

## *Silicosis*

Silicosis is a chronic inflammatory condition of the lung caused by the inhalation of silica particles; this condition is almost universally caused by occupational exposures. Prevalence of silicosis can be examined through the SENSOR program. For SENSOR purposes, silicosis cases require a history of occupational exposure to airborne silica dust and one or both of the following: (1) a chest radiograph (or other imaging technique) interpreted as consistent with silicosis and (2) pathologic findings characteristic of silicosis.

From 1993 to 1995, seven States participated in the SENSOR silicosis program. Together these States identified 604 cases of silicosis, mostly through hospital reports (64%), reports by health care professionals (11%), and death certificates (9%) (Figure 5–23). The cases originated mostly in manufacturing industries (75%), construction (9%), and mining (7%) (Figure 5–24). Operators, fabricators, and laborers represented the majority of cases (61%) (Figure 5–25).

Among silicosis patients who were interviewed, most had chronic disease with onset of symptoms 10 or more years after exposure. Exposure to high airborne concentrations of silica can cause disease within a few years, and acute silicosis (much less common) may result in death within months of intense occupational exposure. Although most of the interviewed workers had been occupationally exposed for more than 20 years, 8% had fewer than 10 years of exposure.

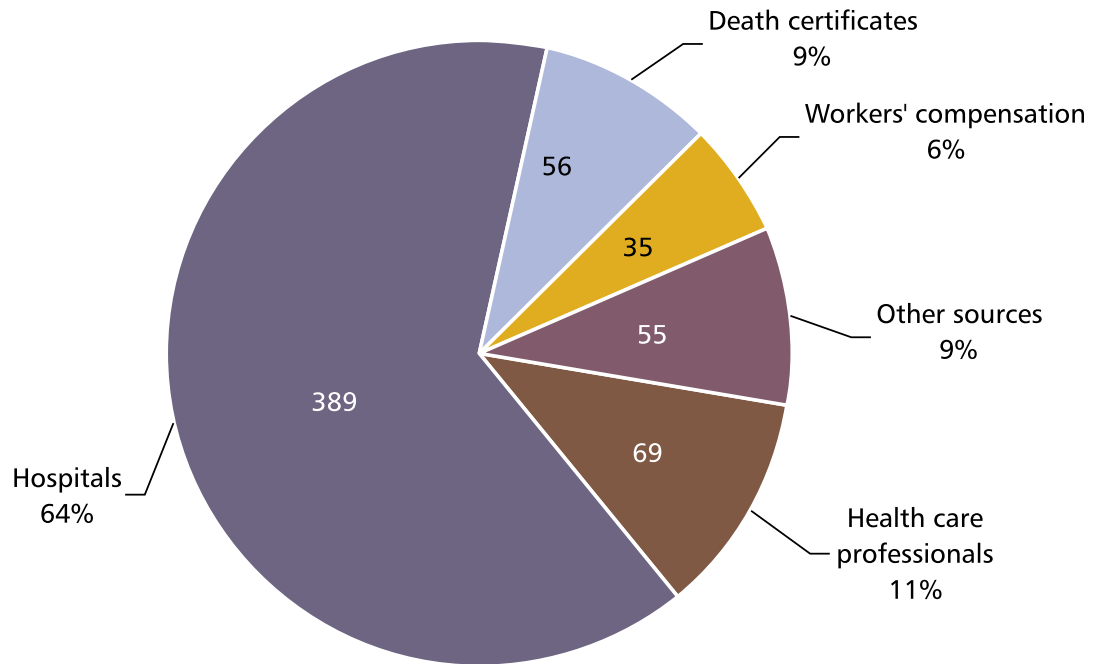


Figure 5-23. Number and distribution of silicosis cases in all seven reporting States by source of report, 1993-1995. (Source: SENSOR [NIOSH 1999].)

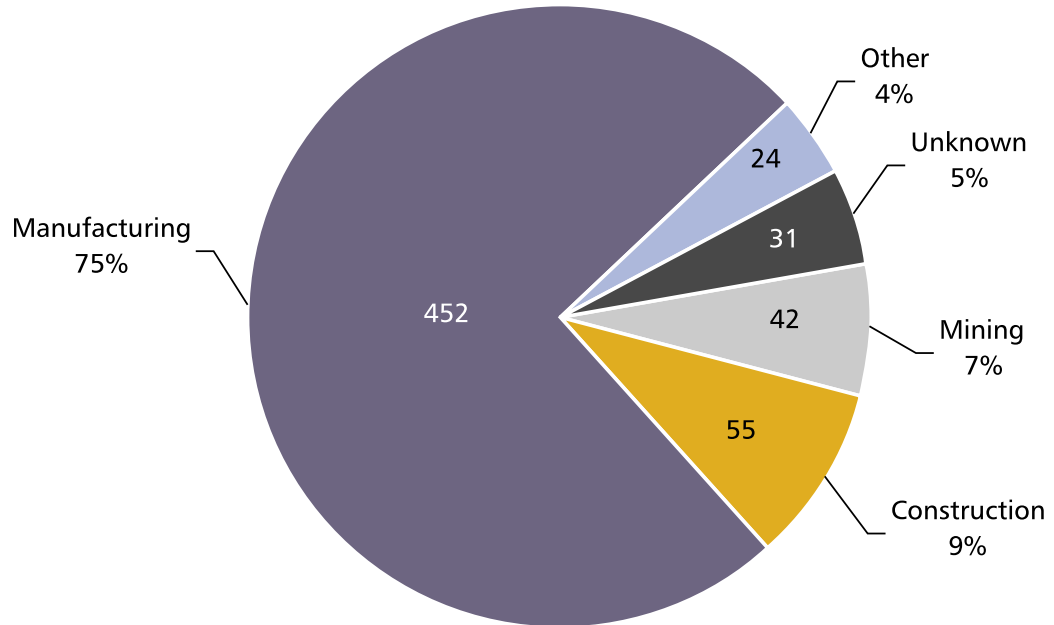


Figure 5-24. Number and distribution of silicosis cases in all seven reporting States by industry division, 1993-1995. (Source: SENSOR [NIOSH 1999].)

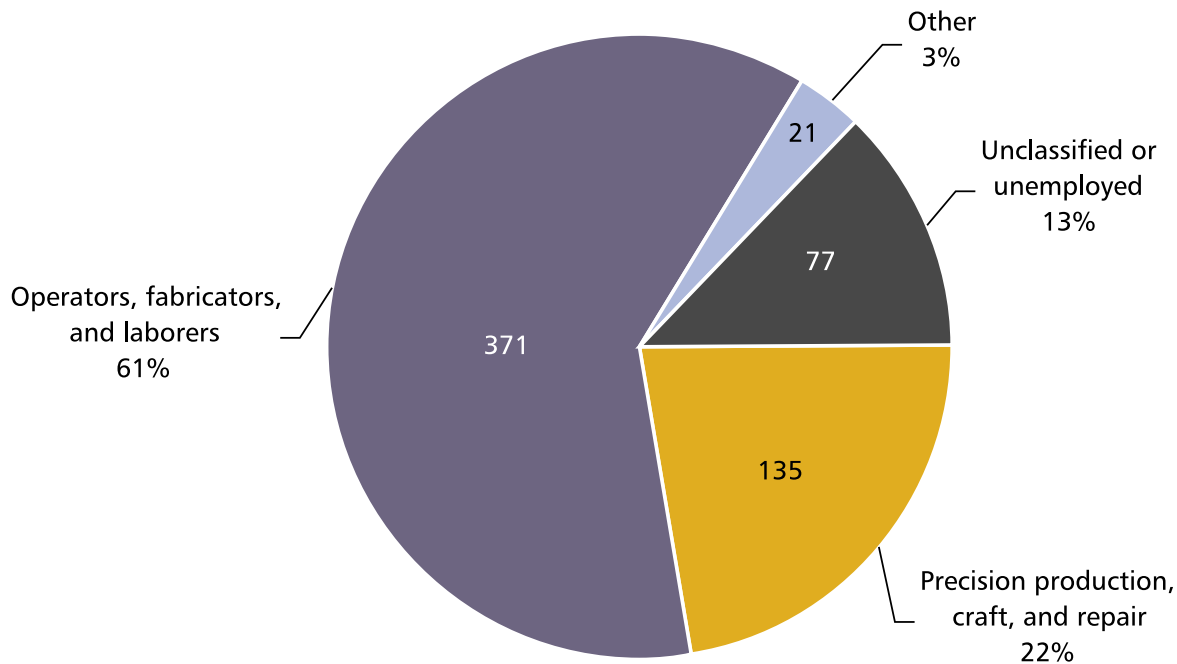


Figure 5–25. Number and distribution of silicosis cases in all seven reporting States by major occupational category, 1993–1995. (Source: SENSOR [NIOSH 1999].)

### Respiratory Disorders Attributable to Toxic Agents

Respiratory disorders attributable to toxic agents in the work environment accounted for 5% (20,300) of the illness cases recorded in SOII in 1997. These disorders include allergic and irritant asthma, chronic bronchitis, and reactive airways dysfunction (an asthma-like syndrome). The industry divisions reporting the most cases in 1997 were manufacturing (37%) and services (34%) (Figure 5–26). SOII reported the highest industry incidence rates in leather tanning and finishing (77 per 10,000 workers), motorcycles, bicycles, and parts (50 per 10,000 workers), ammunition, except for small arms not elsewhere classified (n.e.c.) (36 per 10,000 workers), ship building and repairing (36 per 10,000 workers), and musical instruments (34 per 10,000 workers).

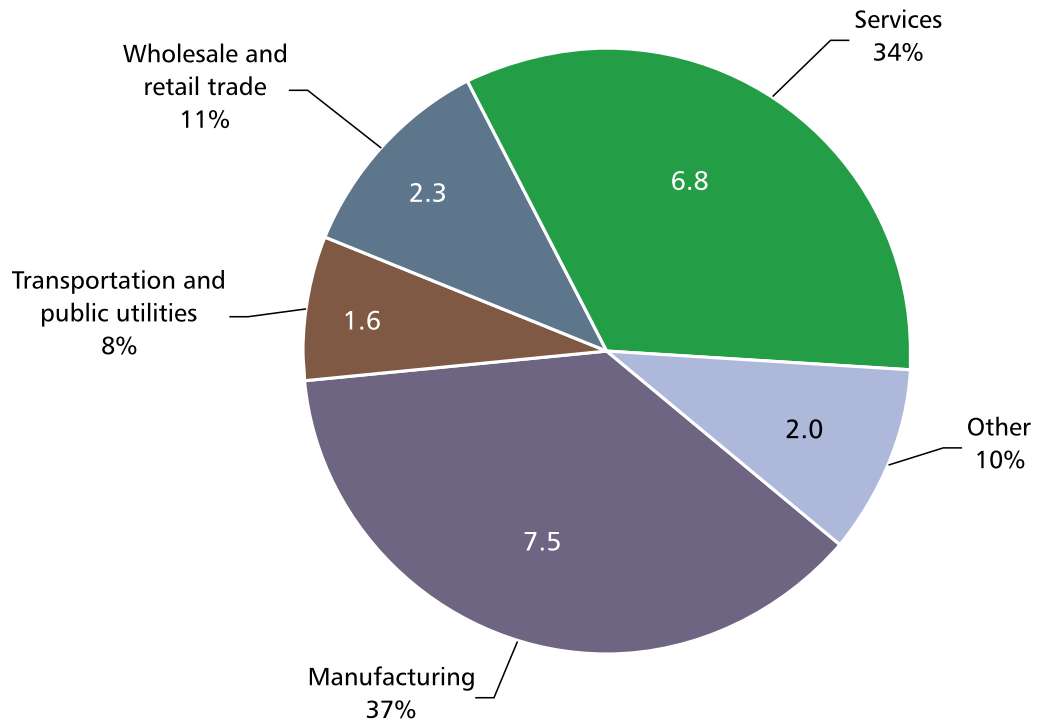
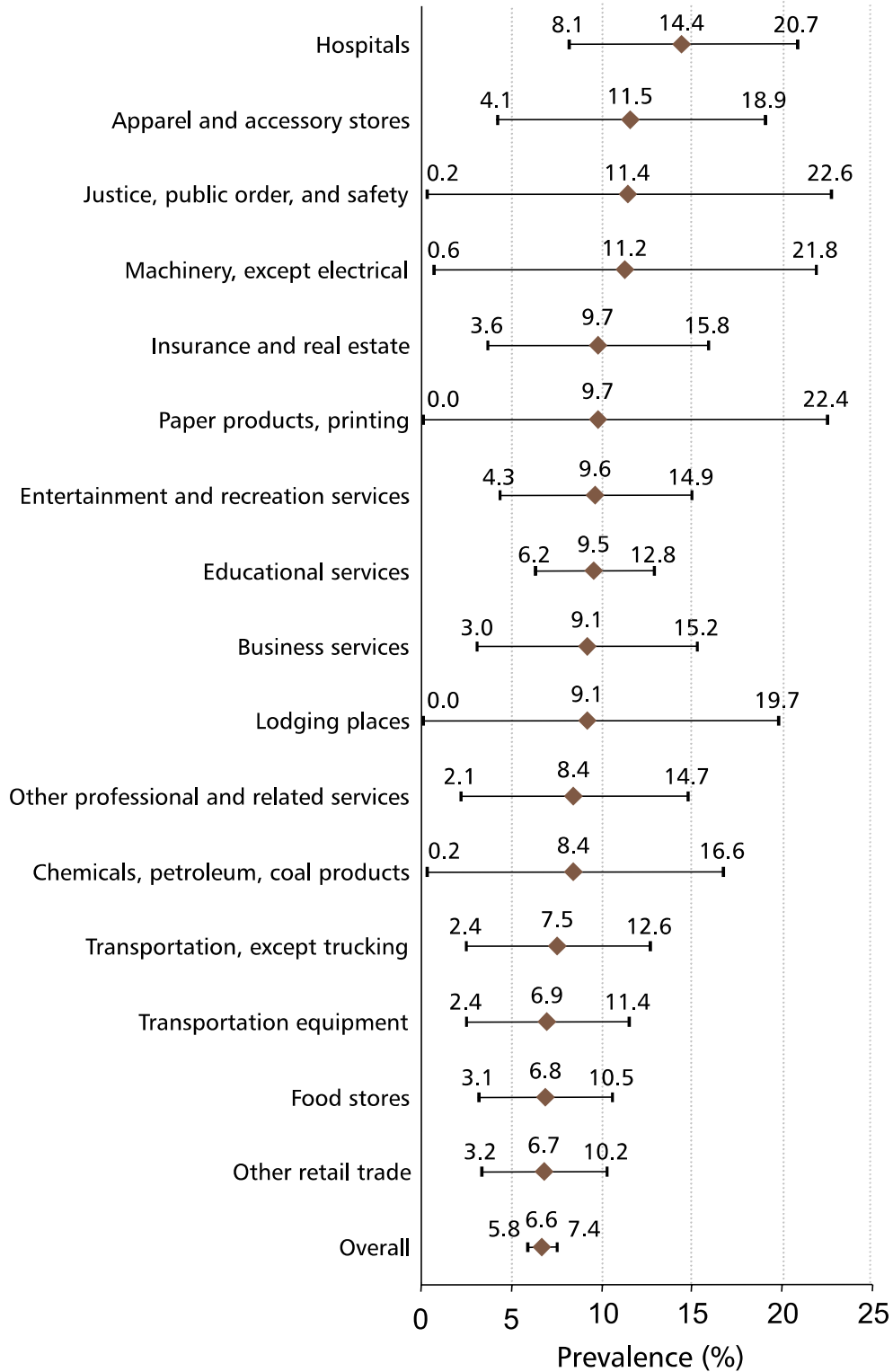


Figure 5–26. Number (thousands) and distribution of respiratory disorder cases attributed to toxic agents in private industry by industry division, 1997. (Source: SOII [1999].)

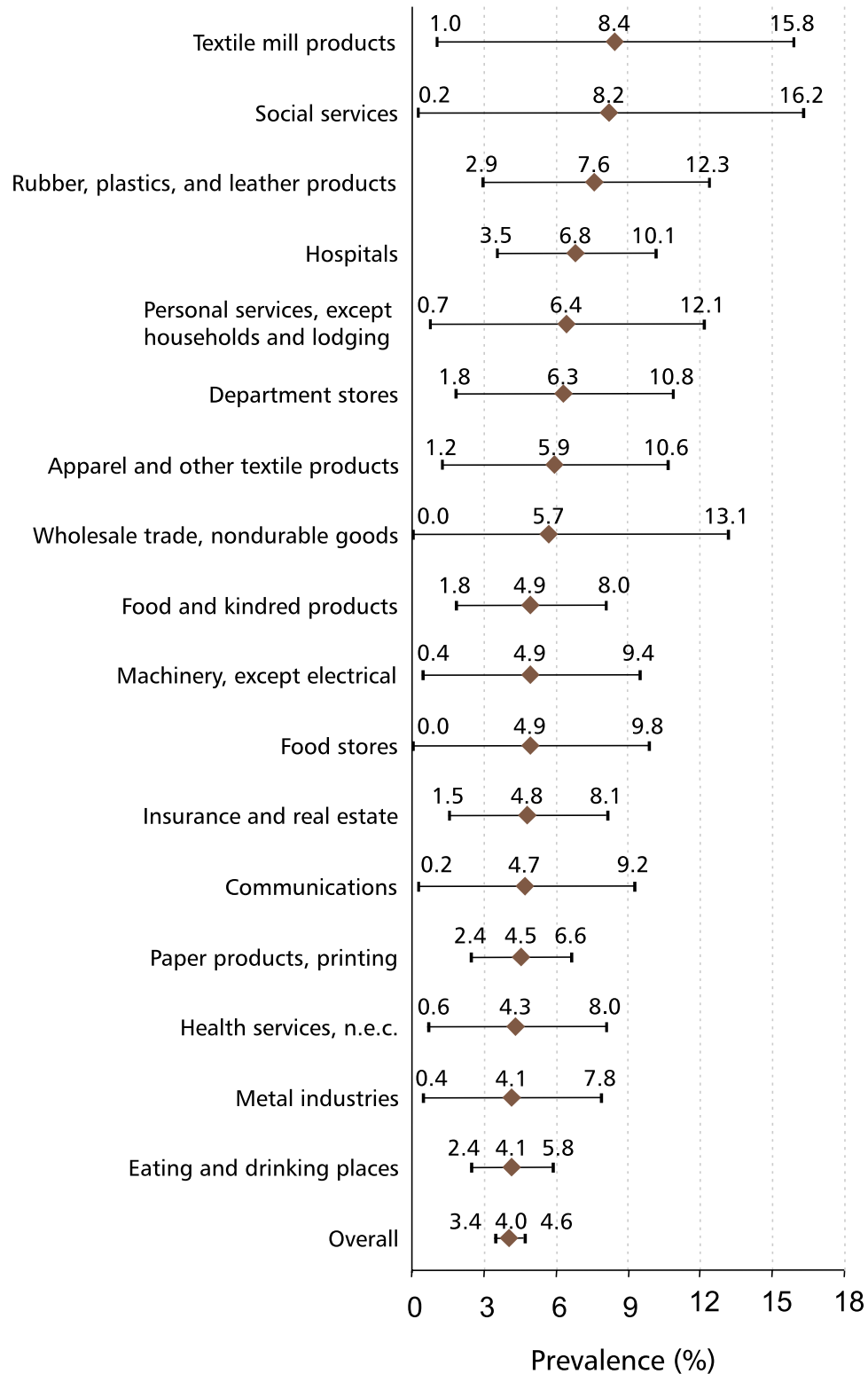
## Asthma and Chronic Obstructive Pulmonary Disease

### NHANES III

Workers' prevalence rates for asthma and chronic obstructive pulmonary disease (COPD) (such as chronic bronchitis and emphysema) are recorded in NHANES III (Figures 5–27 and 5–28). These conditions may be caused or exacerbated by workplace exposures, but no particular attribution to workplace factors is made in NHANES III. Variations in prevalence rates among workers in different industries (particularly among nonsmokers) may suggest an occupational association in some cases.



**Figure 5–27.** Estimated prevalence rates (and 95% confidence intervals [CIs]) for asthma among workers who are nonsmokers, by usual industry of workers’ employment—U.S. residents aged 17 and older, 1988–1994. (Source: NHANES III [1999].)



**Figure 5–28.** Estimated prevalence rates (and 95% CIs) for COPD among workers who are nonsmokers, by usual industry of workers' employment—U.S. residents aged 17 and older, 1988–1994. (Source: NHANES III [1999].)

## SENSOR

Under the SENSOR program, several State health departments have developed surveillance systems for work-related asthma (including occupational asthma, occupationally induced reactive airways dysfunction syndrome [RADS], and work-aggravated asthma). Occupational asthma is now the most common disease reported in occupational respiratory disease surveillance systems in several developed countries. However, most cases either are not recognized as work-related or are not reported as such. Population-based estimates suggest that about 20% of new-onset asthma in adults is work-related.

Four States—New Jersey, Michigan, Massachusetts, and California—had active SENSOR programs during the years for which data are included in this report (1993–1995). California relies on the first reports filed by physicians seeking reimbursement through the State workers' compensation system. The three remaining States rely primarily on more active physician reporting. In all four States, 90% of the 1,101 occupational asthma cases were identified through physician reports (Figure 5–29). Most cases occurred in manufacturing (42%) and services (31%) (Figure 5–30) among operators, fabricators, and laborers (32%) and technical, sales, and administrative support personnel (21%) (Figure 5–31). The categories of agents most frequently associated with occupational asthma cases were all isocyanates (toluene diisocyanate, methylene diisocyanate, and other diisocyanates) (9%), indoor environments (8%), and mineral and inorganic dusts not otherwise specified (n.o.s.) (7%) (Figure 5–32).

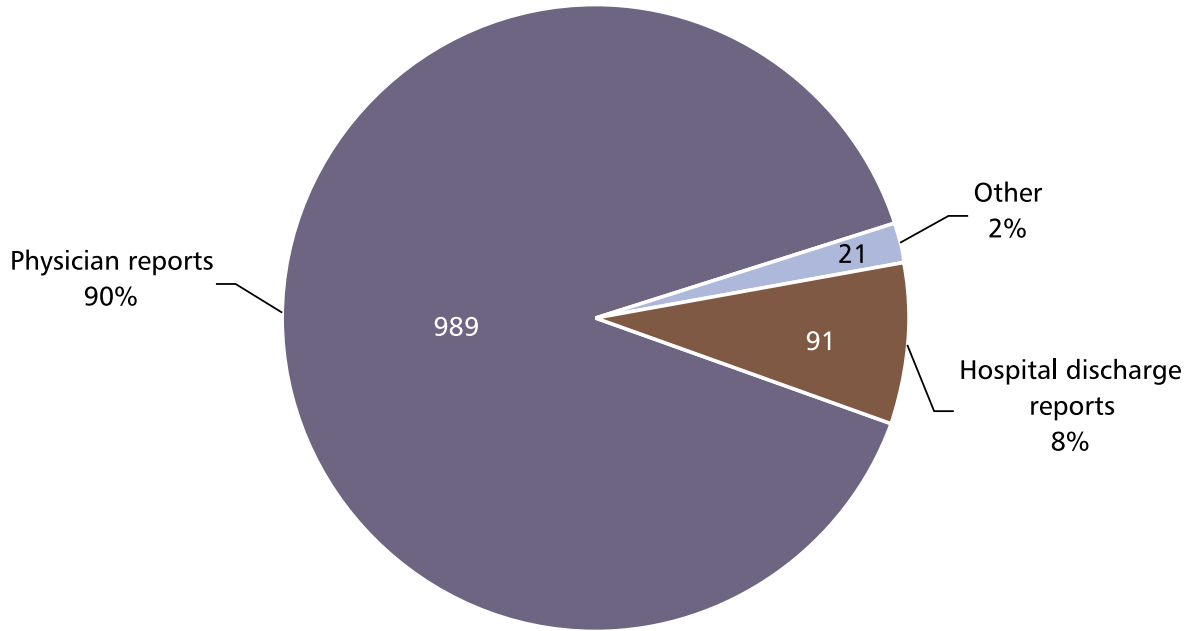


Figure 5–29. Number and distribution of occupational asthma cases for all four reporting States by source of report, 1993–1995. (Source: SENSOR [NIOSH 1999].)

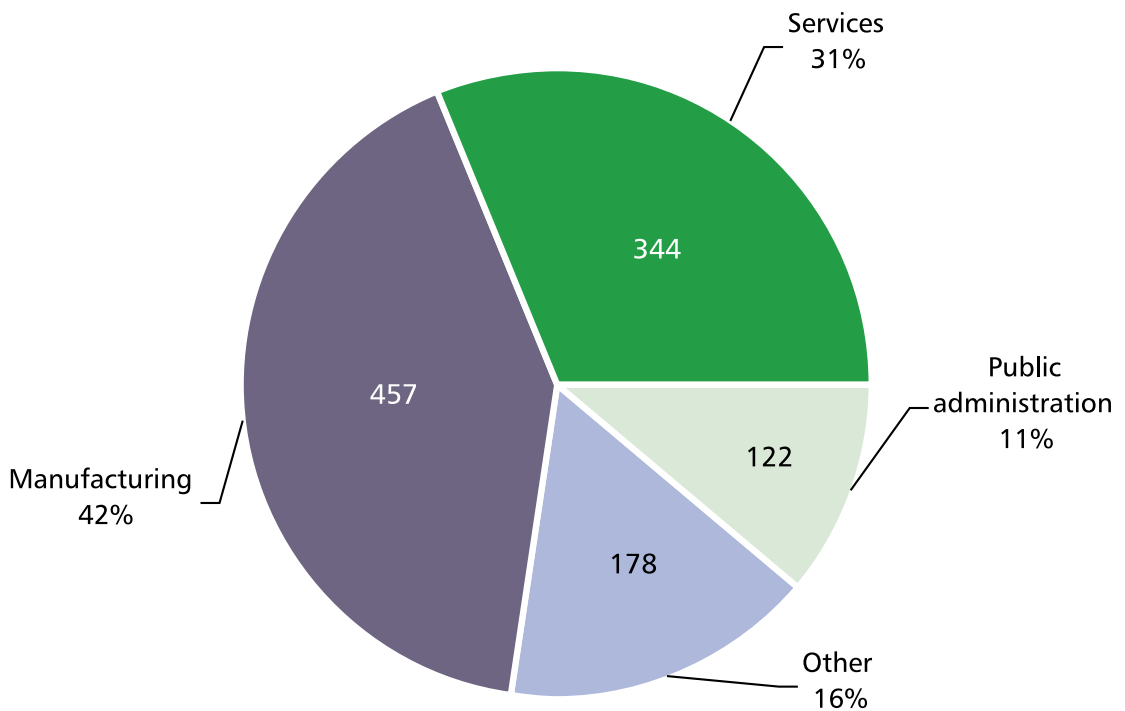
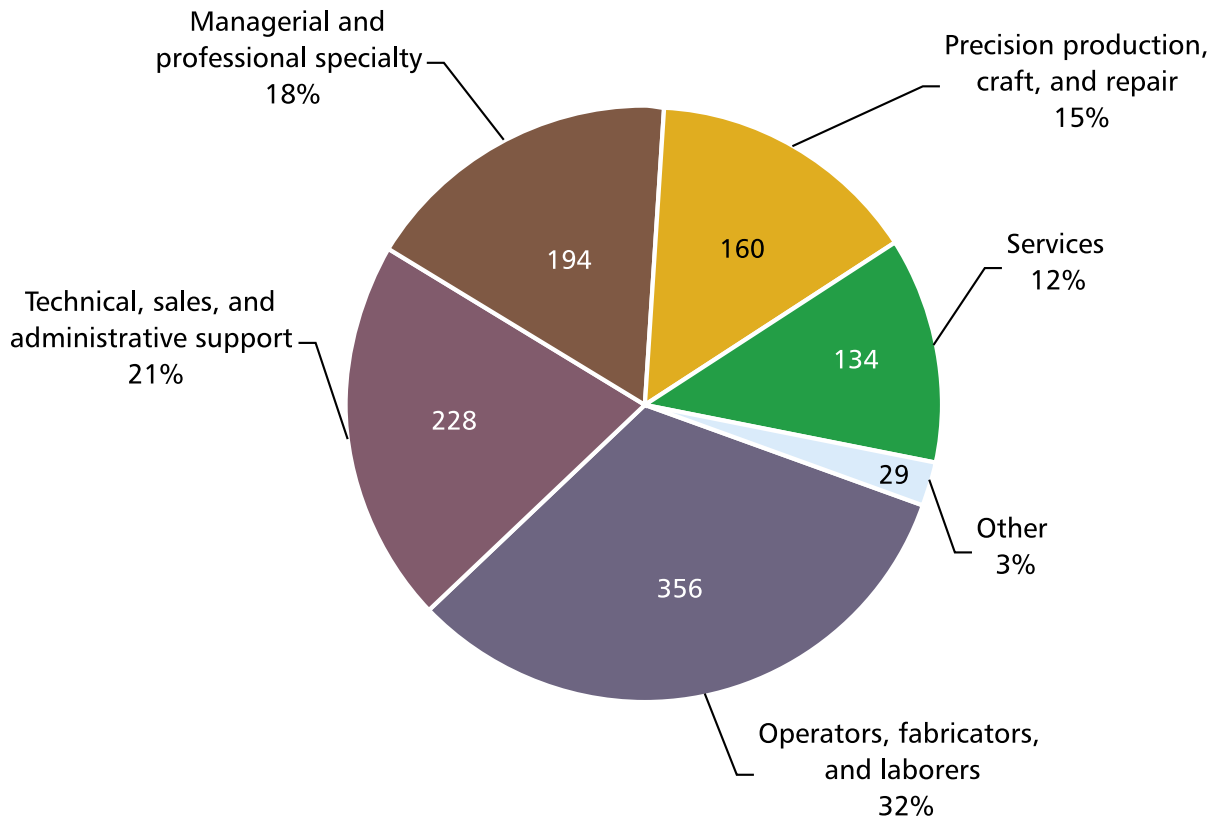


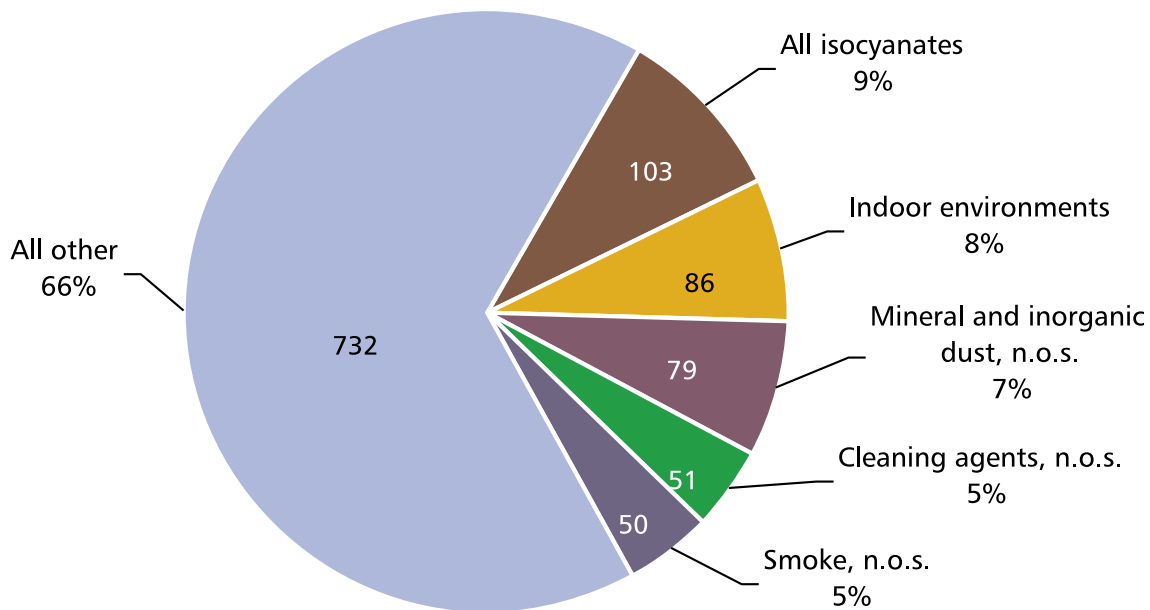
Figure 5–30. Number and distribution of occupational asthma cases for all four reporting States by industry division, 1993–1995. (Source: SENSOR [NIOSH 1999].)



## NONFATAL ILLNESS



**Figure 5-31.** Number and distribution of occupational asthma cases for all four reporting States by occupation, 1993-1995. (Source: SENSOR [NIOSH 1999].)



**Figure 5-32.** Number and distribution of occupational asthma cases for all four reporting States by most frequently associated agents, 1993-1995. (Source: SENSOR [NIOSH 1999].)

## 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).

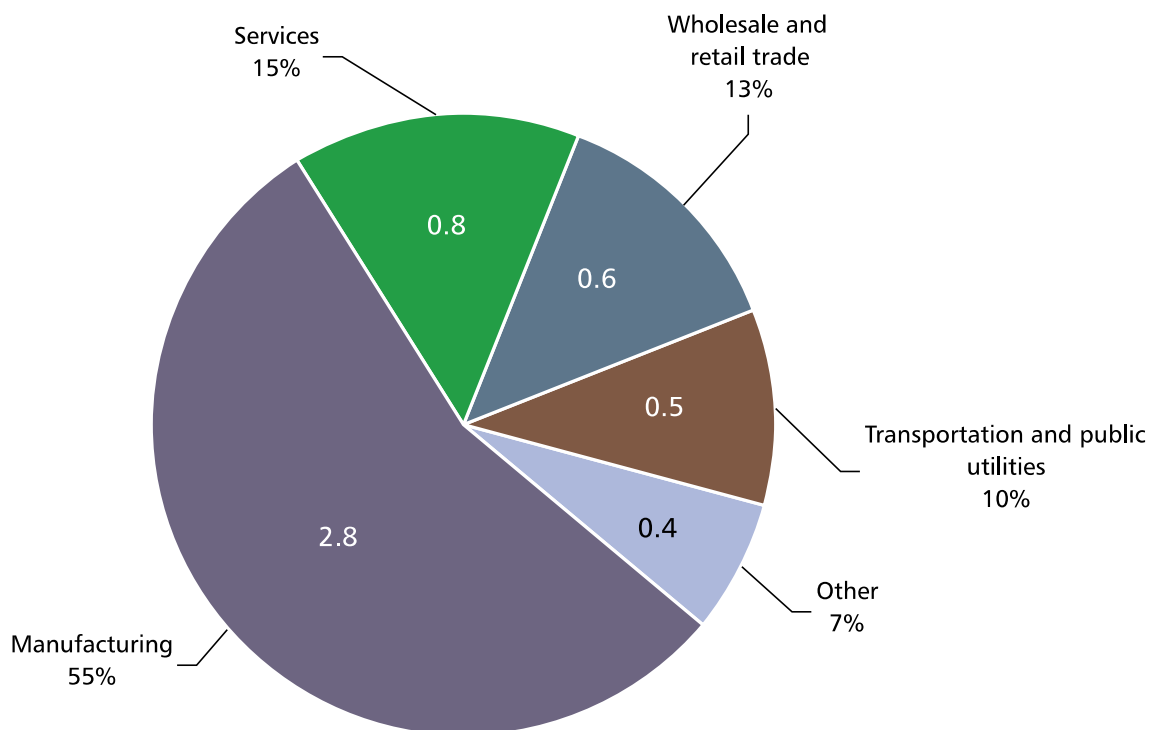
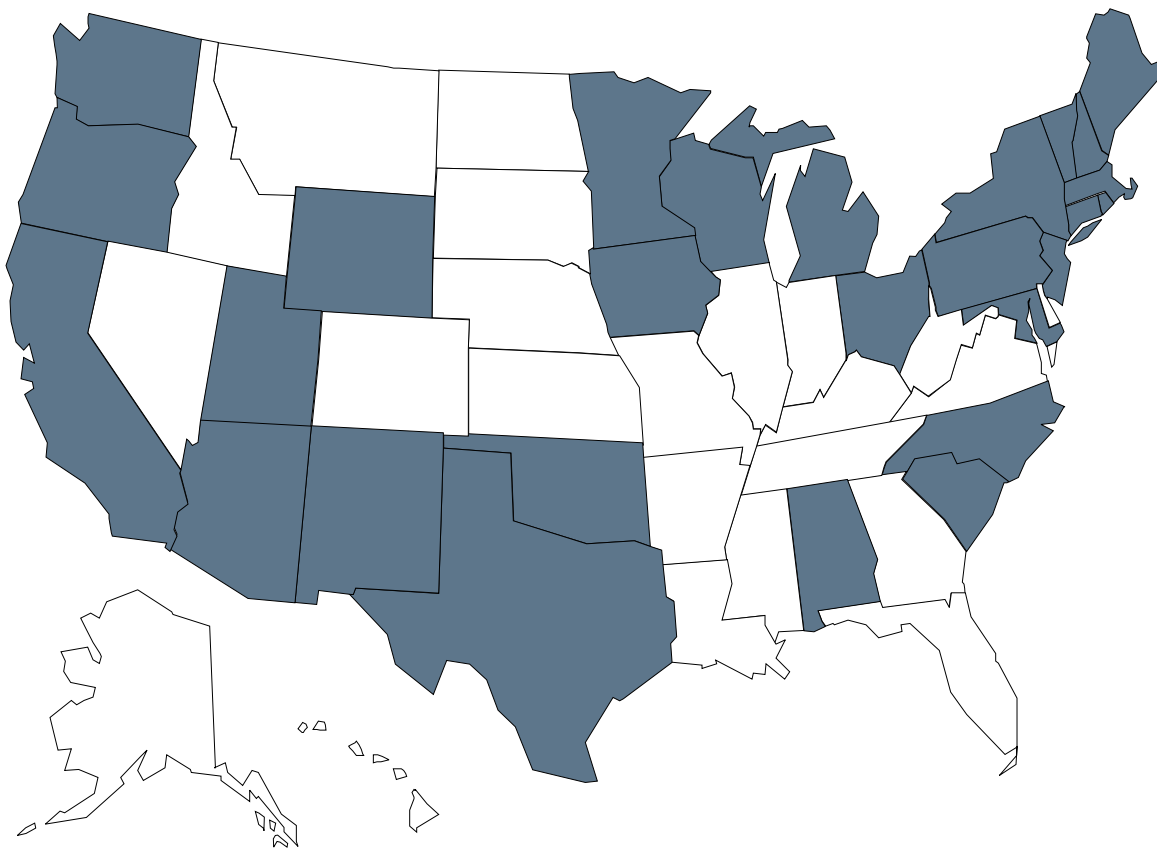


Figure 5–33. Number (thousands) and distribution of poisoning cases in private industry by major industry division, 1997. (Source: SOII [1999].)

## 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].)

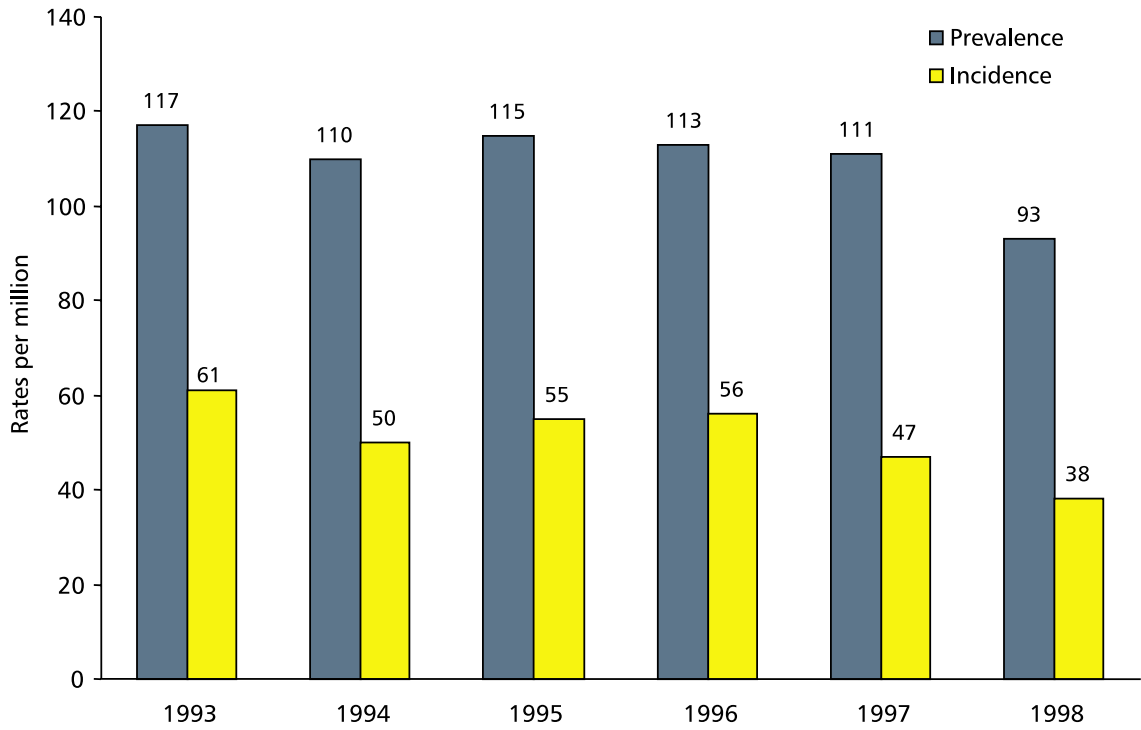


Figure 5–35. Prevalence and incidence rates of adults aged 16 to 64 with BLLs greater than 25 µg/dL, 1993–1998. (Source: ABLES [1999].)

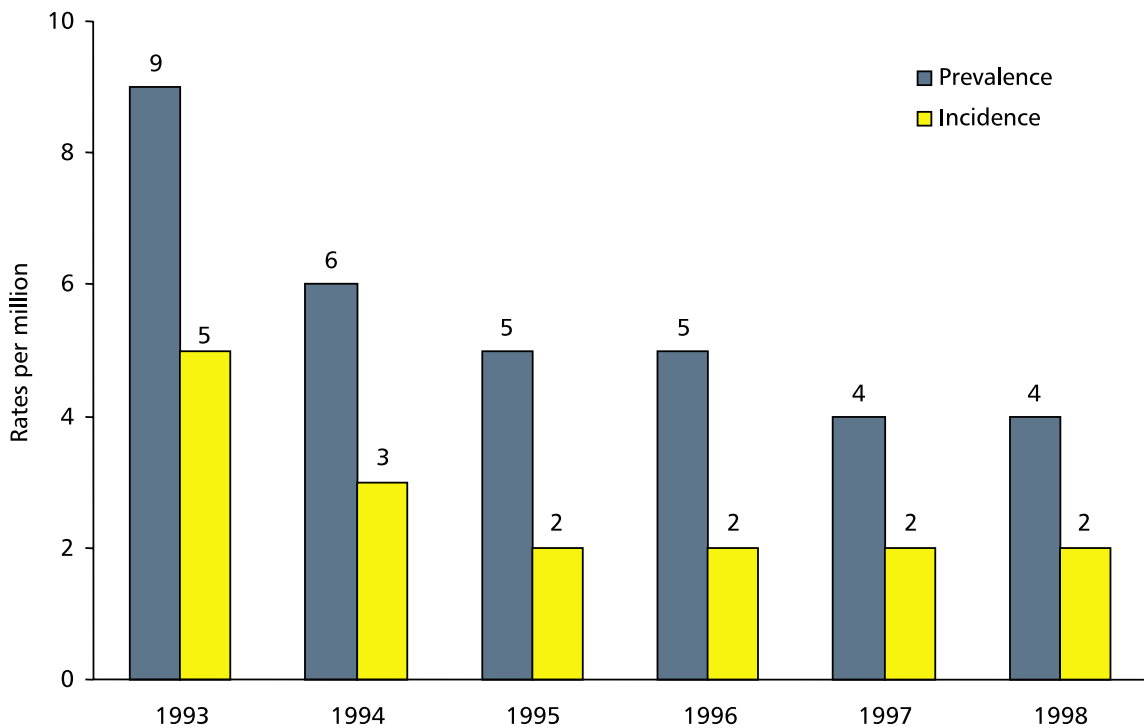


Figure 5–36. Prevalence and incidence rates for BLLs equal to or greater than 50 µg/dL in adults aged 16 to 64 from 10 States (California, Connecticut, Iowa, Maryland, Massachusetts, New Jersey, New York, Oregon, Texas, Utah), 1993–1998. (Source: ABLES [1999].)