2006

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

Summary of 2006 Occupational Disease Reports to the Michigan Department of Labor and Economic Growth

A Joint Report
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SUMMARY

There were 12,778 occupational disease (OD) reports submitted to the Michigan Department of Labor and Economic Growth (MDLEG) in calendar year 2006 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 providing services to companies. The percentage of reports received that were submitted from company medical departments or clinics under contract has decreased from 84-91% in the early 1990s to approximately 60% in the last five years.

The most frequent types of reports were of repetitive trauma (32%), diseases of the nervous system and sense organs (21%), toxic effects of substances (16%), and respiratory disease (14%). The number of reports submitted in 2006 is much lower than the number of reports received from 1994-2001. Since 1999, there has been a downward trend of reporting; 21,538 reports were received in 1999 versus 12,778 reports received in 2006. This could represent an actual reduction in occupational diseases occurring in the state or poorer compliance with the reporting law. To begin to address this issue, two mailings were sent to the 300 occupational health clinics in the state, in June and October of 2005. The mailings were to remind the clinics of the requirements of the Occupational Disease Reporting Law. Initial efforts have increased reporting by clinics from 21 to 50 clinics. Site visits to non-reporting clinics are planned in future years as part of this new initiative to enforce the requirement to report.

Companies tend to report different types of illnesses than non-company associated health practitioners. For example, there were 1,628 (35%) reports from non-company providers for diseases of the respiratory system while only 98 (1%) such reports were received from employer-associated providers (Table 4).

The average age of individuals reported was 48 years, ranging from 14 to 91. Sixty-six percent of individuals reported were between the ages of 25 and 54. Sixty-six 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). The OD reporting system had much higher percentages of illnesses from the toxic effects of substances (poisonings), respiratory conditions due to toxic agents, and dust diseases of the lung categories than the other two reporting systems. Reliance on multiple reporting systems presents a more complete picture of the spectrum of work-related illnesses in our state.

Beginning in 1997, Michigan laboratories were required to report blood lead levels; beginning in 2005, the labs were also required to report blood and urine levels of arsenic, cadmium and mercury. Also in 2005, Michigan laboratories began to report plasma and red cell cholinesterase levels. In 2002, Michigan's two Poison Control Centers began to submit work-related reports. There were 1,291 reports received from these Centers in 2006. Given the complementary nature of all the existing programs, we are able to combine data across systems 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. A recent publication of ours highlights the potential incompleteness of the official statistics on occupational injuries and illnesses. The official statistics are based solely on reporting from employers. Our study indicated that the true occurrence of occupational injuries and illnesses may be undercounted by as much by two-thirds.[1] For 2005, the most recent year available, the Bureau of Labor and Statistics (BLS) survey reported 193,800 occupational injuries and illnesses in Michigan. If this represents only one-third of the true number of

occurrences, then there would have been over 500,000 occupational injuries and illnesses in Michigan in 2005.

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 (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 reports. MDLEG designates the Michigan State University's College of Human Medicine, Occupational and Environmental Medicine Division as its bona fide agent to compile and analyze the occupational disease reports.

Figure 1 is a copy of the Known or Suspected Occupational Disease Report form submitted to MDLEG by company-associated and non-company associated 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. In 1991, computerization of the OD reports began, to allow a more efficient handling of the high volume of reports submitted and facilitating the use of these reports to direct surveillance, intervention and prevention. This is the fifteenth annual report on occupational diseases in Michigan, and is based upon the reports submitted to the MDLEG in calendar year 2006.

On-line occupational disease reporting has been available since 2001 through the Michigan State University Occupational and Environmental Medicine website: www.oem.msu.edu. 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 & Technical Services Division
7150 Harris Drive, PO Box 30649
Lansing, MI 48909-8149

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 an assigned standard industrial classification code (SIC)[2] for each facility;

3) details of the illness, including diagnosis date, suspected causative agent(s), whether the employee died, and an assigned diagnosis or clinical impression coded according to the International Classification of Diseases (ICD-9th Revision[3]); and 4) information about the individual who submitted the report, including whether the reporter is employed by the company, an outside medical department contracted by the company, or a private practice health professional. Beginning in 2008, the company's type of industry will be coded to the 2007 North American Industry Classification System-United States (NAICS) scheme in lieu of the 1987 SIC coding scheme.

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, the Michigan Health and Hospital Association inpatient database, and the Michigan Cancer Registry (for cases of mesothelioma).

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 2004, we changed the way blood lead reports are counted in the OD report statistics. Prior to 2004, if an individual had multiple blood lead tests performed throughout the year, and they were all reported to the state, each report was counted in the year's statistics. Starting in 2004, we began counting each individual one time regardless of the number of blood lead tests he or she may have had throughout the year.

Beginning in 2005, regulations requiring laboratories to report arsenic, cadmium, mercury and cholinesterase testing went into effect. Procedures to handle these reports were developed in 2005. Five work-related elevations of mercury and three each of arsenic and cadmium have been identified since the establishment of these new regulations.

Collection of information on work-related illnesses from Michigan's two Poison Control Centers (PCC) began in 2002. On a monthly basis, the work-related reports are incorporated into the occupational disease reporting database. In 2006, for example, 1,291 (1.6%) of the 82,775 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 12,778 occupational disease reports were submitted to the MDLEG in calendar year 2006. Figure 2 shows the number of reports received each year since 1985.

Source of Reports

Company or contract medical departments submitted 63% of the reports (8,082 cases); non-company associated health practitioners submitted 37% of the reports (4,696 cases) (Figure 3). Most reports were submitted on individuals who worked in large companies (Table 1) with 93% of the 9,247 reports that listed company size coming from businesses with more than 500 employees. A greater proportion of reports involving companies with 500 or fewer employees come from non-company health practitioners. Just over 18% of the 1,636 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 7,611 reports with known company size submitted by company practitioners involved facilities with fewer than 500 employees.

Three hundred nineteen non-company associated clinicians reported 2,546 incidents of occupational disease. One hundred eighty-three non-company affiliated clinics were responsible for identifying 702 reports of lead poisoning. In addition, the two Michigan Poison Control Centers reported 1,291 incidents of work-related poisonings. Two hundred sixty-six (83%) of the clinicians reported only one patient each in calendar year 2006 (Table 2); four clinicians reported more than 100 patients each. The number of reports submitted by these four clinicians in the year 2006 ranged from 129 to 1,238. One of the clinicians is certified to interpret chest x-rays for dust-related lung disease ("B" readers), and two are occupational medicine physicians 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 10 Michigan physicians who are "B" readers.

There are approximately 300 occupational health clinics in Michigan. Since June 2005, the number of such clinics reporting occupational disease cases to the State has increased from 21 to 50. With the planned site visits to non-reporting clinics in future years, we expect the number of reporting clinics to increase.

Demographics

Table 3 shows the age, gender and race distribution of the workers with occupational diseases reported in the year 2006. The mean age of reported patients was 48 ± 13 years (range, 14 to 91 years) with two-thirds of the patients (66%) between the ages of 25 and 54 years. One hundred twenty-three reports were submitted for patients under age 20, and 128 reports were submitted for patients age 80 and older.

Sixty-six percent of all reports submitted were for male workers. Seventy-four percent of the submitted reports (9,458 cases) did not indicate the worker's race. Of the 3,320 reports that did indicate race, 47% were Caucasian, 34% were African American, 3% were Hispanic and 16% were listed as "other."

Younger workers. Of the 68 workers age 18 and younger, one was 14 years of age, four were 15 years old, 15 were 16 years old, 17 were 17 years of age, and 31 were 18 years old. Twenty-six (38%) of the reported patients under age 19 were female and 42 (62%) were male. One of the younger workers was employed in the services industry, one worked in public administration, and two were employed in manufacturing. Place of employment was unknown for 64 workers.

Four of the younger workers were reported by company-affiliated clinicians or clinics. Fifty-five workers were reported for unspecified poisonings (from the Poison Control Centers), five were for respiratory symptoms, two were for an elevated blood lead level (serum lead levels were between 10 and 24 micrograms per deciliter), two were for dermatitis, and one each was for noise-induced hearing loss, a fracture, an abrasion and heat stress. One fatality under the age of 19 from an acute traumatic injury was identified through a review of 2006 death certificates; this death is accounted for in a separate Michigan reporting system for acute work-related fatalities.

Older workers. Of the 128 workers age eighty and older, 122 (95%) were between the ages of 80 and 89, and six were between 90 and 91 years of age. One hundred twenty-two were men and six were women. Seventy-seven of the older patients worked in or were retired from manufacturing, four worked in the services industry, three worked in construction, one worked in the utilities industry, two worked for the railroad, and one worked in public administration. Industry or former industry was not indicated in 40 reports.

A company-affiliated clinician or contract medical clinic reported two of the patients. Seventy-two of the older workers were reported for dust-related lung disease (including 54 with asbestosis, three with pleural thickening, 12 with silicosis, and three for pneumoconiosis, unspecified), 38 for noise-induced hearing loss, seven for cancer, seven for elevated blood lead levels, two for respiratory conditions, and two for an unspecified poisoning.

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 4,035 cases representing 32% of all OD reports submitted. The majority of those reports were for sprains and strains of the wrist, hand and/or finger.

Diseases of the nervous system and sense organs were the second most frequently reported condition, representing 2,696 (21%) of the cases. Toxic effects of substances (poisonings) were the third most frequently reported conditions, with 2,011 cases representing 16% of all reports. Diseases of the respiratory system were the fourth most frequently reported condition, with 1,726 cases representing 14% of all reports submitted. There were 1,456 (11%) reports of musculoskeletal and connective tissue disease, 323 (3%) reports of skin and subcutaneous tissue disease, 119 (1%) reports of mental disorders, and 79 (0.6%) reports of cancer. Less frequently reported conditions included infectious and parasitic diseases, diseases of the digestive system, welding flash (burns to the eye), and diseases of the circulatory system.

Reporting source differences. Company and non-company affiliated providers differ markedly in the types of occupational diseases reported (Table 4). Fifty 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, 43% of non-company reports are of toxic effects of substances (poisonings), 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 (23%), diseases of the musculoskeletal system and connective tissue (18%), and diseases of the skin and subcutaneous tissue (4%). Respiratory illnesses are the second most frequently reported diagnoses by non-company providers (35%). The third and fourth most frequently reported diagnoses for non-company providers are diseases of the nervous system and sense organs (18%) and neoplasms (2%).

Company and non-company practitioners also differ in the types of industries represented in their reports (Table 5). Eighty-four percent of patients reported by company affiliated health care providers are employed in manufacturing, primarily automobile production. Seventy-five percent of patients reported by non-company affiliated providers are employed in manufacturing. The second and third most frequently reported industries by company providers are service industries (11%) and public administration (3%). The second and third industry types most frequently reported by non-company providers are transportation (8%) and construction (8%). The type of industry was missing on 2,189 non-company and 66 company reports.

Gender differences. Repetitive trauma was the most frequently reported diagnosis for men and women, with 27% of submissions on men and 41% of submissions on women (Table 6). The second, third and fourth most frequent diagnoses for men were diseases of the nervous system and sense organs (22%), diseases of the respiratory system (18%), and toxic effects of substances (17%). For women, the second, third and fourth most frequently submitted diagnoses were diseases of the nervous system and sense organs (19%), diseases of the musculoskeletal system and connective tissue (14%), and toxic effects of substances (13%). One hundred eight reports did not indicate gender.

Fatalities. Fatalities related to occupational illnesses were reported for 69 workers (Table 7). None of the illness-related 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 160 (provisional data) acute work-related traumatic fatalities in 2006 that occurred in Michigan. A separate report is being prepared on these deaths, and will be available in late 2007. Past reports can be found at: www.oem.msu.edu. One death of a youth was identified in the MIFACE Program in 2006.

Non-company clinicians reported all 69 of the individuals with occupational illnesses who died. The workers who died ranged in age from 42 to 88 years. Forty-seven died from asbestos-related cancer (including 10 from mesothelioma), 20 from asbestosis, and one each died from asthma and silicosis. Forty-three of the deceased workers had been employed in manufacturing, eight in construction, six in utilities, and two in the services industry. Former occupation was not specified for 10 workers.

Comparison with Other Data Systems

Published Data in Michigan at a Disease Category Level. Table 8 compares data from the OD reporting system with Workers' Compensation Claims and the BLS Annual Survey. These data illustrate the variation of reported disease categories by reporting source and suggest that the magnitude of occupational diseases among Michigan workers is greater than what currently gets reported. No one system completely captures all categories of occupational disease.

The most recent data that is available from the MDLEG Bureau of Workers' Compensation (BWC) at a disease-category level is from mid-April 2005 through April 2006. In that time period, there were 26,057 claims due to occupational illnesses and 13,929 claims for occupational injuries.

The other major data on occupational injuries and illnesses available in Michigan comes from the BLS annual survey of company injury and illness logs. For this data source, the most recent data available at a disease category level is from 2005 with an estimate of 15,700 occupational illnesses and 22,180 occupational injuries in the state.

Hospital Discharge Data – Workers' Compensation. Figure 4 shows the number of patients as well as hospitalizations paid for by Workers' Compensation (WC) for the years 1992 through 2005. The numbers of hospitalizations per year that were paid for by Workers' Compensation from 1995-2005

decreased as compared to the years 1992-1994. In addition, the percentage of hospitalizations that were paid for by WC decreased beginning in 1993 (Figure 5). In 2004, 0.36% of the 1,333,313 Michigan hospitalizations were paid for by WC; in 2005, 0.38% of the 1,322,075 Michigan hospitalizations were paid for by Workers' Compensation.

Table 9 shows the primary discharge diagnosis for hospitalizations from 1992 through 2005, 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 34-44% of patient WC-related hospitalizations from 1992-2005. The second most frequent conditions covered by WC during this same time period are injuries and poisoning, accounting for 36-43% of all WC-related patient hospitalizations.

Table 10 lists the demographic characteristics of patients with WC hospitalizations. Approximately 75% of the hospitalizations were for men, across all years from 1992 to 2005. Among hospitalizations for which race was known, approximately 85% were white, 10% were African American, 1-2% were Hispanic, <1% were Asian or American Indian, and 1-5% were listed as "other."

The majority of hospitalizations involved workers between the ages of 30 and 50 years. Less than 1% involved workers under the age of 15 or 80 years or older, except for 2005 where 4% of the workers were 80 years or older. The percentage of hospitalizations of workers under the age of 20 has decreased slightly over time, from 3% in 1992 to 1.2% in 2005.

Hospital Discharge Data – Pneumoconiosis. Figure 6 shows the number of individuals hospitalized in Michigan with asbestosis, coal workers' pneumoconiosis and silicosis from 1990 to 2005. Repeat admissions of the same individual within each calendar year are excluded from these counts. For most of these patients, pneumoconiosis was not the primary discharge diagnosis listed on the discharge record. For the past decade, there has been a steady increase in the number of hospitalizations for asbestosis (Figure 6). From 2002 to 2005, there was a 46% increase in the number of hospitalizations for asbestosis. Regulations to control asbestos exposure were not promulgated until the early 1970s and were not widely implemented until the 1980s. Given the 25 year or greater latency period from the time of first exposure to the development of asbestos-related radiographic changes, the cases being identified now represent exposures from these earlier unregulated years. The trend we are seeing in Michigan is consistent with national data published in the NIOSH 2005 Work-Related Lung Disease Surveillance Report updates on asbestosis available at: www2a.cdc.gov/drds/WorldReportData/FigureTableDetails.asp?FigureTableID=15.

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 [4,5].

Asbestosis-Related Lung Disease. Asbestos-related lung disease is the most common dust disease reported to the Michigan Department of Labor and Economic Growth. The number of reports of asbestosis in 1999 was 3,384, decreased to 677 reports in the year 2002, and increased in 2006 to 1,098 (Figure 8). The number of reports of pleural thickening decreased from 2001 to 2002, from 2,397 to 1,269 reports. In 2004, the number of reports of asbestos-related pleural thickening increased to 1,976, and decreased to 274 in 2006. The reports for asbestos-related x-ray changes are largely from one of Michigan's B-readers as well as an occupational medicine physician.

In 1995, there were 16 B-readers in Michigan. Today, there are only ten physicians in Michigan who are certified as B-readers. Figure 9 shows the number of B-readers, chest x-rays that were reviewed, and x-rays that showed evidence of asbestos-related lung disease, with pleural and parenchymal changes

separately and combined. About 20% of each year's worth of x-rays reviewed show evidence of occupational disease, ranging from a low of 829 (8%) of 10,591 x-rays reviewed in calendar year 2000, to a high of 3,640 (36%) of 10,575 x-rays reviewed in calendar year 1999. In 2006, 10% of the chest x-rays showed evidence of asbestos-related disease. Figure 9 is based on an annual questionnaire the B-readers complete; therefore, the numbers of reports are greater than the actual B-reader reports with evidence of occupational lung diseases that are included in the statistics of this annual report.

Poison Control Center Data. In 2006, 1,291 calls to 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 (59%) than females (41%). The individuals ranged in age from 14 to 90 years. Almost 85% of these individuals were less than age 50. More details about the nature of these poisonings is provided by the Poison Control Centers, but not in a format that is readily analyzable.

DISCUSSION

There were 12,778 Occupational Disease Reports sent to the MDLEG in calendar year 2006. The most frequent types of occupational diseases reported to the MDLEG were repetitive trauma illnesses (32%), diseases of the nervous system and sense organs (21%), toxic effects of substances (16%), and respiratory disease (14%). From 1988 through 1999, the number of reports sent to the State increased substantially. Figure 2 shows the number of occupational disease reports received each year since 1985. Since 1999, the number of reports has decreased. There was a large decrease in the number of reports received in 2005, with over 2,200 fewer reports received than in 2004; in 2006 the total number of reports received was essentially unchanged. The overall decline in the number of reports reflects fewer reports from company medical departments. The number of reports from non-company affiliated practitioners remained relatively unchanged through 2004; in 2005 and 2006 there was a large decline of approximately 1,000 reports in the number of non-company affiliated practitioner reports as compared to 2004 (Figure 3). The cause for this decrease is unknown, but does parallel the decreases seen in the BLS Annual Survey and Workers' Compensation claims. The number of company medical departments reporting in 2006 increased to 396, compared to 374 in 2005, 373 in 2004 and 305 in 2003.

ICD-9 codes were used to classify the diagnosis or clinical impression recorded on the occupational disease reports submitted to the MDLEG. 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 even though in the ICD-9 coding system, sprains and strains are classified as injuries.

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. Currently, reports are received from approximately 396 company-affiliated and 319 non-company affiliated physicians. There were 249,786 companies in the year 2006 and 27,520 practicing physicians in Michigan in the year 2006. Accordingly, reports are received from 0.2% of companies and 1.2% of physicians. Over the last several years, these percents have remained largely unchanged. Efforts continue to remind employers of the requirement to report by routinely distributing reporting forms during MIOSHA inspections. In addition, all new physicians receive information on the requirement to report when they apply for medical licensure in Michigan.

We know that the 12,778 occupational disease reports received this past year under-represent the actual incidence of occupational diseases in Michigan. Based on our recent matching of multiple data bases in

Michigan for the years 1999-2001, we estimate that the BLS survey missed 50% of the total number of occupational illnesses in Michigan. In 2005, the BLS annual survey reported 15,700 illnesses. If that figure is doubled then we would have expected in excess of 30,000 occupational illnesses in Michigan in 2005 instead of the approximately 13,000 reported. Even this number 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, given the limited training that health care providers receive in diagnosing work-related conditions, and that many individuals never inform their employer when they are diagnosed with a work-related condition.

The type of illness and the type of industry where occupational diseases occur as reported by non-company affiliated health practitioners differs from company-based health practitioners (Tables 1, 4 and 5). These differences vary depending on the specialties of the non-company affiliated physicians who submit reports. For example, the non-company affiliated health practitioners who reported patients in the year 2006 were more likely to report patients with respiratory disease who work in small, non-manufacturing companies. A large percentage of the year 2006 reports from non-company affiliated 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 affiliated specialists reporting, the data illustrates that relying on company-affiliated reports alone would cause occupational illness statistics to markedly under-count certain work-related conditions. Similarly, one cannot rely on workers' compensation data for a reliable count of 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%[6]. This is an ongoing issue, as review of hospital discharge data for individuals with pneumoconioses shows only <1% to 8% are paid by workers' compensation (Figure 7).

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, poisoning represents approximately 17% (2,011) of the OD reports, while that category of diseases only accounts for less than 1% (100 cases) of the BLS survey and less than 1% (13 cases) of WC claims. Non-employer sources such as from Poison Control Centers, "B" Readers, and laboratories provide additional occupational diseases not being reported by employers or practitioners.

In addition to tracking the overall incidence of occupational disease, a more comprehensive system allows 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: ◯ White ◯ Black ◯ Hispanic ◯ 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 ◯ <25 ◯ 25-100 ◯ 100-500 ◯ >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 ◯ No ◯	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? Yes ◯ No ◯ Don't Know ◯
If yes, record information below.

Physician's Name	Phone		
Office Address	City	State	Zip
Name of Person Submitting Report	Physician ◯ Non-Physician ◯		
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

MIOSHA-MTSD-51 (12/03)

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

Figure 2. Occupational Disease Reports to the Michigan Department of Labor and Economic Growth: 1985-2006

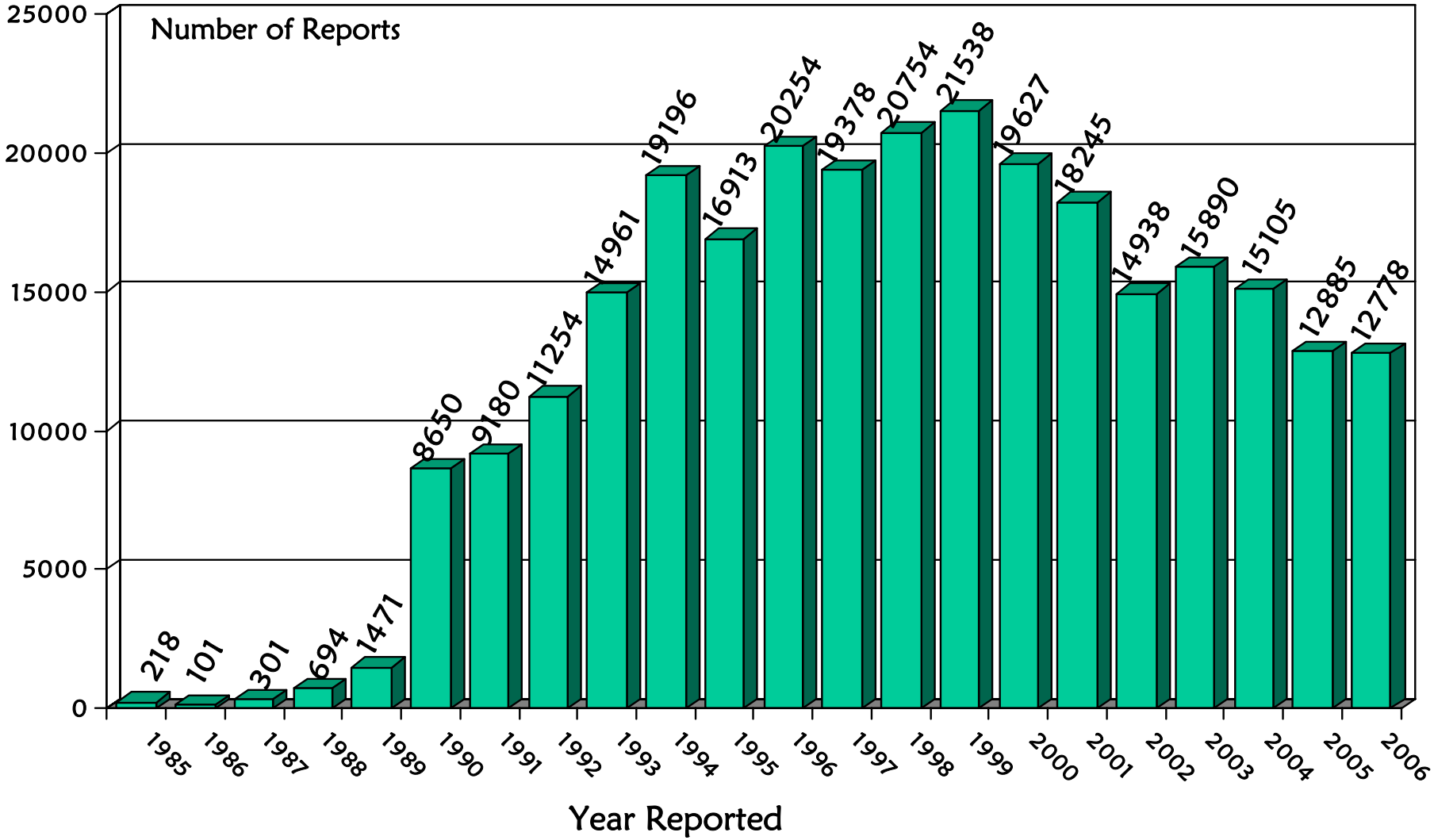
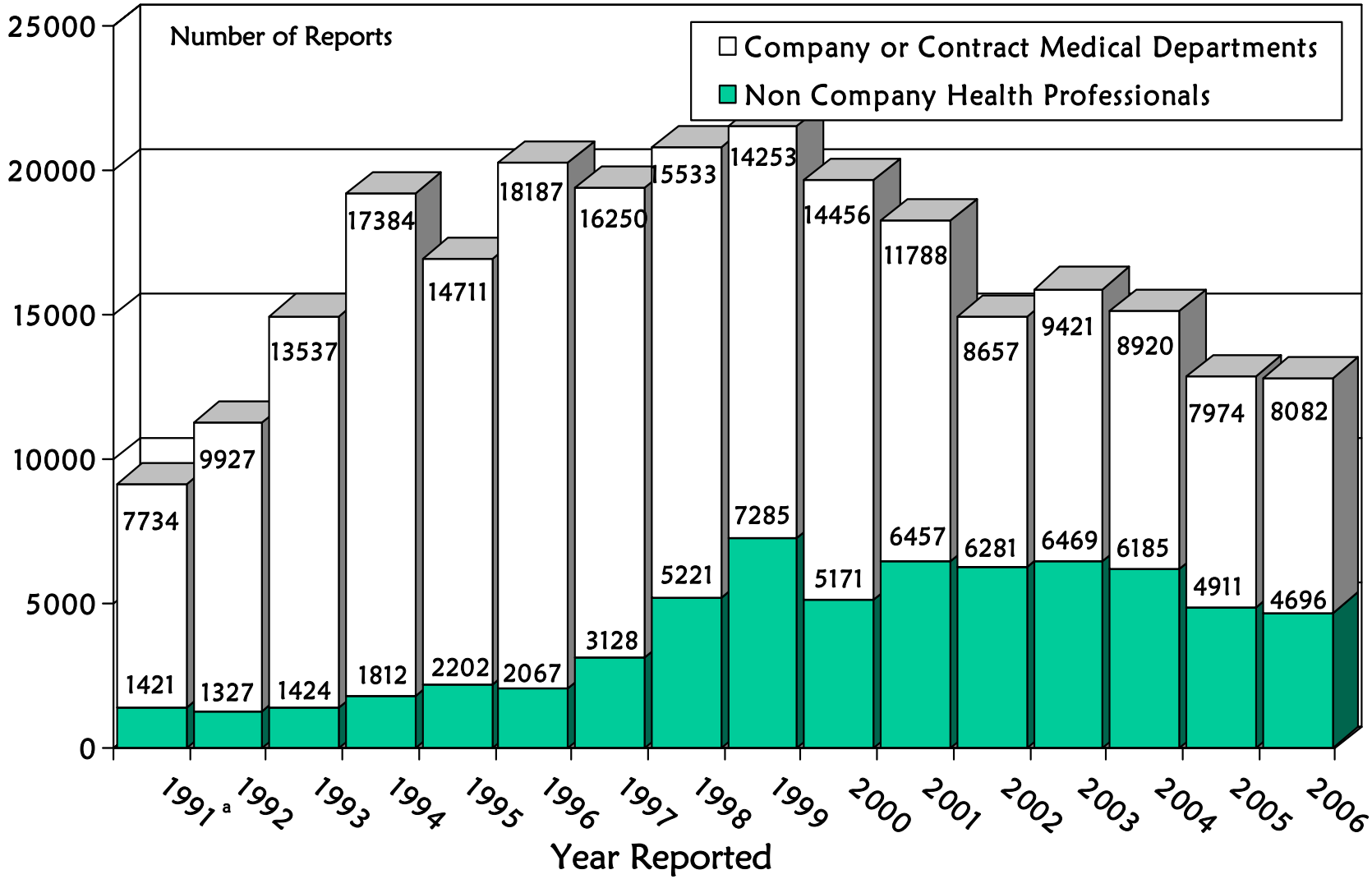


Figure 3. Occupational Disease Reports by Reporting Source, Non-Company Health Professionals and Company or Contract Medical Departments: 1991-2006



[a]Reporting source was unknown for 25 reports that are not included in this column.

Figure 4. Number of Hospitalizations and Number of Patients Paid for by Workers' Compensation in Michigan: 1992-2005

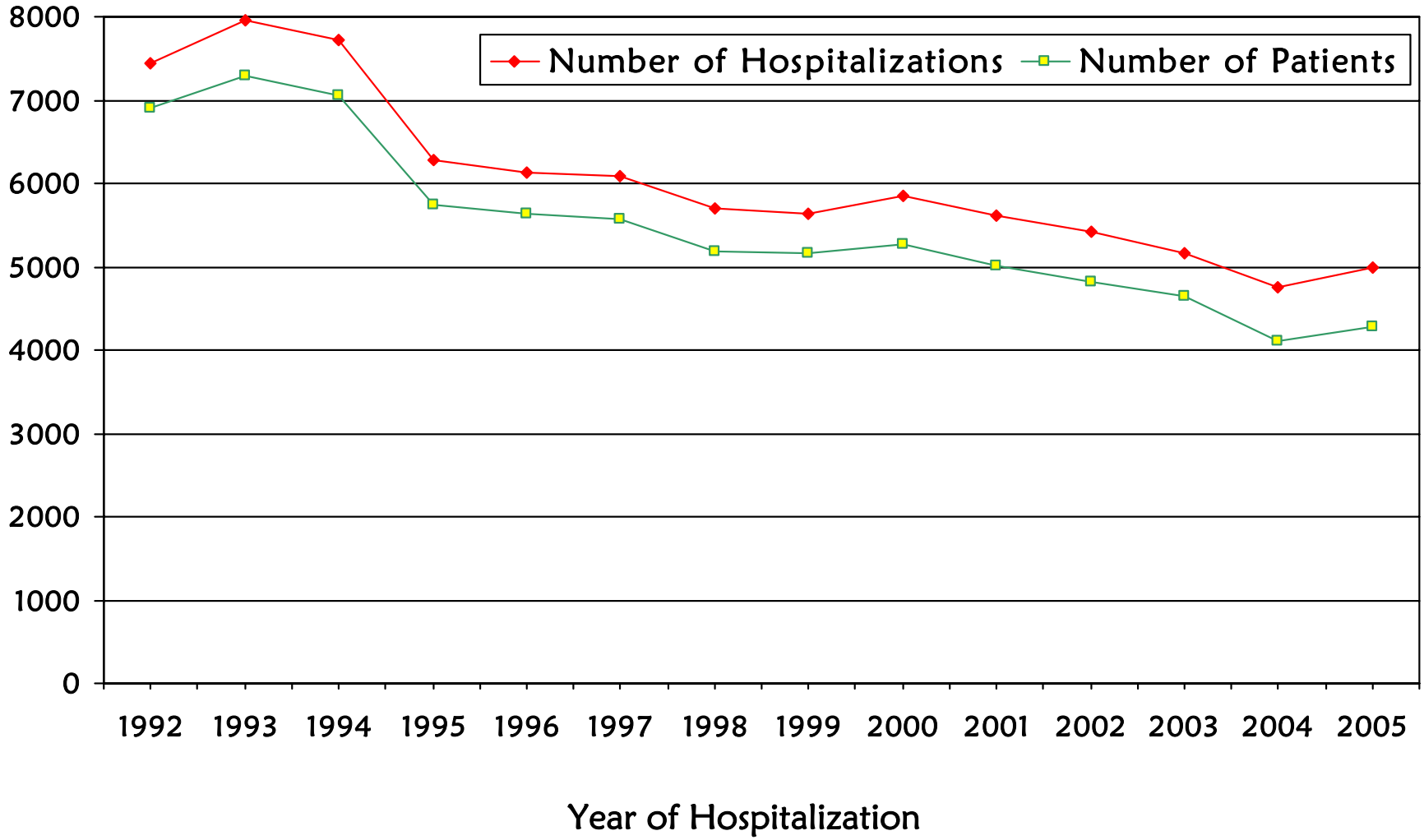


Figure 5. Percent of Total Michigan Hospitalizations Paid for by Workers' Compensation: 1992-2005

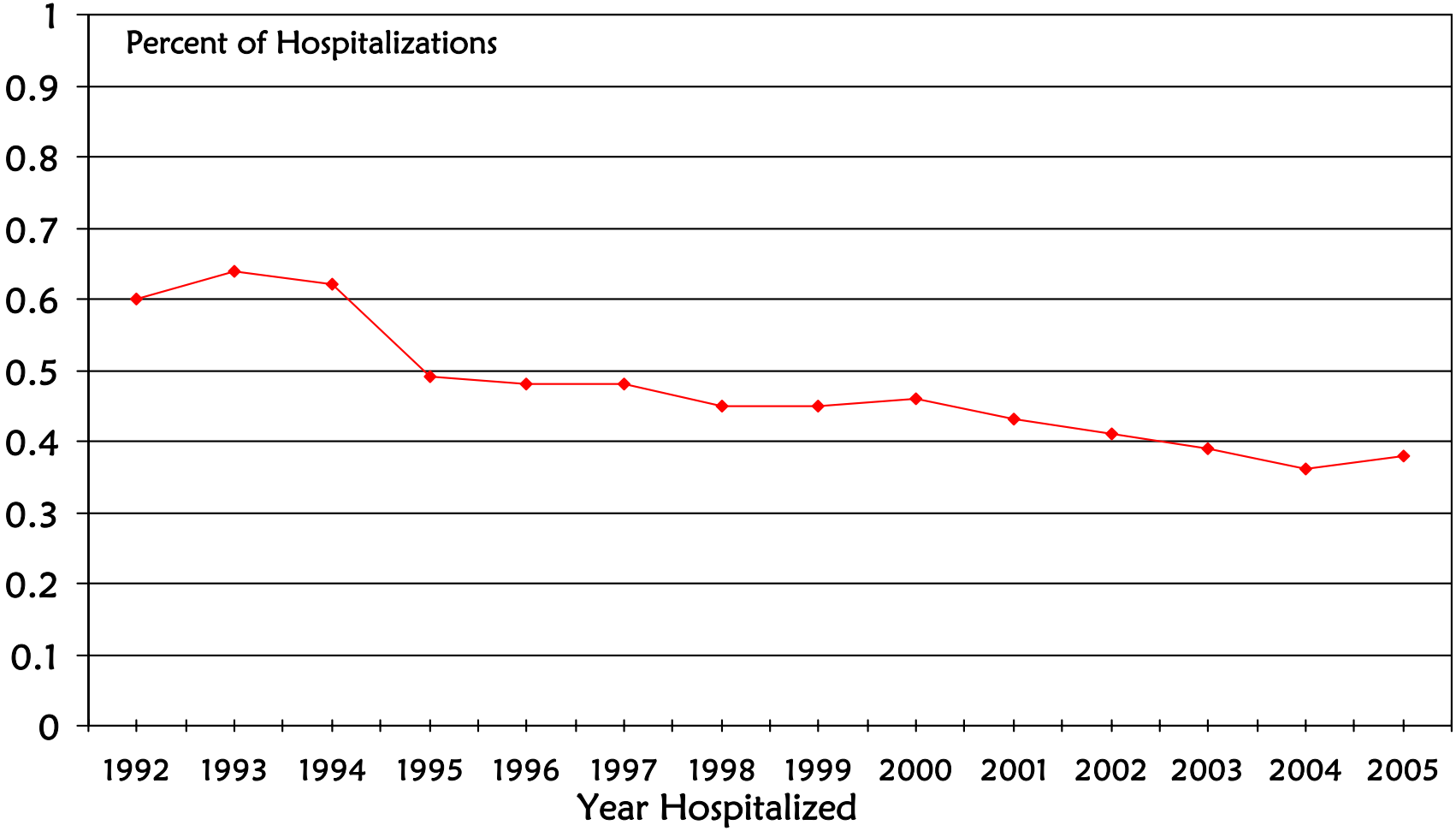


Figure 6. Number of Patients Discharged with Coal Workers' Pneumoconiosis (CWP), Asbestosis and Silicosis in Michigan: 1990-2005

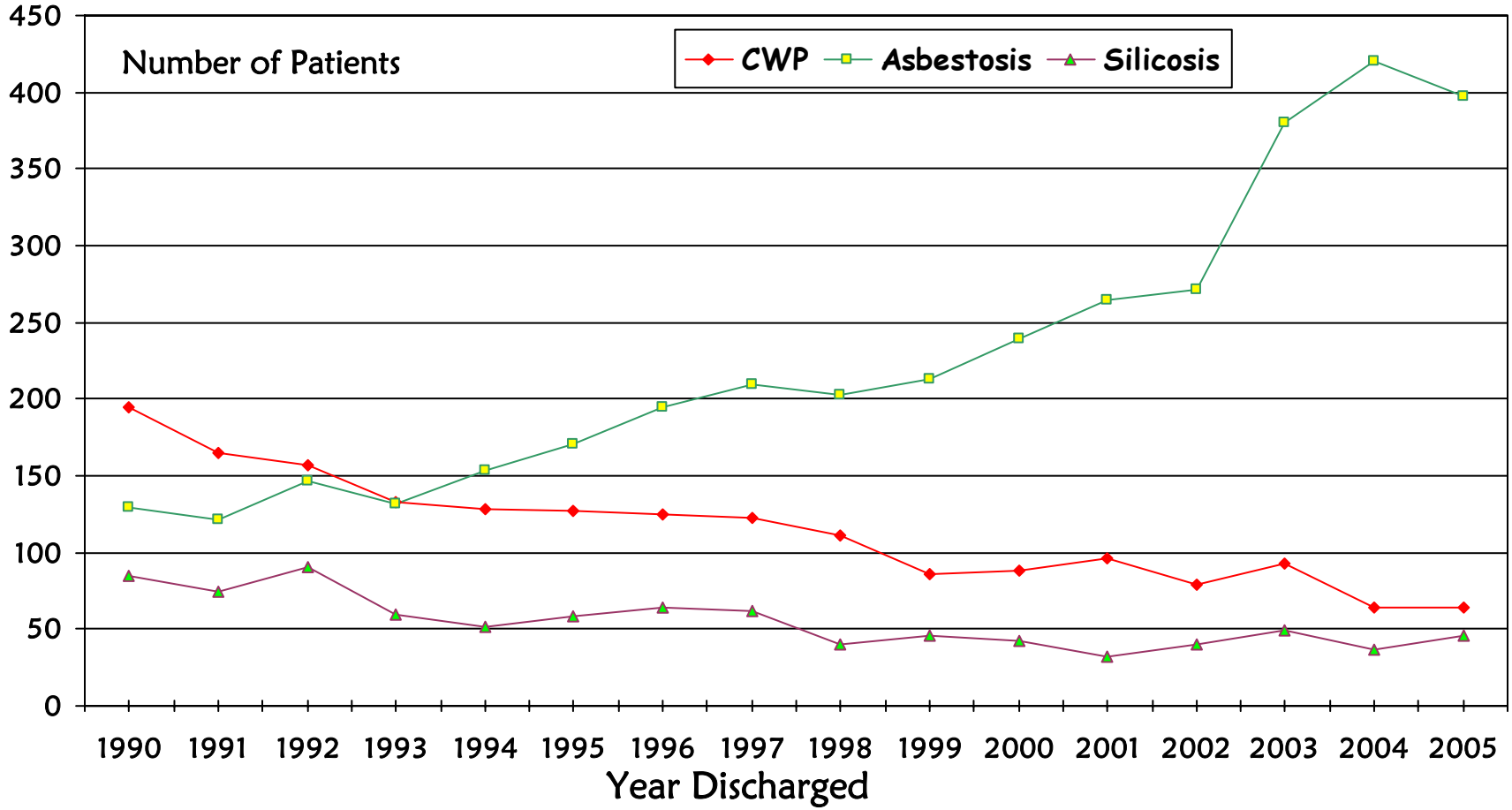
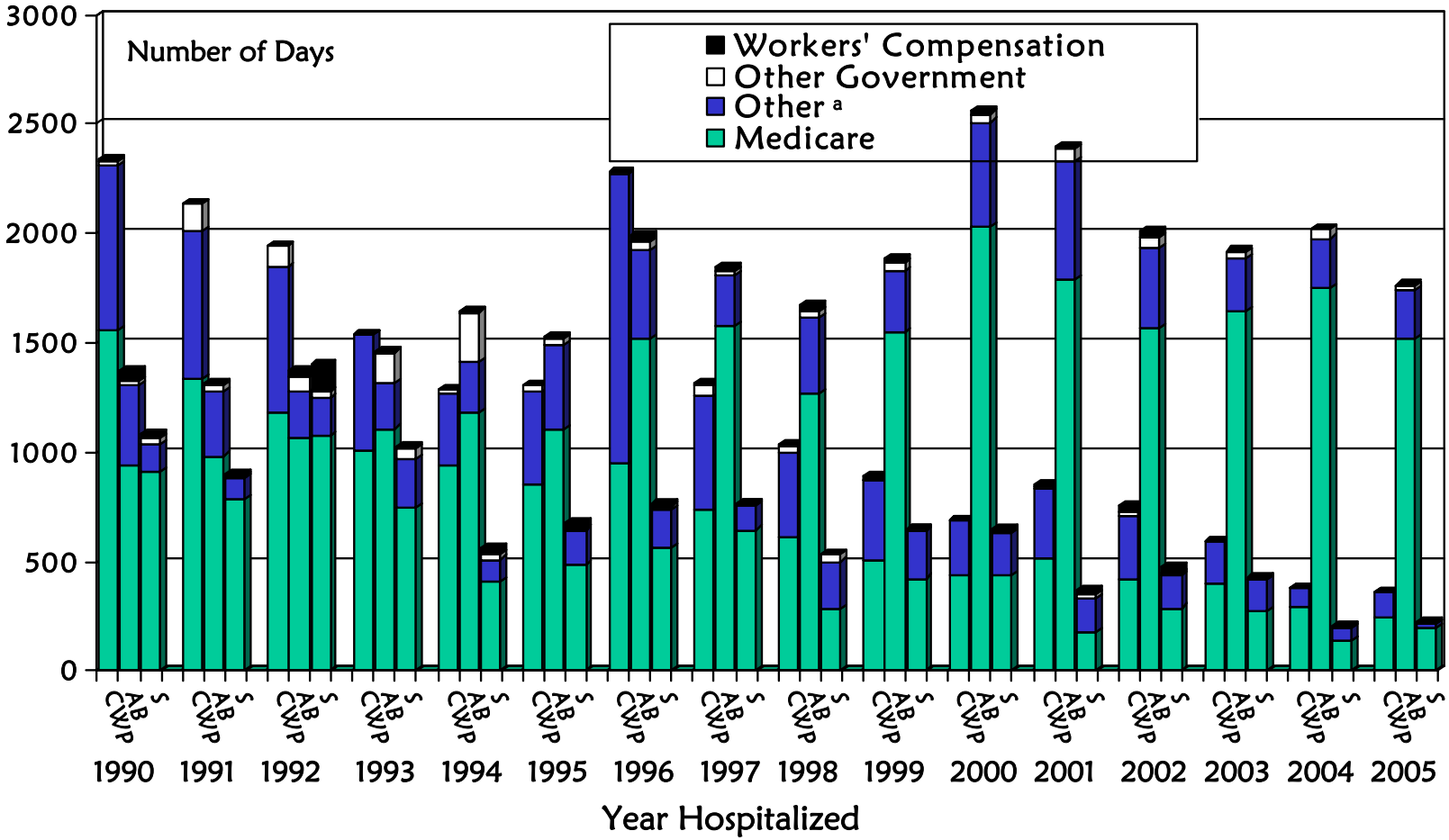


Figure 7. Number of Days Hospitalized by Payment Source for Coal Workers' Pneumoconiosis (CWP), Asbestosis (AB) and Silicosis (S) in Michigan: 1990-2005



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

Figure 8. Asbestos-Related Cases Reported to the Michigan Department of Labor and Economic Growth: 1989-2006

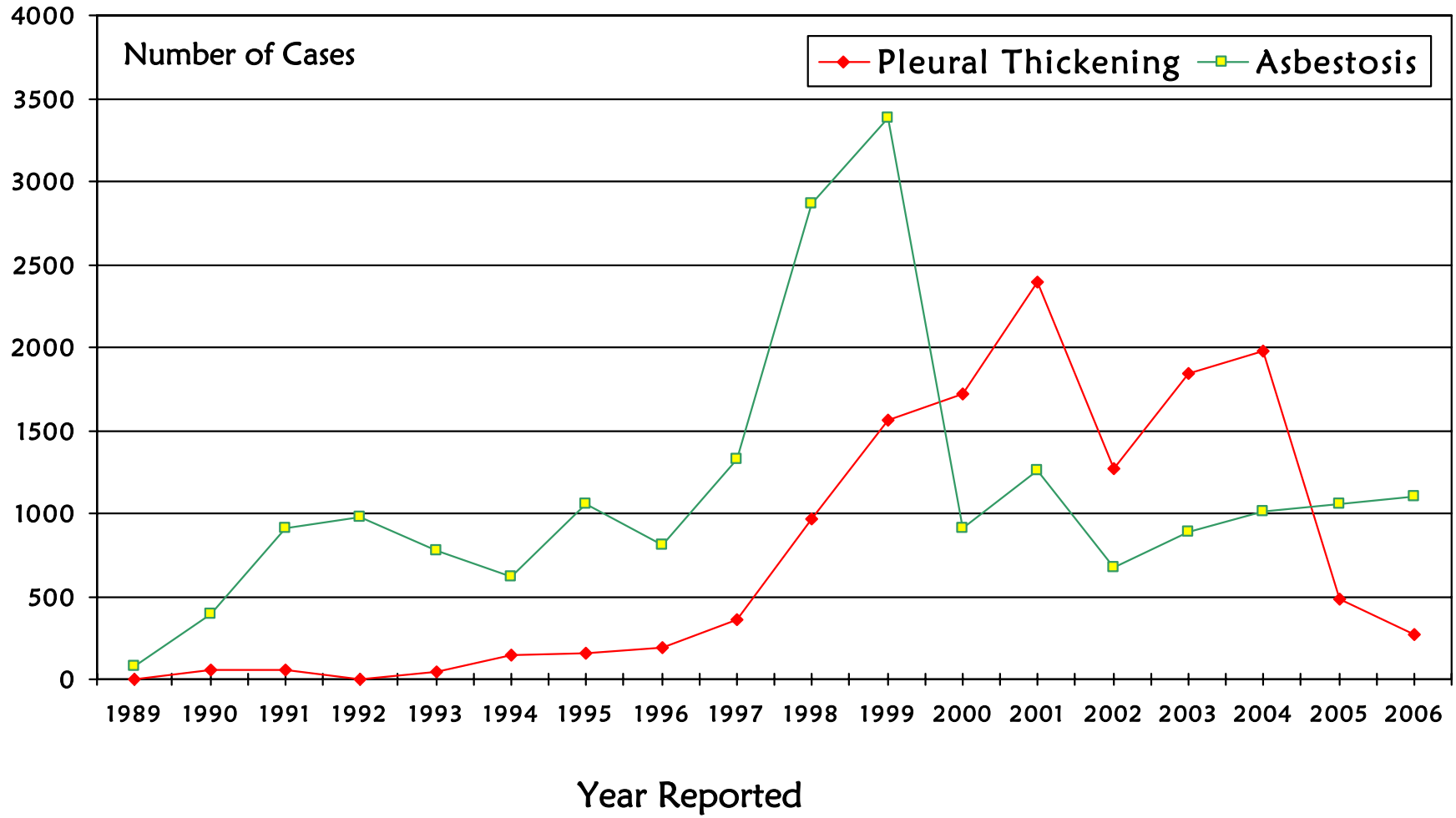


Figure 9. Summary of "B" Reading Interpretations of Chest X-rays in Michigan: 1995-2006

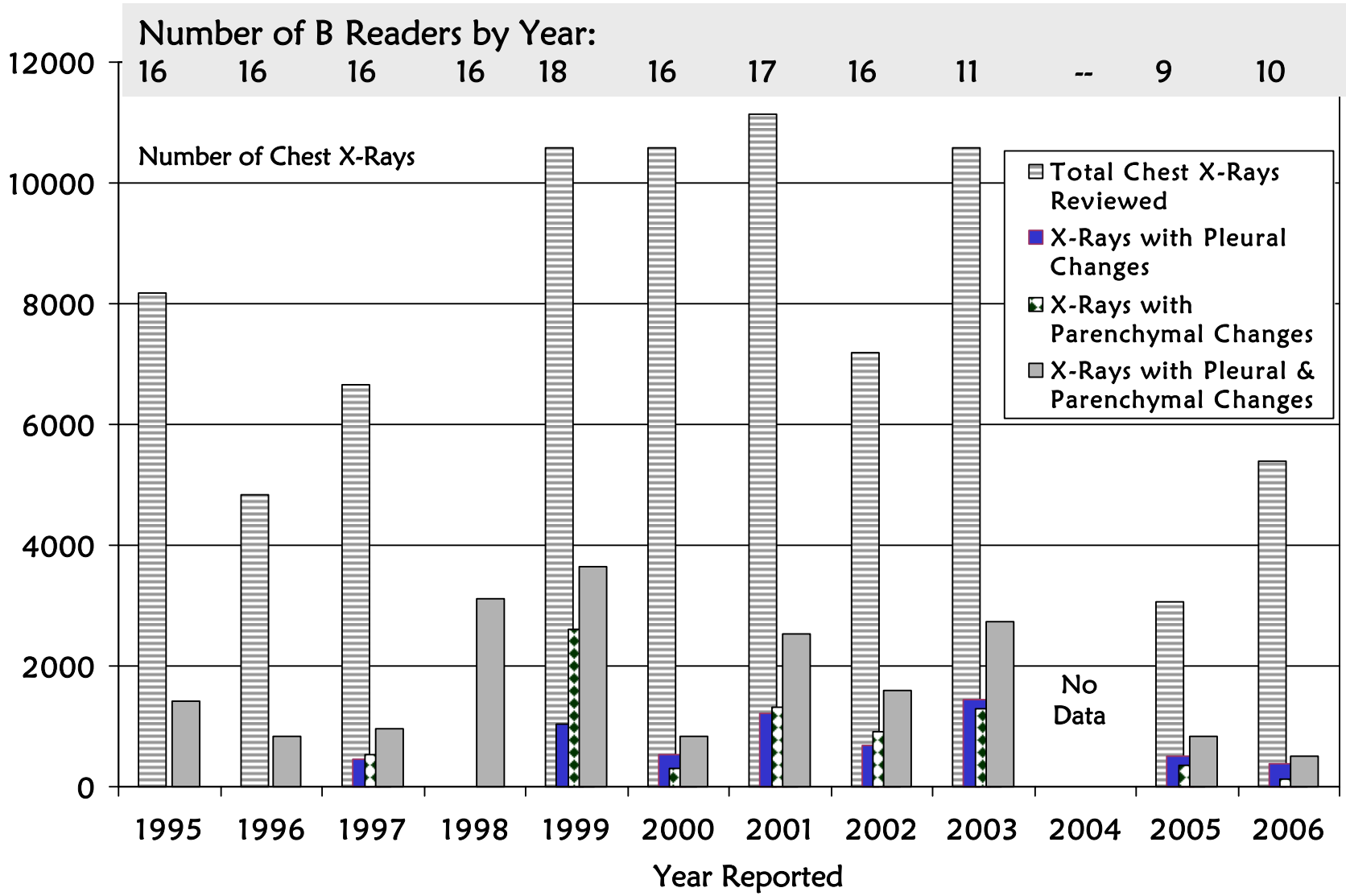


Table 1. Number of Employees at Facilities Where an Occupational Illness Occurred in 2006, by Reporting Source: Company vs. Non-Company Clinician

Number of Employees	Reports from Non-Company Practitioners		Reports from Companies		Total Reports	
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*
< 25	34	2.1	24	0.3	58	0.6
25-100	140	8.6	46	0.6	186	2.0
100-500	124	7.6	256	3.4	380	4.1
> 500	1,338	81.8	7,285	95.7	8,623	93.3
Total	**1,636**[a]	100.1[c]	**7,611**[b]	100.0	**9,247**	100.0

[a] The number of employees was missing on 3,060 reports.
[b] The number of employees was missing on 471 reports.
[c] Percentage does not add to 100 due to rounding.

Table 2. Number of Occupational Disease Reports Submitted by Non-Company Health Practitioners in 2006

Number of Reports	Health Practitioners		Number of Patients Represented
	Number	*Percent*	
1	266	83.4	266
2-5	29	9.1	74
6-10	9	2.8	64
11-20	5	1.6	81
21-100	6	1.9	274
> 100	4	1.3	1,787
Total[a]	**319**	100.1[b]	**2,546**

[a] 702 reports were submitted by labs for lead poisoning, representing 183 clinics. These are not included in the above statistics. 1,291 reports were submitted by Michigan's two Poison Control Centers, and are not included in the above statistics. In addition, 121 reports were identified through workers' compensation and are not included in the above statistics. An additional 36 reports did not list physician name and are not included in the above statistics.

[b] Percentage does not add to 100 due to rounding.

Table 3. Demographic Characteristics of Occupational Disease Cases Reported in 2006

Demographic Characteristic		
Age	*Number*	*Percent*
≤ 19	123	1.1
20-24	344	3.0
25-29	584	5.2
30-34	962	8.5
35-39	1,270	11.3
40-44	1,171	10.4
45-49	1,561	13.8
50-54	1,898	16.8
55-59	1,485	13.2
60-69	1,276	11.3
70-79	481	4.3
≥ 80	128	1.1
Total	**11,283**[a]	100.0
Gender	*Number*	*Percent*
Male	8,397	66.3
Female	4,273	33.7
Total	**12,670**[b]	100.0
Race	*Number*	*Percent*
Caucasian	1,575	47.4
African American	1,131	34.1
Hispanic	84	2.5
Other	530	16.0
Total	**3,320**[c]	100.0

[a]Age was missing on 1,495 reports. Mean age = 48± 13 years.
[b]Gender was missing on 108 reports.
[c]Race was missing on 9,458 reports.

Table 4. Number of Occupational Disease Reports in 2006, by Disease Type and Reporting Source

Disease Type	Non-Company		Company		Total	
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*
Infectious & Parasitic Diseases (ICD 001-139)	2	<0.1	42	0.5	44	0.3
Neoplasms (ICD 140-239)	75	1.6	4	<0.1	79	0.6
Mental Disorders (ICD 290-319)	0	--	119	1.5	119	0.9
Diseases of the Nervous System & Sense Organs (ICD 320-389)	851	18.1	1,845	22.8	2,696	21.1
Diseases of the Circulatory System (ICD 390-459)	2	<0.1	3	<0.1	5	<0.1
Diseases of the Respiratory System (ICD 460-519)	1,628	34.7	98	1.2	1,726	13.5
Diseases of the Digestive System (ICD 520-579)	1	<0.1	15	0.2	16	0.1
Diseases of the Skin & Subcutaneous Tissue (ICD 680-709)	20	0.4	303	3.7	323	2.5
Diseases of the Musculoskeletal System & Connective Tissue (ICD 710-739)	28	0.6	1,428	17.7	1,456	11.4
Symptoms, Signs & Ill-Defined Conditions (ICD 780-799)	71	1.5	187	2.3	258	2.0
Repetitive Trauma: Sprains & Strains (ICD 800-999 except ICD 940 & ICD 980-989)	24	0.5	4,011	49.6	4,035	31.6
Burn Confined to Eye (ICD 940)	0	--	10	0.1	10	0.1
Toxic Effects of Substances (ICD 980-989)	1,994	42.5	17	0.2	2,011	15.7
Total	**4,696**	99.9[a]	**8,082**	99.8[a]	**12,778**	99.8[a]

[a] Percentage does not add to 100 due to rounding.

Table 5. Number of Occupational Disease Reports in 2006, by Industry Type and Reporting Source

Industry Type	Non-Company		Company		Total	
	Number	*Percent*	*Number*	*Percent*	*Number*	*Percent*
Agricultural & Forestry Services (SIC 01,02,07)	6	0.2	8	0.1	14	0.1
Mining (SIC 10-14)	4	0.2	24	0.3	28	0.3
Construction (SIC 15-17)	187	7.5	31	0.4	218	2.1
Manufacturing (SIC 20-39)						
Food & Kindred Products (SIC 20)	7	0.3	33	0.4	40	0.4
Printing & Publishing (SIC 27)	3	0.1	11	0.1	14	0.1
Chemicals & Allied Products (SIC 28)	11	0.4	44	0.5	55	0.5
Rubber & Misc. Plastics Products (SIC 30)	5	0.2	228	2.8	233	2.2
Stone, Clay, Glass & Concrete Products (SIC 32)	10	0.4	3	<0.1	13	0.1
Primary Metal Industries (SIC 33)	806	32.1	121	1.5	927	8.8
Fabricated Metal Products (SIC 34)	94	3.7	867	10.8	961	9.1
Industrial & Commercial Machinery & Computer Equipment (SIC 35)	27	1.1	149	1.9	176	1.7
Electronic Equipment & Components (SIC 36)	12	0.5	121	1.5	133	1.3
Transportation Equipment (SIC 37)	859	34.3	5,104	63.7	5,963	56.7
Miscellaneous Manufacturing (SIC 23,24,25,26,29,31,38,39)	49	2.0	20	0.2	69	0.7
Transportation, Communications, Electric, Gas & Sanitary Services (SIC 40-49)	204	8.1	26	0.3	230	2.2
Wholesale & Retail Trade (SIC 50-59)	24	1.0	67	0.8	91	0.9
Insurance & Real Estate (SIC 60-67)	3	0.1	7	0.1	10	0.1
Services						
Hospitals (SIC 80)	46	1.8	583	7.3	629	6.0
Schools (SIC 82)	39	1.6	95	1.2	134	1.3
Misc. (SIC 70,72,73,75,76,79,83,84,86,87,88,89)	58	2.3	204	2.5	262	2.5
Public Administration (SIC 90-97)	53	2.1	270	3.4	323	3.1
Total	**2,507**	100.0	**8,016**	99.8[a]	**10,523**[b]	100.2[a]

[a] Perentage does not add to 100 due to rounding.
[b]Type of industry was unknown in 2,189 non-company reports and 66 company reports.

Table 6. Number of Occupational Disease Reports in 2006, by Disease Type and Gender[a]

Disease Type	Males		Females	
	Number	*Percent*	*Number*	*Percent*
Infectious & Parasitic Diseases (ICD 001-139)	13	0.2	31	0.7
Neoplasms (ICD 140-239)	78	0.9	1	<0.1
Mental Disorders (ICD 290-319)	58	0.7	58	1.4
Diseases of the Nervous System & Sense Organs (ICD 320-389)	1,847	22.0	830	19.4
Diseases of the Circulatory System (ICD 390-459)	4	<0.1	1	<0.1
Diseases of the Respiratory System (ICD 460-519)	1,544	18.4	182	4.3
Diseases of the Digestive System (ICD 520-579)	11	0.1	4	0.1
Diseases of the Skin & Subcutaneous Tissue (ICD 680-709)	189	2.3	131	3.1
Diseases of the Musculoskeletal System & Connective Tissue (ICD 710-739)	838	10.0	615	14.4
Symptoms, Signs & Ill-Defined Conditions (ICD 780-799)	150	1.8	108	2.5
Repetitive Trauma Injuries (ICD 800-999 except ICD 940 & ICD 980-989)	2,248	26.8	1,749	40.9
Burn Confined to Eye (ICD 940)	10	0.1	0	--
Toxic Effects of Substances Chiefly Non-Medicinal (ICD 980-989)	1,407	16.8	563	13.2
Total[a]	**8,397**	100.1[b]	**4,273**	100.0

[a] Gender was missing on 108 reports.
[b] Percentage does not add to 100 due to rounding.

Table 7. Demographic Characteristics of Reported Occupational Disease Fatalities in 2006

Demographic Characteristic		
	Number	*Percent*
Fatal	69	0.5
Non-Fatal	12,709	99.5
Total	**12,778**	100.0
Age	*Number*	*Percent*
40-49	2	2.9
50-59	5	7.2
60-69	20	29.0
70-79	36	52.2
$\geq$ 80	6	8.7
Total [a]	**69**	100.0
Disease Type	*Number*	*Percent*
Neoplasms	37	53.6
Asbestosis	20	29.0
Mesothelioma	10	14.5
Asthma	1	1.4
Silicosis	1	1.4
Total	**69**	99.9[b]
Industry Type	*Number*	*Percent*
Manufacturing	43	72.9
Construction	8	13.6
Utilities	6	10.2
Services	2	3.4
Total[a]	**59**	100.1[b]

[a]Industry was missing on 10 reports.
[b]Percentage does not add to 100 due to rounding.

Table 8. Comparison of 2005 BLS Occupational Illness Survey Data and 2005 MDLEG Workers' Compensation (WC) Claims with 1992-2006 MDLEG Occupational Disease (OD) Reports

	Disease Category														
	Occupational Skin Disease		Dust Diseases of the Lung		Respiratory Conditions Due to Toxic Agents		Poisoning		Disorders Due to Physical Agents		Disorders Due to Repeated Trauma		All Other Occupational Illnesses		Reports per Year[a]
MDLEG	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*
2005 BLS Survey[b]	2,300	14.6	70	0.4	800	5.1	100	0.6	650	4.1	1,920	12.2	9,860	62.8	15,700
2005 WC Claims[b]	103	0.4	1	<0.1	147	0.6	13	<0.1	50	0.2	20,808	79.9	4,935	18.9	26,057
MDLEG OD Reports	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*
1992-1993[c,d]	776	6.1	914	7.2	290	2.3	207	1.6	469	3.7	7,151	56.0	2,972	23.3	12,779[e]
1994-1995[c,d]	1,034	5.9	966	5.5	570	3.2	315	1.8	419	2.4	10,601	60.3	3,680	20.9	17,585
1996-1997[c,d]	1,405	7.3	1,159	6.0	799	4.1	631	3.3	414	2.1	11,293	58.3	3,668	18.9	19,369
1998-1999[c]	1,307	6.3	3,225	15.6	1,481	7.2	1,120	5.4	328	1.6	9,644	46.7	3,541	17.2	20,646
2000-2001[c]	953	5.1	1,165	6.3	2,334	12.5	1,246	6.7	231	1.2	9,068	48.7	3,639	19.5	18,636
2002-2003[c]	426	2.9	861	5.9	1,800	12.3	2,858	19.6	105	0.7	5,942	40.8	2,587	17.7	14,579
2004-2005[c]	377	2.8	1,105	8.2	1,602	11.9	2,267	16.9	46	0.3	5,094	37.9	2,938	21.9	13,429
2006	322	2.7	1,146	9.6	580	4.9	2,011	16.8	55	0.5	4,606	38.6	3,226	27.0	11,946

[a]Totals do not match those in Figure 2 due to the classification method for disease categories in this table.

[b]Most recent time period available; BLS Survey covers calendar year 2005 and WC claims cover mid-April 2005 through April 2006. The method used to classify diseases in the WC database for this time period differs from previous years; this year's categorization was modeled after the classification system used to group the MDLEG OD Reports.

[c]Number of reports per year (averaged over the 2 years).

[d]Counts published in previous years' OD reports for 1992-1997 have been corrected here.

[e]Type of occupational disease was missing for 97 reports.

Table 9. Primary Diagnosis of Patients Hospitalized in Michigan from 1992-2005, Paid for by Workers' Compensation

Primary Discharge Diagnosis (ICD-9[a])	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
	# (%)	# (%)	# (%)	# (%)	# (%)	# (%)	# (%)	# (%)	# (%)	# (%)	# (%)	# (%)	# (%)	# (%)
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)	22 (0.4)	17 (0.4)	35 (0.7)
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)	10 (0.2)	9 (0.2)	21 (0.4)
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)	15 (0.3)	19 (0.4)	8 (0.2)
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)	3 (0.1)	5 (0.1)	4 (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)	34 (0.7)	37 (0.8)	28 (0.6)
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)	59 (1.1)	58 (1.2)	48 (1.0)
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)	135 (2.6)	140 (2.9)	199 (4.0)
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)	86 (1.7)	96 (2.0)	110 (2.2)
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)	93 (1.8)	96 (2.0)	124 (2.5)
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)	31 (0.6)	28 (0.6)	38 (0.8)
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)	23 (0.4)	7 (0.1)	9 (0.2)
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)	179 (3.5)	157 (3.3)	179 (3.6)
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)	2030 (39.3)	1832 (38.5)	1707 (34.2)
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)	12 (0.2)	14 (0.3)	5 (0.1)
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 --	0 --	0 --	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)	90 (1.7)	70 (1.5)	91 (1.8)
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)	2093 (40.6)	1956 (41.1)	2116 (42.4)
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)	245 (4.7)	219 (4.6)	274 (5.5)
Total[b]	**6891**	**7282**	**7058**	**5726**	**5631**	**5567**	**5183**	**5153**	**5278**	**5013**	**4809**	**5160**	**4760**	**4996**

[a]International Classification of Diseases, 9th Revision.

[b]Totals vary due to missing information.

Table 10. Demographic Characteristics of Patients Hospitalized in Michigan from 1992-2005, Paid for by Workers' Compensation

	1992[a]	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
	# (%)	# (%)	# (%)	# (%)	# (%)	# (%)	# (%)	(%)	# (%)	# (%)	# (%)	# (%)	# %	# %
Gender														
Male	5103 (74)	5388 (74)	5388 (76)	4387 (76)	4381 (78)	4205 (75)	3919 (76)	3907 (76)	4042 (77)	3797 (76)	3635 (76)	3427 (74)	3634 (76)	3748 (75)
Female	1792 (26)	1903 (26)	1675 (24)	1349 (24)	1253 (22)	1365 (25)	1267 (24)	1249 (24)	1235 (23)	1217 (24)	1174 (24)	1208 (26)	1126 (24)	1248 (25)
Total	6895	7291	7063	5736	5634	5570	5186	5156	5277	5014	4809	4635	4760	4996
Race														
White	5173 (85)	5346 (86)	5179 (87)	3708 (85)	3355 (84)	3274 (85)	3016 (85)	2899(85)	3036 (85)	2833 (85)	2697 (86)	2598 (85)	2737 (86)	3016 (87)
African American	519 (9)	515 (8)	544 (9)	417 (10)	425 (11)	378 (10)	387 (11)	323 (9)	366 (10)	335 (10)	276 (9)	324 (11)	319 (10)	319 (9)
Asian	11 (<1)	9 (<1)	10 (<1)	12 (<1)	7 (<1)	5 (<1)	14 (<1)	9 (<1)	16 (<1)	3 (<1)	9 (<1)	6 (<1)	11 (<1)	11 (<1)
American Indian	0 --	1 (<1)	2 (<1)	1 (<1)	2 (<1)	13 (<1)	13 (<1)	5 (<1)	7 (<1)	12 (<1)	8 (<1)	3 (<1)	7 (<1)	7 (<1)
Hispanic	32 (1)	37 (1)	41 (1)	49 (1)	37 (1)	26 (1)	41 (1)	51 (1)	40 (1)	51 (2)	63 (2)	66 (2)	65 (2)	60 (2)
Other	321 (5)	337 (5)	190 (3)	183 (4)	165 (4)	149 (4)	90 (3)	118 (3)	92 (3)	109 (3)	70 (2)	49 (2)	33 (1)	52 (2)
Total	**6056**	**6245**	**5966**	**4370**	**3991**	**3845**	**3561**	**3405**	**3557**	**3343**	**3123**	**3046**	**3172**	**3465**
Age														
< 15	57 (1)	45 (1)	41 (1)	7 (<1)	9 (<1)	10 (<1)	2 (<1)	6 (<1)	4 (<1)	8 (<1)	8 (<1)	16 (<1)	6 (<1)	1 (<1)
15-19	147 (2)	140 (2)	159 (2)	121 (2)	87 (2)	87 (2)	113 (2)	107 (2)	109 (2)	75 (2)	69 (1)	51 (1)	74 (2)	60 (1)
20-29	1248 (18)	1176 (16)	1104 (16)	903 (16)	810 (14)	801 (14)	722 (14)	725 (15)	666 (13)	629 (13)	540 (11)	537 (12)	513 (11)	573 (11)
30-39	2115 (31)	2157(30)	2097 (30)	1684 (29)	1636 (29)	1597 (29)	1421 (28)	1358 (27)	1362(26)	1224 (24)	1188 (25)	1102 (24)	1057 (22)	987 (20)
40-49	1642 (24)	1820(25)	1810 (26)	1531 (27)	1583 (28)	1618 (29)	1548 (30)	1513 (30)	1656(32)	1556 (31)	1541 (32)	1446 (31)	1519 (32)	1434 (29)
50-59	1053 (15)	1205 (17)	1248 (18)	1034 (18)	1062 (19)	1017 (18)	934 (18)	884 (18)	1026 20)	1084 (22)	1029 (21)	1005 (22)	1093 (23)	1186 (24)
60-69	417 (6)	466 (7)	440 (6)	360 (6)	351 (6)	329 (6)	306 (6)	309 (6)	343 (7)	331 (7)	314 (7)	361 (8)	373 (8)	377 (8)
70-79	92 (1)	113 (2)	104 (1)	68 (1)	74 (1)	73 (1)	78 (2)	85 (2)	75 (1)	77 (2)	85 (2)	97 (2)	101 (2)	176 (4)
≥ 80	23 (<1)	40 (1)	37 (1)	10 (<1)	9 (<1)	12 (<1)	8 (<1)	12 (<1)	11 (<1)	15 (<1)	18 (<1)	20 (<1)	24 (1)	192 (4)
Total	**6794**	**7162**	**7040**	**5718**	**5621**	**5544**	**5132**	**4999**	**5252**	**4999**	**4792**	**4635**	**4760**	**4986**
Avg. age, std. dev.	40 ±13	41 ±13	41 ±12	41 ±12	42 ±12	42 ±12	42 ±12	42 ±12	43 ±12	43 ±12	43 ±12	44 ±13	44±12	46±15

[a]Totals vary due to missing information.

Table 11. Demographic Characteristics of 1,291 Individuals Reported by the Two Michigan Poison Control Centers in 2006

Demographic Characteristics		
Age	*Number*	*Percent*
< 15	1	0.1
15-19	92	8.6
20-29	337	31.7
30-39	267	25.1
40-49	202	19.0
50-59	139	13.1
60-69	22	2.1
≥ 70	4	0.4
Total	**1,064**[a]	100.1[b]
Gender	*Number*	*Percent*
Male	733	58.6
Female	517	41.4
Total	**1,250**[c]	100.0

[a] Age was missing on 227 reports.
[b] Percentage does not add to 100 due to rounding.
[c] Gender was missing on 41 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 the reported statistics.

ICD-9 Code	Description
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