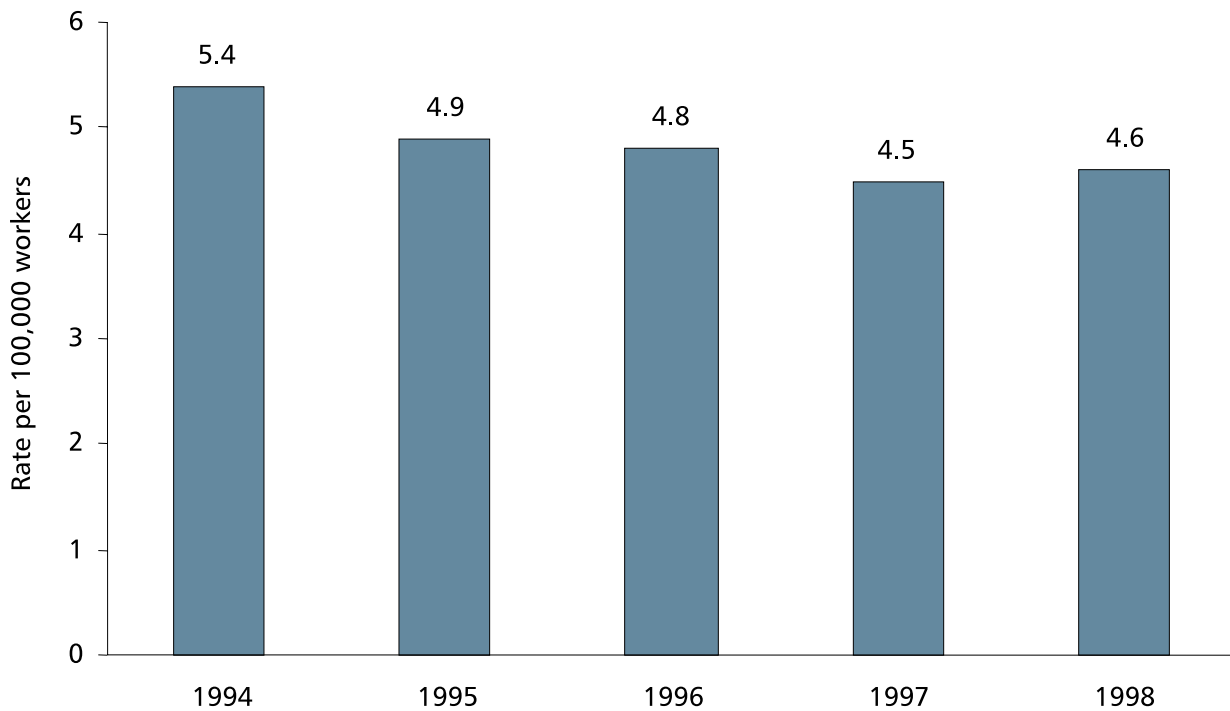


Figure 5–49. Incidence rates of TB in health care workers, 1994–1998. (Source: *staffTRAK-TB* [1999].)