

2003

**Annual Summary of
Occupational Disease Reports
to the Michigan Department
of Labor and Economic
Growth**



Summary of 2003 Occupational Disease Reports to the Michigan Department of Labor and Economic Growth

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SUMMARY

There were 15,890 occupational disease (OD) reports submitted to the Michigan Department of Labor and Economic Growth (formerly the Michigan Department of Consumer and Industry Services) in calendar year 2003 as required under the Michigan Occupational Disease Reporting Law. These reports were submitted by company medical departments or clinics under contract to companies to provide occupational health services to their employees, as well as health practitioners not associated with a particular company.

The most frequent types of reports were of repetitive trauma (29%), respiratory disease (19%), toxic effects of substances (18%) and diseases of the nervous system and sense organs (18%). Although the number of reports submitted in 2003 is slightly higher than the previous year, in general, there has been a downward trend of reporting since 1999 when 21,538 reports were received. This could represent an actual reduction in occupational diseases occurring in the state or poorer compliance with the reporting law. Further work to ensure compliance with the reporting law is needed to determine if this trend actually reflects fewer occupational illnesses.

There were differences in the types of reports submitted by companies compared to those submitted by independent health practitioners. For example, there were 2,919 reports from independent providers for diseases of the respiratory system while only 34 such reports were received from employers (Table 4).

The average age of individuals reported was 47 years, ranging from 15 to 97. Sixty-seven percent of individuals reported were between the ages of 25 and 55. Sixty-nine percent of all reports submitted were for male workers.

There were differences in the types of reports received through the OD reporting system compared to illnesses identified through either the Bureau of Labor Statistics' Annual Survey of a sample of employers or the Michigan Workers' Compensation Claims system (Table 8).

An initiative begun three years ago to combine all reports from nine programs that track Michigan occupational injuries and illnesses to present a more comprehensive overview of work-related injuries and illnesses in our state is nearing completion. Preliminary data suggest the true number of work-related conditions is significantly greater than estimates provided by the Bureau of Labor Statistics.

In 2002, Michigan's two Poison Control Centers began to submit work-related reports. Approximately 1,500 reports were received from these Centers in 2003. Given the complementary nature of all the existing programs, we envision that by combining the data across these systems we will be able to better characterize and understand the extent and distribution of individuals who become sick and injured at work. This is an essential first step in reducing the burden of these preventable injuries and illnesses in our state.

INTRODUCTION

Since 1978, physicians, hospitals, clinics, other health professionals and employers have been required by the Michigan Public Health Code (Article 368, Part 56, P.A. 1978, as amended) to report known or suspected cases of occupational diseases. Until 1996, these reports were submitted to the Michigan Department of Public Health (MDPH). Reports are now submitted to the Michigan Department of Labor and Economic Growth (MDLEG, formerly the Michigan Department of Consumer and Industry Services). During the initial years after the reporting law was enacted, the number of reports received by the MDPH was generally less than one hundred each year. Following the 1988 implementation of the Sentinel Event Notification System for Occupational Risks (Project SENSOR), a statewide initiative for occupational disease surveillance began, with active solicitation of occupational disease (OD) reports. MDLEG contracts with Michigan State University's College of Human Medicine, Occupational and Environmental Medicine Division to assist in handling the occupational disease reports.

Computerization of the OD report data began in 1991, allowing for more efficient handling of the high volume of reports submitted and facilitating the use of these reports to direct surveillance, intervention and prevention efforts. This is the twelfth annual report on occupational diseases in Michigan, and is based upon the reports submitted to the MDLEG in calendar year 2003.

Figure 1 is a copy of the occupational disease (OD) report that is submitted to MDLEG by companies and independent health care providers. The form requests medical and demographic information on the affected employee and information about the facility at which the employee became ill. This information is used to monitor occupational diseases within the state, and to assist in directing intervention and prevention efforts.

On-line occupational disease reporting has been available since 2001 through the Michigan State University Occupational and Environmental Medicine website: www.chm.msu.edu/oem. A secure server is used to maintain the confidentiality of the information submitted on-line. The ability to submit audiogram results was added to on-line reporting in 2003, for cases of occupational noise-induced hearing loss. The health professional electronically submitting occupational disease reports is first given a choice between submitting an occupational disease report for hearing loss or for any other illness. If hearing loss is selected, the user is directed to a screen to report the standard occupational disease report information. Next, the user is asked whether audiogram results will be submitted electronically or via fax or mail. If submitted electronically, a screen to enter audiogram results can be used to report right and left ear hearing thresholds ranging from 250 Hz to 8000 Hz. In addition to completing the OD report form (Figure 1) on-line, information can be submitted by:

*Email: ODReport@msu.edu

*Fax: (517) 432-3606

*Phone-in: 1-800-446-7805

*Request postage paid envelopes: 1-800-446-7805

*Mail directly to: MDLEG, MIOSHA

Management and Technical Services Division

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METHODS

The computerized OD records contain: 1) the employee's name, age, sex, race, zip code and social security number; 2) the employer's name, work site address, city, zip code, number of persons employed at the facility and the company's standard industrial classification code (SIC)¹; 3) details of the illness, including diagnosis date, suspected causative agent(s), whether the employee died, and diagnosis or clinical impression coded according to the International Classification of Diseases (ICD-9th Revision²); and 4) information about the individual who submitted the report, including company affiliation (i.e., whether the reporter is employed by the company, or an outside medical department contracted by the company, or a private practice health professional). An OD report is initiated when a clinician knows or suspects that a patient's illness is work-related. Reports are submitted by physicians, audiologists, employers, hospitals, clinics, laboratories, the 3rd Judicial Court of Michigan (which processes the majority of the asbestos-related claims in Michigan), the two Michigan Poison Control Centers and the Federal Mine Safety and Health Administration. Additional reports are generated through annual review of death certificates and the Michigan Health and Hospital Association inpatient database.

Since October 11, 1997, all clinical laboratories doing business in Michigan have been required to report all blood lead analysis results for both adults and children, to the Michigan Department of Community Health. The blood lead results of 10 µg/dL or greater for adults are incorporated into the Occupational Disease reports submitted each year to the MDLEG. Many of the adults reported through this system have had blood lead testing as part of their company's monitoring program. However, it is the clinical laboratories that actually submit the results to the state, not the employers. In fact, aside from the clinical laboratory reports of blood lead analysis, employers themselves almost never submit an elevated blood lead level report to the MDLEG, even though they would be required to do so under the Michigan Occupational Disease Reporting Law. In light of this, blood lead reports submitted by the clinical laboratories are all considered as non-company reports, even though the company may have initially ordered the blood lead test.

In 2002 the collection of information on work-related illnesses from the two Michigan Poison Control Centers (PCC) began. On a monthly basis, the work-related reports are incorporated into the occupational disease reporting database. In 1999, for example, 1,406 (1.6%) of the 87,604 human exposure-related PCC calls were related to occupational exposures.

More than one report on a given individual with different work-related diseases may be submitted to the MDLEG within a given year and across multiple years. If more than one report is submitted in a given year for a chronic disease in a single individual, only one of the submissions is included in our statistics. If multiple reports are submitted over several years on that individual's chronic disease, only the earliest report is included in our statistics. In contrast, if several reports are submitted for acute illnesses for a single individual, all of the reports are included in our statistics. Appendix A lists the chronic disease categories for which duplicate reports within and across years are removed.

RESULTS

A total of 15,890 occupational disease reports were submitted to the MDLEG in calendar year 2003. Figure 2 shows the number of reports received each year since 1985.

Source of Reports

Company or contract medical departments submitted 59% of the reports (9,421 cases). Non-company health practitioners submitted the remaining 41% of the reports (6,469 cases) (Figure 3). Most reports were submitted on individuals who worked in large companies (Table 1) with 95% of the 9,577 reports that listed company size coming from businesses with more than 500 employees. A slightly larger proportion of reports involving companies with fewer than 500 employees come from non-company health practitioners. Just over eight percent of the 691 reports with known company size that were submitted by non-company practitioners involved companies with fewer than 500 employees, while just over four percent of the 8,886 reports with known company size that were submitted by company practitioners involved facilities with fewer than 500 employees.

Four hundred fifty-nine private practice clinicians (non-company affiliated) reported 4,986 incidents of occupational disease. In addition, the two Michigan Poison Control Centers reported 1,481 incidents of work-related poisonings. One hundred fifty-eight (75%) of the clinicians reported only one patient each in calendar year 2003 (Table 2), while four clinicians reported more than 100 patients each. The number of reports submitted by these four clinicians in the year 2003 ranged from 125 to 1,994. Two of these clinicians are certified to interpret chest x-rays for dust-related lung disease ("B" readers); one is an occupational medicine physician who practices at a hospital based clinic; and one is an occupational medicine physician in private practice. A "B" reader is a licensed physician who has passed a test on interpreting chest x-rays for pneumoconiosis, and maintains certification by passing an additional test every four years. Currently, there are 11 Michigan physicians who are "B" readers.

Demographics

Table 3 shows the age, gender and race distribution of the workers with occupational diseases reported in the year 2003. The mean age of reported patients was 47 ± 15 years (range, 15 to 97 years) with two-thirds of the patients (67%) between the ages of 25 and 55 years. One hundred sixty-four reports were submitted for patients under age 20, and 372 reports were submitted for patients over age 79.

Sixty-nine percent of all reports submitted were for male workers. Seventy-two percent of the submitted reports (11,415 cases) did not indicate the worker's race. Of the 4,475 reports that did indicate race, 62% were Caucasian, 35% were African American, 1% were Hispanic and 2% were listed as "other."

Younger workers . Of the 98 workers age 18 and younger, twelve were 15 years old, 18 were 16 years old, 31 were 17 years of age, and 37 were 18 years old. Twenty-eight of the reported patients under age 19 were women and 70 were men.

Five of the younger workers were employed in manufacturing, five worked in educational services and three worked in hospitals. Place of employment was unknown for 85 workers.

Eleven of the younger workers were reported by company affiliated clinicians or clinics. Seventy-one workers were reported for unspecified poisonings (from the Poison Control Centers), 15 for an elevated blood lead level, three were for exposure to tuberculosis, three for diseases of the skin, two reports were for repetitive trauma (sprains and strains), and one was for respiratory symptoms. No fatalities were reported for any workers under age 19. Of the 15 cases of elevated lead levels, nine had serum lead levels between 10 and 24 micrograms per deciliter, and six had serum lead levels between 25 and 45 micrograms per deciliter.

Older workers . Of the 372 workers age eighty and older, 340 were between the ages of 80 and 89, and 32 were between 90 and 97 years of age. Three hundred thirty-six were men, fourteen were women and gender for 22 individuals was unknown. Four of these patients were reported by a company-affiliated clinician or contract medical clinic.

Three hundred thirty-three of the older workers were reported for dust-related lung disease (including 53 with asbestosis, 268 with pleural thickening, and 12 with silicosis), 26 for noise-induced hearing loss, eight for elevated blood lead levels, three for cancer, one for a respiratory condition and one for an unspecified poisoning.

Thirty-five of the older patients worked in or were retired from manufacturing, nine in construction, four from a shooting range, two in educational services, one from utilities, and one in county government. Industry or former industry was not indicated in 320 reports.

Illness Information

Table 4 shows the distribution of diagnoses or clinical impressions by reporting source. Diagnoses are grouped by major International Classification of Diseases categories (ICD-9th Revision). Overall, repetitive trauma illnesses were the most frequently reported conditions, with 4,607 cases representing 29% of all OD reports submitted. The majority of reports were for sprains and strains of the wrist, hand and finger.

Diseases of the respiratory system were the second most frequently reported condition, with 2,953 cases representing 19% of all reports submitted. Toxic effects of substances were the third most frequently reported conditions, with 2,905 cases representing 18% of all reports. Diseases of the nervous system and sense organs represented 2,792 (18%) of the cases. There were 1,864 reports of musculoskeletal and connective tissue disease (12%), 350 reports of skin

and subcutaneous tissue disease (2%), 60 reports of mental disorders (0.4%), 52 burns to the eye (0.3%), and 48 reports of cancer (0.3%). Infrequently reported conditions included infectious and parasitic diseases, diseases of the digestive system, diseases of the genitourinary system, and diseases of the circulatory system.

Two hundred four reports of symptoms, signs and ill-defined conditions were also submitted, which suggests that physicians and other health care providers are reporting both *known* and *suspected* cases of occupational disease.

Reporting source differences . Company and non-company affiliated practitioners differ markedly in the types of occupational diseases reported (Table 4). Forty-nine percent of reports from company health care providers are of repetitive trauma illnesses, while less than one percent of reports by non-company providers represent these diagnoses. Conversely, 45% of non-company reports are of respiratory illness, compared to less than one percent of company submissions. The second, third and fourth most frequently reported diagnoses for company providers are diseases of the nervous system and sense organs (24%), diseases of the musculoskeletal system and connective tissue (20%), and skin and subcutaneous tissue (4%). Poisonings (toxic effects of substances) are the second most frequently reported diagnoses by non-company providers (45%). The third and fourth most frequently reported diagnoses for non-company providers are diseases of the nervous system and sense organs (8%) and symptoms, signs and ill-defined conditions (1%).

Company and non-company practitioners also differ in the types of industries represented in their reports (Table 5). Eighty-six percent of patients reported by company affiliated health care providers are employed in manufacturing, primarily automobile production. In contrast, 64% of patients reported by non-company affiliated providers are employed in manufacturing. The second and third industry types most frequently reported by company providers are service industries (9%) and public administration (3%). The second and third industry types most frequently reported by non-company providers are construction (19%) and services (7%). The type of industry was missing on 4,180 non-company and 54 company reports.

Gender differences . Repetitive trauma illnesses were the most frequently reported diagnoses for both men and women, with 26% of submissions on men and 38% of submissions on women reporting one of these diagnoses (Table 6). The second, third and fourth most frequently submitted diagnoses for men were diseases of the respiratory system (23%), poisonings (21%), and diseases of the nervous system and sense organs (16%). For women, the second, third and fourth most frequently submitted diagnoses were diseases of the nervous system and sense organs (22%), diseases of the musculoskeletal system and connective tissue (18%), and poisonings (13%). Four hundred ninety-eight reports did not indicate gender.

Fatalities. Fatalities related to occupational illnesses were reported for 38 workers (Table 7). None of the fatalities reported were from acute incidents. The state has a separate program to track acute traumatic fatalities, called MIFACE (Michigan Fatality Assessment and Control Evaluation). The MIFACE program identified an additional 153 acute work-related traumatic

fatalities in 2003 that occurred in our state.

Non-company clinicians reported all 38 of the individuals with occupational illnesses who died. Gender was unknown for all of the cases. The age range of the workers who died was from 51 to 88 years. Thirty individuals died from asbestos-related cancer and eight died from asbestosis. Twenty-five of the deceased workers had been employed in manufacturing, and one worked in educational services. Former occupation was not specified for 12 workers.

Comparison With Other Data Systems

Data Linkage Initiative. We have been working on a project to obtain a better estimate of the true number of occupational illnesses and injuries in Michigan. One of the main objectives of this project is to combine data across several reporting systems and look at the overlap of patients reported. Using a capture-recapture methodology, we have been developing estimates for the number of work-related conditions not tracked in any of the reporting systems. The nine reporting systems are:

- Michigan Adult Blood Lead Epidemiology and Surveillance Program (ABLES)
- Michigan Bureau of Workers' Disability and Compensation First Injury and Illness Reports
- Michigan Census of Fatal Occupational Injuries (CFOI)
- Michigan Hospital Inpatient/Outpatient Database
- Michigan Occupational Disease Reports
- United States Department of Labor Bureau of Labor Statistics Annual Survey
- United States Department of Labor Mine Safety and Health Administration Injury and Illness Reports
- United States Department of Labor Occupational Safety and Health Administration Annual Survey
- United States Department of Labor Occupational Safety and Health Administration Integrated Management Information System (IMIS)

Preliminary data from this effort is available. For example, in 1999 there were 11,407 individuals reported to the Bureau of Labor Statistics (BLS) with days away from work from the 5,934 Michigan facilities that were sampled. After weighting, BLS estimates there were 68,400 lost workday cases and a total of 296,700 injuries and illnesses in Michigan for 1999. Three thousand eight hundred and four names matched in BLS and Workers' Compensation (WC), 7,603 names were in BLS but not WC, and 1,283 names were in WC but not BLS. After weighting, 22,960 matched, 45,203 were in BLS but not WC, and 9,749 were in WC but not BLS. Using capture-recapture, we estimated that 7,983 weighted cases were missed by both systems. This totals to an estimate of 85,895 days away from work cases. Our estimate is 25.6% greater than the official BLS estimate of days away from work cases.

Published Data in Michigan at a Disease Category Level. Prior to the data linkage initiative, the best picture of occupational diseases in our state was to compare data from the OD

reporting system with Workers' Compensation Claims and the MDLEG Annual Survey (Table 8). Those data also suggest that the magnitude of occupational conditions among Michigan workers is greater than what currently gets reported.

The most recent data that is available from the MDLEG Bureau of Workers' Compensation (BWC) at a disease-category level is from 2001. In that year, there were 8,902 claims due to occupational illnesses and 42,550 claims for occupational injuries. Although not yet available at a disease-category level, in 2003 the BWC reported 38,425 claims for both occupational injuries and illnesses.

The other major data on occupational injuries and illnesses available in Michigan comes from the MDLEG annual survey of company injury and illness logs. For this data source, the most recent data available at a disease category level is also from 2001 with an estimate of 31,700 occupational illnesses in the state. Table 8 compares occupational disease reports received by MDLEG with this survey and the BWC reports.

Hospital Discharge Data - Workers' Compensation. Figure 4 shows the number and percentage of patients as well as hospitalizations paid for by Workers' Compensation (WC) for the years 1992 through 2002. The numbers of hospitalizations per year that are paid for by Workers' Compensation from 1998-2002 are decreased as compared to the years 1992-1997. In addition, the percentage of hospitalizations that are paid for by WC has decreased since 1994 (Figure 5). In 2002, 0.41% of the 1,306,766 Michigan hospitalizations were paid for by Workers' Compensation.

Table 9 shows the primary discharge diagnosis for hospitalizations from 1992 through 2002, where the primary source of payment was WC. WC covers a broad range of conditions, including mental illness, infections, heart disease and cancer. The most common conditions covered by WC are musculoskeletal diseases, accounting for approximately 40-45% of patient WC-related hospitalizations from 1992-2002. The second most frequent conditions covered by WC during this same time period are injuries and poisoning, accounting for 35-40% of all WC-related patient hospitalizations.

The demographic characteristics of patients with WC hospitalizations are shown in Table 10. Approximately 75% of the hospitalizations were for men, across all years from 1992 to 2002. Among hospitalizations for which race was known, approximately 85% were white, 10% were African American, 1% were Hispanic, <1% were Asian or American Indian, and 2-5% were listed as "other."

The majority of hospitalizations involved workers between the ages of 30 and 50 years. Around 1% involved workers under the age of 15 or over the age of 80 years. The number of hospitalizations of workers under the age of 20 has decreased slightly over time, from 3% in 1992 to 1.6% in 2002.

Hospital Discharge Data - Pneumoconiosis. Figure 6 shows the number of individuals

hospitalized in Michigan with asbestosis, coal workers' pneumoconiosis and silicosis from 1990 to 2002. Repeat admissions of the same individual are excluded from these counts. For most of these patients, pneumoconiosis was not the primary discharge diagnosis listed on the discharge record. As shown in Figure 7, Medicare is the primary payment source for hospitalizations related to these dust diseases of the lung. WC is very rarely the source of payment, which is consistent with findings in both Michigan and New Jersey that the majority of patients with pneumoconiosis never apply for WC^{3,4}.

Mesothelioma/Asbestosis. The association between exposure to asbestos and the risk of developing mesothelioma was first reported in the medical literature in 1943⁵. The only other exposure associated with the risk of developing mesothelioma has been the therapeutic use of x-rays. The percentage of patients with mesothelioma who have a history of occupational asbestos exposure is lower in studies that are based on review of medical records compared to studies based on a complete work history where 90% of mesothelioma has been attributed to asbestos exposure⁶. Among cohorts of asbestos-exposed workers, up to 10% of deaths have been attributed to mesothelioma.

Asbestos-related lung disease is the most common of the dust diseases reported to the Michigan Department of Labor and Economic Growth. The number of reports of asbestosis in 1999 was 3,384, and decreased to a low of 677 reports in the year 2002 (Figure 8). The number of reports of pleural thickening decreased from 2001 to 2002, from 2,397 to 1,269 reports. In 2003, the number of reports of asbestos-related lung disease increased to 1,847. The reports for asbestos-related x-ray changes are largely from one of Michigan's B-readers as well as an occupational medicine physician.

We have used data from the Michigan Cancer Registry to describe the demographics of mesothelioma in Michigan. From 1985 through the year 2000 there were 1,471 Michigan residents reported to the Michigan Cancer Registry with invasive mesothelioma. Figure 9 shows the number of men and women diagnosed with mesothelioma by year, from 1985 to 2000. Approximately one quarter (25.5%) of the reports of mesothelioma occurred in women. Mesothelioma occurred predominantly among Caucasians (93.5%) compared to African Americans (5.6%). Thirteen (0.9%) were classified as "other" ancestry.

Figure 10 shows the age at diagnosis separately for men and women. The peak age of occurrence of mesothelioma was for individuals 65 years and older for both men and women.

Figure 11 shows the distribution of the number of cases of mesothelioma among Michigan residents, by county. Figure 12 shows the average annual incidence rates of mesothelioma among Michigan residents, by county. The counties with the highest rates are: Presque Isle (4.6 per 100,000); Bay (4.2 per 100,000); Alger (4.1 per 100,000); Mackinac (3.7 per 100,000); Ontonagon (3.6 per 100,000); and Midland (3.5 per 100,000).

Poison Control Center Data. In 2003, a total of 1,481 calls to one of the two Michigan Poison Control Centers were identified as work-related. Table 11 reports the available demographic

characteristics of the individuals reported. There were more reports for males (61%) than females (39%). The individuals ranged in age from 15 to 80 years. Almost 90% of these individuals were less than age 50. More detailed information about the nature of these poisonings is available, but not in a format that is readily analyzable.

DISCUSSION

There were 15,890 Occupational Disease Reports sent to the MDLEG in calendar year 2003. The most frequent types of occupational diseases reported to the MDLEG were repetitive trauma illnesses (29%), respiratory disease (19%), toxic effect of substances (18%), and diseases of the nervous system and sense organs (18%). From 1988 through 1999, the number of reports sent to the MDPH/MDLEG has increased substantially. Figure 2 shows the number of occupational disease reports received each year since 1985. Since 1999 the number of reports has decreased. This year, in 2003, there was a slight increase in the number of reports received, with approximately 1,000 more reports received than in 2002. The overall decline in the number of reports reflects fewer reports from company medical departments, while the number of reports from private practitioners has remained relatively unchanged the last six years (Figure 3). The cause for this decrease is unknown. The actual number of companies reporting in 2003 increased to 305 from 227 in 2002.

We used the ICD-9 codes to classify the diagnosis or clinical impression recorded on the occupational disease reports submitted to the MDLEG. In the ICD-9 coding system, sprains and strains are classified as injuries. Employers are only required to report *illnesses* on the OD reporting form, not injuries. Sprains and strains, except those involving the back, are considered by the Federal and Michigan OSHA programs as illnesses secondary to cumulative trauma, and are therefore required to be reported.

Many employers, physicians and other health care providers do not report patients with occupational diseases either because they are unaware of the reporting law or choose not to report for a different reason. We currently receive reports from approximately 305 companies and 212 non-company physicians. There were approximately 250,000 companies in the year 2003 and 26,037 practicing physicians in Michigan in the year 2003. Accordingly, we are receiving reports from 0.1% of companies and 0.8% of physicians. Over the last several years, these percents have remained largely unchanged. We have continued our efforts to remind employers of the requirement to report by routinely distributing reporting forms during MIOSHA inspections. Also, all new physicians receive information on the requirement to report when they apply for medical licensure in Michigan. There are discussions underway about enforcing the reporting law, after providing further notification to health care providers about the regulations related to occupational diseases.

We know that the 15,000-20,000 reports received each year do not represent the actual incidence of occupational diseases in Michigan. Using capture-recapture analysis we have previously estimated that 29,193 to 60,968 individuals are diagnosed with diseases caused by

work place exposures each year in Michigan⁷. Even this range is an underestimate because it assumes that all physicians recognize work related illness in their patients and that all employers are informed when work-related conditions are diagnosed. These assumptions often go unmet.

The type of illness and the type of industry where occupational diseases occur as reported by non-company health practitioners differs from company-based health practitioners (Tables 1, 4 and 5). These differences vary depending on the specialties of the private practice physicians who submit reports. For example, the non-company health practitioners who reported patients in the year 2003 were more likely to report patients with respiratory disease who work in small, non-manufacturing companies. A large percentage of the year 2003 reports from non-company health practitioners were from physicians who are specialists in the radiographic interpretation of mineral and dust-related lung disease. Without these reports the increased diagnosis of asbestos related lung disease would be missed (Figure 8). However, regardless of the mix of non-company specialists reporting, the data illustrate that relying on company based reports alone would cause occupational illness statistics to markedly under-count certain work-related conditions. For the years 1992-1994, only 9.6% of the workers for whom an Occupational Disease Report was submitted had definitely filed a Workers' Compensation reference claim, although an additional 36% may have filed a claim for a total of 45.6%⁸.

Review of Table 8 shows a large difference in the distribution of occupational illnesses identified through the state's OD reporting system, compared to both the Bureau of Labor Statistics' (BLS) Annual Survey of Employers and the state's Workers' Compensation (WC) claims system. For example, respiratory disease represents approximately 12% (1,800) of the OD reports, while that category of diseases only accounts for 4% (1,200 cases) of the BLS survey and only 2% (145 cases) of WC claims.

To determine the true burden of occupational disease in our state, multiple reporting sources must be used. Efforts to develop a comprehensive surveillance system for Michigan as well as the nation are needed. Preliminary estimates from the Data Linkage Initiative show little overlap between the nine Michigan occupational illness and injury reporting systems. A newer source added to the state's system for tracking occupational diseases, are the two Poison Control Centers in Michigan. These Centers contributed an additional 1,481 reports to the 2003 total of occupational diseases.

In addition to tracking the incidence of occupational disease, a more comprehensive system would allow us to identify areas of concern in our state, develop interventions designed to prevent additional occupational disease, and then evaluate the effectiveness of these efforts.

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Figure 1. Occupational Disease Reporting Form

Michigan Department of Labor and Economic Growth Management and Technical Services Division
Known or Suspected Occupational Disease Report
(Information will be held confidential as prescribed in Act.)

EMPLOYEE AFFECTED				
Name (Last, First, Middle)	Age	Sex M F	Race: <input type="radio"/> White <input type="radio"/> Black <input type="radio"/> Hispanic <input type="radio"/> Other	
Street	City		State	Zip
Home Phone Number		Social Security Number		
CURRENT EMPLOYER				
Current Employer Name		Worksite County		
Worksite Address		City	State	Zip
Business Phone		If Known, Indicate Business Type (products manufactured or work done)		
Number of Employees <input type="radio"/> < 25 <input type="radio"/> 25-100 <input type="radio"/> 100-500 <input type="radio"/> > 500				
Employee's Work Unit/Department		Dates of Employment From: _____ To: _____ Mo Day Year Mo Day Year		
Employee's Job Title or Description of Work				
ILLNESS INFORMATION				
Nature of Illness or Health Condition (Examples: Headache, Nausea, Difficulty Breathing, Cough, etc.)			Date of Diagnosis Mo Day Year	
Suspected Causative Agents (Chemicals, Physical Agents, Conditions)		Did Employee Die? Yes <input type="radio"/> No <input type="radio"/>		If Yes, Date of Death Mo Day Year
If Physician, Indicate Clinical Impression for Suspected Occupational Disease, or Diagnosis of Confirmed Occupational Disease				
ADDITIONAL COMMENTS				
REPORT SUBMITTED BY				
If Report Submitted by Non-Physician, Did Employee See a Physician? If yes, record information below.				
Physician's Name		Yes <input type="radio"/> No <input type="radio"/> Don't Know <input type="radio"/>		
Office Address		City	State	Zip
Name of Person Submitting Report		Physician <input type="radio"/> Non-Physician <input type="radio"/>		
Address		City	State	Zip
Signature		Phone		Date

The Michigan Department of Labor and Economic Growth is an equal opportunity, affirmative action employer, service provider and buyer.

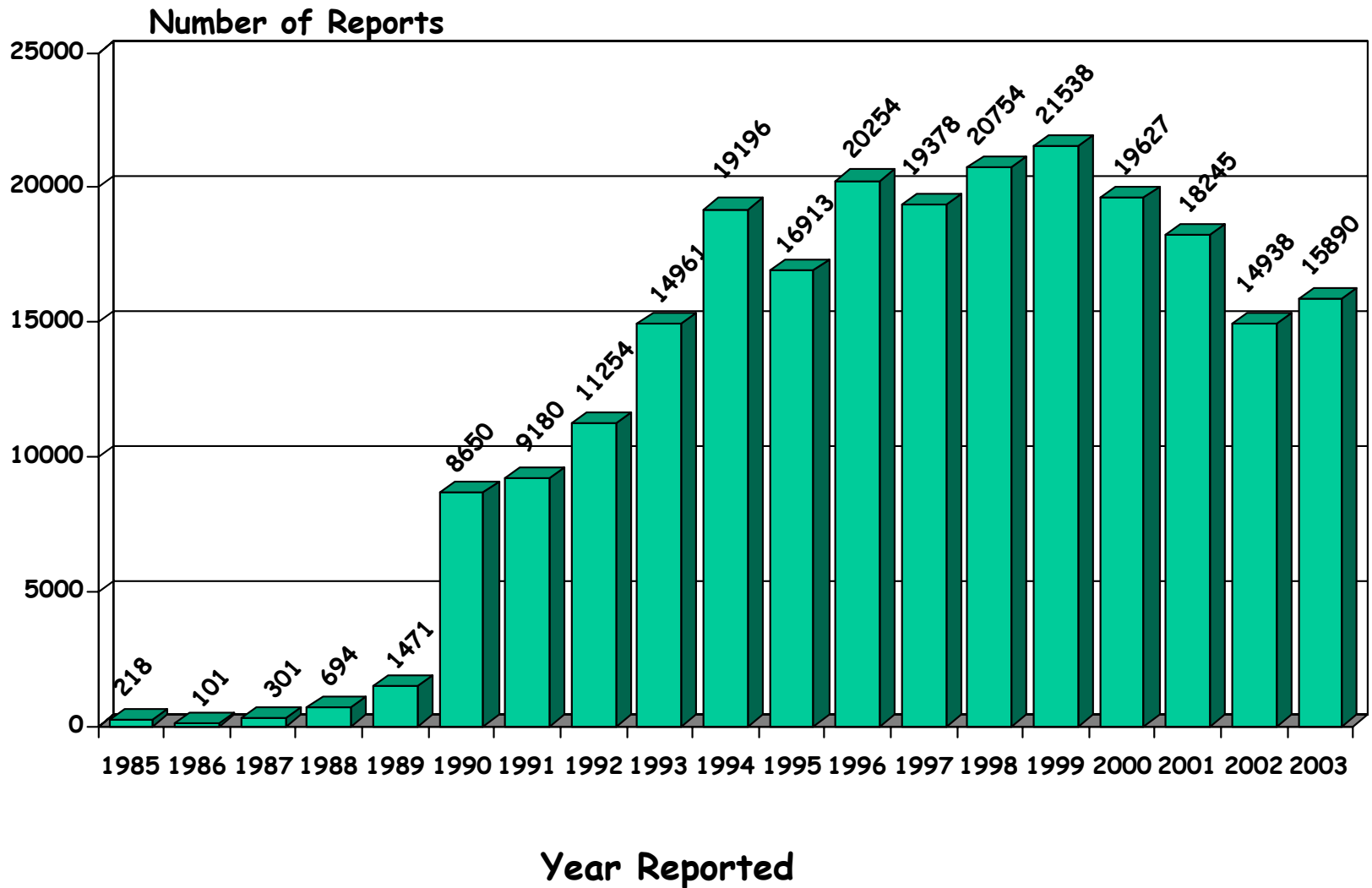
Return completed form to:

**Michigan Department of Labor and Economic Growth
Michigan Occupational Safety and Health Administration
Management and Technical Services Division
7150 Harris Drive, P.O. Box 30649
Lansing, MI 48909-8149**

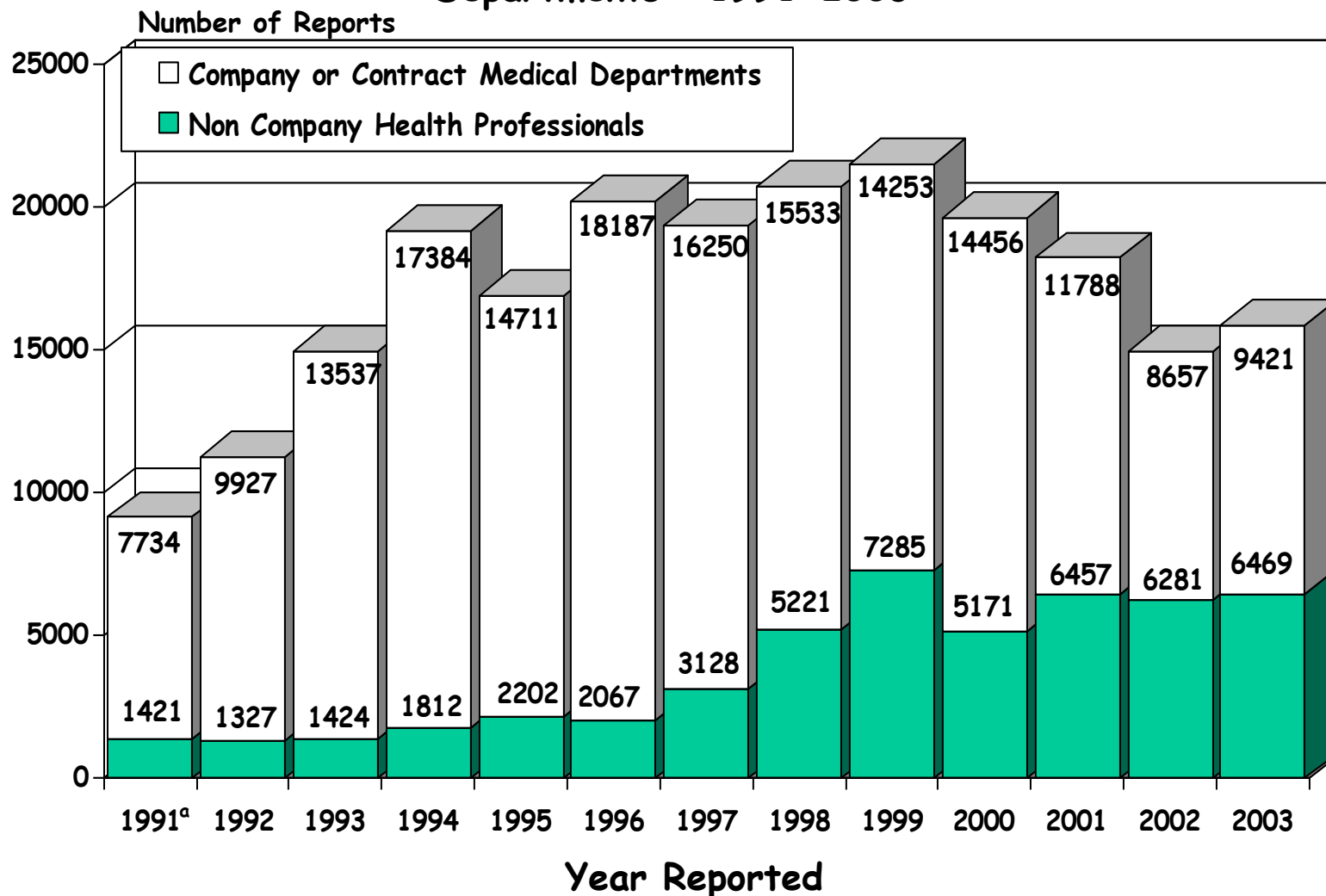
Authority: P.A. 368 of 1978
Completion: Required
Penalty: Misdemeanor

MIOSHA-MTSD-51 (12/03)

Figure 2. Occupational Disease Reports to the Michigan Department of Labor and Economic Growth: 1985-2003

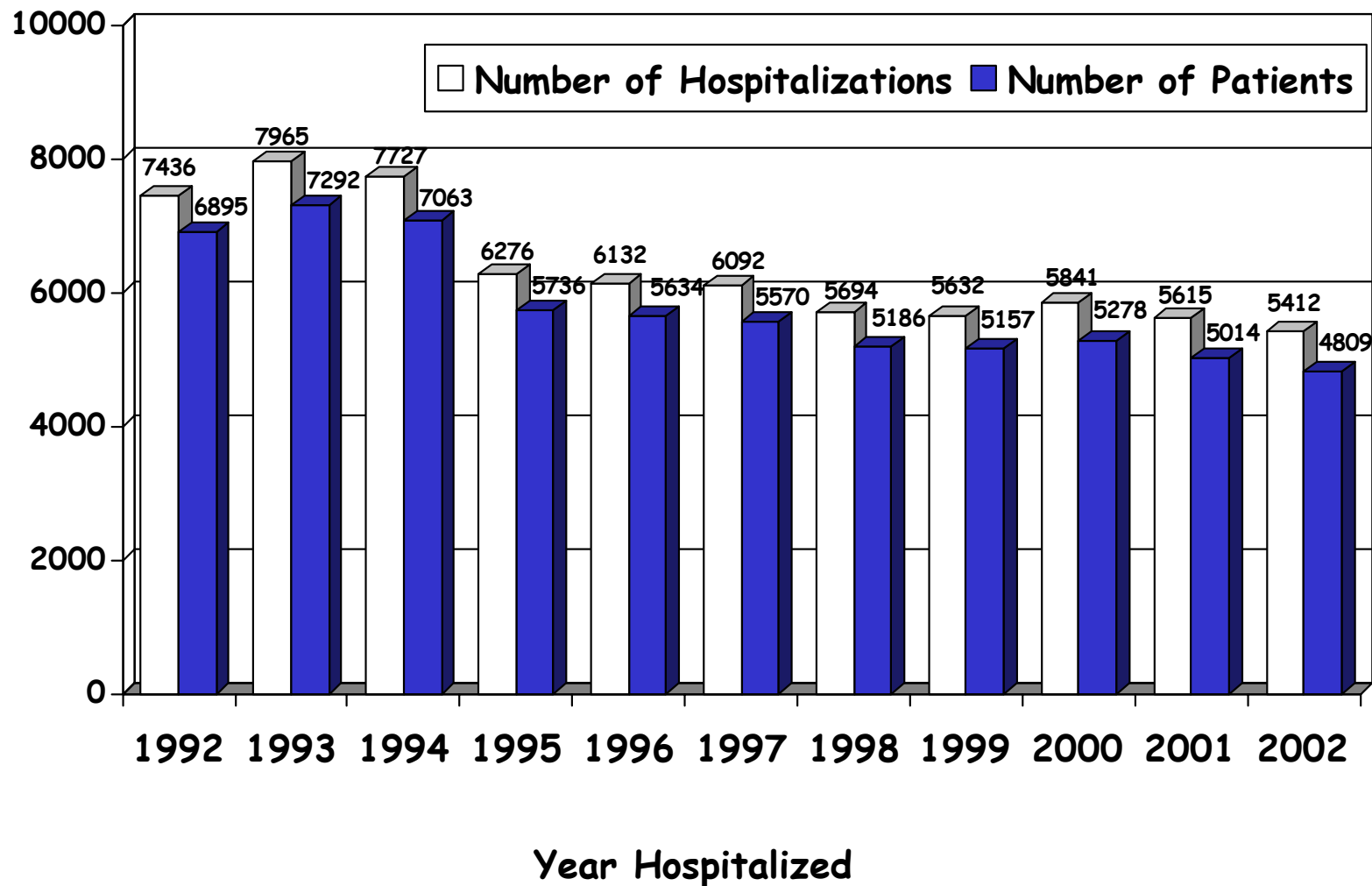


**Figure 3. Occupational Disease Reports by Reporting Source,
Non-Company Health Professionals and Company or Contract Medical
Departments: 1991-2003**



^aReporting source was unknown for 25 reports.

Figure 4. Number of Hospitalizations and Number of Patients Paid for by Workers' Compensation in Michigan: 1992-2002



**Figure 5. Percent of Total Michigan Hospitalizations
Paid for by Workers' Compensation: 1992-2002**

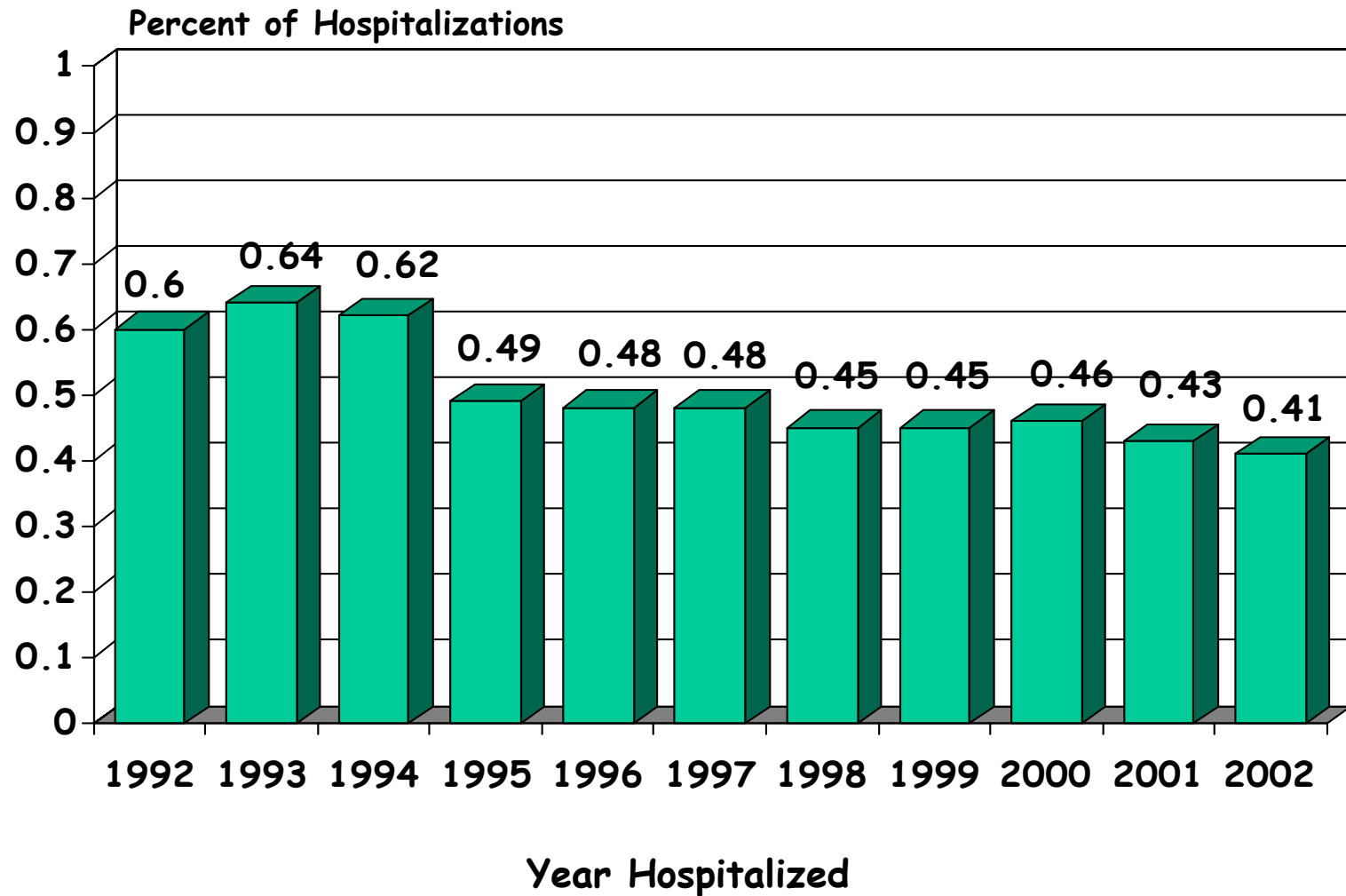


Figure 6. Number of Patients Discharged with Coal Workers' Pneumoconiosis (CWP), Asbestosis and Silicosis in Michigan: 1990-2002

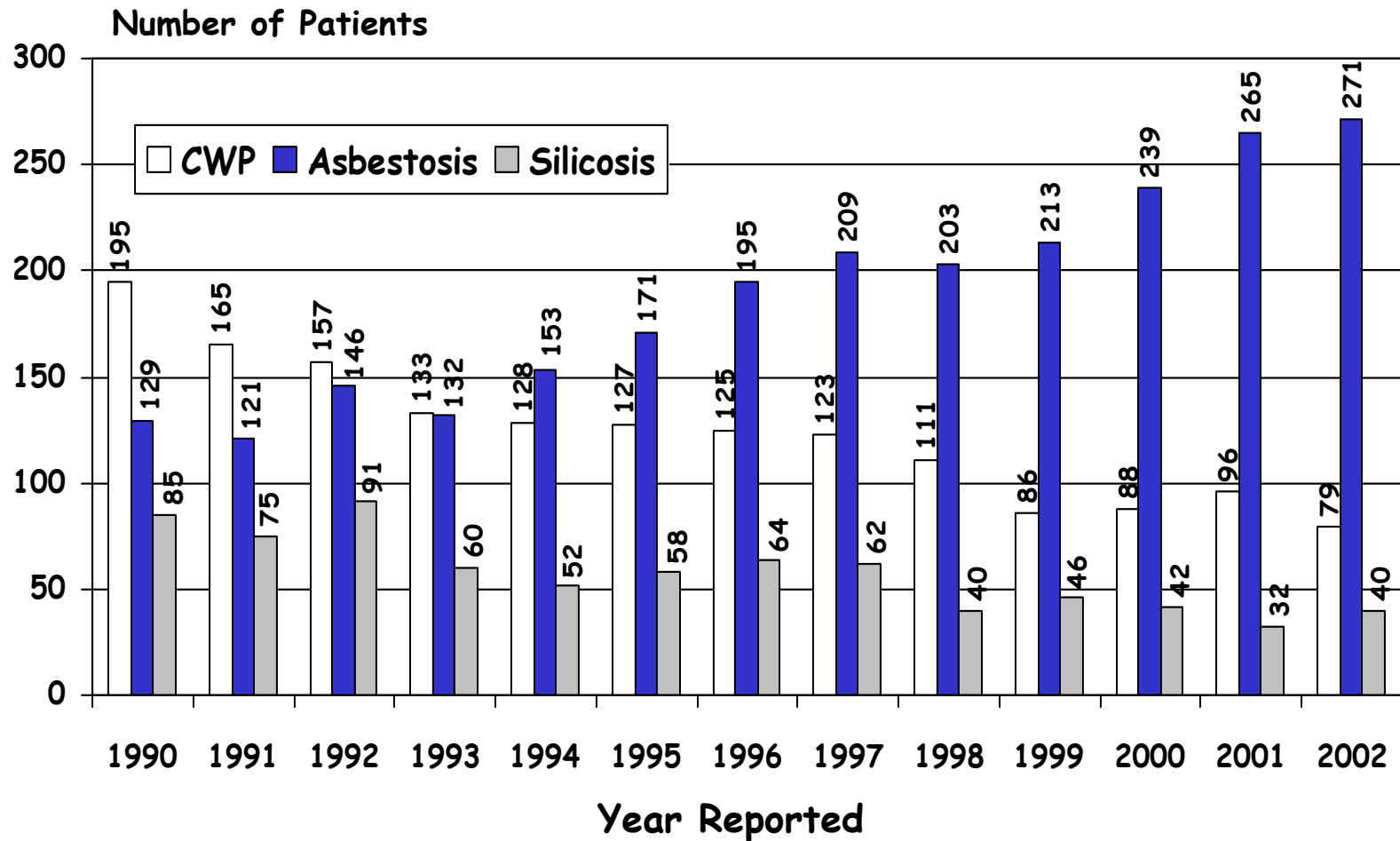
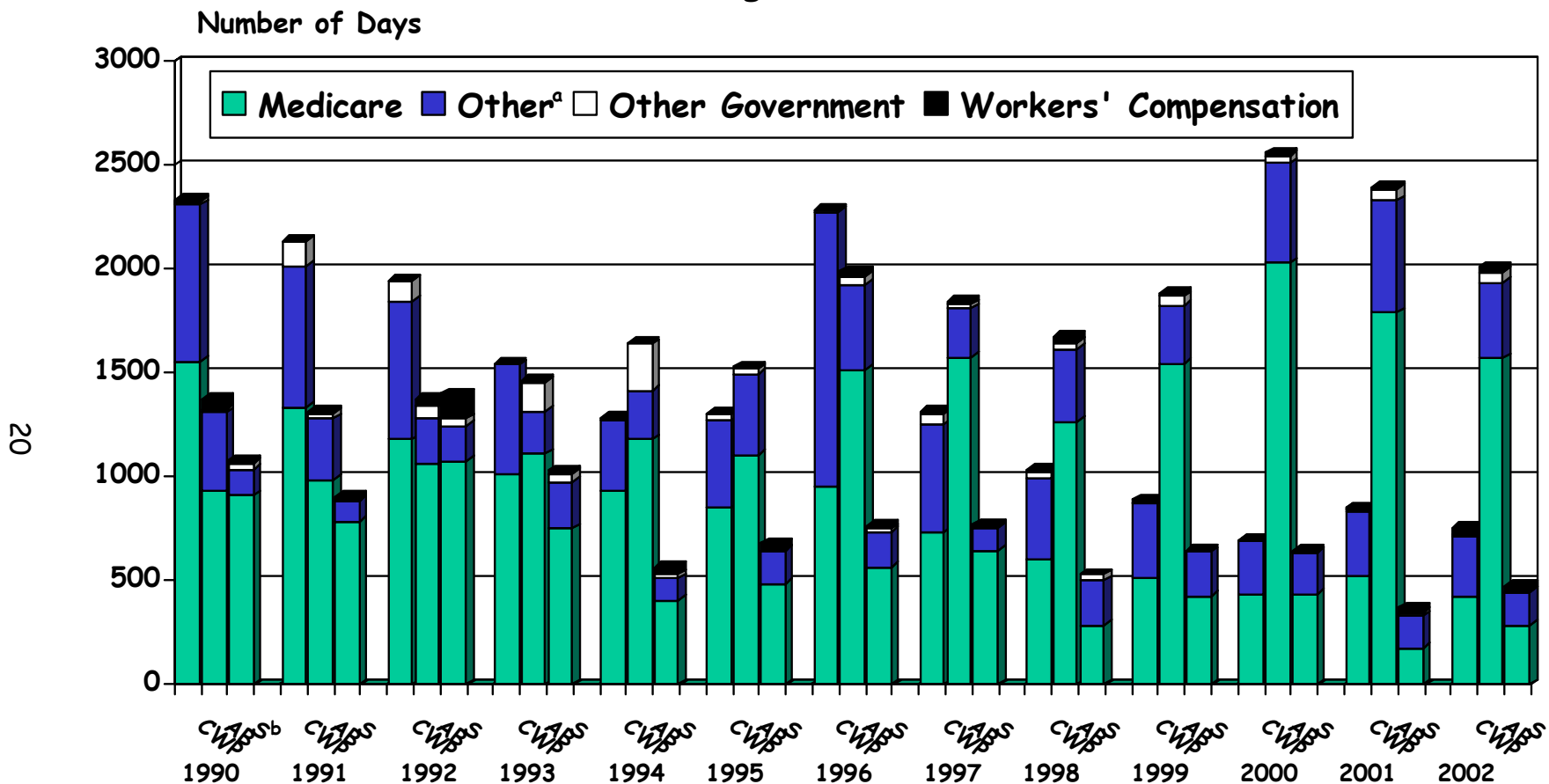


Figure 7. Number of Days Hospitalized by Payment Source for Coal Workers' Pneumoconiosis, Asbestosis and Silicosis in Michigan: 1990-2002



^a"Other" includes: Medicaid, HMOs, PPOs, Other Insurance, Self-Pay and No-Charge payment sources.

^bDiagnosis codes: CWP=Coal Workers' Pneumoconiosis; AB=Asbestosis; S=Silicosis.

Figure 8. Asbestos-Related Cases Reported to the Michigan Department of Labor and Economic Growth: 1989-2003

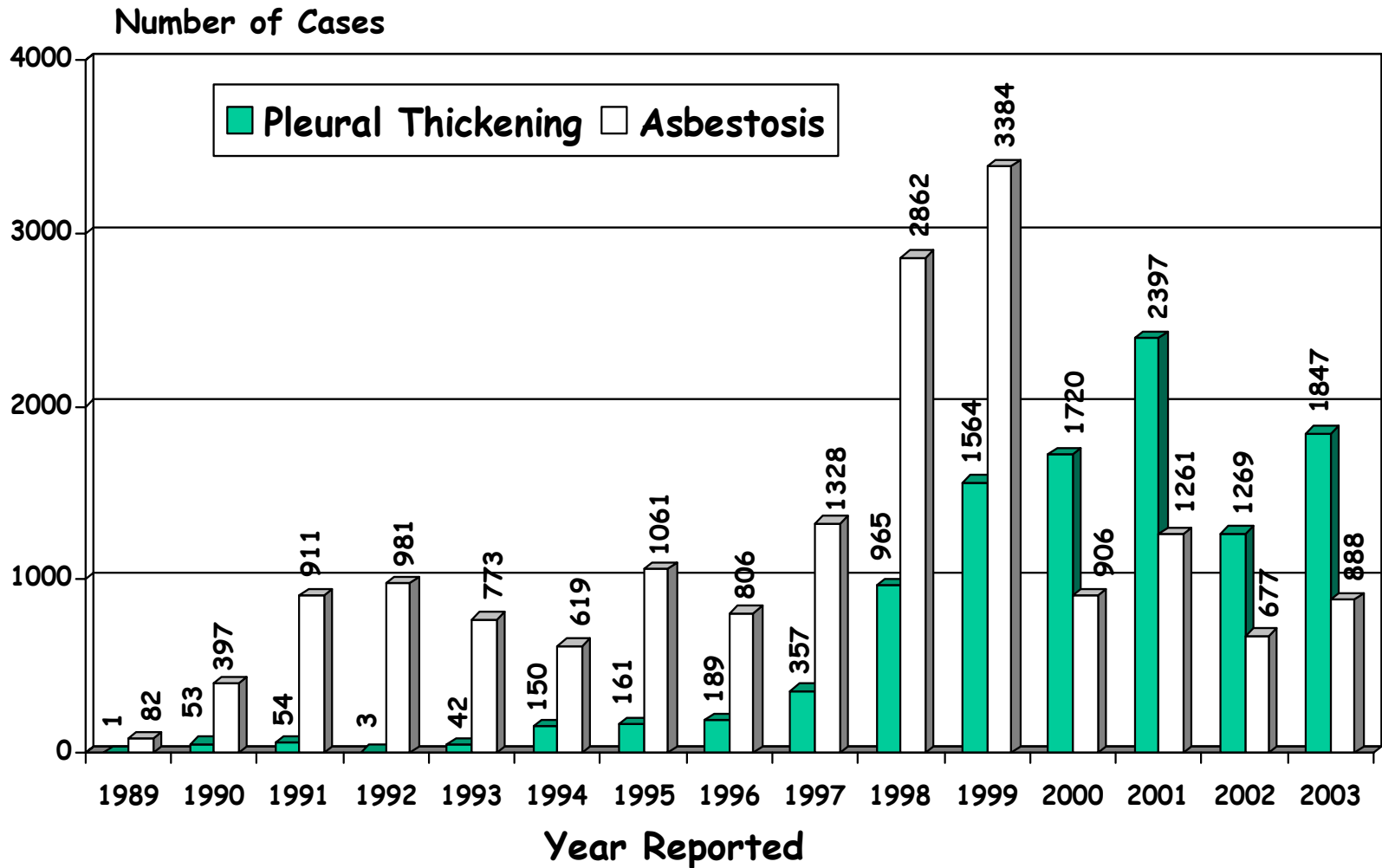
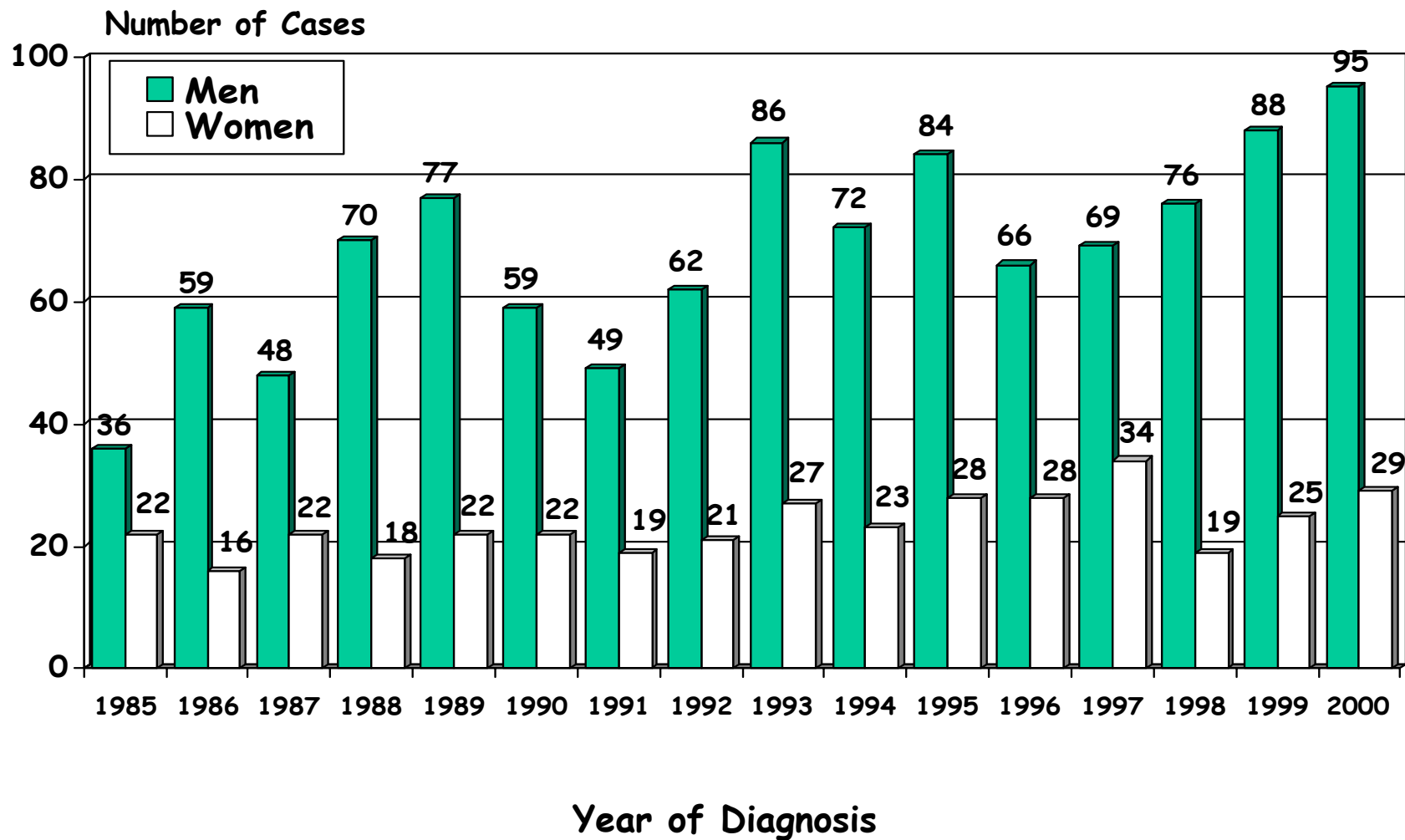
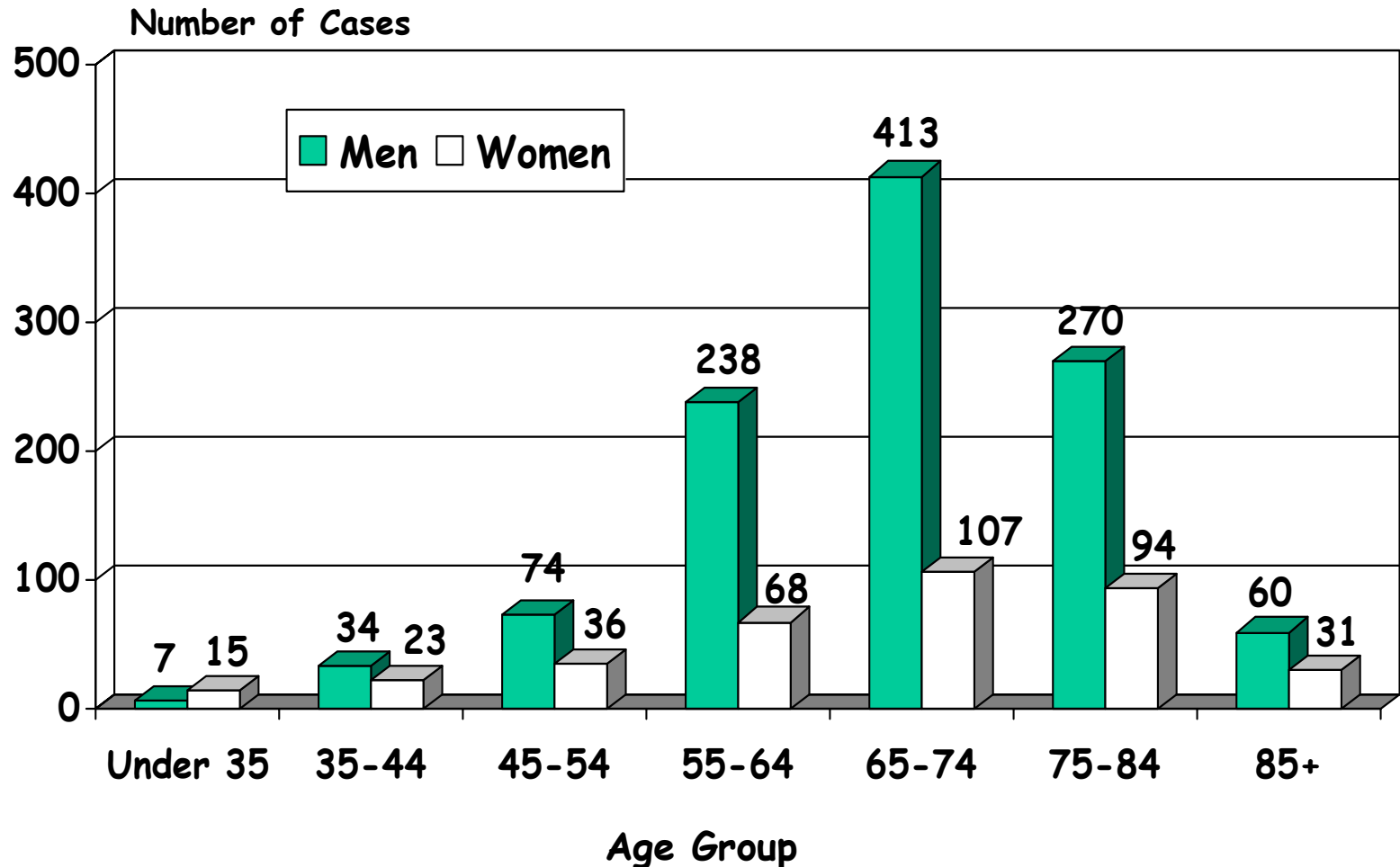


Figure 9. Number of Men and Women in Michigan Diagnosed with Mesothelioma: 1985-2000



**Figure 10. Cases of Mesothelioma in Michigan
by Gender and Age at Diagnosis^a: 1985-2001**



^aFor one female, age at diagnosis was unknown.

Figure 11. Distribution of Michigan Residents Diagnosed with Mesothelioma by County: 1985-2000

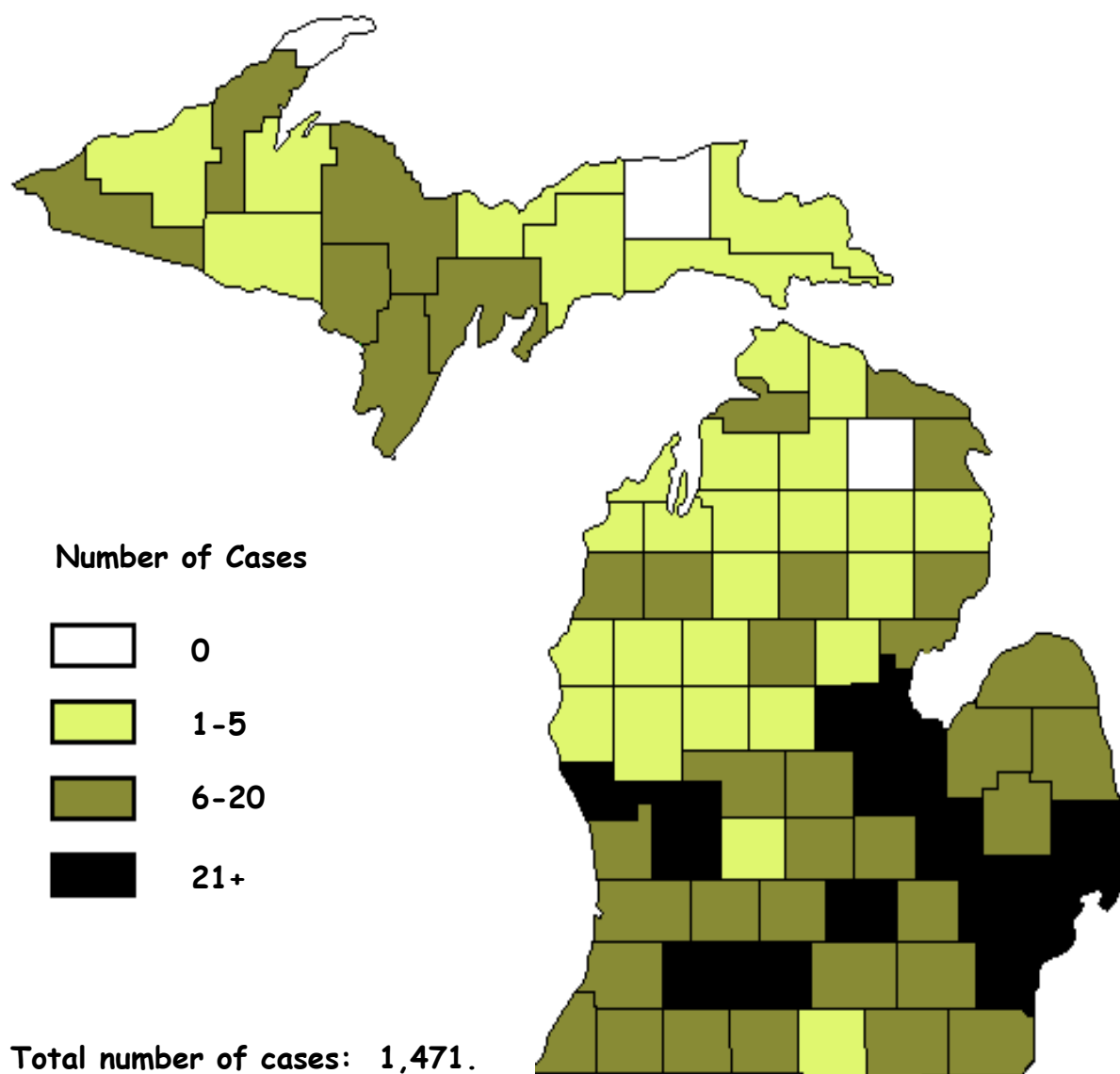
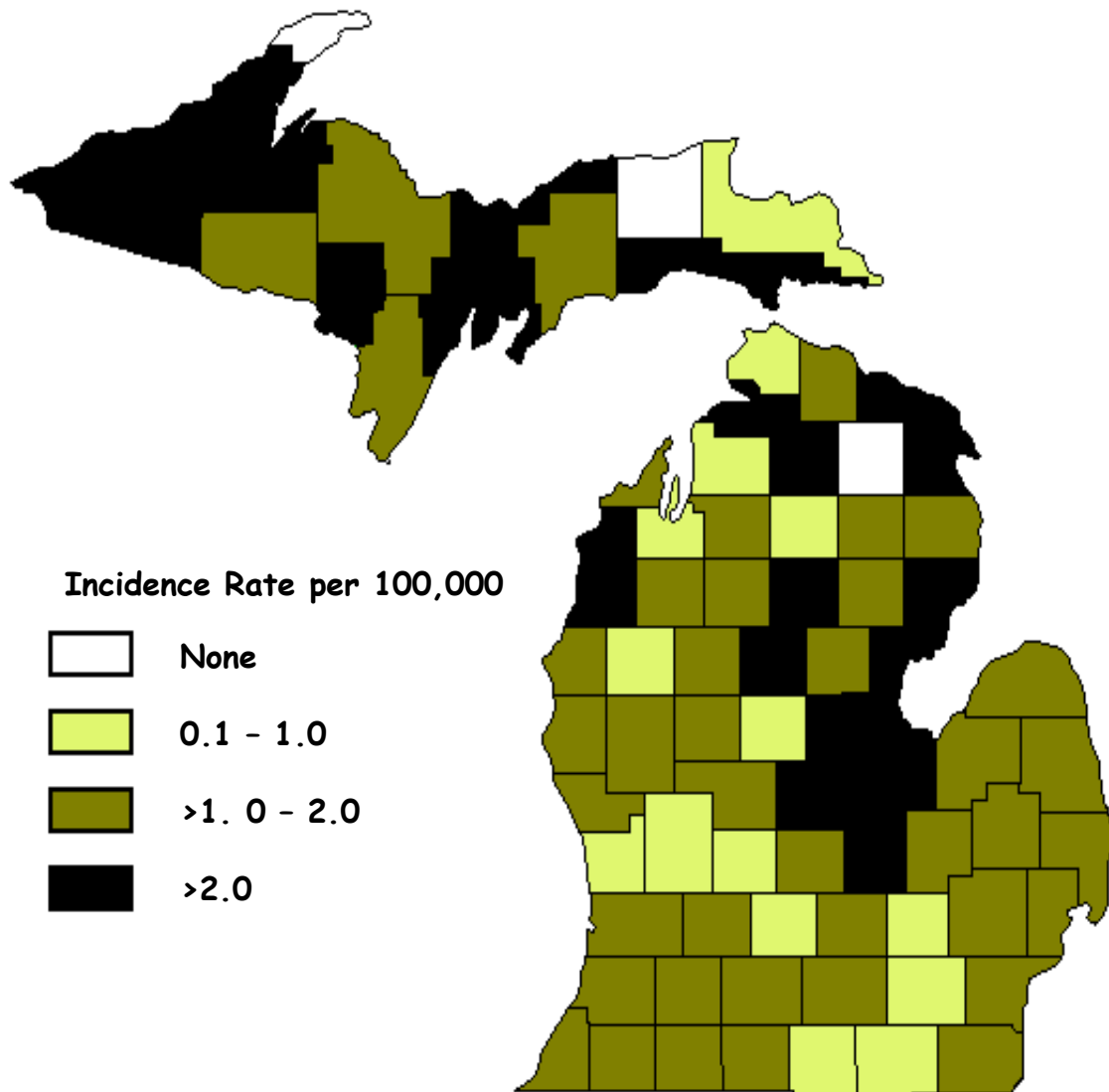


Figure 12. Average Annual Incidence Rates of Mesothelioma Among Michigan Residents, by County^a



^aNumerator is the average number of Michigan residents by county, diagnosed with mesothelioma from 1985-2000. Denominator is the estimated number of Michigan residents age 16+ by county, from the United States Census Bureau for July 1, 1993.

Table 1. Number of Employees at Facilities Where an Occupational Illness Occurred By Reporting Source: Company vs. Non-Company Clinician

NUMBER OF EMPLOYEES	Reports from Non-Company Practitioners		Reports from Companies		Total Reports	
	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>
<25	12	1.7	9	0.1	21	0.2
25-100	18	2.6	95	1.1	113	1.2
100-500	27	3.9	291	3.3	318	3.3
>500	634	91.8	8,491	95.6	9,125	95.3
Total	691^a	100.0	8,886^b	100.0	9,577	100.0

^a The number of employees was missing on 5,778 reports.

^b The number of employees was missing on 535 reports.

Table 2. Number of Occupational Disease Reports Submitted by Non-Company Health Practitioners

Number of Reports	Health Practitioners		Number of Patients Represented
	Number	Percent	
1	158	74.5	158
2-5	29	13.7	86
6-10	12	5.7	91
11-20	3	1.4	46
21-100	6	2.8	235
101+	4	1.9	2,968
Total^a	212	100.0	3,584

^a 1,402 reports were submitted by labs for lead poisoning, representing 247 clinicians. These are not included in the above statistics. 1,481 reports were submitted by Michigan's two Poison Control Centers, and are not included in the above statistics. In addition, two reports did not list physician name and are not included in the above statistics.

Table 3. Demographic Characteristics of Reported Occupational Disease Cases

	<i>Number of Reports</i>	<i>Percent of Reports</i>
AGE		
≤19	164	1.2
20-24	524	3.7
25-29	1,016	7.2
30-34	1,639	11.6
35-39	1,384	9.8
40-44	1,712	12.1
45-49	1,941	13.7
50-54	1,826	12.9
55-59	1,324	9.3
60-69	1,345	9.5
70-79	931	6.6
80+	372	2.6
Total	14,178^a	
GENDER		
Male	10,592	68.8
Female	4,800	31.2
Total	15,392^b	
RACE		
Caucasian	2,772	61.9
African American	1,571	35.1
Hispanic	64	1.4
Other	68	1.5
Total	4,475^c	

^aAge was missing on 1,712 reports. Mean age = 47± 15 years.

^bGender was missing on 498 reports.

^cRace was missing on 11,415 reports.

Table 4. Number of Occupational Disease Reports by Disease Type and Reporting Source

DISEASE TYPE	Non-Company		Company		Total	
	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>
Infectious & Parasitic Diseases (ICD 001-139)	1	<0.1	18	0.2	19	0.1
Neoplasms (ICD 140-239)	48	0.7	0	--	48	0.3
Diseases of Endocrine Glands (ICD 250-259)	0	--	1	<0.1	1	<0.1
Mental Disorders (ICD 290-319)	2	<0.1	58	0.6	60	0.4
Diseases of the Nervous System & Sense Organs (ICD 320-389)	530	8.2	2,262	24.0	2,792	17.6
Diseases of the Circulatory System (ICD 390-459)	0	--	3	<0.1	3	<0.1
Diseases of the Respiratory System (ICD 460-519)	2,919	45.1	34	0.4	2,953	18.6
Diseases of the Digestive System (ICD 520-579)	0	--	31	0.3	31	0.2
Diseases of the Genitourinary System (ICD 580-629)	1	<0.1	0	--	1	<0.1
Diseases of the Skin & Subcutaneous Tissue (ICD 680-709)	7	0.1	343	3.6	350	2.2
Diseases of the Musculoskeletal System & Connective Tissue (ICD 710-739)	17	0.3	1,847	19.6	1,864	11.7
Symptoms, Signs & Ill-Defined Conditions (ICD 780-799)	44	0.7	160	1.7	204	1.3
Repetitive Trauma: Sprains & Strains (ICD 800-999 except ICD 940 & ICD 980-989)	17	0.3	4,590	48.7	4,607	29.0
Burn Confined to Eye (ICD 940)	0	--	52	0.6	52	0.3
Toxic Effects of Substances (ICD 980-989)	2,883	44.6	22	0.2	2,905	18.3
Total	6,469	100.0	9,421	100.0	15,890	100.0

Table 5. Number of Reports by Industry Type and Reporting Source

INDUSTRY TYPE	Non-Company		Company		Total	
	Number	Percent	Number	Percent	Number	Percent ^t
Agricultural and Forestry Services (SIC 01,07,08)	6	0.3	5	0.1	11	0.1
Mining (SIC 10-14)	0	--	19	0.2	19	0.2
Construction (SIC 15-17)	445	19.4	44	0.5	489	4.2
Manufacturing (SIC 20-39)						
Food and Kindred Products (SIC 20)	0	--	13	0.1	13	0.1
Furniture (SIC 25)	2	0.1	28	0.3	30	0.3
Paper and Allied Products (SIC 26)	6	0.3	0	--	6	0.1
Printing and Publishing (SIC 27)	3	0.1	4	<0.1	7	0.1
Chemicals and Allied Products (SIC 28)	24	1.0	267	2.9	291	2.5
Rubber and Misc. Plastics Products (SIC 30)	1	<0.1	104	1.1	105	0.9
Stone, Clay, Glass & Concrete Products (SIC 32)	11	0.5	0	--	11	0.1
Primary Metal Industries (SIC 33)	684	29.9	163	1.7	847	7.3
Fabricated Metal Products (SIC 34)	207	9.0	990	10.6	1,197	10.3
Industrial & Commercial Machinery & Computer Equipment (SIC 35)	20	0.9	147	1.6	167	1.4
Electronic Equipment and Components (SIC 36)	4	0.2	161	1.7	165	1.4
Transportation Equipment (SIC 37)	472	20.6	6,112	65.3	6,584	56.5
Miscellaneous Manufacturing (SIC 22,23,24,29,39)	24	1.0	34	0.4	58	0.5
Transportation, Communications, Electric, Gas & Sanitary Services (SIC 40-49)	113	4.9	36	0.4	149	1.3
Wholesale and Retail Trade (SIC 50-59)	43	1.9	99	1.1	142	1.2
Insurance & Real Estate (SIC 60-67)	9	0.4	2	<0.1	11	0.1
Services						
Hospitals (SIC 80)	25	1.1	173	1.8	198	1.7
Schools (SIC 82)	35	1.5	380	4.1	415	3.6
Misc. (SIC 70,72,73,75,76,79,83,86,87,88)	90	3.9	327	3.5	417	3.6
Public Administration (SIC 90-97)	65	2.8	259	2.8	324	2.8
Total	2,289	99.8^a	9,367	100.2^a	11,656^b	100.3^a

^aPercent does not add to 100 due to rounding.

^bType of industry was unknown in 4,180 non-company reports and 54 company reports.

Table 6. Number of Occupational Disease Reports by Disease Type and Gender^a

DISEASE	MALES		FEMALES	
	<i>Number</i>	<i>Percent</i>	<i>Number</i>	<i>Percent</i>
Infectious and Parasitic Diseases (ICD 001-139)	9	0.1	10	0.2
Diseases of Endocrine Glands (ICD 250-259)	0	--	1	<0.1
Mental Disorders (ICD 290-319)	28	0.3	31	0.6
Diseases of the Nervous System and Sense Organs (ICD 320-389)	1,718	16.2	1,071	22.3
Diseases of the Circulatory System (ICD 390-459)	2	<0.1	1	<0.1
Diseases of the Respiratory System (ICD 460-519)	2,457	23.2	160	3.3
Diseases of the Digestive System (ICD 520-579)	29	0.3	2	<0.1
Diseases of the Genitourinary System (ICD 580-629)	0	--	1	<0.1
Diseases of the Skin and Subcutaneous Tissue (ICD 680-709)	218	2.1	131	2.7
Diseases of the Musculoskeletal System and Connective Tissue (ICD 710-739)	1,007	9.5	852	17.8
Symptoms, Signs and Ill-Defined Conditions (ICD 780-799)	119	1.1	84	1.8
Repetitive Trauma Injuries (ICD 800-999 except ICD 940 and ICD 980-989)	2,789	26.3	1,816	37.8
Burn Confined to Eye (ICD 940)	49	0.5	3	0.1
Toxic Effects of Substances Chiefly Non-Medicinal (ICD 980-989)	2,167	20.5	637	13.3
Total^a	10,592	100.1 ^b	4,800	99.9 ^b

^a Gender was missing on 498 reports.

^b Percent does not add to 100 due to rounding.

Table 7. Number of Reported Occupational Disease Fatalities

	<i>Number</i>	<i>Percent</i>
Fatal	38	0.2
Non-Fatal	15,852	99.8
Total	15,890	100.0

**Table 8. Comparison of 2001 BLS Occupational Illness Survey Data and
2001 MDLEG Workers' Compensation (WC) Claims
with 1992-2003 Occupational Disease Reports**

DISEASE CATEGORY	MDLEG BLS Survey & Workers' Compensation Claims				MDLEG Occupational Disease Reports											
	2001 BLS Survey^b		2001 WC Claims^b		1992-1993^c		1994-1995^c		1996-1997^c		1998-1999		2000-2001		2002-2003	
	#	%	#	%	Mean #^a	%	Mean #^a	%	Mean #^a	%	Mean #^a	%	Mean #^a	%	Mean #^a	%
Occupational Skin Disease or Disorders	3,300	10.4	319	3.6	776	6.0	1,034	5.9	1,405	7.3	1,307	6.3	953	5.1	426	2.9
Dust Diseases of the Lung	100 ^e	0.3	1	<0.1	914	7.1	966	5.5	1,159	6.0	3,225	15.6	1,165	6.3	861	5.9
Respiratory Conditions Due to Toxic Agents	1,200	3.8	145	1.6	290	2.3	570	3.0	799	4.1	1,481	7.2	2,334	12.5	1,800	12.3
Poisoning	200	0.6	54	0.6	207	1.6	315	1.8	631	3.3	1,120	5.4	1,246	6.7	2,858	19.6
Disorders Due to Physical Agents	1,200	3.8	37	0.4	469	3.6	419	2.4	414	2.1	328	1.6	231	1.2	105	0.7
Disorders Due to Repeated Trauma	23,200	73.2	2,941	33.0	7,151	55.8	10,601	60.3	11,293	58.3	9,644	46.7	9,068	48.7	5,942	40.8
All Other Occupational Illnesses	2,500	7.9	5,405	60.7	2,972	23.2	3,680	20.9	3,668	18.9	3,541	17.2	3,639	19.5	2,587	17.7
Number of Reports/year	31,700		8,902		12,779^d		17,585		19,369		20,646		18,636		14,579	

^aNumber of reports per year (averaged over the 2 years).

^bMost recent year available.

^cCounts published in previous years' OD reports for 1992-1997 have been corrected here.

^dType of occupational disease was missing on 97 reports.

^eThis number is estimated since the BLS Annual Survey does not provide numbers for conditions with individual rates <0.05 per 10,000 full time workers.

**Table 9. Primary Diagnosis of Patients Hospitalized in Michigan from 1992-2002,
Paid for by Workers' Compensation**

Primary Discharge Diagnosis (ICD-9 ^a)	1992		1993		1994		1995		1996		1997		1998		1999		2000		2001		2002	
	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)
Infectious Diseases (001-139)	16	(0.2)	19	(0.3)	23	(0.3)	22	(0.4)	16	(0.3)	13	(0.2)	16	(0.3)	10	(0.2)	9	(0.2)	12	(0.2)	6	(0.1)
Neoplasms (140-239)	18	(0.3)	37	(0.5)	11	(0.2)	17	(0.3)	17	(0.3)	15	(0.3)	18	(0.3)	18	(0.3)	12	(0.2)	13	(0.3)	10	(0.2)
Endocrine Diseases (240-279)	24	(0.3)	26	(0.4)	22	(0.3)	19	(0.3)	15	(0.3)	10	(0.2)	20	(0.4)	17	(0.3)	18	(0.3)	13	(0.3)	19	(0.4)
Blood Diseases (280-289)	6	(0.1)	3	(<0.1)	5	(0.1)	2	(<0.1)	5	(0.1)	7	(0.1)	9	(0.2)	7	(0.1)	1	(<0.1)	1	(<0.1)	2	(<0.1)
Mental Disorders (290-319)	100	(1.5)	104	(1.4)	102	(1.4)	63	(1.1)	52	(0.9)	54	(1.0)	43	(0.8)	63	(1.2)	56	(1.1)	43	(0.9)	43	(0.9)
Nervous System Diseases (320-389)	192	(2.8)	167	(2.3)	168	(2.4)	130	(2.3)	91	(1.6)	103	(1.9)	77	(1.5)	55	(1.1)	57	(1.1)	51	(1.0)	52	(1.1)
Circulatory Diseases (390-459)	187	(2.7)	190	(2.6)	161	(2.3)	144	(2.5)	159	(2.8)	130	(2.3)	121	(2.3)	120	(2.3)	116	(2.2)	129	(2.6)	103	(2.1)
Respiratory Diseases (460-519)	68	(1.0)	104	(1.4)	73	(1.0)	76	(1.3)	76	(1.3)	70	(1.3)	61	(1.2)	71	(1.4)	57	(1.1)	62	(1.2)	68	(1.4)
Digestive Diseases (520-579)	135	(2.0)	159	(2.2)	133	(1.9)	113	(2.0)	98	(1.7)	108	(1.9)	94	(1.8)	104	(2.0)	81	(1.5)	83	(1.7)	84	(1.7)
Genitourinary Diseases (580-629)	53	(0.8)	71	(1.0)	35	(0.5)	42	(0.7)	43	(0.8)	31	(0.6)	25	(0.5)	23	(0.4)	24	(0.5)	23	(0.5)	26	(0.5)
Pregnancy Complications (630-676)	98	(1.4)	120	(1.6)	23	(0.3)	26	(0.5)	30	(0.5)	51	(0.9)	59	(1.1)	51	(1.0)	36	(0.7)	21	(0.4)	23	(0.5)
Skin Diseases (680-709)	183	(2.7)	190	(2.6)	244	(3.5)	211	(3.7)	195	(3.5)	193	(3.5)	176	(3.4)	189	(3.7)	196	(3.7)	158	(3.2)	155	(3.2)
Musculoskeletal Diseases (710-739)	2932	(42.5)	3127	(42.9)	2989	(42.3)	2386	(41.7)	2402	(42.7)	2313	(41.5)	2178	(42.0)	2096	(40.7)	2125	(40.3)	2172	(43.3)	2113	(43.9)
Congenital Anomalies (740-759)	34	(0.5)	36	(0.5)	27	(0.4)	22	(0.4)	13	(0.2)	18	(0.3)	9	(0.2)	20	(0.4)	13	(0.2)	11	(0.2)	11	(0.2)
Perinatal Complications (760-779)	1	(<0.1)	1	(<0.1)	0	--	1	(<0.1)	0	--	1	(<0.1)	0	--	0	--	0	--	1	(<0.1)	0	--
Symptoms & Signs (780-799)	86	(1.2)	93	(1.3)	95	(1.3)	94	(1.6)	93	(1.7)	85	(1.5)	69	(1.3)	80	(1.6)	84	(1.6)	62	(1.2)	59	(1.2)
Injury & Poisoning (800-999)	2522	(36.6)	2585	(35.5)	2758	(39.1)	2292	(40.0)	2251	(40.0)	2273	(40.8)	2071	(40.0)	2094	(40.6)	2286	(43.3)	2056	(41.0)	1927	(40.1)
V Codes	236	(3.4)	250	(3.4)	189	(2.7)	66	(1.2)	75	(1.3)	92	(1.7)	137	(2.6)	135	(2.6)	107	(2.0)	102	(2.0)	108	(2.2)
Total^b	6891		7282		7058		5726		5631		5567		5183		5153		5278		5013		4809	

^aInternational Classification of Diseases, 9th Revision.

^bTotals vary due to missing information.

**Table 10. Demographic Characteristics of Patients Hospitalized in Michigan
from 1992-2002, Paid for by Workers' Compensation**

	1992 ^a		1993		1994		1995		1996		1997		1998		1999		2000		2001		2002	
	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)
GENDER																						
Male	5103	(74.0)	5388	(73.9)	5388	(76.3)	4387	(76.5)	4381	(77.8)	4205	(75.5)	3919	(75.6)	3907	(75.8)	4042	(76.6)	3797	(75.7)	3635	(75.6)
Female	1792	(26.0)	1903	(26.1)	1675	(23.7)	1349	(23.5)	1253	(22.2)	1365	(24.5)	1267	(24.4)	1249	(24.2)	1235	(23.4)	1217	(24.3)	1174	(24.4)
Total	6895		7291		7063		5736		5634		5570		5186		5156		5277		5014		4809	
RACE																						
White	5173	(75.0)	5346	(85.6)	5179	(86.8)	3708	(84.9)	3355	(84.1)	3274	(85.1)	3016	(84.7)	2899	(85.1)	3036	(85.4)	2833	(84.7)	2697	(86.4)
African American	519	(8.6)	515	(8.2)	544	(9.1)	417	(9.5)	425	(10.6)	378	(9.8)	387	(10.9)	323	(9.5)	366	(10.3)	335	(10.0)	276	(8.8)
Asian	11	(0.2)	9	(0.1)	10	(0.2)	12	(0.3)	7	(0.2)	5	(0.1)	14	(0.4)	9	(0.3)	16	(0.4)	3	(0.1)	9	(0.3)
American Indian	0	--	1	(<0.1)	2	(<0.1)	1	(<0.1)	2	(0.1)	13	(0.3)	13	(0.4)	5	(0.1)	7	(0.2)	12	(0.4)	8	(0.3)
Hispanic	32	(0.5)	37	(0.6)	41	(0.7)	49	(1.1)	37	(0.9)	26	(0.5)	41	(1.2)	51	(1.5)	40	(1.1)	51	(1.5)	63	(2.0)
Other	321	(5.3)	337	(5.4)	190	(3.2)	183	(4.2)	165	(4.1)	149	(2.7)	90	(2.5)	118	(3.5)	92	(2.6)	109	(3.3)	70	(2.2)
Total	6056		6245		5966		4370		3991		3845		3561		3405		3557		3343		3123	
AGE																						
<15	57	(0.8)	45	(0.6)	41	(0.6)	7	(0.1)	9	(0.2)	10	(0.2)	2	(<0.1)	6	(0.1)	4	(0.1)	8	(0.2)	8	(0.2)
15-19	147	(2.2)	140	(2.0)	159	(2.3)	121	(2.1)	87	(1.5)	87	(1.6)	113	(2.2)	107	(2.1)	109	(2.1)	75	(1.5)	69	(1.4)
20-29	1248	(18.4)	1176	(16.4)	1104	(15.7)	903	(15.8)	810	(14.4)	801	(14.4)	722	(14.1)	725	(14.2)	666	(12.7)	629	(12.6)	540	(11.3)
30-39	2115	(31.1)	2157	(30.1)	2097	(29.8)	1684	(29.5)	1636	(29.1)	1597	(28.8)	1421	(27.7)	1358	(26.6)	1362	(25.9)	1224	(24.5)	1188	(24.8)
40-49	1642	(24.2)	1820	(25.4)	1810	(25.7)	1531	(26.8)	1583	(28.2)	1618	(29.2)	1548	(30.2)	1513	(29.6)	1656	(31.5)	1556	(31.1)	1541	(32.2)
50-59	1053	(15.5)	1205	(16.8)	1248	(17.7)	1034	(18.1)	1062	(18.9)	1017	(18.3)	934	(18.2)	884	(19.5)	1026	(19.5)	1084	(21.7)	1029	(21.5)
60-69	417	(6.1)	466	(6.5)	440	(6.3)	360	(6.3)	351	(6.2)	329	(5.9)	306	(6.0)	309	(6.0)	343	(6.5)	331	(6.6)	314	(6.6)
70-79	92	(1.4)	113	(1.6)	104	(1.5)	68	(1.2)	74	(1.3)	73	(1.3)	78	(1.5)	85	(1.7)	75	(1.4)	77	(1.5)	85	(1.8)
80+	23	(0.3)	40	(0.6)	37	(0.5)	10	(0.2)	9	(0.2)	12	(0.2)	8	(0.2)	12	(0.2)	11	(0.2)	15	(0.3)	18	(0.4)
Total	6794		7162		7040		5718		5621		5544		5132		5110		5252		4999		4792	
Avg. age, std. dev.	40.1	± 12.8	41.0	± 13.0	41.1	± 12.8	41.3	± 12.2	41.8	± 12.1	41.8	± 12.0	41.7	± 12.1	42.0	± 12.3	42.5	± 12.1	43.0	± 12.1	43.4	± 12.0

^aTotals vary due to missing information.

**Table 11. Demographic Characteristics of 1,481
Individuals Reported by the Two Michigan
Poison Control Centers in 2003**

	<i>Number of Reports</i>	<i>Percent of Reports</i>
AGE		
15-19	120	10.6
20-29	363	31.9
30-39	267	23.5
40-49	245	21.5
50-59	109	9.6
60-69	27	2.4
70-79	5	0.4
80+	1	0.1
Total	1,137^a	
GENDER		
Male	843	61.0
Female	539	39.0
Total	1,382^b	

^aAge was missing on 344 reports.

^bGender was missing on 99 reports.

APPENDIX A

Chronic Occupational Diseases

Multiple reports for an individual patient with one of the following diseases may be submitted within and across years, but only one of these submissions is counted in our statistics.

<u>ICD-9 Code</u>	<u>Description</u>
011	Pulmonary Tuberculosis
015	Tuberculosis of the bones and joints
135	Sarcoidosis
137	Tuberculosis , Late Effects of
140-239	Neoplasms (Cancers)
250-259	Diseases of Other Endocrine Glands
260-269	Nutritional Deficiencies
270-279	Metabolic and Immunity Disorders Except 276, Dehydration
280-289	Disease of the Blood and Blood Forming Organs
290-319	Mental Disorders Except 308:Acute Reaction to Stress, and 309: Adjustment Reaction
320-340	Selected Diseases of the Nervous System and Sense Organs
388-389	Disorders of the Ear: Noise Induce Hearing Loss, Tinnitus
390-409	Selected Diseases of the Circulatory System
491-505	Selected Diseases of the Respiratory System
509	Pleural Plaques with no parenchymal abnormality marked on the ILO Form
515	Interstitial Lung Disease, Pulmonary Fibrosis
517	Connective Tissue Lung Disease
520-579	Diseases of the Digestive System
580-629	Diseases of the Genitourinary System