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Association of Occupational and Environmental Clinics

Occupational and Environmental Disease Surveillance Database

Summary of AOEC Database Case Reports

1994 - 1996

Prepared by:

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Copies of the AOEC Database software, with installation instructions and documentation, are available to member clinics from the AOEC office.

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I. INTRODUCTION

Background

The Association of Occupational and Environmental Clinics (AOEC) has developed a unique national surveillance database for a broad range of occupational and environmental illnesses and chronic injuries. This Occupational and Environmental Disease Surveillance Database has been supported in part by the National Institute for Occupational Safety and Health (NIOSH). In addition, AOEC member clinics, clinicians, and staff have volunteered their efforts to contribute case-report data to this project and to provide Database direction and oversight.

Since the mid-1980's, when the AOEC was first formed, a number of AOEC clinicians devoted considerable effort to plan and secure support for the AOEC Database. Several individuals have played key roles in the AOEC Database project. Dr. James Cone (while he was with the San Francisco General Occupational Health Clinic) directed the scientific and technical development of the AOEC Database during 1990 and 1991 and oversaw the collection of a pilot year of case reports. Katherine Kirkland, (AOEC Executive Director) and Ingrid Denis (Staff Generalist) maintain the database at the AOEC office. The AOEC staff receive case reports from clinics, and perform coding, data entry, and preliminary quality control. AOEC staff also communicate frequently with member clinics regarding Database issues and questions on case reports. Katherine Hunting of the George Washington University (GWU) Department of Environmental and Occupational Health assumed the scientific and technical direction of the AOEC Database project in early 1992. Judith Anderson of GWU assists with this effort. In 1996, AOEC contracted with M-Vision, a computer consulting firm, for computer programming support. The AOEC staff and GWU staff work together with the computer consultant on database software development and enhancement.

The first extensive report on the AOEC Database summarized 2774 cases which were reported by AOEC clinics during the first three years of the Database project (1991 - 1993). This report concerns 3080 cases of illness or injury diagnosed by participating AOEC clinics in 1994 - 1996. Where it is of interest, we have identified trends based not only on the last three years of data but also incorporating results from 1991 - 1993.

Methods

Ten AOEC member clinics have contributed cases of occupational or environmental disease or injury to this 1994-1996 report. To be included in the Database, a case must have at least one diagnosis that is related to an occupational or environmental exposure. The AOEC accepts cases with two types of diagnosis/exposure relationships for inclusion in the Database. The predominant type of diagnosis/exposure relationship is "probable or definite", where, in the physician's judgment, the diagnosis is more than 50% likely to be causally related to occupational or environmental exposure(s). This criterion was established jointly by AOEC Database Committee members and NIOSH; "causally related" includes cases in which the occupational or environmental exposure is the sole cause of a condition as well as cases in which the occupational or environmental exposure exacerbates an existing condition. ("Probable" and "definite" are not distinguished in the AOEC Database.)

The second type of diagnosis/exposure relationship is "possible." In late 1992, the AOEC decided to include cases with diagnoses which the physician believed might have been caused or exacerbated by occupational or environmental exposure(s), but for which there was insufficient

evidence to meet the 50% criterion. This report, for the first time, includes data on "possible" cases. (Possible cases were not included in past reports, because of inconsistencies in reporting.)

Cases are submitted to the AOEC office in one of two formats: (1) on case report forms (see form following this text); or (2) on diskette, using a custom-designed software package which provides records in a DBASE IV format. All Database fields with limited coding possibilities have pop-up help screens and range-checks designed to provide the proper codes and ensure that required fields are not left blank. The AOEC Database utilizes Standard Industrial Classification (SIC) and Standard Occupational Classification (SOC) codes to describe the industry and occupation in which work-related exposure(s) occurred. International Classification of Diseases, 9th Revision (ICD-9) codes are used to classify diagnoses. Katherine Hunting and Susan McDonald (a consulting industrial hygienist) developed a hierarchical classification scheme for coding occupational and environmental exposures which was adopted for the AOEC Database in late 1994. (All previously reported exposures were converted to the new scheme.) SIC code, union code, and exposure code look-ups have been integrated into the AOEC Database software. AOEC encourages clinics to use the case-reporting software whenever possible. Participating clinics do a variable amount of coding, depending on their own resources and expertise, with the remainder of the coding done in the AOEC office.

It is worth noting that the AOEC requests consult-level cases from member clinics, and asks clinics to exclude screening cases unless they have had full clinical followup. Also, a number of clinics are seeing large numbers of patients with acute occupational injuries, and these cases are not included in the AOEC Database unless they require more extensive followup at the member clinic. Finally, the AOEC Database excludes the following types of cases which do not have an occupational or environmentally-related diagnosis:

- post-exposure evaluations with diagnoses of healthy physical, etc.;
- cases who have received counseling regarding the potential risks of exposures;
- cases with valid diagnoses which are unrelated to any occupational or environmental exposures;
- cases with valid diagnoses thought to be caused by occupational or environmental factors, but where the exposure is unknown;

With a recent revision in the AOEC Database software, member clinics can now keep track of these cases in their individual clinic databases (as "clinic-only cases"), even though they are not included in the centralized AOEC Database.

Organization of this Report

This report provides a summary of case reports submitted by participating clinics for 1994, 1995 and 1996. Inclusion of cases is based on a date of diagnosis in 1994 through 1996. Following this introduction, the report is organized into five sections, each with accompanying tables and graphs:

- Summary of all cases with diagnoses related to occupational or environmental exposures (this section summarizes all the data that will be described in the three detailed sections that follow);
- Description of cases related to occupational exposures other than asbestos;
- Description of cases related to asbestos exposure;
- Description of cases related to environmental exposures;
- Description of cases possibly related to occupational or environmental exposures.

II. SUMMARY OF ALL CASES, 1994 - 1996

Overview

In 1994 - 1996, the participating clinics reported 3080 cases which had at least one diagnosis with a probable/definite relationship to occupational or environmental exposure(s). These cases are profiled in the first set of tables and graphs. Table S-1 shows that 1740 cases (56.5%) had asbestos-related diagnoses. The proportion of reported cases related to asbestos has increased since the 1991 inception of the AOEC Database, from twenty-three percent the first year to well over fifty percent for 1995 and 1996. These cases represent a significant proportion of the care being delivered by AOEC member clinics and reflect the burden of disease that remains from historical exposures to asbestos. Almost all of the asbestos exposures were occupational.

In 1994-1996, 1366 cases (44.% of total) had diagnoses related to exposures other than asbestos. While most non-asbestos cases were related to occupational exposures, 8% of these cases had one or more diagnoses related to environmental exposures. This report also includes information on a small group of cases with diagnoses *possibly* related to occupational or environmental exposures. Because 129 (4.2%) of the 3080 cases had diagnoses with exposure relationships counted in more than one category, the numbers in Table S-1 sum to slightly more than 100%.

Demographics

Figure S-1 shows the number of cases submitted to the AOEC Database since its inception in January 1991, while Table S-2 presents data on case submission by clinic, as well as some demographic characteristics of the patients. The number of cases per month was relatively constant from January 1991 to mid-1994. After then, case-counts appear more variable. A number of clinics have participated in the Database project for all or most of the six-year period, while some have recently begun to participate. Others have become inactive and are no longer submitting cases. This change in "clinic mix" over time no doubt accounts for changes in the types of patient referral patterns, demographics, industries and occupations, exposures, and diagnoses seen over time. The ten participating clinics for 1994-1996 represent diverse geographic areas of the U.S., but do not by any means represent the entire U.S. One large clinic (St. Lawrence Hospital in Michigan) contributed half of the 1994-1996 cases. Three other clinics (George Washington University in Washington DC, Massachusetts Respiratory Hospital, and Robert Wood Johnson in New Jersey) contributed another 40% of the cases. The large number of asbestos screenings and resulting patient followup visits at the St. Lawrence clinic markedly influence the overall Database case characteristics for 1995 and 1996, as described below.

The median age of all the patients was 40-49 years in 1994, but 50-59 years in 1995 and 1996. Overall, for 1994-1996, three-fourths of the patients were male; this proportion was much higher in 1995 and 1996 than in 1994. The proportion of union members among occupationally-related cases represented in the Database increased from 34% to 54% from 1991 to 1994, and then dropped dramatically in 1995 and 1996. In the last two years, union membership status was unknown for over half of all the occupationally-related cases.

Figure S-2 shows the ethnicity of the AOEC Database cases for 1994-1996. Most (55%) of the cases were white, with 33% black, 4% Hispanic, and the remainder unknown or from other ethnic minority groups. This is a higher proportion black and a lower proportion white than seen

in AOEC case reports for 1991-1993, and reflects the increasing number of black patients seen in 1995 and 1996 for asbestos-related diseases.

Figure S-3 presents data on referral source for the 3080 cases. During 1994-1996, 63% of cases were referred to AOEC clinics by attorneys, 15% by physicians, 9% were self-referred, and 4% were referred by employers. Since 1991, when attorney-referred patients constituted only 20% of the AOEC , cases, the proportion of cases referred by attorneys has increased steadily to 76% in 1995 and 57% in 1996. In addition to the increasingly litigious nature of occupational and environmental medicine, this pattern also reflects the changing mix of clinics which are reporting AOEC cases, and the increasing proportion of cases related to asbestos.

Figure S-4 illustrates job status for the 2976 cases related to occupational exposures. Forty-nine percent of the patients were employed at the time of their diagnosis, while 35% were retired, 12% were disabled, and 4% were unemployed. From 1991 to 1993, the proportion of employed cases had decreased from 71% to 65%; this decrease continued from 1994 to 1996. This was balanced by increases in the proportions of retired and disabled cases. Again, the proportional increase in asbestos-related cases has influenced these trends.

Table S-3 summarizes the industries in which the 2796 occupational cases were employed. The most common industry sector was manufacturing (42.1% of cases), followed by construction (20.5%), and services (16.7%). With the exception of AOEC cases diagnosed in 1995 (which came predominantly from manufacturing), the proportion of cases employed in manufacturing industries has decreased from 1991 to 1996. The proportion of cases from the services, construction and transportation, communication, and utilities industries increased correspondingly over time (except for 1995). The 644 occupational cases held a wide variety of jobs, as illustrated in Table S-4. More detailed data on occupation and industry will be presented in the next two sections.

Table S-5 presents data on union membership for the 690 patients whose diagnoses were related to occupational exposures and who were known to be union members. Construction trades -- including laborers, electrical workers, plumbers and pipefitters, and sheet metal workers -- are heavily represented, as are major industrial unions such as automobile workers and machinists. Nurses constitute the largest number of unionized service-sector workers among Database cases. About half of the union members were treated for asbestos-related conditions, and were represented by distinctly different unions, compared to workers with other occupational exposures (see data in sections III and IV).

Exposures

Each case report describes up to three exposures which may have caused or contributed to as many as three diagnoses. Among the 3080 patients with occupational or environmental disease and injury, 3482 hazards were reported to be related one or more diagnoses. More than one hazard can be recorded per diagnosis -- for instance, a clinic seeing a clerical worker with carpal tunnel syndrome might list both repetitive motion and keyboard use as contributing to the problem. Table S-6 is a frequency distribution of these hazards; the percentages reflect the percent of all 3482 hazards cited (rather than the percent of all 3080 cases). The hazard codes are organized by exposure groups; individual exposures are included under each group. The most frequently reported hazard was asbestos (1742 cases), followed by air pollutants, indoor (198 cases), repetitive motion (121 cases), keyboard use (117 cases), solvents NOS (104 cases), methyl chloroform (also known as 1,1,1-trichloroethane, 75 cases), perchloroethylene (also known as

tetrachloroethylene, 72 cases), falls (69 cases), crystalline silica (64 cases), lifting (57 cases), and natural rubber latex (45 cases). The long list of hazards emphasizes the variety of exposures experienced by the AOEC patient population. A more detailed discussion of hazards will follow in each of the subset data analyses.

III. CHARACTERISTICS OF CASES RELATED TO OCCUPATIONAL EXPOSURES OTHER THAN ASBESTOS

Demographics

The majority of the 1277 cases related to occupational exposures other than asbestos were white, male, and relatively young. Table O-1 summarizes the demographic characteristics of these patients. Thirty-seven percent of the patients were less than 40 years of age, and over two-thirds were less than 50 years of age. There were slightly more male than female patients in this subset of cases. Figures O-1, O-2, and O-3 present additional demographic data on the non-asbestos case group. Regarding ethnicity (Figure O-1), 58% were white, 24% were black, and 6% were Hispanic, with smaller proportions falling into other categories. The proportion of AOEC Database cases belonging to ethnic minority groups increased slightly from 1991 to 1996. Most of the case group (70%) were employed at the time of their diagnosis, while 17% were disabled (Figure O-3). The most frequent source of referral to AOEC clinics for patients with non-asbestos-related occupational illnesses (Figure O-2) was other physicians (32%), followed by attorneys (26%), self-referrals (14%), and employers (10%). From 1991 to 1995, the proportion of cases referred by other physicians went down substantially, while the proportion referred by attorneys increased from 12% to 28%. Attorney referral decreased in 1996.

Data on industry for the 1277 cases related to occupational exposures other than asbestos are presented in Table O-2. Employment information is presented for the job in which the exposure occurred -- either the current job, or a past job. Over one-third (466) of the patients received their exposures in the services industry, including 195 health service workers (15.3%) and 98 educational services workers (7.7%). The proportion of AOEC cases employed in the service sector was higher in the last three years compared to 1991-1993. Next most frequently represented was the manufacturing sector (309 cases, 24.2%), most notably in primary metal industries (67 cases), printing and publishing (45 cases), and in the manufacture of electronic equipment (25 cases), chemicals (23 cases), and transportation equipment (23 cases). Two-hundred-and-five patients (16.1%) were employed in the transportation, communications, and utilities sector. One-hundred-and-twelve of the patients from this category (8.8% of all non-asbestos occupational cases) were railroad transportation workers, most of whom were seen at one clinic.

The next table (O-3) presents complementary data on occupation. It is clear from this table that AOEC clinics are treating workers from a wide variety of occupations, and that no single occupation dominates the cases related to hazards other than asbestos. Except for service occupations (156 cases, 12.2%), production working occupations (151 cases, 11.8%), and administrative support occupations (151 cases, 11.8%), fewer than 10% of patients belonged to any one occupational category. Looking at specific occupations rather than broader categories, the most frequently represented jobs among these cases (each with at least 2% of the 1277 cases) were: registered nurses (102 cases); miscellaneous handlers, equipment cleaners, and manual occupations (53); cleaning and building service occupations (43); extractive occupations (40); secretaries, stenographers and typists (39); vehicle and mobile equipment mechanics (31); teachers (30); personal service occupations (30); metal and plastic working machine operators (28);

miscellaneous administrative support occupations (27); and food and beverage service workers (26). Note that patients who experienced their exposure(s) as students are classified with the appropriate occupational group (eg., music student with musicians, medical student with health care workers) or as "student, NOS", unless the exposure was clearly environmental in nature or unless the student was a child.

From 1994-1996, 29% of the individuals with non-asbestos occupational exposures were known to belong to unions (Table O-1). The proportion of union members among these cases increased from 29% in 1991 to 44% in 1994, and then decreased in 1995 and 1996. However, the proportion of cases whose union status was unknown increased substantially in the last two years, so the trend seen is probably explained by incomplete data collection at the clinic level. Table O-4 lists a large number of different unions for the 373 non-asbestos cases known to be union members. The most frequently included unions are those representing nurses (72 patients), machinists (27), educators (24), laborers (21), electrical workers (20), automobile workers (16), and communication workers (16).

Exposures

For each patient, the Database records up to three exposures which may have caused or contributed to as many as three diagnoses. Among the 1277 patients with occupational illnesses or injuries not related to asbestos, 1535 hazards were reported in relationship to the diagnoses. Table 0-5 lists the frequency for each hazard; the percentages reflect the percent of all 1535 hazards (rather than the percent of all 1277 cases). Each reported hazard for a case is listed only once in this table, even if it is related to more than one diagnosis. The variety of exposures is notable. Only four major categories accounted for a substantial proportion of the hazards: "Ergonomic Factors" accounted as a group for 23.1% of related hazards; "Miscellaneous Chemicals and Materials, Referenced by Use" accounted for 15.2%; "Halogenated Aliphatic Hydrocarbons (Except Organochlorine Pesticides)" accounted as a group for 10.6%; and "Physical Factors" accounted for 10.5%. All other categories accounted for fewer than 8% of related hazards. Some interesting features of the related hazards will be described in the following sections.

Ergonomic and Physical Hazards

Repetitive motion (121 cases), and keyboard use (113 cases), were the most frequently reported hazards in the "Ergonomic Factors" category. There are relatively few exposure codes available in this category. We have, however, built into the data entry software a prompt that asks the user for more information when an ergonomic hazard is entered. This supplemental description will allow interested users of the AOEC Database to conduct more detailed analyses of ergonomic exposures.

Altogether, 354 (23.1%) of the reported hazards were ergonomic factors. These hazards affected 305 patients (23.9% of patients). It is interesting to note the occupations and industries of these patients. The three largest industrial sectors represented among these 305 patients were: 127 from services (41.6% of cases, including 25 from membership organizations, 24 from business services, 21 from education, and 18 from health care); 63 from manufacturing (20.7% of cases, including 25 from the publishing industry); and 41 from transportation, communication, and utilities (13.4% of cases, including 12 from the airline industry and 10 from communications). In terms of occupation, these patients were very diverse: 88 workers came from a variety of blue collar jobs; 77 from clerical jobs; the remaining workers held various jobs, most of which were white collar jobs such as writers, computer programmers, and bookkeepers. The AOEC cases

reflect the fact that ergonomic hazards and related musculoskeletal disorders, while very common among manufacturing workers, are also occurring in a wide variety of other jobs, particularly those involving the use of computers.

Among "Physical Factors," falls (69 cases), acute trauma, NOS (29 cases), and struck against/struck by object (19 cases) were the most frequented cited hazards. The increasing frequency of these risk factors in the past three years probably reflects the increasing role of occupational and environmental medicine clinics in evaluating workers with traumatic injuries.

Chemical and Biological Hazards

There are hundreds of chemical exposures referenced in the AOEC exposure coding system; occupational disease case reports for 1994-1996 reference about 150 separate exposures. The non-specific exposures, "air pollutants, indoor", were responsible for the largest number of cases related to non-physical hazards (168, 10.9% of all non-asbestos occupational hazards cited). These patients worked predominantly in three industries -- in health care (74 cases, mostly registered nurses), in education (34 cases, mostly teachers), and in public administration (28 cases, many occupations). It should be borne in mind that "indoor air pollutants" is a non-specific designation, and the causal agents could be chemicals, molds, or other biological hazards. Numerous other cases (not discussed here) were related to specified indoor air pollutants such as mold, or unspecified indoor air pollutants such as perfumes, solvents NOS, and dust NOS.

The most commonly mentioned specific chemicals were methyl chloroform (1,1,1-trichloroethane, 73 cases) and perchloroethylene (tetrachloroethylene, 72 cases). Almost all of these cases were railroad workers -- machinists, electricians, pipefitters, mechanics, laborers, and others -- who were exposed to both solvents, and who were diagnosed with depression, organic affective disorders, or toxic encephalopathy (see Table O-6).

Sixty-one workers seen in participating AOEC clinics had diagnoses (primarily silicosis) related to crystalline silica exposure. These exposures occurred most often in foundry jobs (47 of the 61 cases) and in construction (8 cases, including brick and cement masons, an electrician, and an equipment operator).

Thirty patients were diagnosed with lead poisoning or other conditions related to exposure to inorganic lead. Lead poisoning is well-recognized and preventable, considered by NIOSH to be a sentinel health event where a single case should trigger an investigation of the worksite. The lead exposures occurred primarily in four types of settings: 12 cases were from the construction industry, including 6 painters; 4 cases were reported among welders working for local transit systems; 4 workers held various jobs in primary metal industries; and 4 individuals were employed in the manufacture of electrical or electronic components.

Another occupational hazard that has been recognized for many years is welding fumes. In 1994 through 1996, there were 15 cases related to welding fume exposures and one to fluxes. Predictably, 9 of these 16 workers were welders, most from the construction, ship building, and motor vehicle manufacturing industries. Other construction workers included a plumbing supervisor, a boilermaker, and a sheetmetal worker. The diagnoses related to welding fumes included: asthma; reactive airways disease (RADS); COPD; upper respiratory irritation; pneumoconiosis; emphysema; laryngeal polyps; and metal fume fever. (See Tables O-6 and O-7.)

Health care workers represented 15.3% of non-asbestos occupational cases for 1994 through 1996 (195 cases). It was mentioned above that a significant fraction of the indoor air pollution exposures were to health care workers; it is interesting to look at some of the other exposures affecting these individuals. Thirty-seven health care workers -- mostly RN's and LPN's, but other professions as well, including a secretary -- had conditions related to latex gloves or other natural latex products. Twenty-one out of these 37 workers were diagnosed with occupational asthma and most had multiple diagnoses, including latex allergies (not specified further), rhinitis, urticaria, and dermatitis. Tuberculosis, Hepatitis C, and other infectious agents also pose hazards for health care workers. Of the 22 workers with diagnosed PPD conversions, 10 were physicians (including 6 residents), 3 were nurses, and three were medical technicians, and the remainder had other jobs. (One additional worker had a PPD conversion, an insulator not in health care.) The PPD conversions were all reported by one clinic (GWU). The AOEC Database references three workers-- a nurse, a hospital laboratory technician, and a counselor in child day care -- diagnosed with Hepatitis C in 1994 through 1996.

Finally, two other hazardous exposures seen in the health care industry are the sterilants glutaraldehyde (12 cases among RN's, LPN's, dental assistants, medical technicians, and a medical assistant) and ethylene oxide (8 cases, 6 among health care workers and 2 in manufacturing). Diagnoses attributed by AOEC physicians to occupational glutaraldehyde exposure (see Table O-6) include: asthma; RADS; headache; upper airway irritation; dermatitis; and nosebleeds. The diagnoses related to ethylene oxide exposure were: upper airways irritation; chronic bronchitis; asthma; dermatitis; a miscarriage; and non-specified ethylene oxide toxicity.

Diagnosis/Exposure Relationships

The most valuable contribution of the AOEC Database is to provide information on diagnosis/exposure relationships. Table O-6, which details close to 1,800 of these relationships (for occupational exposures other than asbestos), is therefore the heart of this report. Musculoskeletal conditions and respiratory diagnoses and were most frequently diagnosed in 1994 through 1996 by participating clinics.

The AOEC Database allows physicians to report up to three diagnoses for each case, although in most cases fewer diagnoses are made. Among the 1277 patients included in this non-asbestos, occupational subset of the AOEC data, most had only one related diagnosis. In total, there were 1575 diagnoses related to hazards other than asbestos. Since each diagnosis can be related to as many as three hazards, there are as many as nine diagnosis/exposure relationships in the most complex cases. The 1575 diagnoses, in relationship to the 1535 non-asbestos occupational hazards described in Table O-5, yielded nearly eighteen hundred diagnosis/exposure relationships for analysis. Table O-6 is organized into diagnosis groups and individual diagnoses, and for the most part follows ICD-9 codes. In some cases, particularly with respiratory diseases and musculoskeletal disorders, we have grouped similar diagnoses across ICD-9 codes for analysis. For each diagnosis listed in the table, we give the percent of all cases who had this diagnosis. The diagnosis group total represents the number of diagnoses in the group. We do not list a corresponding percentage for these groups, since a case may have more than one diagnosis in a group and such a percentage would overestimate the proportion of cases in the category. (For example, a patient diagnosed with both occupational asthma and chronic rhinitis would be double-counted in the diagnosis group "Respiratory Disorders.") This same principle applies in a number of the other diagnosis/hazard relationship tables where summary percentages are not presented.

Because the essence of Table O-6 is in the detail, it is impossible to succinctly summarize the data. Rather, the reader should examine the table, focusing on the diseases and exposures that are of most interest to him or her. The highlights of the table are as follows. Respiratory diagnoses (468 diagnoses) accounted for 30.5% of the 1575 diagnoses related to occupational exposures other than asbestos. One hundred and eighty-eight (14.7%) of the 1277 cases with non-asbestos occupational diseases were diagnosed with asthma, making it (after asbestosis) the second-most common diagnosis made by participating AOEC clinicians in 1994 - 1996. RADS accounted for an additional 40 diagnoses (3.1% of cases); in this year's report we have tabulated RADS and its related exposures separately from asthma. We combined sinusitis, rhinitis, pharyngitis, laryngitis, and symptoms of upper airways irritation (either "chronic" or not specified whether acute or chronic) into a single category for this report. Patients treated in participating AOEC clinics were frequently diagnosed with these problems; ninety-five workers (7.4% of non-asbestos occupational cases) received these diagnoses.

Musculoskeletal conditions (529 diagnoses, 33.6% of non-asbestos, work-related diagnoses) were also frequently diagnosed among AOEC clinic patients, especially carpal tunnel syndrome (93 cases, 7.3%), tendinitis, tenosynovitis, or bursitis of the forearm, wrist, hand, or fingers (59 cases, 4.6%), epicondylitis (37 cases, 2.9%), and sprains, strains, or tears of the lower back/back NOS (50 cases, 3.9%) or neck/upper back (29 cases, 2.3%). Among musculoskeletal disorders with body locations specified, upper extremity problems predominated, accounting for well over half of the diagnoses in this category.

Other common problems diagnosed by AOEC clinics included psychiatric and neurological disorders (142 diagnoses), symptoms and ill-defined conditions (including multiple chemical sensitivity) (161 diagnoses), chemical poisoning and syndromes (76 diagnoses), and skin disorders (70 diagnoses).

To present a cumulative summary of the most frequent conditions diagnosed among participating AOEC clinics, we have combined case reports from 1991 - 1993 and 1994 - 1996. Diagnoses seen among at least 1.5% of the patients with occupational exposures other than asbestos, along with the most commonly related hazards, are listed in Table 1 on the next page. These 1991-1996 summary data allow us to maintain a historical perspective, even though this report examines in detail only the past three years' cases. The common diagnoses are listed in Table 1 according to the same general ICD-9 order used in Table O-6. Not surprisingly, respiratory and musculoskeletal diagnoses predominate. Patients with positive PPD's, solvent-related toxic encephalopathies, dermatitis, poisonings by lead and solvents, headaches, multiple chemical sensitivity (MCS) and sick building syndromes were also frequently seen by participating clinicians. One trend that was not seen in the 1991-1993 report, but is demonstrated by the 1991-1996 cumulative data, is the emergence of natural latex gloves and other products as an important cause of both asthma and dermatitis.

MCS has been the subject of controversy among occupational/environmental disease specialists. From 1991 to 1996 (cumulative), the Database includes reports of 100 occupational cases with this diagnosis, and another 43 cases related to environmental hazards, plus 9 possible cases (1994-1996 only). Because diagnosis and labeling of this condition vary from clinician to clinician, there are no doubt additional similar cases whose diagnoses refer to non-specific symptoms (eg., headache, breathing difficulties, upper respiratory irritation) rather than to "MCS." Some occupational and environmental physicians have recently suggested that porphyria is associated with MCS; it is interesting to note that only one of the cases reported to the AOEC Database include a diagnosis of porphyria related to chemical exposures. (This case was related to

Table 1 - Diagnoses Made in at Least 1.5% of the Occupational Non-Asbestos Cases (N=3324 cases), with the Most Commonly Related Hazards 1991-1996, Cumulative

Diagnosis	# of Cases	(% of Cases)	Commonly Related Hazards* - Freq.
Positive PPD	66	(2.0)	tuberculosis - 66
Toxic Encephalopathy	153	(4.6)	methyl chloroform - 77 perchloroethylene - 74 solvents, NOS - 40
Asthma	416	(12.5)	air pollution, indoor -73 isocyanates, all - 41 dust, NOS - 37 solvents, NOS - 28 latex, natural rubber -23
Bronchitis, NOS (Incl. Asthmatic)	61	(1.8)	air pollutants, indoor - 7 ammonia solution - 4 cutting oils - 4
Reactive Airways Disease (RADS)	121	(3.6)	isocyanates, all - 15 air pollutants, indoor - 11 chlorine - 10
Silicosis	76	(2.3)	silica, crystalline - 72
Upper Respiratory Irritation (Chronic or NOS)	308	(9.3)	air pollutants, indoor - 100 solvents, NOS - 31 dust, NOS - 16 mold - 15
Dermatitis, All	143	(4.3)	latex, natural rubber - 28 solvents, NOS - 17 lubricants, NOS - 9
Sprains/Strains/Tears of Lower Back/Back, NOS	72	(2.2)	lifting - 28 fall - 14
Carpal Tunnel Syndrome/ Median Nerve Neuropathy	256	(7.7)	repetitive motion - 138 keyboard use - 113
DeQuervain's disease	72	(2.2)	keyboard use - 35 repetitive motion - 32
Epicondylitis	129	(3.9)	keyboard use - 98 repetitive motion - 26
Tendinitis/Tenosynovitis/Bursitis of Forearm, Wrist, Hand, or Fingers	139	(4.2)	keyboard use - 86 repetitive motion - 41
Unspecified Cumulative Trauma Disorders or Musculoskeletal Pain, Upper Extremity	64	(1.9)	keyboard use - 33 repetitive motion - 28
Osteoarthritis NOS	78	(2.3)	repetitive motion - 77
Headache (Chemical or NOS)	85	(2.6)	air pollution, indoor -19 solvents, NOS - 14
Multiple Chemical Sensitivity/ Acquired Chemical Intolerance	100	(3.0)	air pollution, indoor - 33 solvents, NOS - 15 pesticides, all - 11
Sick Building Syndrome/Other Gen'l Symptoms	110	(3.3)	air pollutants, indoor - 77
Toxic Effect of Lead	123	(3.7)	inorganic lead - 121
Toxic Effect of Solvents	103	(3.1)	solvents, NOS - 40 toluene - 15 xylene - 10

* For other hazards related to these diagnoses, see Table O-6.

environmental exposure to chlorinated dibenzodioxins, and is seen in Table E-3.) This observation does not by itself indicate a lack of association, because we cannot know from the AOEC Database the number of AOEC clinic patients who were tested for porphyria.

The AOEC clinics are continuing to treat many patients with occupational lung disease. While Table O-6 lists the causal or contributing exposures by diagnosis group, Table O-7 highlights respiratory diagnoses, organized by exposure. In this way, the burden of respiratory disease related to each exposure or exposure category can be readily seen. Of the 468 respiratory diagnoses, 142 were related to hazards in the category "Miscellaneous Chemicals and Materials, Referenced by Use", 102 to various "Mineral and Inorganic Dusts", 48 to the category "Hydrocarbons, NOS", and 35 to "Polymers". The hazards most commonly cited in relationship to respiratory diagnoses were: air pollutants, indoor (102 related diagnoses); crystalline silica (61); dust, NOS (26); solvents, NOS (24); latex, natural rubber (23); mold (20); welding exposures (16); smoke NOS (16); paint (14); isocyanates, NOS and toluene diisocyanate (12); glutaraldehyde (10); and lubricants NOS (10). Chan-Yeung and Malo (in Asthma, Barnes et al. (eds), Raven Press, 1997) have reviewed substances that have been reported to induce occupational asthma. These substances are designated with special codes in the AOEC exposure coding system, and are marked with asterisks (* or **, see footnotes) in Table O-7. It is interesting to note that most of the hazards reported by expert AOEC clinicians to cause or exacerbate asthma or RADS are related to substances not on the Chan-Yeung list.

These AOEC surveillance cases, in combination with surveillance data collected by the NIOSH SENSOR states, are valuable for identifying emerging occupational respiratory disease risk factors. The non-specific identification of many of the "non-listed" hazards -- for example: solvents, NOS; dust, NOS; and air pollutants, indoor -- is problematic because we don't know the precise causal exposures. An AOEC specialist treating an asthma patient would evaluate whether known asthma-inducers were present in the worker's environment and could explain the diagnosis. Therefore, the "non-listed" hazards, especially when reported by two or more AOEC clinics, are worthy of increased attention and evaluation for their asthma-inducing potential. For example, solvents classed as aliphatic and chlorinated hydrocarbons are not generally recognized as asthma inducers. AOEC clinicians, however, diagnosed twenty four workers with asthma related to unspecified or multiple solvents, and several more cases related to specified solvents in these categories. These exposures occurred in a variety of industries, including plastics manufacturing, commercial printing, construction, railroad, and chemical manufacturing. One challenge to AOEC clinics will be to precisely identify and report the solvents that are causing these illnesses.

The AOEC exposure coding scheme identifies organic solvents and pesticides in addition to noting whether hazards are classified as occupational asthma-inducers. Organic solvents were reported as causal or contributing hazards for 216 (16.9%) patients with diagnoses related to non-asbestos occupational exposures. The largest group of workers affected by solvents were 105 railroad maintenance employees who, as described above, were diagnosed with psychiatric disorders related to methyl chloroform (1,1,1-trichloroethane) and perchloroethylene (tetrachloroethylene). The majority of other workers with solvent-related diagnoses were manufacturing workers, 15 from plastics manufacturing, 9 from chemical manufacturing, and 8 from electronics manufacturing. Ten individuals with various educational-sector jobs were also diagnosed with solvent-related conditions.

Many different solvents, including aliphatic and alicyclic hydrocarbons, aromatic hydrocarbons, alcohols, ketones, and halogenated aliphatic hydrocarbons, were reported in relationship to AOEC diagnoses. Table O-8 summarizes the 245 diagnoses related to occupational

solvent exposure. Most commonly reported were: toxic encephalopathy (74); organic affective disorder (24); neurotic depression (14); asthma (26); upper respiratory irritation, chronic or NOS (15); and multiple chemical sensitivity (13). Also, many clinics reported solvent-related illnesses and syndromes without providing specific diagnoses; these 22 cases are listed as "toxic effects of solvents". After methyl chloroform (1,1,1-trichcloroethane) and perchloroethylene (tetrachloroethylene), "solvents, NOS" was reported more often than any specified solvent; we hope to improve the specificity of future hazard reporting.

Table O-9 provides parallel information on the 21 patients with diagnoses related to occupational pesticide exposures. Of the 21 diagnoses made in this group, respiratory disorders were most common. Except for a four agricultural workers, a pest control worker, a tree trimmer, and a secretary in the agricultural chemicals manufacturing industry, it appeared that the affected individuals were indirectly exposed to pesticides that were applied in their work settings. Altogether, pesticides caused or contributed to the diagnoses of 1.7% of the 1277 patients with diagnoses related to occupational exposures other than asbestos.

IV. CHARACTERISTICS OF CASES RELATED TO ASBESTOS

In 1994 through 1996, the participating AOEC clinics treated 1740 patients with asbestos-related diagnoses. (Over 100 of these 1740 asbestos cases also had diagnoses related to other exposures and were also included in the analyses described in Section III, above.) Because the asbestos case series differed from patients with other occupational exposures, we analyzed them separately. Table A-1 and Figures A-1 through A-3 describe the demographic characteristics of the asbestos cases. This patient population was markedly different than the cases related to non-asbestos exposures. They were older: whereas 69% of the non-asbestos occupational cases were under 50, 58.4% of the asbestos-related cases were 60 years of age or older. The asbestos cases were 99% male, predominantly either white (49%) or black (42%), and over half were retired. Ninety-four percent of these patients were referred to the AOEC clinics by an attorney, a percentage which has increased since 1991. Some AOEC clinics conduct asbestos screenings that are sponsored by lawyers or unions. Any screening patients who were followed up and diagnosed with asbestos-related disease would be included in the AOEC Database, and indeed it can be seen that a large proportion of the asbestos-related cases were contributed by the St. Lawrence clinic in Michigan. These screening programs can also affect trends in referral patterns.

All but four of the patients with asbestos-related diseases received their exposures on the job. Of the 1736 occupational asbestos cases, 58% were retired at the time of diagnosis, 31% were employed, and the remainder were disabled or unemployed (Figure A-3). Table A-2 summarizes the industries in which the occupational asbestos exposures occurred. The manufacturing sector accounted for the largest share of asbestos cases (55.7%), with 855 of the 967 manufacturing cases working currently or previously in the primary metal industry. The construction industry accounted for 31.5% of cases. Approximately 11% of patients were exposed to asbestos in the transportation, communication and utilities industry (most of these were railroad workers).

The information on occupation in Table A-3 parallels that on industry. Construction occupations (28.8% of cases) and production working occupations (35.2% of cases) were the most frequent occupational groups in which exposures occurred. The most common trades among the asbestos cases were machine operators and tenders (551 cases), miscellaneous manual occupations (179), plumbers, pipefitters, and steamfitters (145 cases), brickmasons (116), electricians (74), sheet metal workers (56), industrial machinery repairers (43), insulation workers (40), boilermakers (38), and carpenters (34).

Over ninety percent of the patients diagnosed with asbestos-related diseases in 1994 were union members, while in 1995 and 1996, union membership status was unknown for most of the asbestos-exposed patients. As seen in Table A-4, the most frequent unions represented were: Plumbers and Pipefitters; Laborers; Sheet Metal Workers; Electrical Workers; Automobile Workers; Carpenters, Insulation Workers, Plasterers and Cement Masons, Bricklayers. Machinists, and Utility Workers. Asbestos cases tended to cluster with particular AOEC clinics by trade and union membership largely because of union- or attorney-initiated screening programs.

Table A-5 lists the 1771 asbestos-related diagnoses among these 1740 cases. Often, the clinics reported that patients had both asbestosis and pleural disease; in those cases we disregarded the pleural disease. We also disregarded abnormal lung function results in the presence of asbestosis. Over ninety percent (1582) of patients with asbestos-related disease were diagnosed with asbestosis. An additional 129 patients (7.4%) were diagnosed with pleural disease. Seventeen patients with respiratory cancers and six patients with gastrointestinal tract cancers were diagnosed by participating AOEC clinicians as related to asbestos.

V. CHARACTERISTICS OF CASES RELATED TO ENVIRONMENTAL EXPOSURES

Demographics

The next set of tables and charts describes the 105 cases reported to the AOEC Database for 1994 - 1996 whose diagnoses were definitively related to environmental exposures. Environmental exposures include those that occur in a household or community setting, and typically result from indoor air pollution, environmental pollution, toxic spills, or fires. Exposures experienced in these settings have been considered environmental, except for exposures experienced in a household by employed domestic workers. As mentioned earlier, exposures experienced by students were coded as occupational unless environmental exposures were clearly indicated or unless the student was a child.

The cases related to environmental exposure were diagnosed in nine of the ten participating clinics, as shown in Table E-1, with two of these clinics (Massachusetts Respiratory Hospital and Robert Wood Johnson) reporting most of the environmental disease. These cases were similar in age to the non-asbestos occupational cases; 37% were less than 40 years of age. Almost two-thirds of the environmental cases were female, a pattern which is also different from that seen with the occupational cases related to both asbestos and other hazards. As was seen for 1991-1993, the proportion of environmental patients belonging to minority groups (Figure E-1) was relatively small. For 1994 through 1996, the ethnic composition was: 85% white; 9% black; 2% Hispanic; 4% other and unknown.

Figure E-2 summarizes the diverse referral sources for the 105 individuals with conditions related to environmental exposures. One-third of the cases were self-referred, 30% by other physicians, and 19% by attorneys; the remaining 17% of cases were referred by a variety of other sources. The proportion of physician-referred environmental cases decreased from 1991 to 1996, while the proportion of self-referred patients increased.

Exposures

Table E-2 details the 118 environmental hazards which were related to the diagnoses of these 105 patients. Twenty-eight percent of the related hazards were in the group "Miscellaneous Chemicals and Materials, Referenced by Use" (most commonly: indoor air pollutants - 12 cases; pesticides, NOS - 7 cases). In addition to these two exposures, solvents NOS caused environmental disease in 10 patients, natural rubber latex in 6 cases, environmental tobacco smoke in 4 cases, hydrocarbons NOS in 4 cases, perfume NOS in 3 cases, and dust NOS in 3 cases. No other exposures accounted for more than 2 cases. It is of interest that the exposure profile of the environmental cases differed somewhat from that of the occupational cases. Notably, pesticides contributed to the diagnoses of 16% of the environmental cases, compared to only 1.7% of the non-asbestos occupational cases (see Table E-5 and related discussion, below). As with the occupational exposures, a substantial proportion of the environmental exposures reported were non-specific. We are encouraging clinics to be more specific whenever possible in the exposures they report.

Diagnosis/Exposure Relationships

Table E-3 presents data on diagnoses and related exposures for the 105 patients whose diagnoses were related to environmental exposures. There were 112 diagnoses made in this group. Of these, respiratory disorders, including asthma (16 diagnoses, 15% of all environmental cases), and chronic or unspecified upper respiratory irritation (14 diagnoses, 13%), and RADS (6 cases, 6%), were diagnosed most frequently. Multiple chemical sensitivity/acquired chemical intolerance was diagnosed in 21 cases (20%). Eighteen of the 112 diagnoses were non-specific chemical poisonings or syndromes, with seven of these diagnoses related to pesticides. For detail on diagnosis-hazard relationships, the reader should examine Table E-3.

There were 19 cases with diagnoses related to environmental solvent exposure. Table E-4 summarizes their diagnoses; upper respiratory irritation, MCS, and headaches were the conditions most frequently attributed to environmental solvent exposure. Table E-5 summarizes the 17 diagnoses related to environmental pesticide exposures. The diagnoses most often reported were: non-specific pesticide poisonings or syndromes (7 cases) and MCS (4 cases).

VI. CHARACTERISTICS OF CASES THAT ARE POSSIBLY RELATED TO OCCUPATIONAL OR ENVIRONMENTAL EXPOSURES

The majority of cases (96.8%) that were reported to the AOEC from 1994 to 1996 were considered to be either probably or definitely related to an exposure. However, the remaining 100 cases (3.2%) reported diagnoses which the physician believed might have been caused or exacerbated by an exposure(s), but for which there was insufficient evidence to say that a causal relationship was more than 50% likely. Such cases were not included in past reports because the member clinics were inconsistent in their reporting. These "possible" cases -- where a real diagnosis/exposure relationship is suspected but not reported with confidence -- are a valuable means of identifying newly recognized or emerging hazards.

Demographics

In 1994-1996, five of the ten participating clinics reported 100 cases with possible relationships between exposure and disease. Of these, the majority (85 cases) were exposed to occupational hazards, while the remaining 15 cases concerned environmental hazards. One clinic

(Robert Wood Johnson, New Jersey) reported 71 of the 100 cases. (This clinic pattern may reflect a unique patient mix, consisting of many cases with exposure/diagnosis relationships that are not well-established, or it may reflect a varying tendencies among physicians to use this "possible" designation.) Given that only 2% of the "possibles" were related to asbestos, the following discussion will compare the possible cases to the 1382 cases with definitive relationships to occupational and environmental hazards other than asbestos (referred to for these comparisons as "total cases").

The age distribution of the "possibles" (Table P-1) is similar to that of the total cases. There is a slight difference in the racial makeup of the "possibles"(Figure P-1). Compared to the total cases, whites are over-represented (72%) and blacks are under-represented (13%).

Regarding employment status, the proportion of "possibles" remaining employed was similar to that seen among the non-asbestos occupational cases. However, a higher proportion of the "possibles" are unemployed (18%, Figure P-3) compared to the non-asbestos occupational cases (5%, Figure O-3). Also, a slightly lower proportion of the "possibles" are disabled (11% compared to 17%). This pattern may relate to the lack of certainty about whether diagnoses are work-related among the cases with possible diagnosis/hazard relationships.

Only 15% of the "possibles" were referred to their physician by an attorney, compared with 25% of the overall cases (Figure P-2). Obviously, an attorney has more of an interest in representing a client with an established exposure-disease relationship.

The confirmed union membership rate amongst the "possible" cases (32%) was indistinguishable from the total cases (29%) (Table P-1); however, the proportion of "unknown union status" for the total cases was almost twice that of the "possibles" because the clinics that reported "possible" cases tended to submit more complete information on union membership status.

A total of 61% of the cases in the "possibles" group were women (Table P-1), compared with only 49% of the 1382 total cases. Further analysis of Table P-3 indicated that 56% of these women reported an office job, compared with only 20% of the men in the "possibles" group, and 31% of the total cases.

Exposures and Diagnosis/Exposure Relationships

The exposures and diagnoses reflect this predominance of office workers (Table P-6); exposure to indoor air pollutants (NOS) was cited as the most likely agent for three of the top four diagnoses (upper respiratory irritation, asthma, and multiple chemical sensitivity) and was on equal footing with other potentially-related agents for the fourth most-common diagnosis (chronic fatigue). Other symptoms and ill-defined conditions -- such as headache, sick building syndrome, and shortness of breath -- were also seen frequently among these individuals with difficult-to-establish diagnosis/hazard relationships.

There were three tumors among these cases: a brain tumor possibly related to chlordane exposure, a bladder cancer possibly related to acetone exposure, and a case of acute myelogenous leukemia possibly related to ethylene glycol exposure. Other interesting possible diagnosis/hazard relationships can be seen in the detail of Table P-6. Tables P-7 and P-8 summarize the diagnoses in this subgroup which were possibly related to solvents and pesticides. The proportion of these

possible cases which cite pesticide exposures (13%) is much higher than seen among the non-asbestos occupational cases, and is similar to that seen for the environmental cases.

VII. DISCUSSION

The AOEC Database began in 1991 as a small pilot effort at occupational disease surveillance. From 1991 to 1995, eight to ten clinics participated in the AOEC Database project, this number dropped to 5 clinics in 1996. The number of cases reported per year have decreased slightly in 1994 and 1996, while increasing in 1995 due to a jump in asbestos-related cases reported from one clinic. Case reports from a few of the larger clinics tend to dominate the characteristics of cases in the Database. AOEC Staff have increased outreach efforts to member clinics to encourage Database participation, and this will continue to be a priority in the coming year. As it is difficult to maintain a quality surveillance program solely on the voluntary efforts or participating clinics, one of the priorities for the AOEC is to find a way to reimburse clinics for some of the cost of submitting case reports. We are confident that subsequent reports will show an increasing number of cases. At this time, the case data cannot be considered a representative sample of either cases seen in all AOEC clinics, or of occupational disease seen in the U.S.

Yet, the data presented in this report illustrate its potential utility as a tool for tracking occupational and environmental illnesses and chronic injuries treated across North America. Cumulatively for 1991-1996, the AOEC Database catalogs information on 5854 individuals diagnosed with diseases and injuries related to occupational and environmental exposures. The AOEC Database is a ready source of surveillance data for specific questions on types of diseases and exposures being diagnosed in our member clinics.

This report has presented a broad descriptive look at the data for cases with asbestos-related disease, disease related to occupational exposures other than asbestos, environmental disease, and (for the first time) diseases with "possible" relationships to occupational and environmental hazards. There is, of course, much more that could be examined in the AOEC data. For instance, we have taken only a limited look at the link between exposure, disease, industry, and occupation (see Section III). It would be interesting to look in further detail at these patterns, as well as at patterns of exposure or disease by ethnicity or gender. The AOEC case reports also provide a means of identifying cases for clinical or epidemiological studies focusing on particular disorders. For instance, one AOEC member is initiating a study on patients from the AOEC Database who have been diagnosed with asthma or RADS related to indoor air pollutants. Interested clinicians and researchers are welcome to contact the AOEC office for information on access to the Database.

The availability of the customized AOEC Database software has enabled more clinics and members to begin entering their own case data, for uploading to the centralized AOEC Database. Other Database enhancements have included computerized look-up utilities for industry and exposure coding. (A look-up utility for diagnosis codes is slated for 1998.) Database limitations noted by participating clinics were the motivating factor behind a software change introduced in June 1996. Clinics now have the ability to enter data on a complete series of clinic patients, including those without diagnoses related to occupational or environmental exposures. This change enables clinics to enter data on these types of cases, and then tag them as "clinic-only cases". The central AOEC data import utility excludes these cases from the AOEC Database, while keeping them in local clinic databases. This change was important because it makes the AOEC Database software a more useful information management tool for the clinics, while at the same time providing clinics with the ability to report the "related" cases to the AOEC.

"Supplemental screens" software was introduced in 1997, also to increase the practical utility of the Database to participating clinics. Data entry for the supplemental screens is coordinated with data entry for the AOEC Database screen, and is accessed through the same menus. The supplemental screens allow clinics to keep a comprehensive data base on their patient visits, including: identifying and contact data on patients; data on referring physicians, union officials, or attorneys; visit date tracking; results of exams and lab tests; and case disposition information. Complete information on "clinic-only cases" can also be entered into the supplemental database. The supplemental screens data are solely for the clinics' use, and are not reported to the AOEC Database.

Another Database limitation is that its relational DBASE file structure makes data analysis difficult. This relational structure includes three linked files: a file containing demographic information (one record for each patient); a file containing hazard information (up to three records for each patient); and a file containing diagnosis information (up to nine records for each patient). Some selection and simple listing capability is now available through the supplemental screens software. A priority for 1998 is the development of a menu-driven utility enabling clinics to run a broader range of analyses on their data.

At AOEC and at GWU, we have continued to make efforts to improve the quality of the data being submitted to and entered into the Database. Besides issues of coding (SIC, SOC, and ICD-9), these quality control issues include provision of: detailed and complete information on both occupation and industry; appropriate and complete diagnoses; appropriate and specific exposure data; and complete information linking each diagnosis to each hazard. Queries to the participating clinics are an integral part of this quality control effort, and we appreciate the willingness of clinics to go back and do more "homework". We also hope that clinics will recognize the importance of reporting specific information on exposures, whenever possible. Hopefully, this will result in the reporting of fewer non-specific exposures (eg., solvents NOS, dust NOS, hydrocarbons NOS, and pesticides NOS, all of which have been frequently reported in the past).

The issue of quality control as it relates to disease causality is an important one for participating clinics to consider. Careful readers may note in Tables O-6 through O-9, A-5, and E-3 through E-5, that some disease/exposure relationships which have been reported by participating clinics fall outside the scope of current knowledge in occupational medicine. While some of these disease/exposure specifications may be coding errors or the result of imprecise conclusions on the part of the clinician, others may be newly recognized disease/exposure relationships. Except in the case of very unlikely relationships, we (at GWU) have not attempted to second-guess the reporting clinics, and most cases have been included in this report. As members of a diverse group of "surveillance reporters", AOEC clinicians are encountering previously unrecognized causes of occupational and environmental disease. Thus, the need for case reports and for the Database as a whole to be accurate cannot be overemphasized. This will remain a critical challenge for the AOEC as the Database grows.

The AOEC Database solicits data only on cases with a diagnosed condition related (either definitively or possibly) to occupational or environmental exposures. There have been some questions as to whether particular types of cases qualify for inclusion. Some cases fall along the boundaries of the criteria for inclusion. In order to encourage uniformity among clinics in case reporting, the following guidelines are offered:

(1) Should cases be reported in which biological monitoring shows elevated levels of a substance or metabolite in the blood or urine? Many clinics have reported diagnoses such as "elevated blood lead" or "elevated urinary phenol"; some cases are specifically listed as asymptomatic. While these cases do make it clear that an exposure has occurred, it is not clear that a disease has resulted.

When there are related symptoms, or when the biologic marker clearly indicates the potential for adverse effects, report the case. When there are no symptoms, or when the biologic marker is only marginally raised/decreased, the case would not qualify for inclusion in the AOEC Database. Clinics who use the data entry software can, however, save these cases as "clinic-only" cases.

(2) Should cases be reported where there has been exposure to HIV or blood-borne pathogens via needlestick or other sharps or splash exposures, with no evidence of conversion? In some of these cases there is confirmed exposure to HIV, while in others the HIV or HepB status of the blood exposure may not be known.

Cases like these (exposure with no diagnosis) do not qualify for inclusion in the AOEC Database. A number of these cases were included in the 1991-1993 report with a diagnosis of acute trauma from HIV or blood-contaminated sharps, but are excluded from the Database after 1993. Again, these cases can be tracked as clinic-only cases by participating clinics.

(3) Should cases be reported where there have been real exposures, and extensive counseling about potential problems, eg., cancer risk or risk of adverse reproductive effects?

Again, cases like these (exposure with no diagnosis) are not included in the AOEC Database. They can be tracked as clinic-only cases by participating clinics.

(4) Should acute injury cases be reported to the AOEC database?

- *Injuries which occurred at work would qualify for inclusion if they are given a consult-level evaluation in the participating clinic.*
- *Injuries that did not occur at work should not be reported to the AOEC Database.*

(5) Should screening cases be reported to the AOEC Database?

Patients whose diagnoses were identified through screening programs and who were given a consult-level workup in the participating clinic will be included in the AOEC Database. With a screening diagnosis only (no consult workup) the case should not be included.

These examples point out that the AOEC Database provides only a partial picture of the broad spectrum of care provided at occupational and environmental medicine clinics. For many patients, an extensive clinical workup does not result in a diagnosis that can be definitively (or even possibly) linked to occupational or environmental hazards. The Database represents only those cases where diagnosis/exposure links have been established.

The AOEC Database has great potential utility as a surveillance resource for sentinel diseases and injuries and for emerging diseases and injuries. Information from the Database could be useful for targeting prevention efforts. In addition to the data found in this report, there are many other descriptive analyses that interested clinicians, researchers, or regulators might wish to see or carry out. We encourage such inquiries.

The AOEC Database is also a resource to link clinicians who wish to share information on the diagnosis and treatment of occupational and environmental conditions. For example, one physician who was treating tipple workers exposed to acrylamide called the AOEC office to see whether other clinicians were treating acrylamide-exposed workers, and was matched to an appropriate physician from another clinic. In another instance, an OSHA staff person called, looking to see whether the AOEC Database included any cases of chemical hepatitis due to specific pesticides or herbicides. The AOEC office was able to match him up not only with one of the clinics who had seen cases like this, but also with a leading pesticide expert known to the AOEC through contacts with the pesticide SENSOR program.

We welcome feedback from any reader of this report on the results, research ideas, or other issues raised by the report. As the AOEC Database continues to grow in size and representation, it will also grow in its practical utility, both for participating clinics and for the occupational and environmental health community as a whole. We (at AOEC and at GWU) are committed to working on enhancements to better serve the needs of participating clinics, and to enhance the utility of the Database for surveillance of occupational and environmental disease.

AOEC CASE REPORT FORM

IDENTIFIER
Clinic
#_____
Patient
#_____

COMPLAINT_____

_____

FIRST VISIT
/ /

DATE DX
/ /

YEAR BORN: 19_____

ZIP CODE - PC:_____-_____

ETHNICITY
__ Asian/Pac. Islander
__ Black
__ Hispanic
__ Native American/ Aboriginal
__ White
__ Other

SEX
_____ Male
_____ Female

REFERRED BY
__ Self Referred
__ Physician
__ Employer
__ Attorney
__ Union
__ Govt. Agency
__ Other

UNION ? __Y __N

UNION NAME_____

JOB STATUS
___Employed
___Unemployed
___Retired
___Disabled

CURRENT JOB_____ **CODE**_____
INDUSTRY_____ **CODE**_____

MOST RELEVANT JOB_____ **CODE**_____
INDUSTRY_____ **CODE**_____

HAZARDS
#1_____ **CODE**_____ **OCC/ENV?**____
#2_____ **CODE**_____ **OCC/ENV?**____
#3_____ **CODE**_____ **OCC/ENV?**____

DIAGNOSES
#1_____ **CODE**_____ **HAZ #1**__ **#2**___ **#3**___
#2_____ **CODE**_____ **HAZ #1**__ **#2**___ **#3**___
#3_____ **CODE**_____ **HAZ #1**__ **#2**___ **#3**___

COMMENTS_____

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AOEC DATABASE, 1994 - 1996

"SUMMARY" TABLES AND FIGURES

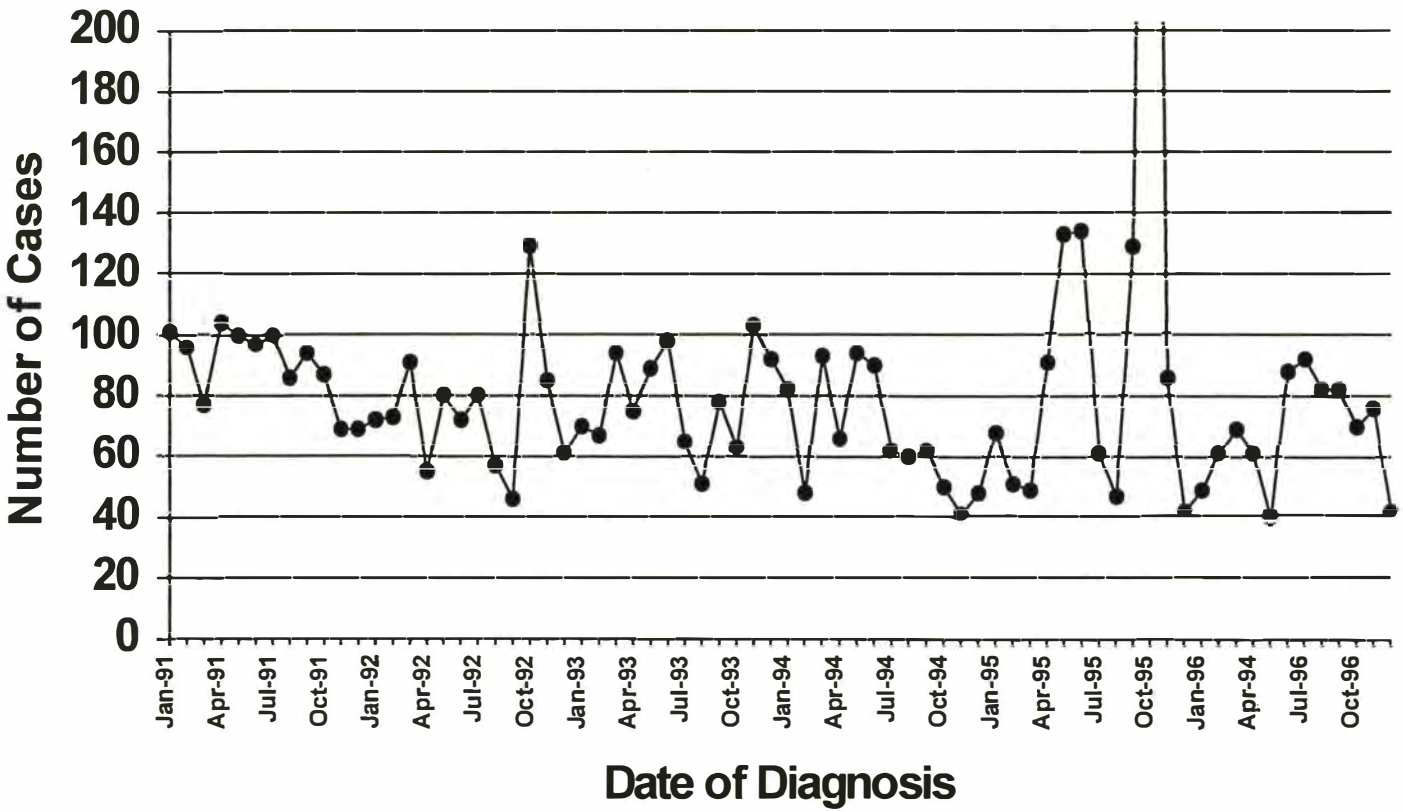
All Cases Related to Occupational or Environmental Exposures, Including Possibles
(N=3080)

Table S-1 - Summary of AOEC Cases Related to Occupational or Environmental Exposures (N=3080)

Category	1994	1995	1996	Total*	(%)
Cases Definitively Related to Asbestos Exposure					
Occupational Exposure	218	1053	458	1731	
Environmental Exposure	0	1	3	4	
Both	0	5	0	5	
Total	**218**	**1059**	**459**	**1740**	**(56.5)**
Cases Definitively Related to Other Exposures					
Occupational Exposure	523	389	349	1261	
Environmental Exposure	34	41	14	89	
Both	6	8	2	16	
Total	**563**	**438**	**365**	**1366**	**(44.4)**
Cases Possibly Related to Asbestos Exposure					
Occupational Exposure	1	1	0	2	
Environmental Exposure	0	0	0	0	
Both	0	0	0	0	
Total	**1**	**1**	**0**	**2**	**(0.1)**
Cases Possibly Related to Other Exposures					
Occupational Exposure	48	23	10	81	
Environmental Exposure	14	2	0	16	
Both	4	0	0	4	
Total	**66**	**25**	**10**	**101**	**(3.3)**

* Because there are 129 cases with diagnosis/hazard relationships counted in more than one category above, the total number of cases across categories exceeds 3080. Most of these double-counted cases (108) have diagnoses related to occupational asbestos exposure as well as to occupational exposures other than asbestos. The remainding 21 cases demonstrated a variety of combinations.

Figure S-1 - All AOEC Cases, Frequency of Diagnoses (N=5854) By Month 1/91-12/96



*** 551 cases in Oct-95.**

Table S-2 - All AOEC Cases Related to Occupational or Environmental Exposures (N=3080)

Demographic Characteristics

	1994	1995	1996	**Total** Subtotal	**(%)** (%)
Cases from Participating Clinics	**796**	**1464**	**820**	**3080**	**(100.0)**
CA, San Francisco Gen'l Hosp.	43	3	0	46	(1.5)
DC, George Washington Univ.	135	161	318	614	(19.9)
IL, Cook County Hospital	82	0	0	82	(2.7)
MA, Cambridge Hospital	25	20	0	45	(1.5)
MA, Mass. Respiratory Hosp.	72	160	128	360	(11.7)
MI, St. Lawrence Hospital	209	1027	371	1607	(52.2)
MI, Wayne State University	0	1	1	2	(0.1)
NJ, Robert Wood Johnson	192	83	0	275	(8.9)
PA, Medical College of PA	8	9	2	19	(0.6)
RI, Brown University	30	0	0	30	(1.0)
Age					
< 20	3	4	0	7	(0.2)
20 - 29	44	39	40	123	(4.0)
30 - 39	162	136	116	414	(13.4)
40 - 49	225	252	159	636	(20.6)
50 - 59	194	374	210	778	(25.3)
> 60	168	659	295	1122	(36.4)
Gender					
Male	490	1224	624	2338	(75.9)
Female	306	240	196	742	(24.1)
Union Member (Occupational Cases Only, N=2976)					
Yes	409	162	119	690	(22.4)
No	290	151	87	528	(17.1)
Unknown	53	1108	597	1758	(57.1)

Figure S-2 - Ethnicity
All AOEC Cases, 1994-1996 (N=3080)

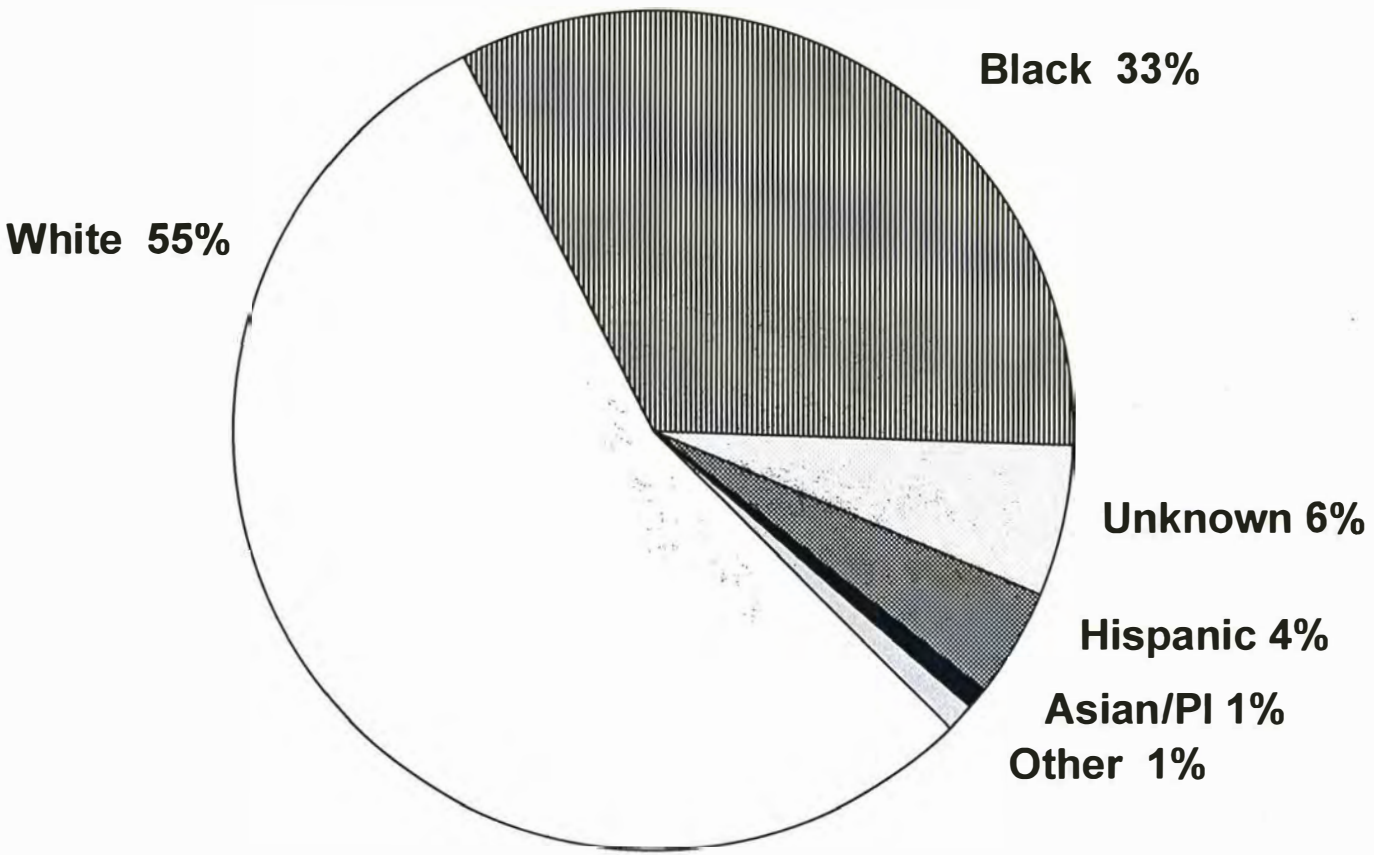


Figure S-3 - Referral Source
All AOEC Cases, 1994-1996 (N=3080)

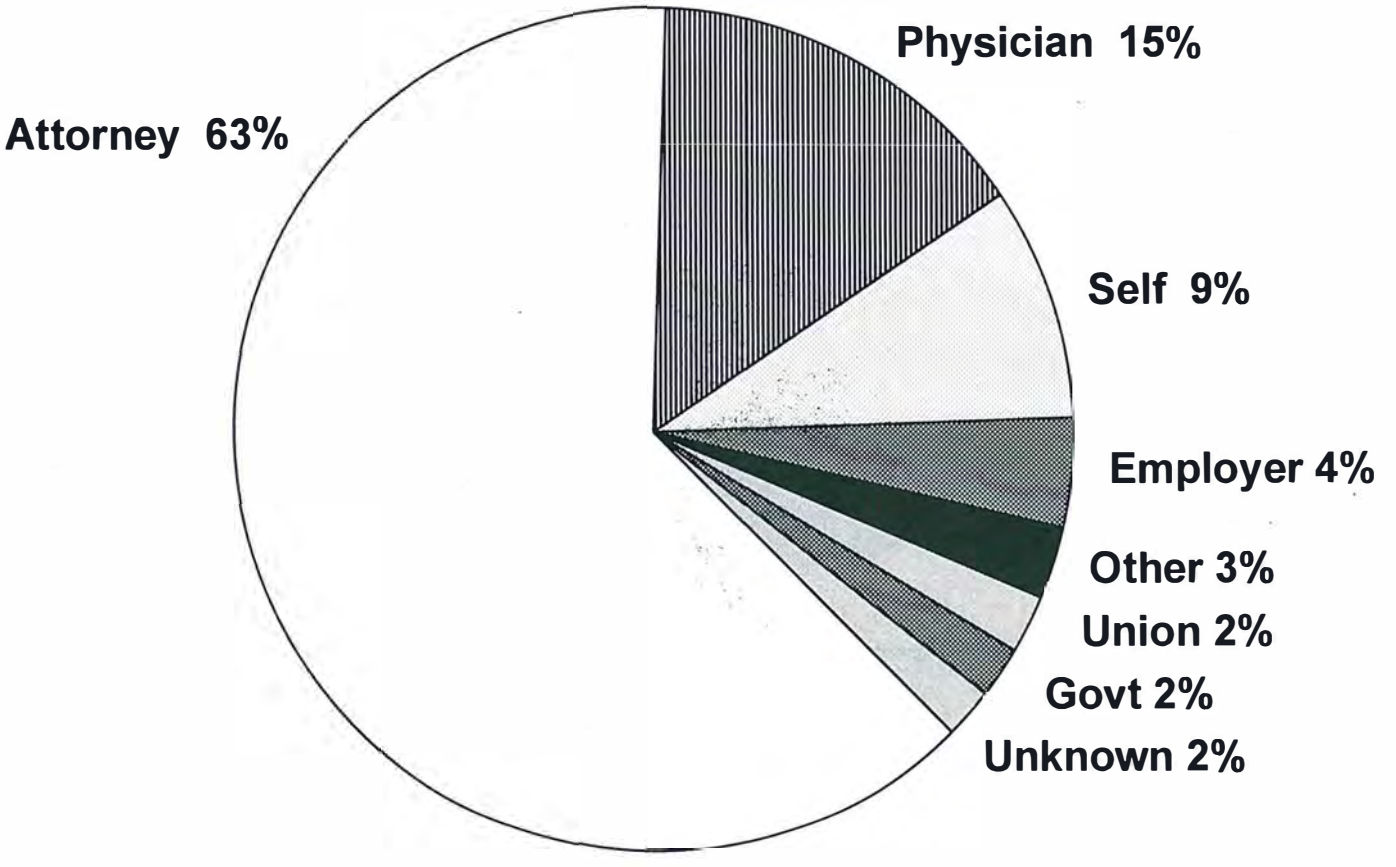
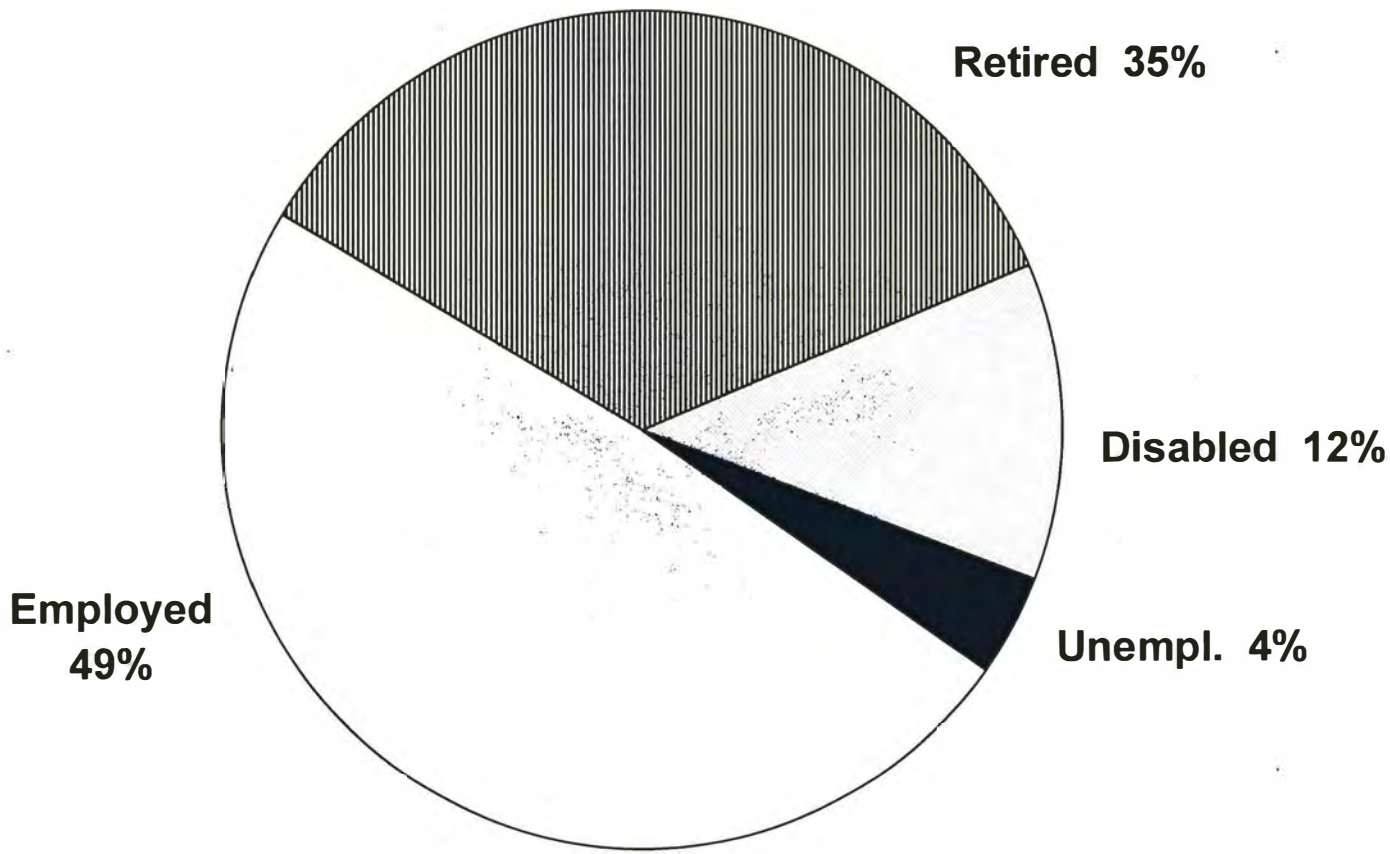


Figure S-4 - Job Status
All AOEC Cases, 1994-1996 (N=2976*)



* Occupational Cases Only

Table S-3 - All AOEC Occupational Cases (N=2976)

Current or Most Relevant Industry

SIC CODE	INDUSTRY	1994	1995	1996	TOTAL	(%)*
01-09	Agriculture	4	4	1	9	(0.3)
10-14	Mining	8	1	3	12	(0.4)
15-17	Construction	152	166	291	609	(20.5)
20-39	Manufacturing	188	929	136	1253	(42.1)
40-49	Transportation, Communication, Electric, Gas and Sanitary Services	129	87	147	363	(12.2)
50-51	Wholesale Trade	0	3	4	7	(0.2)
52-59	Retail Trade	7	11	22	41	(1.4)
60-67	Finance, Insurance and Real Estate	9	9	9	27	(0.9)
70-89	Services	199	164	135	498	(16.7)
91-97	Public Administration	42	41	52	135	(4.5)
	Missing	14	6	3	23	(0.8)
	Total	**752**	**1421**	**803**	**2976**	

* Percents do not total to 100 due to rounding.

Table S-4 - All AOEC Occupational Cases (N= 2976)

Current or Most Relevant Occupation

SOC CODE	OCCUPATION	1994	1995	1996	Total	(%)*
11-14	Executive, Administrative, and Managerial	29	29	28	86	(2.9)
16	Engineers and Architects	4	2	6	12	(.4)
17-18	Natural Scientists and Mathematicians	11	6	11	28	(.9)
19-21	Social Scientists, Social Workers and Lawyers	6	8	3	17	(.6)
22-25	Teachers, Librarians and Counselors	25	21	16	62	(2.1)
26, 28	Health Diagnosing and Treating Practitioners	5	4	2	11	(.4)
29-30	Registered Nurses, Pharmacists and Therapists	39	48	19	106	(3.6)
32-33	Writers, Artists and Entertainers	17	11	4	32	(1.1)
36	Health Technologists and Technicians	19	3	2	24	(.8)
37-39	Technologists and Technicians, Except Health	11	9	8	28	(.9)
40-43	Marketing and Sales Occupations	13	5	4	22	(.7)
45-47	Administrative Support Occupations, Including Clerical	71	47	48	166	(5.6)
50-52	Service Occupations	37	56	91	185	(6.2)
55-56	Agricultural Occupations	6	5	5	16	(.5)
60-61	Mechanics and Repairers	64	96	60	220	(7.4)
63-65	Construction and Extractive Occupations	139	202	227	568	(19.1)
67-69	Precision Production Occupations	75	49	91	215	(7.2)
71-78	Production Working Occupation	97	602	68	767	(25.8)
81-83	Transportation and Material Moving Occupations	19	51	32	102	(3.4)
86-87	Handlers, Equipment Cleaners, Helpers and Laborers	61	163	70	295	(9.9)
91	Military Occupations	1	0	1	2	(.1)
99	Miscellaneous/Missing Occupations	3	4	4	11	(.4)
	Total	**752**	**1421**	**803**	**2976**	

* Percents do not total to 100 due to rounding.

Table S-5 - All AOEC Occupational Cases Belonging to Unions, 1994-1996 (N=690)

Union Membership

Union Name	Total	(%)*
AFL-CIO	4	(0.6)
United **Automobile**, Aerospace & Agricultural Implement Workers of America	43	(6.2)
Bakery, Confectionery and Tobacco Workers Int'l Union	3	(0.4)
Int'l Brotherhood of **Boilermakers**, Iron Ship Builders, Blacksmiths, Forgers and Helpers	8	(1.2)
Int'l Union of **Bricklayers** and Allied Craftsmen	13	(1.9)
United Brotherhood of **Carpenters** & Joiners of America	16	(2.3)
Amalgamated **Clothing and Textile** Workers Union	4	(0.6)
Communication Workers of America	19	(2.8)
National **Education** Association	25	(3.6)
Int'l Brotherhood of **Electrical Workers**	42	(6.1)
Int'l Union of **Electronic,** Electrical, Salaried, Machine and Furniture Workers	7	(1.0)
Int'l Union of **Elevator Constructors**	1	(0.1)
Int'l Association of **Fire Fighters**	9	(1.3)
United **Food and Commercial Workers** Int'l Union	7	(1.0)
Graphic Communications Int'l Union	4	(0.6)
American Federation of Government Employees	3	(0.4)
National Federation of Federal **Government Employees**	2	(0.3)
Int'l Association of Heat & Frost **Insulators and Asbestos Workers**	14	(2.0)
Council of **Iron Workers**	1	(0.1)
Int'l. Association of Bridge, Structural & Ornamental **Iron Workers**	9	(1.3)
Laborers Int'l Union	54	(7.8)
Int'l Association of **Machinist and Aerospace Workers**	29	(4.2)
Brotherhood of **Maintenance of Way Employees**	2	(0.3)
Industrial Union of **Marine and Shipbuilding Workers** of America	7	(1.0)
Int'l **Masonry** Institute	4	(0.6)
United **Mine Workers**	6	(0.9)
Newspaper Guild	7	(1.0)
Federation of **Nurses and Health Practitioners**	1	(0.1)
Massachusetts **Nurses Assoc.**	72	(10.4)
Office and Professional Employees Int. Union	3	(0.4)

* Percents do not total to 100 due to rounding.

Union Name	Total	(%)*
National Union of **Public and General Employees**	1	(0.1)
Oil, Chemical and Atomic Workers	1	(0.1)
Int'l Union of **Operating Engineers**	11	(1.6)
Operative Plasterers' and Cement Masons Int'l Association	14	(2.0)
Int'l Brotherhood of **Painters** and Allied Trades	8	(1.2)
United **Paperworkers** Int'l Union	1	(0.1)
United Assoc of Journeyman & Apprentices of the **Plumbing and Pipefitting** Industry	70	(10.1)
American **Postal Workers** Union	2	(0.3)
Intl Allied **Printing Trades** Assoc.	1	(0.1)
Brotherhood of **Railway, Airline, and Steamship** Clerks, Freight Handlers...	1	(0.1)
Brotherhood of **Railway Carmen**	5	(0.7)
Railway Supervisors Assoc	1	(0.1)
Retail, Wholesale, and Dept Store Union	1	(0.1)
United Union of **Roofers,** Waterproofers and Allied Workers	1	(0.1)
American Assoc. of Classified **School Employees**	1	(0.1)
Intl **Security Officers,** Police,and Guards Union	1	(0.1)
Service Employees Int'l Union	6	(0.9)
Sheet Metal Workers' Int'l Association	42	(6.1)
American Federation of **State County & Municipal Employees**	13	(1.9)
United **Steel Workers** of America	3	(0.4)
American Federation of **Teachers**	5	(0.7)
Int'l Brotherhood of **Teamsters,** Chauffers, Warehouseman and Helpers of America	6	(0.9)
Tile, Marble, Terrazzo, Finishers, Shopworkers and Granite Cutters Int'l Union	1	(0.1)
Amalgamated **Transit** Union	2	(0.3)
Transport Workers Union	1	(0.1)
United **Transportation** Union	1	(0.1)
National **Treasury Employees** Union	1	(0.1)
American Association of **University Employees**	2	(0.3)
Utility Workers' Union of America	16	(2.3)
Unknown/Incomplete Union Name	52	(7.5)
Total	**690**	

Table S-6-All AOEC Cases Related to Occupational or Environmental Exposures, 1994-1996 (3080 Cases, 3482 Hazards)

Hazards Related to One or More Diagnoses

HAZ CODE	HAZARD	FREQ	(%) of HAZARDS
010	**MINERAL AND INORGANIC DUSTS**	**1852**	**(53.2)**
010.00	Dust, NOS	29	(0.9)
010.02	Asbestos	1742	(50.7)
010.03	Cement Dust	3	(0.1)
010.04	Carbon Black	1	(0.0)
010.06	Coal	7	(0.2)
010.07	Fly Ash	1	(0.0)
010.09	Man-Made Mineral Fibers	2	(0.1)
010.10	Plaster	1	(0.0)
010.12	Silica, Amorphous	1	(0.0)
010.13	Silica, Crystalline	64	(0.7)
010.16	Ash, NOS	1	(0.0)
020	**METALS AND METALLOIDS**	**92**	**(2.6)**
020.00	Metal Fumes, NOS	3	(0.1)
020.01	Aluminum	2	(0.1)
020.05	Arsenic	5	(0.1)
020.08	Beryllium	1	(0.0)
020.10	Boron	1	(0.0)
020.12	Cadmium	6	(0.2)
020.14	Chromium, Not Hexavalent	1	(0.0)
020.16	Copper	2	(0.1)
020.21	Lead, Inorganic	33	(1.0)
020.22	Lead, Organic	1	(0.0)
020.25	Mercury, Inorganic	3	(0.1)
020.26	Mercury, Organic	1	(0.0)
020.28	Nickel	1	(0.0)
020.30	Platinum	1	(0.0)
020.31	Selenium	1	(0.0)
020.32	Silver	1	(0.0)
020.39	Zinc	4	(0.1)
020.46	Heavy Metals, NOS	1	(0.0)
020.47	Metals, NOS	1	(0.0)
020.49	Copper Phthalocyanine	1	(0.0)
021.00	Metal Dust, NOS	2	(0.1)
022.00	Chromium, Hexavalent, NOS	3	(0.1)
022.04	Chromic Acid	1	(0.0)
023.00	Welding, NOS	14	(0.4)
023.03	Welding Fume, Copper/Nickel	1	(0.0)
023.06	Welding Fume, Galvanized Metal	1	(0.0)

030	**HALOGENS (INORGANIC)**	**5**	**(0.1)**
030.02	Chlorine	5	(0.1)
040	**MISCELLANEOUS INORGANIC COMPOUNDS**	**18**	**(0.5)**
040.03	Carbon Dioxide	1	(0.0)
040.04	Carbon Monoxide	4	(0.1)
040.05	Fluxes, NOS	1	(0.0)
040.06	Hydrogen Sulfide	3	(0.1)
040.11	Ozone	1	(0.0)
040.20	Sulfur Oxides	4	(0.1)
040.24	Irritant Gases, NOS	3	(0.1)
042.02	Sodium Nitrate	1	(0.0)
050	**ACIDS, BASES, AND OXIDIZING AGENTS**	**36**	**(1.0)**
050.00	Acids, Bases, Oxidizers, NOS	7	(0.2)
050.01	Quaternary Ammonium Compounds	1	(0.0)
050.02	Bleach	3	(0.1)
050.10	Hydrochloric Acid	2	(0.1)
050.13	Nitric Acid	1	(0.0)
050.15	Phosphoric Acid	2	(0.1)
050.17	Potassium Hydroxide	1	(0.0)
050.18	Sodium Hydroxide	1	(0.0)
050.22	Sodium Metasilicate	1	(0.0)
050.24	Sulfuric Acid	6	(0.2)
050.30	Aluminum Hydroxide	1	(0.0)
050.34	Acetic Acid	1	(0.0)
050.37	Trifluoroacetic Acid	1	(0.0)
050.40	Sodium Bisulfate	1	(0.0)
050.41	Potassium Carbonate	1	(0.0)
052.02	Ammonia Solution	5	(0.1)
052.03	Ammonium Salts	1	(0.0)
060	**ALIPHATIC AND ALICYCLIC HYDROCARBONS**	**26**	**(0.7)**
060.03	Heptane	1	(0.0)
060.04	Isobutane	1	(0.0)
060.10	Turpentine	1	(0.0)
060.11	4-PC	2	(0.1)
061	Petroleum Derivatives		
061.00	Petroleum Fractions	1	(0.0)
061.01	Petroleum Spirits	1	(0.0)
061.02	Naphtha	5	(0.1)
061.03	Kerosene	1	(0.0)
061.04	Gasoline	3	(0.1)
061.05	Jet Fuel	2	(0.1)
061.06	Diesel Fuel	4	(0.1)
061.07	Asphalt	4	(0.1)

070	**ALCOHOLS**	**10**	**(0.3)**
070.05	Ethanol	2	(0.0)
070.06	Isopropyl Alcohol	7	(0.2)
070.07	Methanol	1	(0.0)
080	**GLYCOLS**	**3**	**(0.1)**
080.01	Ethylene Glycol	3	(0.1)
090	**GLYCOL ETHERS**	**6**	**(0.2)**
090.00	Glycol Ethers, NOS	3	(0.1)
090.01	Propylene Glycol Ethers	1	(0.0)
091	Ethylene Glycol Ethers		
091.03	EGBE	2	(0.1)
100	**ETHERS**	**2**	**(0.1)**
100.05	Ethyl Ether	1	(0.0)
100.08	Methyl Tertiary Butyl Ether	1	(0.0)
110	**EPOXY COMPOUNDS**	**14**	**(0.4)**
110.02	Epoxy Resins	6	(0.2)
110.03	Ethylene Oxide	8	(0.2)
120	**ALDEHYDES AND ACETALS**	**24**	**(0.7)**
120.03	Formaldehyde	12	(0.3)
120.05	Glutaraldehyde	11	(0.3)
120.09	Crotonaldehyde	1	(0.0)
130	**KETONES**	**7**	**(0.2)**
130.01	Acetone	1	(0.0)
130.03	Methyl Ethyl Ketone	6	(0.2)
140	**ESTERS**	**4**	**(0.1)**
142	Acrylates		
142.00	Acrylates, NOS	2	(0.1)
142.04	Methyl Methacrylate	2	(0.1)
160	**AROMATIC HYDROCARBONS**	**12**	**(0.3)**
160.00	Aromatic Hydrocarbons, NOS	1	(0.0)
160.02	Toluene	4	(0.1)
160.03	Xylene	3	(0.1)
160.04	Styrene	3	(0.1)
161	Polycyclic Aromatic Hydrocarbons		
161.00	Polycyclic Aromatic Hydrocarbons, NOS	1	(0.0)

170	**HYDROCARBONS, NOS**	**145**	**(4.2)**
170.00	Hydrocarbons, NOS	6	(0.2)
170.01	Cutting Oils	7	(0.2)
170.03	Oils, NOS	2	(0.1)
171	Solvents, NOS		
171.00	Solvents, NOS	104	(3.0)
171.01	Paint	23	(0.7)
171.03	Stripper	1	(0.0)
171.04	Degreaser, NOS	2	(0.1)
180	**PHENOLS AND PHENOLIC COMPOUNDS**	**4**	**(0.1)**
180.04	Phenol	2	(0.1)
180.07	Orthophenylphenol	1	(0.0)
181	Chlorinated Phenols		
181.00	Chlorinated Phenols, NOS	1	(0.0)
190	**HALOGENATED ALIPHATIC HYDROCARBONS (EXCEPT ORGANOCHLORINE PESTICIDES)**	**168**	**(4.8)**
190.00	Chlorinated Hydrocarbons, NOS	3	(0.1)
190.03	Chloroform	1	(0.0)
190.08	Methyl Chloroform (1,1,1-Trichloroethane)	75	(2.2)
190.09	Methylene Chloride	3	(0.1)
190.10	Perchloroethylene (Tetrachloroethylene)	72	(2.1)
190.12	1,1,2-Trichloroethane	5	(0.1)
190.13	Trichloroethylene	5	(0.1)
192	Flurocarbons		
192.01	Freon	3	(0.1)
192.05	Difluoroethane	1	(0.0)
200	**HALOGENATED AROMATIC HYDROCARBONS**	**18**	**(0.5)**
200.01	Agent Orange	1	(0.0)
200.04	Chlorinated Dibenzodioxins	2	(0.1)
200.07	PCBs	1	(0.0)
200.11	Chlorophenoxy Herbicides, NOS	1	(0.0)
221	Diisocyanates		
221.00	Isocyanates, NOS	11	(0.3)
221.01	Toluene Diisocyanate	2	(0.1)
230	**ALIPHATIC AND ALICYCLIC AMINES**	**3**	**(0.1)**
231	Ethanolamines		
231.00	Ethanolamines, NOS	2	(0.1)
232	Polyamines		
232.01	Ethylenediamine	1	(0.0)

250	**AROMATIC AND AMINO COMPOUNDS (INCLUDING HETEROCYCLIC)**	**7**	**(0.2)**
250.09	Picric Acid	1	(0.0)
250.17	Dyes, NOS	5	(0.1)
251.06	Phenylene Diamine	1	(0.0)
260	**ALIPHATIC (INCLUDING HERE ROCYCLIC) AND MISC. NITROGEN COMPOUNDS**	**2**	**(0.1)**
260.17	Triazine	1	(0.0)
260.25	Garlon 4	1	(0.0)
270	**POLYMERS**	**59**	**(1.7)**
270.00	Polymers, NOS	1	(0.0)
270.02	Latex, Natural Rubber	45	(1.2)
270.06	Polyethylene	1	(0.0)
270.07	Polyurethane	4	(0.1)
270.09	Polyvinyl Chloride	2	(0.1)
270.10	Silicone	1	(0.0)
270.15	Resin Systems, NOS	2	(0.1)
270.16	Urea Formaldehyde	1	(0.0)
270.20	Polystyrene	2	(0.1)
280	**ORGANOCHLORINE PESTICIDES**	**4**	**(0.1)**
280.00	Organochlorine Pesticides, NOS	3	(0.1)
280.02	Chlordane	1	(0.0)
290	**ORGANOPHOSPHATE PESTICIDES AND CARBAMATE PESTICIDES**	**20**	**(0.6)**
290.01	Piperonyl Butoxide	1	(0.0)
291	Organophosphate Pesticides		
291.00	Organophosphate Pesticides, NOS	8	(0.2)
291.01	Malathion	1	(0.0)
291.05	Chlorpyrifos	5	(0.1)
291.10	Dichlorvos	1	(0.0)
291.11	Acephate	1	(0.0)
292	Carbamate Pesticides		
292.00	Carbamate Pesticides, NOS	2	(0.1)
292.04	Baygon	1	(0.0)
310	**ORGANIC SULFUR COMPOUNDS**	**8**	**(0.2)**
310.01	Carbon Disulfide	6	(0.2)
310.11	Sulfites, NOS	2	(0.1)

320	**MISCELLANEOUS CHEMICALS AND MATERIALS REFERENCED BY USE**	**294**	**(8.4)**
320.01	Air Pollutants, Indoor	198	(5.8)
320.05	Carbonless Paper	1	(0.0)
320.06	Chemicals, NOS	18	(0.5)
320.08	Fungicide, NOS	2	(0.1)
320.11	Glues, NOS	5	(0.1)
320.12	Hair Products	7	(0.2)
320.13	Herbicides, NOS	2	(0.1)
320.14	Lubricants, NOS	9	(0.3)
320.15	Odors	2	(0.1)
320.16	Pesticides, NOS	15	(0.4)
320.17	Photo Developing Chemicals, NOS	7	(0.2)
320.18	Pyrethrins	3	(0.1)
320.19	Surfactants, NOS	1	(0.0)
320.23	Perfume, NOS	5	(0.1)
320.29	Printing Chemicals, NOS	1	(0.0)
320.30	N-Octyl Bicycloheptene Dicarboximide	1	(0.0)
321	Pharmaceutical Compounds		
321.00	Pharmaceuticals, NOS	1	(0.0)
321.22	Trental	1	(0.0)
321.26	Ceclor	1	(0.0)
322	Cleaning Materials		
322.00	Cleaning Materials, NOS	1	(0.0)
322.01	Soap	6	(0.2)
323	Waste		
323.00	Waste, NOS	2	(0.1)
323.01	Waste, Hazardous	2	(0.1)
323.02	Leachate	1	(0.0)
323.03	Sewer Water	1	(0.0)
323.04	Waste, Treated Human Sludge	1	(0.0)
330	**PYROLYSIS PRODUCTS**	**45**	**(1.3)**
330.01	Cigarette Smoke	5	(0.1)
330.02	Plastic Smoke	2	(0.1)
330.03	Smoke, NOS	20	(0.6)
330.06	Smoke, Lead-Containing	1	(0.0)
331	Exhaust		
331.00	Exhaust, NOS	3	(0.1)
331.01	Diesel Exhaust	9	(0.3)
331.02	Engine Exhaust	5	(0.1)

350	**PHYSICAL FACTORS**	**162**	**(4.7)**
350.00	Physical Factors, NOS	2	(0.1)
350.01	Noise	4	(0.1)
350.02	Cold	3	(0.1)
350.03	Heat	3	(0.1)
350.04	Humidity, Low	3	(0.1)
352	Non-Ionizing Radiation		
352.00	Radiation, Nonionizing, NOS	1	(0.0)
352.01	Radiation, Electromagnetic	1	(0.0)
353	Trauma-Related Exposures		
353.00	Trauma, Acute, NOS	29	(0.8)
353.03	Fall, NOS	69	(2.0)
353.05	Motor Vehicle Accident	8	(0.2)
353.06	Struck by Motor Vehicle (Road)	2	(0.1)
353.08	Struck by Falling Object	7	(0.2)
353.09	Struck Against/Struck By Objects or Persons	19	(0.6)
353.10	Caught In or Between Objects	5	(0.1)
353.11	Cutting or Piercing Object, Except Blood-Contam.	2	(0.1)
353.12	Assaulted	1	(0.0)
354	Vibration		
354.00	Vibration, NOS	2	(0.1)
354.02	Vibration, Whole Body	1	(0.0)
360	**ERGONOMIC FACTORS**	**360**	**(10.3)**
360.00	Ergonomic Factors, NOS	20	(0.6)
360.01	Contact Pressure	2	(0.1)
360.02	Keyboard Use	117	(3.4)
360.03	Repetitive Motion	121	(3.5)
360.04	Stress	2	(0.1)
360.07	Bodily Reaction	3	(0.1)
361	Force		
361.01	Forceful Movements, NOS	8	(0.2)
361.02	Lifting	57	(1.7)
361.03	Gripping, Forceful	8	(0.2)
362	Posture		
362.00	Posture, NOS	3	(0.1)
362.01	Posture, Upper Extremity	3	(0.1)
362.02	Posture, Body - Static	3	(0.1)
362.03	Posture, Body - Dynamic	13	(0.4)
370	**PLANT MATERIAL**	**17**	**(0.5)**
370.00	Plant Material, NOS	2	(0.1)
370.01	Paper Dust	3	(0.1)
370.05	Fruit Juices	1	(0.0)
370.07	Grass Cuttings	1	(0.0)
370.10	Pollen	2	(0.1)

371	Flour		
371.00	Flour, NOS	4	(0.1)
373	Wood Dusts		
373.00	Wood Dust, NOS	3	(0.1)
373.24	Hardwood, Tropical, NOS	1	(0.0)
380	**ANIMAL MATERIALS**	**3**	**(0.1)**
380.16	Avian Material, NOS	1	(0.0)
382	Insect Materials		
382.00	Insect, NOS	1	(0.0)
382.21	Insect Bite, NOS	1	(0.0)
390	**MICROORGANISMS**	**52**	**(1.5)**
390.00	Microorganisms, NOS	2	(0.1)
390.01	Mold	20	(0.6)
390.07	Infectious Agents, NOS	2	(0.1)
390.08	HIV Exposure	2	(0.1)
390.10	Tuberculosis	23	(0.7)
390.12	Hepatitis C	3	(0.1)
	TOTAL	**3482**	**(100.0)**

AOEC DATABASE, 1994 - 1996

"OTHER OCCUPATIONAL" TABLES AND FIGURES

Cases Related to Occupational Exposures Other than Asbestos (N=1277)

Table O-1 - AOEC Cases Related to Occupational Exposures, Other Than Asbestos (N=1277)

Demographic Characteristics

	1994	1995	1996	**Total** Subtotal	(%) (%)
Cases from Participating Clinics	**529**	**397**	**351**	**1277**	**(100.0)**
CA, San Francisco Gen'l Hosp.	33	3	0	36	(2.8)
DC, George Washington Univ.	89	103	228	420	(32.8)
IL, Cook County Hospital	75	0	0	75	(5.9)
MA, Cambridge Hospital	24	19	0	43	(3.4)
MA, Mass. Respiratory Hosp.	53	110	90	253	(19.8)
MI, St. Lawrence Hospital	114	110	30	254	(19.9)
MI, Wayne State University	0	1	1	2	(0.2)
NJ, Robert Wood Johnson	111	44	0	155	(12.1)
PA, Medical College of PA	8	7	2	17	(1.3)
RI, Brown University	22	0	0	22	(1.7)
Age					
< 20	0	0	0	0	(0)
20 - 29	35	33	38	106	(8.3)
30 - 39	140	122	110	372	(29.1)
40 - 49	185	110	113	408	(31.9)
50 - 59	108	74	63	245	(19.2)
>60	61	58	27	146	(11.4)
Gender					
Male	279	210	175	664	(52.0)
Female	250	187	176	613	(48.0)
Union Member					
Yes	235	88	51	373	(29.2)
No	247	125	65	437	(34.2)
Unknown	47	184	236	467	(36.6)

Figure O-1 - Ethnicity
AOEC Cases Related to Occupational Exposures Other Than Asbestos, 1994-1996 (N=1277)

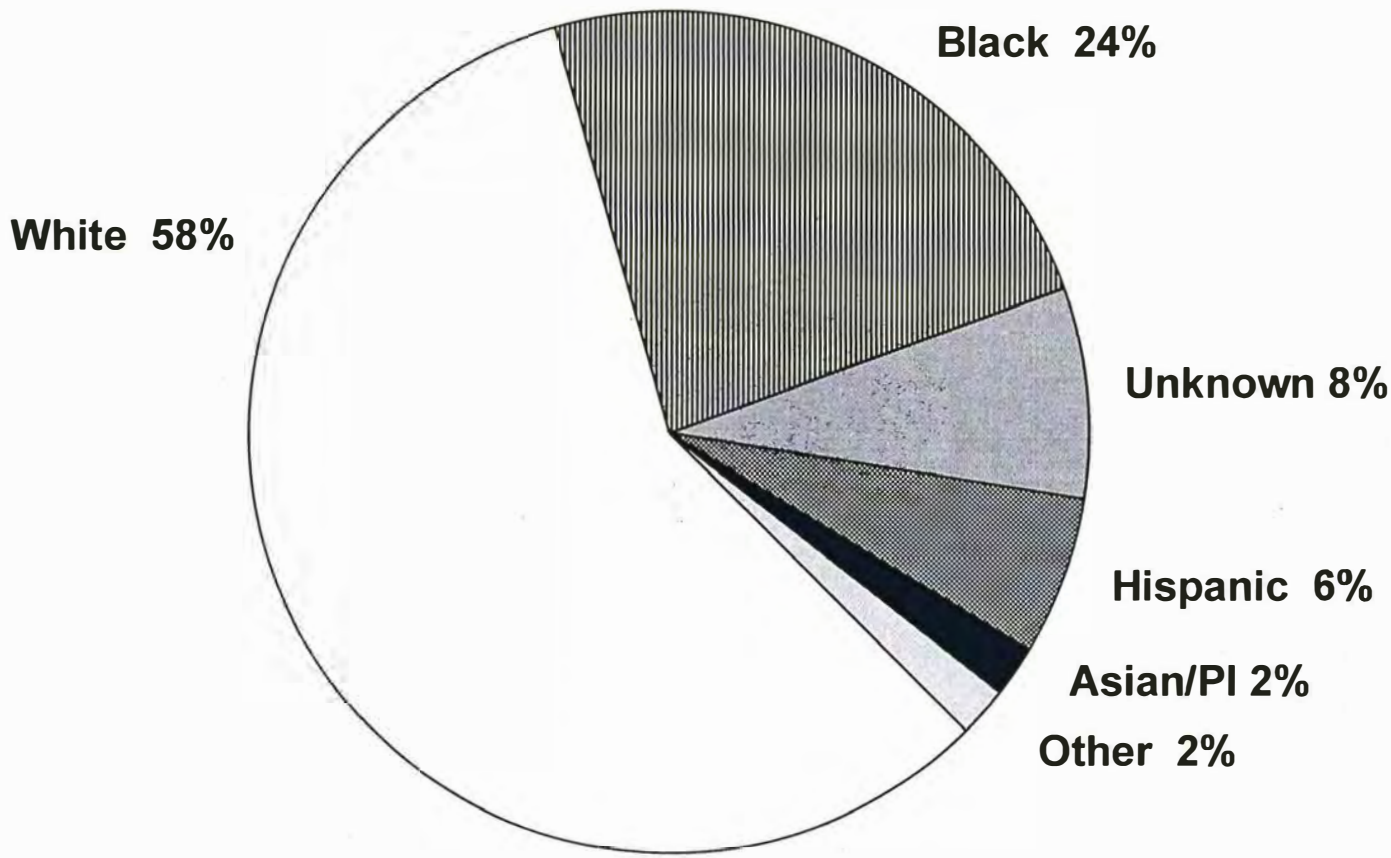


Figure O-2 - Referral Source
AOEC Cases Related to Occupational Exposures Other Than Asbestos 1994-1996 (N=1277)

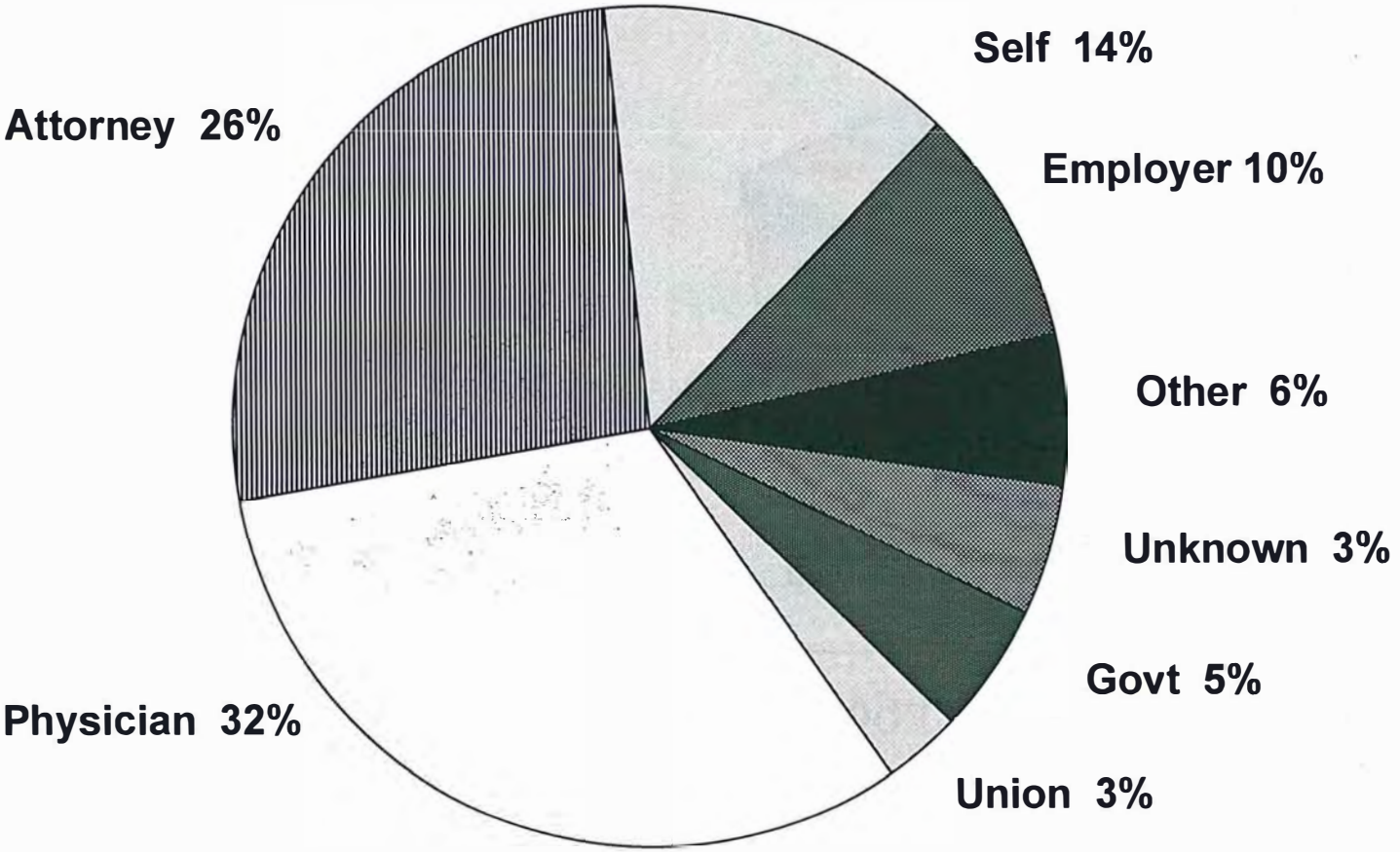


Figure O-3 - Job Status
AOEC Cases Related to Occupational Exposures Other Than Asbestos, 1994-1996 (N=1277)

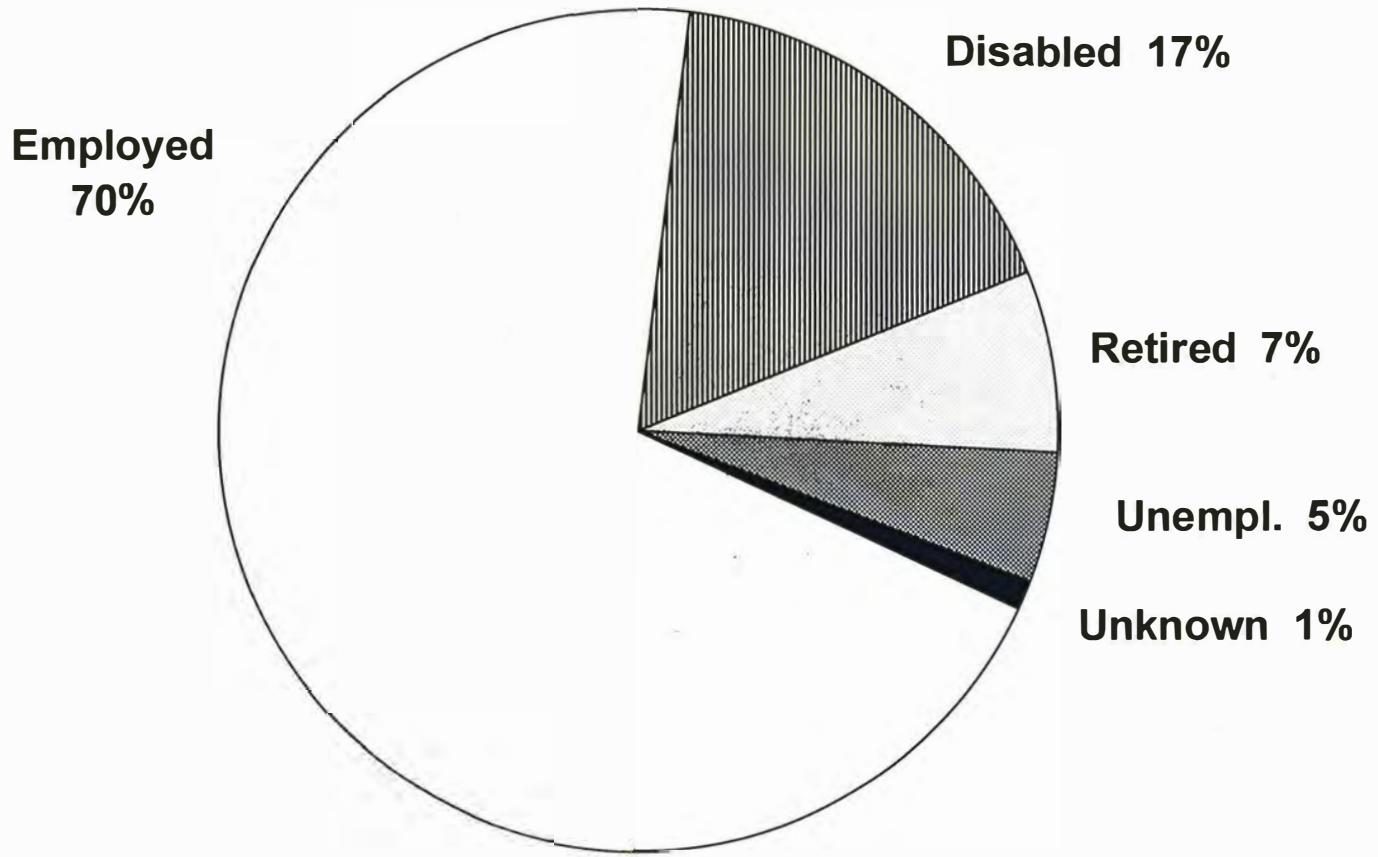


Table O-2 - AOEC Cases Related to Occupational Exposures, Other Than Asbestos (N=1277)

Current or Most Relevant Industry

SIC CODE	INDUSTRY	1994	1995	1996	TOTAL	(%)*
01-08	**Agriculture**	**2**	**4**	**1**	**7**	**(0.6)**
	Agricultural Production, crops				4	
	Agricultural Services				3	
	Agricultural Production, livestock				0	
	Forestry				0	
10-13	**Mining & Natural Gas**	**7**	**0**	**2**	**9**	**(0.7)**
	Coal Mining				7	
	Metal Mining				1	
	Petroleum & Natural Gas				1	
15-17	**Construction**	**39**	**14**	**30**	**83**	**(6.5)**
	Construction - special trade contractors				41	
	Building Construction-general contractors and operative builders				37	
	Heavy Construction, other than building				5	
20-39	**Manufacturing**	**145**	**108**	**56**	**309**	**(24.2)**
	Primary Metal Industries				67	
	Printing, Publishing and Allied Industries				45	
	Electronic and Other Electric Equipment and Components, except computer equipment				25	
	Chemicals and Allied Products				23	
	Transportation Equipment				23	
	Food and Kindred Products				20	
	Rubber and Miscellaneous Plastic Products				20	
	Fabricated Metal Products, except machinery and transportation equipment				12	
	Industrial and Commercial Machinery & Computer Equipt.				9	
	Textile Mill Products				6	
	Measuring, Analyzing and Controlling Instruments				5	
	Paper and Allied Products				4	
	Petroleum Refining and Related Industries				4	
	Stone, Clay, Glass and Concrete Products				4	
	Apparel and Other Finished Products				3	
	Furniture and Fixtures				3	
	Miscellaneous Manufacturing Industries				36	
40-49	**Transportation, Communication, Electric, Gas and Sanitary Services**	**95**	**59**	**51**	**205**	**(16.1)**
	Railroad Transportation				112	
	Transportation by Air				40	
	Communications				16	
	Electric, Gas and Sanitary Services				16	
	Motor Freight Transportation & Warehousing				9	
	Local and Suburban Transit and Interurban Highway				7	
	U.S. Postal Service				4	
	Transportation Services				1	

SIC CODE	INDUSTRY	1994	1995	1996	TOTAL	(%)*
50-51	**Wholesale Trade**	**0**	**0**	**2**	**2**	**(0.2)**
	Wholesale Trade-durable goods				1	
	Wholesale Trade-nondurable goods				1	
52-59	**Retail Trade**	**5**	**10**	**21**	**36**	**(2.8)**
	Eating and Drinking Places				17	
	Food Stores				6	
	General Merchandise Stores				4	
	Miscellaneous Retail				4	
	Apparel and Accessory Stores				2	
	Auto Dealers & Gasoline Service Stations				2	
	Home Furniture, Furnishing & Equipment Stores				1	
60-67	**Finance, Insurance and Real Estate**	**4**	**8**	**9**	**21**	**(1.6)**
	Real Estate				6	
	Depository Institutions				5	
	Insurance Carriers				4	
	Insurance Agents, Brokers and Services				3	
	Security and Commodity Brokers, Dealers, Exchanges and Services				2	
	Holding and Other Investment Offices				1	
70-89	**Services**	**187**	**151**	**128**	**466**	**(36.5)**
	Health Services				195	
	Educational Services				98	
	Business Services				41	
	Membership Organizations				28	
	Hotels, Rooming Houses, Camps and Other Lodging Places				23	
	Personal Services				15	
	Automobile Repair, Services and Parking				13	
	Engineering, Accounting, Research, Management and Related Services				13	
	Miscellaneous Services				12	
	Museums, Art Galleries, & Botanical & Zoological Gardens				7	
	Legal Services				6	
	Social Services				6	
	Miscellaneous Repair				4	
	Amusement and Recreation Services				3	
	Motion Pictures				2	
91-97	**Public Administration**	**36**	**39**	**48**	**123**	**(9.6)**
	Justice, Public Order, and Safety				37	
	Executive, Legislative and General Gov't, except finance				22	
	Public Administration, NOS				21	
	Admin. of Environmental Quality & Housing Programs				13	
	Public Finance, Taxation & Monetary Policy				12	
	Administration of Human Resource Programs				10	
	National Security and International Affairs				6	
	Administration of Economic Programs				2	
	Missing	**9**	**4**	**3**	**16**	
	Total	**529**	**397**	**351**	**1277**	

* Percents do not total to 100 due to rounding.

Table O-3 - AOEC Cases Related Occupational Exposures, Other Than Asbestos (N=1277)

Current or Most Relevant Occupation

SOC CODE	OCCUPATION	1994	1995	1996	Total	(%)*
11-14	**Executive, Administrative, and Managerial**	**25**	**23**	**25**	**73**	**(5.7)**
	Accountants, Auditors and Other Financial Specialists				16	
	Officials and Administrators, Government Agencies				10	
	Service Organization Managers				7	
	Education Administrators				4	
	Medicine and Health Managers				4	
	Social Science Managers				3	
	Industrial Production Managers				3	
	Admnistrative Services Managers				3	
	Management Analysts				3	
	Other Officials and Administrators				10	
	Other Management Related Occupations				10	
16	**Engineers and Architects**	**2**	**1**	**2**	**5**	**(0.4)**
17-18	**Natural Scientists and Mathematicians**	**9**	**6**	**10**	**25**	**(2.0)**
	Physical Scientists				8	
	Computer Scientists				8	
	Life Scientists				6	
	Mathematical and Operations Research Occupations				3	
19-21	**Social Scientists, Social Workers and Lawyers**	**6**	**7**	**3**	**16**	**(1.3)**
	Lawyers				7	
	Social and Recreation Workers				5	
	Social Scientists				4	
22-25	**Teachers, Librarians and Counselors**	**23**	**19**	**15**	**57**	**(4.5)**
	Teachers; except Postsecondary Institutions				30	
	Librarians				11	
	Vocational and Educational Counselors and Adult Education Teachers				7	
	College, University & Other Postsecondary Teachers				5	
	Archivists and Curators				4	
26, 28	**Health Diagnosing and Treating Practitioners**	**5**	**4**	**2**	**11**	**(0.9)**
	Physicians				10	
	Other Health Practitioners				1	
	Optometrist				1	
29-30	**Registered Nurses, Pharmacists and Therapists**	**39**	**47**	**19**	**105**	**(8.2)**
	Registered Nurses				102	
	Pharmacists, Dietitians and Therapists				3	
32-33	**Writers, Artists and Entertainers**	**14**	**11**	**4**	**29**	**(2.3)**
	Editors				6	
	Actors and Directors				3	
	Reporters				7	
	Painters, Sculptors and other Artists				5	
	Other Writers, Artists and Entertainers				8	

36	**Health Technologists and Technicians**	**19**	**3**	**2**	**24**	**(1.9)**
	Licensed Practical Nurses				8	
	Clinical Laboratory Technologist and Technicians				5	
	Radiologic Technologists and Technicians				4	
	Other Health Technologists and Technicians				7	
37-39	**Technologists and Technicians, Except Health**	**10**	**9**	**5**	**24**	**(1.9)**
	Programers				8	
	Science Technologists and Technicians				6	
	Technicians, except Health, Engineering and Science				4	
	Chemical and Nuclear Technologists and Technicians				4	
	Other Technologists and Technicians				2	
40-44	**Marketing and Sales Occupations**	**13**	**4**	**4**	**21**	**(1.6)**
	Retail Sales Occupations				12	
	Insurance and Advertising Sales Occupations				7	
	Other Sales Occupations				2	
45-47	**Administrative Support Occupations, Including Clerical**	**64**	**44**	**43**	**151**	**(11.8)**
	Secretaries, Stenographers and Typists				39	
	Clerks				24	
	General Office Occupations				14	
	Mail and Message Distributing Occupations				9	
	Supervisors; Administrative Support Occupations				9	
	Financial Record Processing Occupations				7	
	Material Recording, Scheduling, and Distributing Clerks				7	
	Communications Equipment Operators				5	
	Duplicating and Office Machine Operators				4	
	Adjusters, Investigators, and Collectors				3	
	Computer Operators				3	
	Miscellaneous Administrative Support Occupations				27	
50-52	**Service Occupations**	**35**	**37**	**84**	**156**	**(12.2)**
	Cleaning & Bldg. Service Occs., except private household				43	
	Personal Service Occupations				30	
	Food and Beverage Preparation and Service Occupations				26	
	Health Service Occupations				24	
	Firefighting and Fire Prevention Occupations				15	
	Police and Detectives				8	
	Guards				6	
	Other Service Occupations				4	
55-56	**Agricultural Occupations**	**2**	**4**	**5**	**11**	**(0.9)**
	Groundskeepers and Gardeners				6	
	Farmers				4	
	Animal Caretakers				1	
60-61	**Mechanics and Repairers**	**46**	**29**	**18**	**93**	**(7.3)**
	Vehicle and Mobile Equipment Mechanics and Repairers				31	
	Industrial Machinery Repairers				23	
	Electrical and Electronic Equipment Repairers				18	
	Maintenance Mechanics				3	
	Other Mechanics and Repairers				18	

63-65	**Construction and Extractive Occupations**	**46**	**50**	**23**	**119**	**(9.3)**
	Extractive Occupations				40	
	Plumbers, Pipefitters and Steamfitters				14	
	Painters				13	
	Electricians				8	
	Supervisors; Construction and Extractive Occupations				7	
	Insulator Workers				4	
	Carpenters				3	
	Ironworkers				3	
	Plasterers				3	
	Other Construction Workers				24	
67-69	**Precision Production Occupations**	**30**	**23**	**15**	**65**	**(5.1)**
	Machinists				23	
	Precision Printing Occupations				9	
	Boilermakers				8	
	Sheet Metal Workers				8	
	Plant and Systems Operators				3	
	Precision Food Production Occupations				4	
	Supervisors, Managers and Inspectors				4	
	Other Precision Production Occupations				9	
71-78	**Production Working Occupation**	**84**	**43**	**24**	**151**	**(11.8)**
	Metal and Plastic Working Machine Operators and Tenders				28	
	Assemblers				23	
	Welders and Solderers				20	
	Metal and Plastic Processing Machine Operators and Tenders				17	
	Textile, Apparel and Furnishings Machine Operators and Tenders				7	
	Painting Machine Operators				7	
	Printing Machine Operators and Tenders				7	
	Production Inspectors, Grader, Sorters and Expediters				6	
	Supervisors; Production Occupations				5	
	Machine Setup Operators				4	
	Hand Working Occupations				4	
	Other Machine Operators and Tenders				23	
81-83	**Transportation and Material Moving Occupations**	**13**	**12**	**7**	**31**	**(2.4)**
	Motor Vehicle Operators				13	
	Rail Transportation Occupations				9	
	Material Moving Equipment Operators				7	
	Railroad Conductors and Yardmasters				2	
	Water Transportation Occupations				1	
86-87	**Handlers, Equipment Cleaners, Helpers and Laborers**	**42**	**19**	**34**	**95**	**(7.4)**
	Freight, Stock and Material Movers; Hand				20	
	Garage and Parking Lot Occupations				10	
	Construction Laborers				8	
	Helpers				4	
	Misc. Handlers, Equipment Cleaners and Manual Occupations				53	
91	**Military Occupations**	**1**	**0**	**0**	**1**	**(0.1)**
99	**Miscellaneous/Missing Occupations**	**1**	**3**	**7**	**11**	**(0.1)**
	Total	**529**	**397**	**351**	**1277**	

Table O-4 - AOEC Occupational Cases Belonging to Unions, Excluding Asbestos-Related, 1994-1996 (N=373)

Union Membership

Union Name	Total	(%)
AFL/CIO	3	(0.8)
United **Automobile**, Aerospace & Agricultural Implement Workers of America	16	(4.3)
Bakery, Confectionery and Tobacco Workers Int'l Union	2	(0.5)
Int'l Brotherhood of **Boilermakers**, Iron Ship Builders, Blacksmiths, Forgers and Helpers	4	(1.1)
United Brotherhood of **Carpenters** & Joiners of America	1	(0.3)
Amalgamated **Clothing and Textile** Workers Union	2	(0.5)
Communication Workers of America	16	(4.3)
National **Education** Association	24	(6.4)
Int'l Brotherhood of **Electrical Workers**	20	(5.4)
Int'l Union of **Electronic,** Electrical, Salaried, Machine and Furniture Workers	7	(1.9)
Int'l Association of **Fire Fighters**	8	(2.1)
United **Food and Commercial Workers** Int'l Union	7	(1.9)
Graphic Communications Int'l Union	4	(1.1)
American Federation of **Government Employees**	3	(0.8)
Int'l Assoc. of Heat & Frost **Insulators and Asbestos Workers**	1	(0.3)
Int'l. Assoc. of Bridge, Structural & Ornamental **Iron Workers**	5	(1.3)
Laborers Int'l Union	21	(5.6)
Int'l Assoc. of **Machinist and Aerospace Workers**	27	(7.2)
Brotherhood of **Maintenance of Way Employees**	2	(0.5)
Industrial Union of **Marine and Shipbuilding Workers** of America	1	(0.3)
Int'l **Masonry** Institute	1	(0.3)
United **Mine Workers**	5	(1.3)
Newspaper Guild	7	(1.9)
Federation of **Nurses and Health Practitioners**	1	(0.3)
Massachusetts **Nurses Association**	71	(19.0)
Office and Professional Employees Int'l Union	3	(0.8)
Int'l Union of **Operating Engineers**	3	(0.8)
Operative Plasterers' and Cement Masons Int'l Association	4	(1.1)
Int'l Brotherhood of **Painters** and Allied Trades	2	(0.5)

Union Name	Total	(%)*
United **Paperworkers** Int'l Union	1	(0.3)
United Assoc. of Journeyman & Apprentices of the **Plumbing and Pipefitting** Industry	12	(3.2)
American **Postal Workers** Union	2	(0.5)
National Union of **Public and General Employees**	1	(0.3)
Brotherhood of **Railway**, Airline, and Steamship Clerks, Freight Handlers...	1	(0.3)
Brotherhood of **Railway Carmen**	5	(1.3)
Railway Supervisors Association	1	(0.3)
Retail, Wholesale, and Dept Store Union	1	(0.3)
United Union of **Roofers**, Waterproofers, and Allied Workers	1	(0.3)
American Assoc. of Classified **School Employees**	1	(0.3)
Service Employees Int'l Union	6	(1.6)
Sheet Metal Workers' Int'l Association	5	(1.3)
American Federation of **State County & Municipal Employees**	13	(3.5)
American Federation of **Teachers**	4	(1.1)
Int'l Brotherhood of **Teamsters**, Chauffers, Warehouseman and Helpers of America	4	(1.1)
Tile, Marble, Terrazzo, Finishers, Shopworkers and Granite Cutters Int'l Union	1	(0.3)
Amalgamated **Transit** Union	2	(0.5)
Transport Workers Union	1	(0.3)
United **Transportation** Union	1	(0.3)
National **Treasury Employees** Union	1	(0.3)
American Association of **University Employees**	2	(0.5)
Utility Workers' Union of America	2	(0.5)
Unknown/Incomplete Union Name	34	(9.1)
Total	**373**	

* Percents do not total to 100 due to rounding.

Table O-5 - AOEC Cases Related to Occupational Exposures, Other Than Asbestos, 1994-1996 (N=1277 cases, 1535 hazards)

Occupational Hazards

HAZ CODE	HAZARD	FREQ.	(%) of HAZARDS
010	**MINERAL AND INORGANIC DUST**	**103**	**(6.7)**
010.00	Dust, NOS	26	(1.7)
010.03	Cement Dust	2	(0.1)
010.04	Carbon Black	1	(0.1)
010.06	Coal	7	(0.5)
010.07	Fly Ash	1	(0.1)
010.09	Man-Made Mineral Fibers	2	(0.1)
010.10	Plaster	1	(0.1)
010.12	Silica, Amorphous	1	(0.1)
010.13	Silica, Crystalline	61	(4.0)
010.16	Ash, NOS	1	(0.1)
020	**METALLOIDS**	**70**	**(4.6)**
020	Metal Fumes, NOS	3	(0.2)
020.01	Aluminum	1	(0.1)
020.05	Arsenic	1	(0.1)
020.08	Beryllium	1	(0.1)
020.12	Cadmium	2	(0.1)
020.14	Chromium, Not Hexavalent	1	(0.1)
020.16	Copper	1	(0.1)
020.21	Lead, Inorganic	30	(2.0)
020.25	Mercury, Inorganic	2	(0.1)
020.30	Platinum	1	(0.1)
020.32	Silver	1	(0.1)
020.39	Zinc	4	(0.3)
020.46	Heavy Metals, NOS	1	(0.1)
020.47	Metals, NOS	1	(0.1)
020.49	Copper Phthalocyanine	1	(0.1)
021	Metal Dust, NOS		
021	Metal Dust, NOS	1	(0.1)
022	Hexavalent Chromium Compounds		
022.00	Chromium, Hexavalent, NOS	2	(0.1)
022.04	Chromic Acid	1	(0.1)
023	Welding Exposures		
023.00	Welding, NOS	13	(0.9)
023.03	Welding Fume, Copper/Nickel	1	(0.1)
023.06	Welding Fume, Galvanized Metal	1	(0.1)

030	**HALOGENS, INORGANIC**	**2**	**(0.1)**
030.02	Chlorine	2	(0.1)
040	**MISCELLANEOUS INORGANIC COMPOUNDS**	**12**	**(0.8)**
040.03	Carbon Dioxide	1	(0.1)
040.04	Carbon Monoxide	1	(0.1)
040.05	Fluxes, NOS	1	(0.1)
040.06	Hydrogen Sulfide	2	(0.1)
040.11	Ozone	1	(0.1)
040.20	Sulfur Oxides	3	(0.2)
040.24	Irritant Gases, NOS	3	(0.2)
050	**ACIDS, BASES, AND OXIDIZING AGENTS**	**32**	**(2.1)**
050.00	Acids, Bases, Oxidizers, NOS	6	(0.4)
050.01	Quaternary Ammonium Compounds	1	(0.1)
050.02	Bleach	2	(0.1)
050.10	Hydrochloric Acid	2	(0.1)
050.13	Nitric Acid	1	(0.1)
050.15	Phosphoric Acid	2	(0.1)
050.17	Potassium Hydroxide	1	(0.1)
050.18	Sodium Hydroxide	1	(0.1)
050.22	Sodium Metasilicate	1	(0.1)
050.24	Sulfuric Acid	6	(0.4)
050.30	Aluminum Hydroxide	1	(0.1)
050.34	Acetic Acid	1	(0.1)
050.37	Trifluoroacetic Acid	1	(0.1)
050.40	Sodium Bisulfate	1	(0.1)
052.00	Ammonia Compounds		
052.02	Ammonia Solution	4	(0.3)
052.03	Ammonium Salts	1	(0.1)
060	**ALIPHATIC AND ALICYCLIC HYDROCARBONS**	**16**	**(1.0)**
060.03	Heptane	1	(0.1)
060.10	Turpentine	1	(0.1)
060.11	4-PC	2	(0.1)
061	Petroleum Derivatives		
061.02	Naphtha	3	(0.2)
061.04	Gasoline	1	(0.1)
061.05	Jet Fuel	2	(0.1)
061.06	Diesel Fuel	3	(0.2)
061.07	Asphalt	3	(0.2)
070	**ALCOHOLS**	**10**	**(0.7)**
070.05	Ethanol	2	(0.1)
070.06	Isopropyl Alcohol	7	(0.5)
070.07	Methanol	1	(0.1)

080	**GLYCOLS**	**1**	**(0.1)**
080.01	Ethylene Glycol	1	(0.1)
090	**GLYCOL ETHERS**	**6**	**(0.4)**
090	Glycol Ethers, NOS	3	(0.2)
090.01	Propylene Glycol Ethers	1	(0.1)
091	Ethylene Glycol Ethers		
091.03	EGBE	2	(0.1)
100	**ETHERS**	**1**	**(0.1)**
100.05	Ethyl Ether	1	(0.1)
110	**EPOXY COMPOUNDS**	**13**	**(0.9)**
110.02	Epoxy Resins	5	(0.3)
110.03	Ethylene Oxide	8	(0.5)
120	**ALDEHYDES AND ACETALS**	**21**	**(1.4)**
120.03	Formaldehyde	9	(0.6)
120.05	Glutaraldehyde	11	(0.7)
120.09	Crotonaldehyde	1	(0.1)
130	**KETONES**	**6**	**(0.4)**
130.03	Methyl Ethyl Ketone	6	(0.4)
140	**ESTERS**	**3**	**(0.2)**
142	Acrylates		
142.00	Acrylates, NOS	2	(0.1)
142.04	Methyl Methacrylate	1	(0.1)
160	**AROMATIC HYDROCARBONS**	**12**	**(0.8)**
160.00	Aromatic Hydrocarbons, NOS	1	(0.1)
160.02	Toluene	4	(0.3)
160.03	Xylene	3	(0.2)
160.04	Styrene	3	(0.2)
161	Polycyclic Aromatic Hydrocarbons		
161.00	Polycyclic Aromatic Hydrocarbons, NOS	1	(0.1)
170	**HYDROCARBONS**	**121**	**(7.9)**
170.00	Hydrocarbons, NOS	3	(0.2)
170.01	Cutting Oils	7	(0.5)
170.03	Oils, NOS	2	(0.1)

171	Solvents, NOS		
171.00	Solvents, NOS	88	(5.7)
171.01	Paint	19	(1.2)
171.04	Degreaser, NOS	2	(0.1)
180	**PHENOLS AND PHENOLIC COMPOUNDS**	**3**	**(0.2)**
180.04	Phenol	2	(0.1)
180.07	Orthophenylphenol	1	(0.1)
190	**HALOGENATED ALIPHATIC HYDROCARBONS (EXCEPT ORGANOCHLORINE PESTICIDES)**	**163**	**(10.6)**
190.00	Chlorinated Hydrocarbons, NOS	3	(0.2)
190.03	Chloroform	1	(0.1)
190.08	Methyl Chloroform (1,1,1-trichloroethane)	73	(4.8)
190.09	Methylene Chloride	2	(0.1)
190.10	Perchloroethylene (tetrachloroethylene)	72	(4.8)
190.12	1,1,2-Trichloroethane	5	(0.3)
190.13	Trichloroethylene	4	(0.2)
192	Fluorocarbons		
192.01	Freon	2	(0.1)
192.05	Difluoroethane	1	(0.1)
200	**HALOGENATED AROMATIC HYDROCARBONS**	**2**	**(0.1)**
200.01	Agent Orange	1	(0.1)
200.07	PCBs	1	(0.1)
220	**ISOCYANATES**	**13**	**(0.9)**
221	Diisocyanates		
221.00	Isocyanates, NOS	11	(0.7)
221.01	Toluene Diisocyanate	2	(0.1)
230	**ALIPHATIC AND ALICYCLIC AMINES**	**3**	**(0.2)**
231	Ethanolamine		
231.00	Ethanolamines, NOS	2	(0.1)
232	Polyamines		
232.01	Ethylenediamine	1	(0.1)
250	**AROMATIC NITRO AND AMINO COMPOUNDS (INCLUDING HETEROCYCLIC)**	**4**	**(0.3)**
250.09	Picric Acid	1	(0.1)
250.17	Dyes, NOS	2	(0.1)
251.06	Phenylene Diamine	1	(0.1)

260	**ALIPHATIC (INCLUDING HETEROCYCLIC) AND MISCELLANEOUS NITROGEN COMPOUNDS**	**1**	**(0.1)**
260.17	Triazine	1	(0.1)
270	**POLYMERS**	**52**	**(3.4)**
270.00	Polymers, NOS	1	(0.1)
270.02	Latex, Natural Rubber	42	(2.7)
270.06	Polyethylene	1	(0.1)
270.07	Polyurethane	3	(0.2)
270.09	Polyvinyl Chloride	2	(0.1)
270.10	Silicone	1	(0.1)
270.15	Resin Systems, NOS	1	(0.1)
270.16	Urea Formaldehyde	1	(0.1)
290	**ORGANOCHLORINE PESTICIDES**	**11**	**(0.7)**
290.01	Piperonyl Butoxide	1	(0.1)
291	Organophosphate Pesticides		
291.00	Organophosphate Pesticides, NOS	3	(0.2)
291.01	Malathion	1	(0.1)
291.05	Chlorpyrifos	4	(0.3)
291.10	Dichlorvos	1	(0.1)
292	Carbamate Pesticides		
292.04	Baygon	1	(0.1)
310	**ORGANIC SULFUR COMPOUNDS**	**8**	**(0.5)**
310.01	Carbon Disulfide	6	(0.4)
310.11	Sulfites, NOS	2	(0.1)
320	**MISCELLANEOUS CHEMICALS AND MATERIALS, REFERENCED BY USE**	**233**	**(15.2)**
320.01	Air Pollutants, Indoor	168	(10.9)
320.05	Carbonless Paper	1	(0.1)
320.06	Chemicals, NOS	15	(1.0)
320.08	Fungicide, NOS	1	(0.1)
320.11	Glues, NOS	5	(0.3)
320.12	Hair Products	5	(0.3)
320.14	Lubricants, NOS	8	(0.5)
320.15	Odors	1	(0.1)
320.16	Pesticides, NOS	6	(0.4)
320.17	Photo Developing Chemicals, NOS	6	(0.4)
320.18	Pyrethrins	3	(0.2)
320.19	Surfactants, NOS	1	(0.1)
320.23	Perfume, NOS	2	(0.1)
320.29	Printing Chemicals, NOS	1	(0.1)
320.30	N-Octyl Bicycloheptene Dicarboximide	1	(0.1)

321	Pharmaceutical Compounds		
321.00	Pharmaceuticals, NOS	1	(0.1)
321.22	Trental	1	(0.1)
322	Cleaning Materials		
322.00	Cleaning Materials, NOS	1	(0.1)
322.01	Soap	2	(0.1)
323	Waste		
323.00	Waste, NOS	2	(0.1)
323.01	Waste, Hazardous	1	(0.1)
323.04	Waste, Treated Human Sludge	1	(0.1)
330	**PYROLYSIS PRODUCTS**	**34**	**(2.2)**
330.02	Plastic Smoke	2	(0.1)
330.03	Smoke, NOS	19	(1.2)
330.06	Smoke, Lead-Containing	1	(0.1)
331	Exhaust		
331.00	Exhaust, NOS	1	(0.1)
331.01	Diesel Exhaust	8	(0.5)
331.02	Engine Exhaust	3	(0.2)
350	**PHYSICAL FACTORS**	**161**	**(10.5)**
350	Physical Factors, NOS	2	(0.2)
350.01	Noise	4	(0.3)
350.02	Cold	3	(0.2)
350.03	Heat	3	(0.2)
350.04	Humidity, Low	3	(0.2)
352	Non-Ionizing Radiation		
352.00	Radiation, Nonionizing, NOS	1	(0.1)
353	Trauma-Related Exposures		
353.00	Trauma, Acute, NOS	29	(1.9)
353.03	Fall, NOS	69	(4.5)
353.05	Motor Vehicle Accident	8	(0.5)
353.06	Struck by Motor Vehicle (Road)	2	(0.1)
353.08	Struck by Falling Object	7	(0.5)
353.09	Struck Against/Struck By Objects or Persons	19	(1.2)
353.10	Caught In or Between Objects	5	(0.3)
353.11	Cutting or Piercing Object, Except Blood-Contam.	2	(0.1)
353.12	Assaulted	1	(0.1)
354	Vibration		
354.00	Vibration, NOS	2	(0.1)
354.02	Vibration, Whole Body	1	(0.1)

360	**ERGONOMIC FACTORS**	**354**	**(23.1)**
360.00	Ergonomic Factors, NOS	20	(1.3)
360.01	Contact Pressure	2	(0.1)
360.02	Keyboard Use	113	(7.4)
360.03	Repetitive Motion	121	(7.9)
360.04	Stress	2	(0.1)
360.07	Bodily Reaction	3	(0.2)
361	Force		
361.01	Forceful Movements, NOS	8	(0.5)
361.02	Lifting	57	(3.7)
361.03	Gripping, Forceful	7	(0.5)
362	Posture		
362.00	Posture, NOS	3	(0.2)
362.01	Posture, Upper Extremity	2	(0.1)
362.02	Posture, Body - Static	3	(0.2)
362.03	Posture, Body - Dynamic	13	(0.8)
370	**PLANT MATERIAL**	**14**	**(0.9)**
370.00	Plant Material, NOS	2	(0.1)
370.01	Paper Dust	3	(0.2)
370.05	Fruit Juices	1	(0.1)
370.07	Grass Cuttings	1	(0.1)
371	Flours		
371.00	Flour, NOS	4	(0.3)
373	Wood Dust		
373.00	Wood Dust, NOS	3	(0.2)
380	**ANIMAL MATERIAL**	**2**	**(0.1)**
380.16	Avian Material, NOS	1	(0.1)
382	Insect Materials		
382.21	Insect Bite, NOS	1	(0.1)
390	**MICROORGANISMS**	**48**	**(3.1)**
390.00	Microorganisms, NOS	2	(0.1)
390.01	Mold	16	(1.0)
390.07	Infectious Agents, NOS	2	(0.1)
390.08	HIV Exposure	2	(0.1)
390.10	Tuberculosis	23	(1.5)
390.12	Hepatitis C	3	(0.2)
	TOTAL	**1535**	**(100.0)**

Table O-6 - Diagnoses and Exposures of 1277 AOEC Cases Related to Occupational Exposures other than Asbestos, 1994-1996

1575 Diagnoses and Related Exposures

DIAGNOSIS GROUP	# of Cases in Group w/ Dx	
DIAGNOSIS (DX) Hazard	**# of Cases w/ Dx*** Hazard Freq	**(% of Cases)**
INFECTIOUS DISEASE	**26**	
Hepatitis C	**3**	**(0.2)**
Hepatitis C	3	
+PPD	**23**	**(1.8)**
Tuberculosis	23	
TUMORS	**11**	
Bladder Cancer	**1**	**(0.1)**
Smoke, NOS	1	
Colon Cancer	**2**	**(0.2)**
PCBs	1	
Smoke, NOS	1	
Esophageal Cancer	**1**	**(0.1)**
Smoke, NOS	1	
Laryngeal Cancer	**1**	**(0.1)**
Hydrochloric Acid	1	
Nitric Acid	1	
Sulfuric Acid	1	
Lung Cancer	**1**	**(0.1)**
Beryllium	1	
Prostate Cancer	**3**	**(0.2)**
Smoke, NOS	2	
Cadmium	1	
Skin Cancer	**1**	**(0.1)**
Dust, NOS	1	
Tonsillar Cancer	**1**	**(0.1)**
Smoke, NOS	1	

PSYCHIATRIC and NEUROLOGICAL DISORDERS	142	
Anxiety Disorders	**3**	**(0.2)**
Glues, NOS	1	
HIV Exposure	1	
Stress	1	
Dementia	**2**	**(0.2)**
Lead, Inorganic	1	
Pesticides, NOS	1	
Solvents, NOS	1	
Depression, Neurotic	**14**	**(1.1)**
Methyl Chloroform (1,1,1-Trichloroethane)	14	
Perchloroethylene (Tetrachloroethylene)	14	
Depression, NOS	**1**	**(0.1)**
Carbon Disulfide	1	
Organic Affective Disorder	**24**	**(1.9)**
Methyl Chloroform (1,1,1-Trichloroethane)	24	
Perchloroethylene (Tetrachloroethylene)	24	
Organic Brain Syndrome/Cognitive Problems	**4**	**(0.3)**
Solvents, NOS	2	
Carbon Disulfide	1	
Smoke, NOS	1	
Peripheral/Poly Neuropathy Due to Toxic Agents	**5**	**(0.4)**
Air Pollutants, Indoor	1	
Diesel Fuel	1	
Heavy Metals, NOS	1	
Methyl Ethyl Ketone	1	
Perchloroethylene (Tetrachloroethylene)	1	
Solvents, NOS	1	
Trichloroethylene	1	
Post-Traumatic Headaches/Post-Concussive Syndrome	**10**	**(0.8)**
Fall, NOS	6	
Struck by Falling Object	2	
Struck Against/Struck by Object	1	
Trauma, Acute, NOS	1	
Post-Traumatic Stress Syndrome	**2**	**(0.2)**
Polycyclic Aromatic Hydrocarbons	1	
Waste, Hazardous	1	
Toxic Encephalopathy	**77**	**(6.0)**
Methyl Chloroform (1,1,1-Trichloroethane)	33	
Perchloroethylene (Tetrachloroethylene)	32	
Solvents, NOS	30	
1,1,2-Trichloroethane	6	
Air Pollutants, Indoor	1	

Toxic Encephalopathy	**continued**
Carbon Monoxide	1
Ethyl Alcohol	1
Ethyl Ether	1
Glues, NOS	1
Glycol Ethers, NOS	1
Isopropyl Alcohol	1
Paint	1
Toluene	1
Tricholoroethylene	1
Xylene	1

DISORDERS OF SENSORY ORGANS	**16**	
Argyria (Conjunctival)	**1**	**(0.1)**
Silver	1	
Cataracts	**1**	**(0.1)**
Radiation, Nonionizing, NOS	1	
Conjunctivitis	**2**	**(0.2)**
Cement Dust	1	
Chemicals, NOS	1	
Diesel Exhaust	1	
Photo Developing Chemicals, NOS	1	
Eye Irritation*	**1**	**(0.1)**
Waste, NOS	1	
Hearing Loss	**6**	**(0.5)**
Noise	4	
Smoke, NOS	1	
Solvents, NOS	1	
Iritis	**1**	**(0.1)**
Soap	1	
Tinnitus	**1**	**(0.1)**
Smoke, NOS	1	
Smell and Taste Disturbances	**1**	**(0.1)**
Toluene	1	
Visual Abnormalities	**2**	**(0.2)**
Struck Against/Struck By Object	1	
Trauma, Acute, NOS	1	

* Many cases have been reported of eye irritation in combination with upper respiratory irritation. These cases are included with the respiratory diagnoses, and are not included here.

CARDIOVASCULAR DISEASE	**11**	
Arteriosclerotic Cardiovascular Disease	**1**	**(0.1)**
Smoke, NOS	1	
Ateriosclerosis, Unspecified	**2**	**(0.2)**
Carbon Disulfide	1	
Diesel Fuel	1	
Cardiomyopathy	**1**	**(0.1)**
Carbon Disulfide	1	
Picric Acid	1	
Coronary Artery Disease	**3**	**(0.2)**
Carbon Disulfide	3	
Hypertension, Post-traumatic	**1**	**(0.1)**
Trauma, Acute, NOS	1	
Myocardial Infarction	**1**	**(0.1)**
Physical Factors, NOS	1	
Varicose Veins, with Inflammation	**1**	**(0.1)**
Fall, NOS	1	
Vibration White Finger	**1**	**(0.1)**
Vibration, NOS	1	
RESPIRATORY DISORDERS	**468**	
Asthma	**188**	**(14.7)**
Air Pollutants, Indoor	50	
Latex, Natural Rubber	22	
Dust, NOS	14	
Solvents, NOS	12	
Paint	9	
Mold	7	
Glutaraldehyde	6	
Isocyanates, NOS	6	
Smoke, NOS	6	
Formaldehyde	5	
Acids, Bases, Oxidizers, NOS	4	
Chemicals, NOS	4	
Welding, NOS	4	
Diesel Exhaust	3	
Flour, NOS	3	
Heat	3	
Lubricants, NOS	3	
Acrylates, NOS	2	
Cold	2	
Engine Exhaust	2	
Epoxy Resins	2	

Asthma	**continued**	
Hair Products	2	
Irritant Gases, NOS	2	
Metal Fumes, NOS	2	
Photo Developing Chemicals, NOS	2	
Polyurethane	2	
Pyrethrins	2	
Styrene	2	
Toluene Diisocyanate	2	
Wood Dust, NOS	2	
Ammonia Solution	1	
Ammonium Salts	1	
Chlorine	1	
Chloroform	1	
Chromium, Not Hexavalent	1	
Copper	1	
Cutting Oils	1	
Difluoroethane	1	
Dyes, NOS	1	
EGBE	1	
Ethanolamines, NOS	1	
Ethylene Oxide	1	
Exhaust, NOS	1	
Fly Ash	1	
Freon	1	
Hydrochloric Acid	1	
Jet Fuel	1	
Malathion	1	
Methyl Chloroform (1,1,1-Trichloroethane)	1	
Microorganisms, NOS	1	
N-Octyl Bicycloheptene Dicarboximide	1	
Ozone	1	
Paper Dust	1	
Perchloroethylene (Tetrachloroethylene)	1	
Perfume, NOS	1	
Pesticides, NOS	1	
Pharmaceuticals, NOS	1	
Phosphoric Acid	1	
Piperonyl Butoxide	1	
Plant Material, NOS	1	
Plastic Smoke	1	
Platinum	1	
Polymers, NOS	1	
Polyvinyl Chloride	1	
Soap	1	
Sodium Bisulfate	1	
Sodium Hydroxide	1	
Sulfuric Acid	1	
Turpentine	1	
Urea Formaldehyde	1	
Zinc	1	
Bronchitis, Acute	**1**	**(0.1)**
Infectious Agents, NOS	1	

Bronchitis, Chronic	**8**	**(0.6)**
Air Pollutants, Indoor	1	
Chromic Acid	1	
Dust, NOS	1	
Ethylene Oxide	1	
Naphtha	1	
Polyvinyl Chloride	1	
Propylene Glycol Ethers	1	
Smoke, NOS	1	
Sulfuric Acid	1	
Bronchitis, NOS (including Asthmatic Bronchitis)	**25**	**(2.0)**
Air Pollutants, Indoor	4	
Cutting Oils	2	
Diesel Exhaust	2	
Dust, NOS	2	
Lubricants, NOS	2	
Silica, Crystalline	2	
Solvents, NOS	2	
Ammonia Solution	1	
Aromatic Hydrocarbons, NOS	1	
Ash, NOS	1	
Degreaser, NOS	1	
Freon	1	
Glues, NOS	1	
Isopropyl Alcohol	1	
Metal Dust, NOS	1	
Mold	1	
Smoke, NOS	1	
Triazine	1	
Chronic Obstructive Pulmonary Disease (COPD)	**18**	**(1.4)**
Smoke, NOS	5	
Welding, NOS	4	
Air Pollutants, Indoor	1	
Ammonia Solution	1	
Asphalt	1	
Chemicals, NOS	1	
Chromium, Hexavalent, NOS	1	
Degreaser, NOS	1	
Dust, NOS	1	
Isopropyl Alcohol	1	
Man-Made Mineral Fibers	1	
Polyurethane	1	
Solvents, NOS	1	
Sulfuric Acid	1	
Emphysema	**5**	**(0.4)**
Lubricants, NOS	2	
Plastic Smoke	1	
Smoke, NOS	1	
Welding, NOS	1	

Extrinisic Allergic Alveolitis	**1**	**(0.1)**
Avian Material, NOS	1	
Interstitial Pulmonary Fibrosis	**5**	**(0.4)**
Lubricants, NOS	2	
Cutting Oils	1	
Polyethylene	1	
Polyurethane	1	
Smoke, NOS	1	
Laryngeal Polyps	**2**	**(0.2)**
Cutting Oils	1	
Silica, Crystalline	1	
Welding, NOS	1	
Lung Function Abnormalities	**5**	**(0.4)**
Solvents, NOS	2	
Chemicals, NOS	1	
Glycol Ethers, NOS	1	
Paint	1	
Pneumoconiosis, Coal Workers'	**7**	**(0.5)**
Coal	7	
Pneumoconiosis Due to Other Silicate Dust (Silicosis)	**60**	**(4.7)**
Silica, Crystalline	58	
Silica, Amorphous	1	
Sodium Metasilicate	1	
Pneumoconiosis Due to Other Inorganic Dust	**1**	**(0.1)**
Welding, NOS	1	
Reactive Airways Disease (RADS)	**40**	**(3.1)**
Air Pollutants, Indoor	7	
Isocyanates, NOS	4	
Glues, NOS	2	
Isoprophy Alcohol	2	
Acids, Bases, Oxidizers, NOS	1	
Asphalt	1	
Bleach	1	
Carbon Black	1	
Carbon Disulfide	1	
Chemicals, NOS	1	
Cold	1	
Crotonaldehyde	1	
Cutting Oils	1	
Diesel Exhaust	1	
Dust, NOS	1	
Epoxy Resins	1	
Ethylenediamine	1	
Formaldehyde	1	
Glutaraldehyde	1	
Grass Cuttings	1	
Hydrogen Sulfide	1	

Reactive Airways Disease	**continued**	
Irritant Gases, NOS	1	
Lubricants, NOS	1	
Man-Made Mineral Fibers	1	
Metal Fumes, NOS	1	
Methyl Chloroform (1,1,1-Trichloroethane)	1	
Methyl Methacrylate	1	
Naphtha	1	
Paint	1	
Picric Acid	1	
Polymers, NOS	1	
Polyvinyl Chloride	1	
Silicone	1	
Solvents, NOS	1	
Waste, Hazardous	1	
Welding Fume, Galvanized Metal	1	
Welding, NOS	1	
Vocal Chord/Larynx Disorders	**2**	**(0.2)**
Air Pollutants, Indoor	2	
Upper Respiratory Irritation, Acute	**1**	**(0.1)**
Chlorine	1	
Upper Respiratory Irritation, Chronic or NOS (Sinusitis/rhinitis/pharyngitis/laryngitis)	**95**	**(7.4)**
Air Pollutants, Indoor	37	
Mold	12	
Dust, NOS	7	
Solvents, NOS	5	
Chemicals, NOS	3	
Ethylene Oxide	3	
Glutaraldehyde	3	
Humidity, Low	3	
Paint	3	
Toluene	3	
Cutting Oils	2	
Paper Dust	2	
Welding, NOS	2	
Acetic Acid	1	
Aluminum	1	
Asphalt	1	
Bleach	1	
Cement Dust	1	
Chlorpyrifos	1	
Epoxy Resins	1	
Flour, NOS	1	
Fluxes, NOS	1	
Freon	1	
Fruit Juices	1	
Glues, NOS	1	
Hair Products	1	
Heptane	1	
Infectious Agents, NOS	1	

Upper Respiratory Irritation, Chronic or NOS	**continued**	
Irritant Gases, NOS	1	
Isopropyl Alcohol	1	
Jet Fuel	1	
Latex, Natural Rubber	1	
Organophosphate Pesticides, NOS	1	
Phenol	1	
Photo Developing Chemicals, NOS	1	
Plant Material, NOS	1	
Plaster	1	
Smoke, NOS	1	
Styrene	1	
Sulfites, NOS	1	
Sulfur Oxides	1	
Sulfuric Acid	1	
Welding Fume, Copper/Nickel	1	
Wood Dust, NOS	1	
Zinc	1	
Non-Specific Respiratory Disorders	**4**	**(0.3)**
Fungicide, NOS	1	
Printing Chemicals, NOS	1	
Solvents, NOS	1	
Sulfites, NOS	1	
GASTROINTESTINAL DISORDERS	**2**	
Irritable Bowel	**1**	**(0.1)**
Waste, NOS	1	
Peptic Ulcer Disease	**1**	**(0.1)**
Dyes, NOS	1	
LIVER DISORDERS	**2**	
Cirrhosis of Liver	**1**	**(0.1)**
Methyl Chloroform (1,1,1-Trichloroethane)	1	
Perchloroethylene (Tetrachloroethylene)	1	
Chemical Hepatitis	**1**	**(0.1)**
Solvents, NOS	1	

REPRODUCTIVE DISORDERS	**4**	**(0.3)**
Impotence	**1**	**(0.1)**
Cadmium	1	
Stress	1	
Excessive Vomiting During Pregnancy	**1**	**(0.1)**
Ammonia Solution	1	
Miscarriage	**1**	**(0.1)**
Ethylene Oxide	1	
Testicular Pain	**1**	**(0.1)**
Trauma, Acute, NOS	1	
SKIN DISORDERS	**70**	
Cellulitis/Infection	**2**	**(0.2)**
Microorganisms, NOS	1	
Insect Bite, NOS	1	
Dermatitis, Allergic	**27**	**(2.1)**
Latex, Natural Rubber	25	
Air Pollutants, Indoor	2	
Sulfur Oxides	1	
Surfactants	1	
Dermatitis, Irritant	**4**	**(0.3)**
Air Pollutants, Indoor	1	
Aluminum Hydroxide	1	
Diesel Fuel	1	
Glutaraldehyde	1	
Lubricants, NOS	1	
Oils, NOS	1	
Dermatitis, NOS	**22**	**(1.7)**
Epoxy Resins	3	
1,1,1-Trichloroethane	2	
Air Pollutants, Indoor	2	
Chemicals, NOS	2	
Glutaraldehyde	2	
Hair Products	2	
Perchloroethane	2	
Acrylates, NOS	1	
Chromium, Hexavalent, NOS	1	
Cutting Oils	1	
Diesel Exhaust	1	
Ethylene Glycol	1	
Ethylene Oxide	1	
Irritant Gases, NOS	1	
Mold	1	

Dermatitis, NOS	**continued**	
Oils, NOS	1	
Orthophenylphenol	1	
Pesticides, NOS	1	
Potassium Hydroxide	1	
Solvents, NOS	1	
Post-Traumatic Callus (Hand)	**1**	**(0.1)**
Forceful Movements, NOS	1	
Rash/Urticaria	**11**	**(0.9)**
Air Pollutants, Indoor	4	
Carbonless Paper	1	
Chemicals, NOS	1	
Cleaning Materials, NOS	1	
Dust, NOS	1	
Formaldehyde	1	
Latex, Natural Rubber	1	
Phenol	1	
Solvents, NOS	1	
Other Skin Abnormalities	**3**	**(0.2)**
Air Pollutants, Indoor	1	
EGBE	1	
Paint	1	

ACUTE and CHRONIC MUSCULOSKELETAL DISORDERS	**529**	
MUSCULOSKELETAL PROBLEMS - CHEST (5)		
Costochondritis	**1**	**(0.1)**
Fall, NOS	1	
Fracture, Rib	**2**	**(0.2)**
Lifting	1	
Trauma, Acute, NOS	1	
Sprains/Strains/Tears of Chest	**2**	**(0.2)**
Lifting	1	
Struck Against/Struck By Object	1	
LOW BACK PROBLEMS (95)		
Degenerative Joint Disease - Lumbar	**4**	**(0.3)**
Fall, NOS	2	
Lifting	1	
Vibration, Whole Body	1	

Herniated Disc - Lumbar	**14**	**(1.1)**
Lifting	7	
Posture, Body - Dynamic	3	
Trauma, Acute, NOS	3	
Motor Vehicle Accident	2	
Fall, NOS	1	
Forceful Movements, NOS	1	
Pain - Low Back	**17**	**(1.3)**
Trauma, Acute, NOS	7	
Fall	5	
Posture, Body - Dynamic	3	
Repetitive Motion	3	
Lifting	1	
Struck Against/Struck By Object	1	
Radiculopathy - Lumbar	**7**	**(0.5)**
Fall, NOS	3	
Lifting	3	
Trauma, Acute, NOS	1	
Sprains/Strains/Tears - Lower Back or Back, NOS	**50**	**(3.9)**
Lifting	21	
Fall, NOS	11	
Posture, Body - Dynamic	6	
Struck Against/Struck By Object	4	
Forceful Movements, NOS	2	
Motor Vehicle Accident	2	
Struck By Falling Object	2	
Posture, Body - Static	1	
Posture, NOS	1	
Repetitive Motion	1	
Trauma, Acute, NOS	1	
Other and Unspecified Low Back Disorders	**3**	**(0.2)**
Lifting	1	
Repetitive Motion	1	
Trauma, Acute, NOS	1	

NECK/UPPER BACK PROBLEMS (53)

Degenerative Joint Disease, Cervical/Thoracic	**3**	**(0.2)**
Repetitive Motion	3	
Herniated Disc - Cervical	**7**	**(0.5)**
Lifting	3	
Motor Vehicle Accident	1	
Repetitive Motion	1	
Struck Against/Struck By Object	1	
Struck by Falling Object	1	

Pain/Spasms - Trapezius/Neck/Cervical	**12**	**(0.9)**
Keyboard Use	5	
Ergonomic Factors, NOS	2	
Fall, NOS	2	
Struck by Falling Object	2	
Lifting	1	
Motor Vehicle Accident	1	
Posture, Body - Static	1	
Posture, Upper Extremity	1	
Trauma, Acute, NOS	1	
Radiculopathy - Cervical	**2**	**(0.2)**
Fall, NOS	2	
Sprains/Strains/Tears - Neck/Upper Back	**29**	**(2.3)**
Fall, NOS	10	
Lifting	6	
Motor Vehicle Accident	3	
Keyboard Use	2	
Struck By Falling Object	2	
Trauma, Acute, NOS	2	
Forceful Movements, NOS	1	
Posture, Body - Static	1	
Posture, NOS	1	
Repetitive Motion	1	
Struck Against/Struck By Object	1	

LOWER EXTREMITY PROBLEMS (36)

Fracture - Tibia	**1**	**(0.1)**
Fall, NOS	1	
Plantar Fasciitis	**2**	**(0.2)**
Fall, NOS	1	
Trauma, Acute, NOS	1	
Sprain/Strains/Tears - Ankle/Foot	**11**	**(0.9)**
Fall, NOS	7	
Trauma, Acute, NOS	2	
Bodily Reaction	1	
Struck Against/Struck By Object	1	
Sprains/Strains/Tears - Gluteus/Hamstring/Leg	**5**	**(0.4)**
Fall, NOS	3	
Lifting	1	
Struck Against/Struck By Object	1	
Sprains/Strains/Tears - Knee	**16**	**(1.3)**
Fall, NOS	10	
Struck Against/Struck By Object	3	
Bodily Reaction	1	
Posture, Body - Dynamic	1	
Trauma, Acute, NOS	1	

Traumatic Neuritis - Leg	**1**	**(0.1)**
Lifting	1	

UPPER EXTREMITY PROBLEMS - ARM/HAND/WRIST (274)

Carpel Tunnel Syndrome and Median Nerve Neuropathy	**93**	**(7.3)**
Repetitive Motion	48	
Keyboard Use	49	
Ergonomic Factors, NOS	12	
Trauma, Acute, NOS	2	
Fall, NOS	1	
Forceful Movements, NOS	1	
Gripping, Forceful	1	
Posture, Body - Static	1	
Posture, NOS	1	
Vibration, NOS	1	
DeQuervain's Disease	**17**	**(1.3)**
Keyboard Use	12	
Repetitive Motion	4	
Gripping, Forceful	2	
Ergonomic Factors, NOS	1	
Lifting	1	
Epicondylitis	**37**	**(2.9)**
Keyboard Use	25	
Repetitive Motion	8	
Ergonomic Factors, NOS	4	
Fall, NOS	3	
Gripping, Forceful	2	
Lifting	2	
Contact Pressure	1	
Posture, Body - Static	1	
Fracture - Wrist	**1**	**(0.1)**
Fall, NOS	1	
Ganglion Cyst - Hand	**4**	**(0.3)**
Keyboard Use	2	
Repetitive Motion	2	
Ergonomic Factors, NOS	1	
Gripping, Forceful	1	
Osteoarthritis - Elbow	**1**	**(0.1)**
Struck Against/Struck By Object	1	
Sprains/Strains/Tears - Forearm	**2**	**(0.2)**
Keyboard Use	1	
Motor Vehicle Accidet	1	

Sprains/Strains/Tears - Wrist/Hand/Fingers	**10**	**(0.8)**
Fall, NOS	3	
Assault	1	
Bodily Reaction	1	
Caught In or Between Objects	1	
Gripping, Forceful	1	
Keyboard Use	1	
Struck Against/Struck By Object	1	
Struck By Motor Vehicle (Road)	1	
Trauma, Acute, NOS	1	
Tendinitis/Tenosynovitis/Bursitis - Forearm/Wrist/Hand/Fingers	**59**	**(4.6)**
Keyboard Use	28	
Repetitive Motion	19	
Lifting	7	
Ergonomic Factors, NOS	2	
Fall, NOS	2	
Gripping, Forceful	2	
Trauma, Acute, NOS	2	
Cutting or Piercing Object, Except Blood-Contaminated Sharps	1	
Posture, Body - Static	1	
Posture, Upper Extremity	1	
Struck Against/Struck By Object	1	
Struck By Motor Vehicle (Road)	1	
Trigger Finger	**1**	**(0.1)**
Repetitive Motion	1	
Ulnar Neuropathy	**17**	**(1.3)**
Keyboard Use	8	
Repetitive Motion	6	
Forceful Movements, NOS	2	
Contact Pressure	1	
Struck Against/Struck By Object	1	
Trauma, Acute, NOS	1	
Other Upper Extremity Neuropathy	**7**	**(0.5)**
Repetitive Motion	5	
Ergonomic Factors, NOS	1	
Keyboard Use	1	
Struck by Falling Object	1	
Unspecified Cumulative Trauma Disorders or Musculoskeletal Pain, Upper Extremity	**25**	**(2.0)**
Keyboard Use	11	
Repetitive Motion	11	
Ergonomic Factors, NOS	3	
Lifting	1	
Physical Factors, NOS	1	
Trauma, Acute, NOS	1	

UPPER EXTREMITY PROBLEMS - SHOULDER (30)

Sprains/Strains/Tears of Biceps/Shoulder/Rotator Cuff	**11**	**(0.9)**
Fall, NOS	4	
Lifting	2	
Trauma, Acute, NOS	2	
Motor Vehicle Accident	1	
Physical Factors, NOS	1	
Posture, Upper Extremity	1	
Tendinitis/Bursitis of Biceps/Shoulder/Rotator Cuff	**17**	**(1.3)**
Keyboard Use	5	
Repetitive Motion	5	
Fall, NOS	2	
Forceful Movements, NOS	2	
Lifting	2	
Assault	1	
Posture, Body - Dynamic	1	
Posture, Upper Extremity	1	
Thoracic Outlet Syndrome	**2**	**(0.2)**
Keyboard Use	2	

CTDs OR MUSCULOSKELETAL PAIN, LOCATION NOT SPECIFIED (36)

Osteoarthritis, NOS	**18**	**(1.4)**
Repetitive Motion	18	
Unspecified Cumulative Trauma Disorders, Fibromyalgia, or Musculoskeletal Pain, Location not Specified	**18**	**(1.4)**
Repetitive Motion	11	
Keyboard Use	2	
Chemicals, NOS	1	
Ergonomic Factors, NOS	1	
Fall, NOS	1	
Lifting	1	
Motor Vehicle Accident	1	
Paint	1	
Polyurethane	1	
Posture, NOS	1	

SYMPTOMS AND ILL-DEFINED CONDITIONS	**161**	
Chest Pain	**1**	**(0.1)**
Air Pollutants, Indoor	1	
Chronic Fatigue	**1**	**(0.1)**
Isopropyl Alcohol	1	

Cough	**4**	**(0.3)**
Air Pollutants, Indoor	1	
Dichlorvos	1	
Humidity, Low	1	
Methyl Ethyl Ketone	1	
Pyrethrins	1	
Dizziness	**3**	**(0.2)**
Methyl Ethyl Ketone	2	
Formaldehyde	1	
Paint	1	
Struck Against/Struck By Object	1	
Toluene	1	
Trichloroethylene	1	
Headache, Chemical or NOS	**22**	**(1.7)**
Solvents, NOS	5	
Air Pollutants, Indoor	4	
Glutaraldehyde	3	
Cement Dust	1	
Chemicals, NOS	1	
Diesel Exhaust	1	
Diesel Fuel	1	
Dust, NOS	1	
Dyes, NOS	1	
Engine Exhaust	1	
Formaldehyde	1	
Gasoline	1	
Isopropyl Alcohol	1	
Methanol	1	
Methyl Ethyl Ketone	1	
Pesticides, NOS	1	
Resin Systems, NOS	1	
Trichloroethylene	1	
Headache, Migraine	**1**	**(0.1)**
Air Pollutants, Indoor	1	
Hoarseness	**1**	**(0.1)**
Phosphoric Acid	1	
Multiple Chemical Sensitivity and Acquired Chemical Intolerance	**52**	**(4.1)**
Air Pollutants, Indoor	25	
Solvents, NOS	11	
Paint	2	
Pesticides, NOS	2	
Acids, Bases, Oxidizers, NOS	1	
Chemicals, NOS	1	
Degreaser, NOS	1	
Diesel Exhaust	1	
Ethanol	1	
Formaldehyde	1	
Hydrocarbons, NOS	1	
Hydrogen Sulfide	1	

Multiple Chemical Sensitivity and Acquired Chemical Intolerance	**continued**	
Isocyanates, NOS	1	
Odors	1	
Phenylene Diamine	1	
Photo Developing Chemicals, NOS	1	
Quaternary Ammonium Compounds	1	
Sulfur Oxides	1	
Sulfuric Acid	1	
Xylene	1	
Nosebleeds	**1**	**(0.1)**
Glutaraldehyde	1	
Nausea/Vomiting	**2**	**(0.2)**
Solvents, NOS	1	
Waste, NOS	1	
Shortness of Breath	**2**	**(0.2)**
Smoke, NOS	1	
Welding, NOS	1	
Sick Building Syndrome and Other General Symptoms	**71**	**(5.6)**
Air Pollutants, Indoor	63	
4-PC	2	
Solvents, NOS	2	
Carbon Dioxide	1	
Chemicals, NOS	1	
Dust, NOS	1	
Latex, Natural Rubber	1	
Perfume, NOS	1	
CHEMICAL POISONINGS/SYNDROMES	**76**	
Metal Fume Fever	**4**	**(0.3)**
Zinc	2	
Welding Fume, Copper/Nickel	1	
Welding, NOS	1	
Toxic Effects of Carbon Monoxide	**1**	**(0.1)**
Waste, Treated Human Sludge	1	
Toxic Effects of Gas/Fumes/Vapors and Miscellaneous Chemicals	**3**	**(0.2)**
Ethylene Oxide	2	
Air Pollutants, Indoor	1	
Toxic Effect of Lead	**31**	**(2.4)**
Lead, Inorganic	30	
Smoke, Lead-Containing	1	
Toxic Effect of Other Metals	**3**	**(0.2)**
Mercury, Inorganic	2	
Arsenic	1	

Toxic Effects of Pesticides	**6**	**(0.5)**
Chlorpyrifos	3	
Organophosphate Pesticides, NOS	2	
Pesticides, NOS	1	
Baygon	1	
Toxic Effect of Solvents	**28**	**(2.2)**
Solvents, NOS	17	
Chlorinated Hydrocarbons, NOS	3	
Hydrocarbons, NOS	2	
Methylene Chloride	2	
Air Pollutants, Indoor	1	
Ethanolamines, NOS	1	
Glycol Ethers, NOS	1	
Methyl Ethyl Ketone	1	
Naphtha	1	
Photo Developing Chemicals, NOS	1	
Toluene	1	
Xylene	1	
TRAUMATIC INJURIES, NOT INCLUDING MUSCULOSKELETAL AND EYE	**47**	
Burn, Chemical	**2**	**(0.2)**
Acids, Bases, Oxidizers, NOS	1	
Trifluoroacetic Acid	1	
Closed Head Injury	**1**	**(0.1)**
Trauma, Acute, NOS	1	
Contusion/Abrasion, Head	**2**	**(0.2)**
Fall, NOS	2	
Contusion/Abrasion, Lower Extremity	**16**	**(1.3)**
Fall, NOS	9	
Struck Against/Struck By Object	4	
Trauma, Acute, NOS	2	
Struck By Falling Object	1	
Contusion/Abrasion, Trunk	**8**	**(0.6)**
Fall, NOS	7	
Motor Vehicle Accident	1	
Contusion/Abrasion, Upper Extremity	**8**	**(0.6)**
Fall, NOS	2	
Trauma, Acute, NOS	2	
Caught In or Between Objects	1	
Struck Against/Struck By Object	1	
Struck By Falling Object	1	
Struck by Motor Vehicle (Road)	1	

Crush Injury, Hand/Finger	**4**	**(0.3)**
Caught In or Between Objects	2	
Struck by Falling Object	1	
Trauma, Acute, NOS	1	
Laceration, Head	**1**	**(0.1)**
Struck By/Struck Against Object	1	
Laceration, Upper Extremity	**2**	**(0.2)**
Caught In or Between Objects	1	
Fall, NOS	1	
Laceration, Lower Extremity	**1**	**(0.1)**
Cutting or Piercing Object, Except Blood-Contaminated Sharps	1	
Unspecified Traumatic Injuries	**2**	**(0.2)**
Lifting	1	
Trauma, Acute, NOS	1	

MISCELLANEOUS CONDITIONS	**10**	
Anaphylactic Reaction	**2**	**(0.2)**
Air Pollutants, Indoor	1	
Copper Phthalocyanine	1	
Angioedema	**2**	**(0.2)**
Air Pollutants, Indoor	2	
Diabetes	**1**	**(0.1)**
Perchloroethylene (Tetrachloroethylene)	1	
Gout, Toe	**1**	**(0.1)**
Struck Against/Struck By Object	1	
Hypercoagulation	**1**	**(0.1)**
Trental	1	
Immunodeficiency	**1**	**(0.1)**
Agent Orange	1	
Sarcoidosis	**1**	**(0.1)**
Paint	1	
Silica, Crystalline	1	
Side Effects of AZT Treatment	**1**	**(0.1)**
HIV Exposure	1	

Table O-7 - 468 AOEC Respiratory Diagnoses[+] Related to Occupational Exposures other than Asbestos, by Hazard Category, 1994-1996

546 Respiratory Diagnosis-Hazard Relationships

HAZARD CATEGORY			# of dx related to Haz Cat
Haz Code	**Hazard**	Diagnosis (dx)	# of dx related to hazard
MINERAL AND INORGANIC DUSTS			**102**
010.00	**Dust, NOS**		**26**
		Asthma	14
		Chronic/Unspecified Respiratory Irritation	7
		Bronchitis, NOS	2
		Chronic Bronchitis	1
		COPD	1
		RADS	1
010.03	**Cement Dust**		**1**
		Chronic/Unspecified Respiratory Irritation	1
010.04	**Carbon Black**		**1**
		RADS	1
010.06	**Coal**		**7**
		Coal Workers' Pneumoconiosis	7
010.07	**Fly Ash**		**1**
		Asthma	1
010.09	**Man-Made Mineral Fibers**		**2**
		COPD	1
		RADS	1
010.10	**Plaster**		**1**
		Chronic/Unspecified Respiratory Irritation	1
010.12	**Silica, Amorphous**		**1**
		Silicosis	1

+ Not including respiratory symptoms such as cough or shortness of breath (see Table 0-6, "Symptoms and Ill-Defined Conditions").

& Each diagnosis may be related to as many as three hazards. Thus a single diagnosis may appear up to three times in this table. There are 468 unique respiratory diagnoses (see Table 0-6).

* Known asthma inducer, as defined by M. Chan-Yeung and J-L Malo, in *Asthma*, Barnes et al. (eds), Raven Press, 1997.

** Some hazards in this group are known asthma inducers, as defined above.

010.13 Silica, Crystalline		**61**
	Silicosis	58
	Bronchitis, NOS	2
	Laryngeal Polyps	1
010.16 Ash, NOS		**1**
	Bronchitis, NOS	1
METALS AND METALLOIDS		**28**
020.00 Metal Fumes, NOS		**3**
	Asthma	2
	RADS	1
020.01 Aluminum *		**1**
	Chronic/Unspecified Respiratory Irritation	1
020.14 Chromium, Not Hexavalent *		**1**
	Asthma	1
020.16 Copper		**1**
	Asthma	1
020.20 Platinum *		**1**
	Asthma	1
020.39 Zinc *		**2**
	Asthma	1
	Chronic/Unspecified Respiratory Irritation	1
021.00 Metal Dust, NOS		**1**
	Bronchitis, NOS	1
Hexavalent Chromium Compounds		
022.00 Chromium, Hexavalent, NOS		**1**
	COPD	1
022.04 Chromic Acid *		**1**
	Chronic Bronchitis	1
Welding Exposures		
023.00 Welding, NOS		**14**
	Asthma	4
	COPD	4
	Chronic/Unspecified Respiratory Irritation	2
	Emphysema	1
	Laryngeal Polyps	1
	Pneumoconiosis, Inorganic Dust	1
	RADS	1
023.03 Welding Fumes, Copper/Nickel		**1**
	Chronic/Unspecified Respiratory Irritation	1
023.06 Welding Fumes, Galvanized Metal		**1**
	RADS	1

HALOGENS (INORGANIC)		**2**
030.02 Chlorine		**2**
	Acute Respiratory Irritation	1
	Asthma	1
MISCELLANEOUS INORGANIC COMPOUNDS		**8**
040.05 Fluxes, NOS		**1**
	Chronic/Unspecified Respiratory Irritation	1
040.06 Hydrogen Sulfide		**1**
	RADS	1
040.11 Ozone		**1**
	Asthma	1
040.20 Sulfur Oxides		**1**
	Chronic/Unspecified Respiratory Irritation	1
040.24 Irritant Gases, NOS		**4**
	Asthma	2
	Chronic/Unspecified Respiratory Irritation	1
	RADS	1
ACIDS, BASES, AND OXIDIZING AGENTS		**21**
050.00 Acids, Bases, Oxidizers, NOS		**5**
	Asthma	4
	RADS	1
050.02 Bleach		**2**
	Chronic/Unspecified Respiratory Irritation	1
	RADS	1
050.10 Hydrochloric Acid		**1**
	Asthma	1
050.15 Phosphoric Acid		**1**
	Asthma	1
050.18 Sodium Hydroxide		**1**
	Asthma	1
050.22 Sodium Metasilicate		**1**
	Silicosis	1
050.24 Sulfuric Acid		**4**
	Asthma	1
	Chronic Bronchitis	1
	COPD	1
	Chronic/Unspecified Respiratory Irritation	1

050.34 Acetic Acid **		**1**
	Chronic/Unspecified Respiratory Irritation	1
050.40 Sodium Bisulfate		**1**
	Asthma	1
Ammonia Compounds		
052.02 Ammonia Solution		**3**
	Asthma	1
	Bronchitis, NOS	1
	COPD	1
052.03 Ammonium Salts		**1**
	Asthma	1
ALIPHATIC AND ALICYCLIC HYDROCARBONS		**9**
060.03 Heptane		**1**
	Chronic/Unspecified Respiratory Irritation	1
060.10 Turpentine		**1**
	Asthma	1
Petroleum Derivatives		
061.02 Naphtha		**2**
	Chronic Bronchitis	1
	RADS	1
061.05 Jet Fuel		**2**
	Asthma	1
	Chronic/Unspecified Respiratory Irritation	1
061.07 Asphalt		**3**
	Chronic/Unspecified Respiratory Irritation	1
	COPD	1
	RADS	1
ALCOHOLS		**5**
070.06 Isopropyl Alcohol		**5**
	RADS	2
	Bronchitis, NOS	1
	Chronic/Unspecified Respiratory Irritation	1
	COPD	1
GLYCOL ETHERS		**3**
090.00 Glycol Ethers, NOS		**1**
	Lung Funtion Abnormalities	1
090.01 Propylene Glycol Ethers		**1**
	Chronic Bronchitis	1

091.03 EGBE		**1**
	Asthma	1
EPOXY COMPOUNDS		**9**
110.02 Epoxy Resins *		**4**
	Asthma	2
	Chronic/Unspecified Respiratory Irritation	1
	RADS	1
110.03 Ethylene Oxide *		**5**
	Chronic/Unspecified Respiratory Irritation	3
	Asthma	1
	Chronic Bronchitis	1
ALDEHYDES AND ACETALS		**17**
120.03 Formaldehyde*		**6**
	Asthma	5
	RADS	1
120.05 Glutaraldehyde*		**10**
	Asthma	6
	Chronic/Unspecified Respiratory Irritation	3
	RADS	1
120.09 Crotonaldehyde		**1**
	RADS	1
ESTERS		**3**
Acrylates		
142.00 Acrylates, NOS		**2**
	Asthma	2
142.04 Methyl Methacrylate *		**1**
	RADS	1
AROMATIC HYDROCARBONS		**7**
160.00 Aromatic Hydrocarbons, NOS		**1**
	Bronchitis, NOS	1
160.02 Toluene		**3**
	Chronic/Unspecified Respiratory Irritation	3
160.04 Styrene *		**3**
	Asthma	2
	Chronic/Unspecified Respiratory Irritation	1

HYDROCARBONS, NOS		**48**
170.01 Cutting Oils *		**8**
	Chronic/Unspecified Respiratory Irritation	2
	Bronchitis, NOS	2
	Asthma	1
	Interstitial Pulmonary Fibrosis	1
	Laryngeal Polyps	1
	RADS	1
Solvents, NOS		
171.00 Solvents, NOS		**24**
	Asthma	12
	Chronic/Unspecified Respiratory Irritation	5
	Bronchitis, NOS	2
	Lung Function Abnormalities	2
	COPD	1
	Non-Specific Respiratory Disorder	1
	RADS	1
171.01 Paint		**14**
	Asthma	9
	Chronic/Unspecified Respiratory Irritation	3
	Lung Function Abnormalities	1
	RADS	1
171.04 Degreaser, NOS		**2**
	Bronchitis, NOS	1
	COPD	1
PHENOLS AND PHENOLIC COMPOUNDS		**1**
180.04 Phenol		**1**
	Chronic/Unspecified Respiratory Irritation	1
HALOGENATED ALIPHATIC HYDROCARBONS (EXCEPT ORGANOCHLORINE PESTICIDES)		**8**
190.03 Chloroform		**1**
	Asthma	1
190.08 Methyl Chloroform (1,1,1-Trichloroethane)		**2**
	Asthma	1
	RADS	1
190.10 Perchloroethylene (Tetrachloroethylene)		**1**
	Asthma	1
Fluorocarbons		
192.01 Freon *		**3**
	Asthma	1
	Bronchitis, NOS	1
	Chronic/Unspecified Respiratory Irritation	1

192.05 Difluoroethane		**1**
	Asthma	1
ISOCYANATES		**12**
221.00 Isocyanates, NOS *		**10**
	Asthma	6
	RADS	4
221.01 Toluene Diisocyanate *		**2**
	Asthma	2
ALIPHATIC AND ALICYCLIC AMINES		**2**
Ethanolamines		
231.00 Ethanoloamines, NOS		**1**
	Asthma	1
Polyamines		
232.01 Ethylenediamine *		**1**
	RADS	1
AROMATIC NITRO AND AMINO COMPOUNDS (INCLUDING HETEROCYCLIC)		**2**
250.09 Picric Acid		**1**
	RADS	1
250.17 Dyes, NOS		**1**
	Asthma	1
ALIPHATIC (INCLUDING HETEROCYCLIC) AND MISCELLANEOUS NITROGEN COMPOUNDS		**1**
260.17 Triazine		**1**
	Bronchitis, NOS	1
POLYMERS		**35**
270.00 Polymers, NOS		**2**
	Asthma	1
	RADS	1
270.02 Latex, Natural Rubber *		**23**
	Asthma	22
	Chronic/Unspecified Respiratory Irritation	1
270.06 Polyethylene *		**1**
	Interstitial Pulmonary Fibrosis	1

270.07 Polyurethane		**4**
	Asthma	2
	COPD	1
	Interstitial Pulmonary Fibrosis	1
270.09 Polyvinyl Chloride *		**3**
	Asthma	1
	Chronic Bronchitis	1
	RADS	1
270.10 Silicone		**1**
	RADS	1
270.16 Urea Formaldehyde *		**1**
	Asthma	1
ORGANOPHOSPHATE PESTICIDES/CARBAMATE PESTICIDES		**4**
290.01 Piperonyl Butoxide		**1**
	Asthma	1
Organophosphate Pesticides		
291.00 Organophosphate Pesticides, NOS *		**1**
	Chronic/Unspecified Respiratory Irritation	1
291.01 Malathion *		**1**
	Asthma	1
291.05 Chloropyrifos *		**1**
	Chronic/Unspecified Respiratory Irritation	1
ORGANIC SULFUR COMPOUNDS		**3**
310.01 Carbon Disulfide		**1**
	RADS	1
310.11 Sulfites, NOS		**2**
	Chronic/Unspecified Respiratory Irritation	1
	Non-Specific Respiratory Disorders	1
MISC CHEMICALS AND MATERIALS, REFERENCED BY USE		**142**
320.01 Air Pollutants, Indoor		**102**
	Asthma	50
	Chronic/Unspecified Respiratory Irritation	37
	RADS	7
	Bronchitis, NOS	4
	Vocal Cord/Larynx Disorders	2
	Chronic Bronchitis	1
	COPD	1

320.06 Chemicals, NOS		**10**
	Asthma	4
	Chronic/Unspecified Respiratory Irritation	3
	COPD	1
	Lung Function Abnormalities	1
	RADS	1
320.08 Fungicide, NOS		**1**
	Non-Specific Respiratory Disorders	1
320.11 Glues, NOS		**4**
	RADS	2
	Bronchitis, NOS	1
	Chronic/Unspecified Respiratory Irritation	1
320.12 Hair Products		**3**
	Asthma	2
	Chronic/Unspecified Respiratory Irritation	1
320.14 Lubricants, NOS		**10**
	Asthma	3
	Bronchitis, NOS	2
	Emphysema	2
	Interstitial Pulmonary Fibrosis	2
	RADS	1
320.16 Pesticides, NOS		**1**
	Asthma	1
320.17 Photo Developing Chemicals, NOS **		**3**
	Asthma	2
	Chronic/Unspecifed Respiratory Irritation	1
320.18 Pyrethrins		**2**
	Asthma	2
320.23 Perfume, NOS		**1**
	Asthma	1
320.29 Printing Chemicals, NOS		**1**
	Non-Specific Respiratory Disorders	1
320.30 N-Octyl Bicycloheptene Dicarboximide		**1**
	Asthma	1
Pharmaceutical Compounds		
321.00 Pharmaceuticals, NOS		**1**
	Asthma	1
Cleaning Materials		
322.01 Soap		**1**
	Asthma	1

Waste		
323.01 Waste, Hazardous		**1**
	RADS	1
PYROLYSIS PRODUCTS		**27**
330.02 Plastic Smoke		**2**
	Asthma	1
	Emphysema	1
330.03 Smoke, NOS		**16**
	Asthma	6
	COPD	5
	Bronchitis, NOS	1
	Chronic Bronchitis	1
	Chronic/Unspecified Respiratory Irritation	1
	Emphysema	1
	Interstitial Pulmonary Fibrosis	1
Exhaust		
331.00 Exhaust, NOS		**1**
	Asthma	1
331.01 Diesel Exhaust		**6**
	Asthma	3
	Bronchitis, NOS	2
	RADS	1
331.02 Engine Exhaust		**2**
	Asthma	2
PHYSICAL FACTORS		**9**
350.02 Cold		**3**
	Asthma	2
	RADS	1
350.03 Heat		**3**
	Asthma	3
350.04 Humidity, Low		**3**
	Chronic/Unspecified Respiratory Irritation	3
PLANT MATERIALS		**14**
370.00 Plant Material, NOS **		**2**
	Asthma	1
	Chronic/Unspecified Respiratory Irritation	1
370.01 Paper Dust		**3**
	Chronic/Unspecified Respiratory Irritation	2
	Asthma	1

370.05 Fruit Juices		**1**
	Chronic/Unspecified Respiratory Irritation	1
370.07 Grass Cuttings		**1**
	RADS	1
Flours		
371.00 Flour, NOS		**4**
	Asthma	3
	Chronic/Unspecified Respiratory Irritation	1
Wood Dusts		
373.00 Wood Dust, NOS		**3**
	Asthma	2
	Chronic/Unspecified Respiratory Irritation	1
MICROORGANISMS		**24**
390.00 Microorganisms, NOS		**2**
	Asthma	1
	Extrinsic Allergic Alveolitis	1
390.01 Mold **		**20**
	Chronic/Unspecified Respiratory Irritation	12
	Asthma	7
	Bronchitis, NOS	1
390.07 Infectious Agents, NOS		**2**
	Acute Bronchitis	1
	Chronic/Unspecified Respiratory Irritation	1

Table O-8 - 216 AOEC Cases With Diagnoses Related to Occupational Solvent* Exposure, 1994-1996

245 Diagnoses Related to Occupational Solvent Exposures

DIAGNOSIS GROUP Diagnosis	# of Dx in Group Freq.	(% of Solvent Cases)
PSYCHIATRIC and NEUROLOGICAL DISORDERS	**121**	
Toxic Encephalopathy	74	(34.3)
Organic Affective Disorder	24	(11.1)
Depression, Neurotic	14	(6.5)
Organic Brain Syndrome/Cognitive Problems	4	(1.9)
Peripheral Neuropathy Due to Toxic Agents	3	(1.4)
Dementia	1	(0.5)
Unspecified CNS Impairment	1	(0.5)
DISORDERS OF SENSORY ORGANS	**2**	
Hearing Loss	1	(0.5)
Smell and Taste Disorders	1	(0.5)
CARDIOVASCULAR DISEASE	**1**	
Artherosclerosis	1	(0.5)
RESPIRATORY DISORDERS	**59**	
Asthma	26	(12.0)
Upper Respiratory Irritation, Chronic or NOS	15	(6.9)
Reactive Airways Disease	6	(2.8)
Bronchitis, NOS (including Asthmatic Bronchitis)	3	(1.4)
Lung Function Abnormalities	3	(1.4)
Bronchitis, Chronic	2	(0.9)
Chronic Obstructive Pulmonary Disease	2	(0.9)
Non-Specific Respiratory Disorders	2	(0.9)
LIVER DISORDERS	**2**	
Cirrhosis of Liver	1	(0.5)
Chemical Hepatitis	1	(0.5)
SKIN DISORDERS	**7**	
Dermatitis, NOS	3	(1.4)
Rash/Urticaria	2	(0.9)
Dermatitis, Irritant	1	(0.5)
Other Skin Abnormalities	1	(0.5)
CHEMICAL POISONINGS/SYNDROMES	**22**	
Toxic Effect of Solvent	22	(10.2)
SYMPTOMS AND ILL-DEFINED CONDITIONS	**28**	
Multiple Chemical Sensitivity	13	(6.0)
Headache	9	(4.2)
Dizziness	2	(0.9)
Chronic Pain	1	(0.5)
Cough	1	(0.5)
Fatigue	1	(0.5)
Nausea	1	(0.5)
MISCELLANEOUS	**3**	
Diabetes	1	(0.5)
Proteinurea	1	(0.5)
Sarcoidosis	1	(0.5)

* Organic solvents have been tagged with a special code in the AOEC exposure coding system.

Table O-9 - 21 AOEC Cases With Diagnoses Related to Occupational Pesticide* Exposure, 1994-1996

22 *Diagnoses Related to Occupational Pesticide Exposures*

DIAGNOSIS GROUP Diagnosis	# of Dx in Group Freq.	(% of Pesticide Cases)
PSYCHIATRIC and NEUROLOGICAL DISORDERS	**1**	
Dementia	1	(4.8)
RESPIRATORY DISORDERS	**8**	
Asthma	4	(19.0)
Upper Respiratory Irritation, Chronic or NOS	2	(9.5)
Bronchitis, Asthmatic	1	(4.8)
Upper Respiratory Irritation, Acute	1	(4.8)
SKIN DISORDERS	**3**	
Dermatitis, NOS	3	(14.3)
SYMPTOMS AND ILL-DEFINED CONDITIONS	**5**	
Multiple Chemical Sensitivity	2	(9.5)
Cough	1	(4.8)
Headache, Chemical or NOS	1	(4.8)
Immunodeficiency	1	(4.8)
CHEMICAL POISONINGS/SYNDROMES	**5**	
Toxic Effect of Pesticides	5	(23.8)

* Pesticides have been tagged with a special code in the AOEC exposure coding system.

AOEC DATABASE, 1994 - 1996

"ASBESTOS" TABLES AND FIGURES

Cases Related to Occupational and Environmental Asbestos Exposures (N=1740)

Table A-1 - AOEC Cases Related to Asbestos Exposures (N=1740)

Demographic Characteristics

	1994	1995	1996	**Total** Subtotal	(%) (%)
Cases from Participating Clinics	**218**	**1061**	**461**	**1740**	**(100.0)**
CA, San Francisco Gen'l Hosp.	4	0	0	4	(0.2)
DC, George Washington Univ.	38	49	77	164	(9.4)
IL, Cook County Hospital	6	0	0	6	(0.3)
MA, Mass. Respiratory Hosp.	15	33	30	78	(4.5)
MA, Cambridge Hospital	0	1	0	1	(0.1)
MI, St. Lawrence Hospital	134	972	354	1460	(83.9)
NJ, Robert Wood Johnson	15	5	0	20	(1.1)
PA, Medical College of PA	0	1	0	1	(0.1)
RI, Brown University	6	0	0	6	(0.3)
Age					
< 20	0	1	0	1	(0.1)
20 - 29	0	0	0	0	(0.0)
30 - 39	1	2	0	3	(0.2)
40 - 49	22	138	38	198	(11.4)
50 - 59	77	296	149	522	(30.0)
> 60	118	624	274	1016	(58.4)
Gender					
Male	218	1046	456	1720	(99.1)
Female	0	15	5	20	(0.9)
Union Member (Occupational Cases Only, N=1736)					
Yes	199	66	69	334	(19.2)
No	15	16	23	54	(3.1)
Unknown	4	979	365	1348	(77.6)

Figure A-1 - Ethnicity
AOEC Cases Related to Asbestos Exposures
1994-1996 (N=1740)

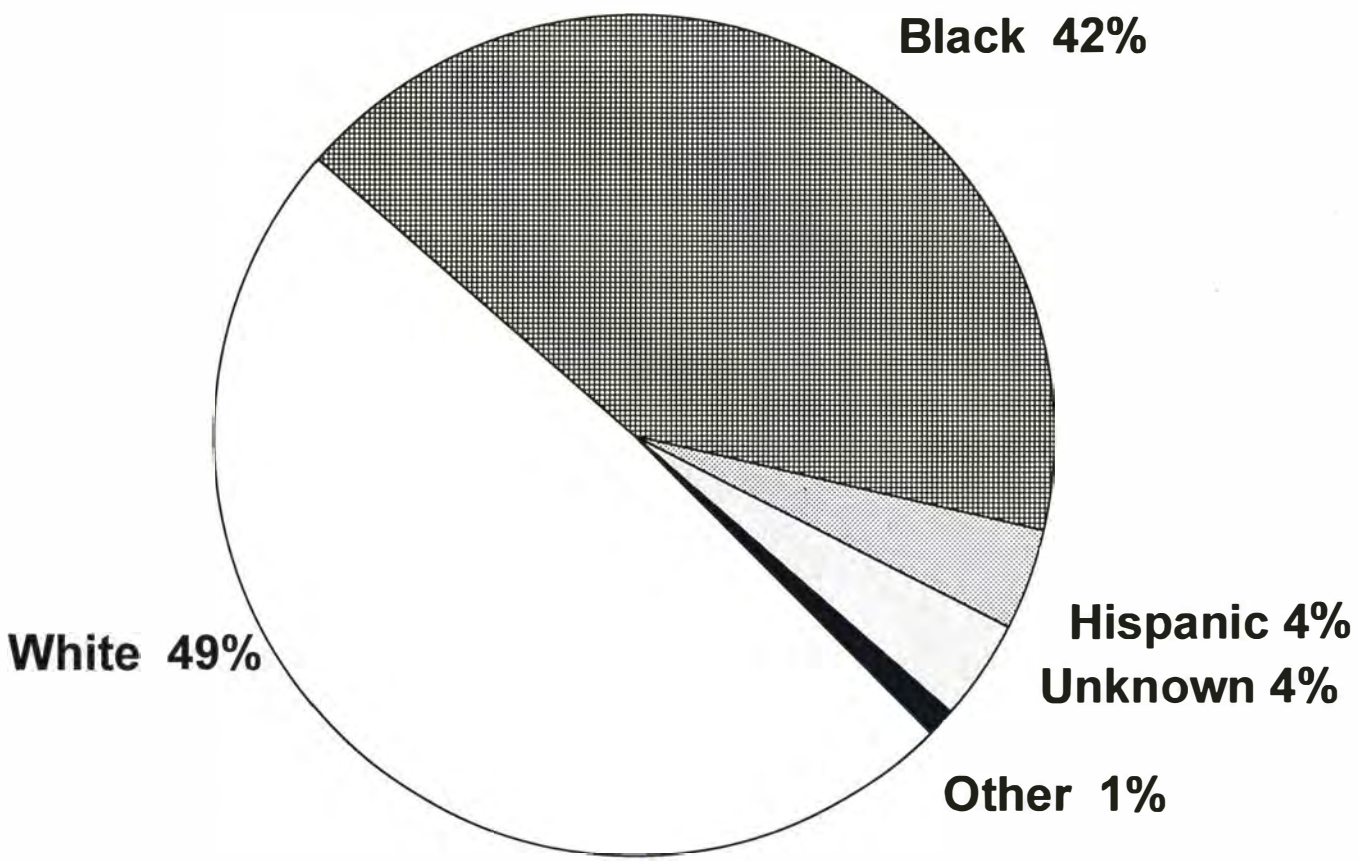


Figure A-2 - Referral Source
AOEC Cases Related to Asbestos Exposures
1994-1996 (N=1740)

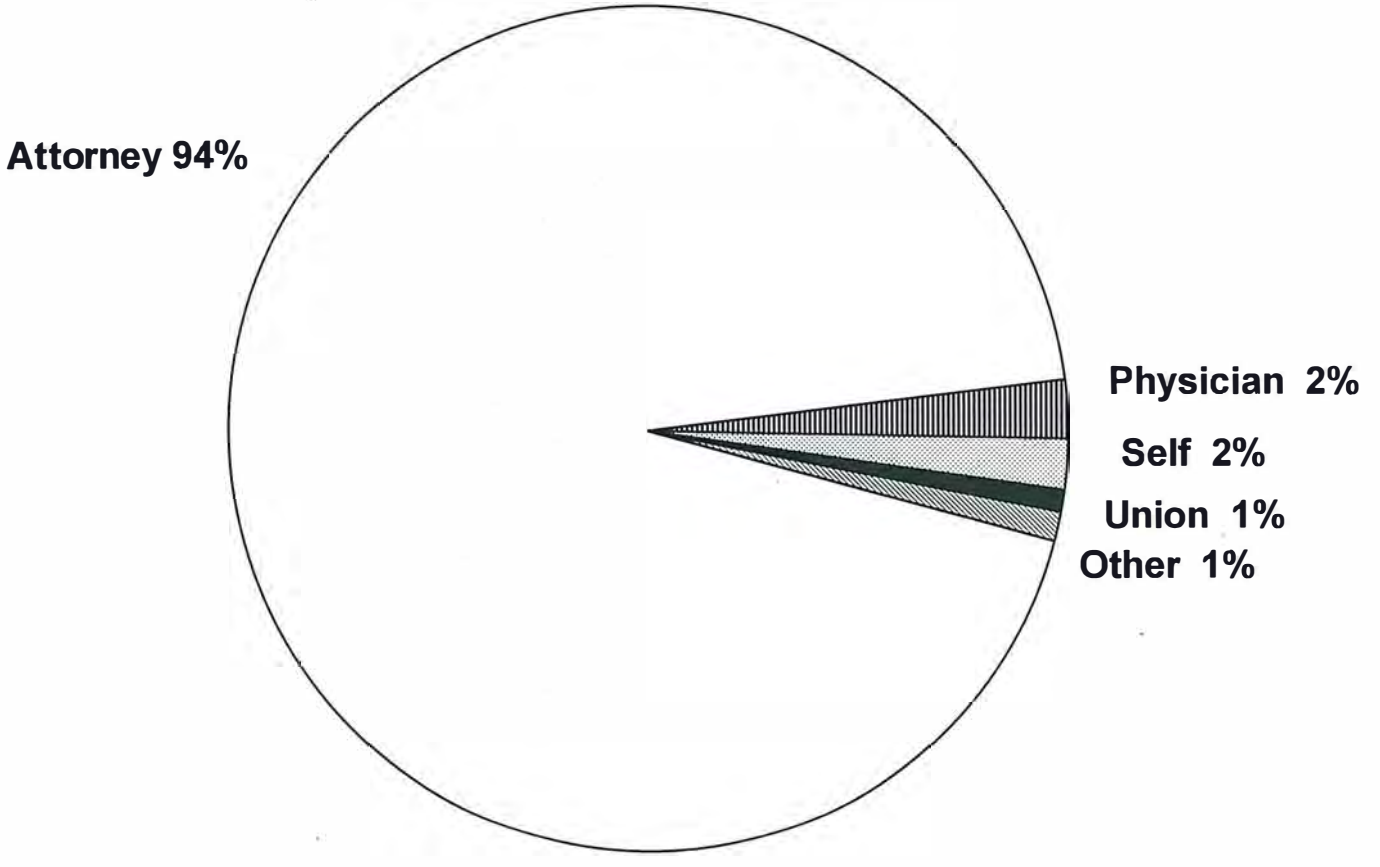
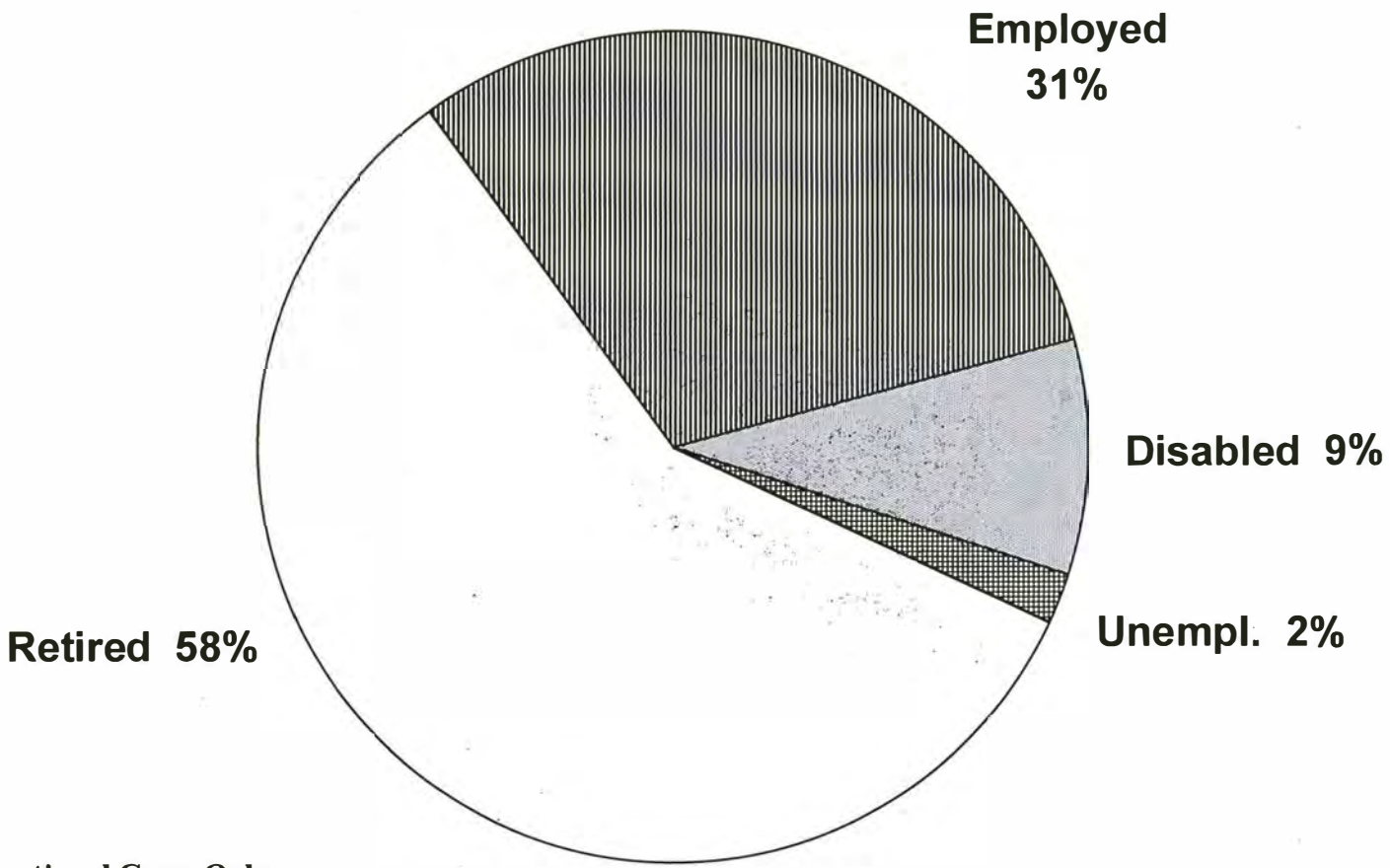


Figure A-3 - Job Status
AOEC Cases Related to Asbestos Exposures
1994-1996 (N=1736*)



* Occupational Cases Only

Table A-2 - AOEC Cases Related to Occupational Asbestos Exposures (N=1736)

Current or Most Relevant Industry

SIC CODE	INDUSTRY	1994	1995	1996	TOTAL	(%)*
10-12	**Mining**	**1**	**1**	**1**	**3**	**(0.2)**
	Coal Mining				1	
	Metal Mining				1	
	Other				1	
15-17	**Construction**	**127**	**153**	**266**	**546**	**(31.5)**
	Construction - special trade contractors				407	
	Building Construction-gen'l contractors & operative builders				138	
	Heavy Construction, other than building construction				1	
20-39	**Manufacturing**	**27**	**854**	**86**	**967**	**(55.7)**
	Primary Metal Industries				855	
	Transportation Equipment				66	
	Fabricated Metal Products, except machinery & transport. equip.				15	
	Chemicals and Allied Products				6	
	Industrial and Commercial Machinery and Computer Equipt.				6	
	Miscellaneous Manufacturing Industries				6	
	Stone, Clay, Glass and Concrete Products				6	
	Food and Kindred Products				3	
	Paper & Allied Products				2	
	Printing, Publishing, & Allied Industries				2	
40-49	**Transport., Communication, Elec.,Gas & Sanitary Svcs.**	**51**	**43**	**96**	**190**	**(10.9)**
	Railroad Transportation				124	
	Electric, Gas and Sanitary Services				63	
	Local and Suburban Transit & Interurban Highway				2	
	Water Transportation				1	
50-51	**Wholesale Trade**	**0**	**3**	**2**	**5**	**(0.3)**
	Durable Goods				5	
52-59	**Retail Trade**	**1**	**1**	**1**	**3**	**(0.2)**
	Food Stores				2	
	Auto Dealers & Gasoline Service Stations				1	
60-67	**Finance, Insurance and Real Estate**	**2**	**0**	**0**	**2**	**(0.1)**
	Real Estate				2	
70-89	**Services**	**4**	**3**	**3**	**10**	**(0.6)**
	Educational Services				6	
	Health Services				2	
	Hotels, Rooming Houses, Camps and Other Lodging Places				1	
	Museums, Art Galleries, & Botanicals & Zoological Gardens				1	
91-97	**Public Administration**	**3**	**1**	**2**	**6**	**(0.3)**
	Executive, Legislative & General Gov't, except finance				4	
	Justice, Public Order and Safety				1	
	National Security and International Affairs				1	
	Missing	**2**	**2**	**0**	**4**	**(0.2)**
	Total	**218**	**1061**	**457**	**1736**	

Table A-3 - AOEC Cases Related to Occupational Asbestos Exposures (N=1736)

Current or Most Relevant Occupation

SOC CODE	OCCUPATION	1994	1995	1996	Total	(%)*
11, 13-14	**Executive, Administrative, and Managerial**	**1**	**3**	**1**	**5**	**(0.3)**
16	**Engineers**	**0**	**0**	**3**	**3**	**(0.2)**
17-18	**Natural Scientists and Mathematicians**	**0**	**0**	**1**	**1**	**(0.1)**
22-25	**Teachers, Librarians and Counselors**	**1**	**0**	**0**	**1**	**(0.1)**
37, 39	**Technologists and Technicians, Except Health**	**0**	**0**	**3**	**3**	**(0.2)**
42	**Marketing and Sales Occupations**	**0**	**1**	**0**	**1**	**(0.1)**
46	**Administrative Support Occupations, Incl. Clerical**	**1**	**0**	**1**	**2**	**(0.1)**
51-52	**Service Occupations**	**1**	**18**	**9**	**28**	**(1.6)**
	Cleaning and Building Service Occupations				24	
	Fireman				2	
	Food and Beverage Preparation & Service Occupations				1	
	Other Service Occupations				1	
55-58	**Agriculture, Forestry and Fishing Occupations**	**0**	**1**	**0**	**1**	**(0.1)**
61	**Mechanics and Repairers**	**28**	**70**	**42**	**140**	**(8.1)**
	Industrial Machinery Repairers				43	
	Vehicle and Mobile Equipment Mechanics				31	
	Electrical and Electronic Equipment Repairers				18	
	Other Mechanics and Repairers				48	
63-64	**Construction and Extractive Occupations**	**101**	**188**	**211**	**500**	**(28.8)**
	Plumbers, Pipefitters and Steamfitters				145	
	Brickmasons				116	
	Electricians				74	
	Insulation Workers				40	
	Carpenters				34	
	Concrete and Terrazzo Finishers				30	
	Plasterers				25	
	Painters				10	
	Structural Metal Workers				7	
	Supervisors; Construction and Extractive Occupations				6	
	Drywall Installers				3	
	Extractive Occupations				2	
	Other Construction Trades				8	

SOC CODE	OCCUPATION	1994	1995	1996	Total	(%)*
67-69	**Precision Production Occupations**	**46**	**33**	**76**	**155**	**(8.9)**
	Sheet Metal Workers				56	
	Boilermakers				38	
	Machinists				23	
	Power Plant Operators				10	
	Boiler and Other Plant Operators				7	
	Stationary Engineers				6	
	Other Precision Production Occupations				15	
71, 73-78	**Production Working Occupation**	**8**	**557**	**46**	**611**	**(35.2)**
	Machine Operators and Tenders				551	
	Welders and Cutters				18	
	Assemblers				15	
	Production Inspectors, Testers, Samplers & Weighers				14	
	Machine Setup Operators				5	
	Graders and Sorters				5	
	Supervisors, Production Occupations				3	
81-83	**Transportation and Material Moving Occupations**	**4**	**43**	**26**	**73**	**(4.2)**
	Rail Transportation Occupations				23	
	Motor Vehicle Operators				15	
	Hoist and Winch Operators				13	
	Crane and Tower Operators				7	
	Supervisors, Transport. & Matl. Moving Occupations				5	
	Operating Engineers				4	
	Other Transportation & Material Moving Occupations				6	
86-87	**Handlers, Equipment Cleaners, Helpers and Laborers**	**27**	**147**	**36**	**210**	**(12.1)**
	Construction Laborers				28	
	Freight, Stock and Material Movers				3	
	Other Manual Occupations				179	
99	**Miscellaneous/Missing Occupations**	**0**	**0**	**1**	**1**	**(0.1)**
	Total	**218**	**1061**	**457**	**1736**	

* Percents do not total to 100 due to rounding.

Table A-4 - Asbestos-Related AOEC Cases Among Union Members, 1994-1996 (N= 334)

Union Membership

Union Name	Total	(%
AFL-CIO	1	(0.
United **Automobile**, Aerospace & Agricultural Implement Workers of America	22	(6.
Int'l Brotherhood of **Boilermakers**, Iron Ship Builders, Blacksmiths, Forgers, & Helpers	6	(1.
Int'l Union of **Bricklayers** and Allied Craftsmen	13	(3.
United Brotherhood of **Carpenters** & Joiners of America	15	(4.
Communications Workers of America	1	(0.
National **Education** Assoc.	1	(0.
Int'l Brotherhood of **Electrical Workers**	25	(7.
Intl. Union of **Elevator Constructors**	1	(0.
Int'l Association of **Firefighters**	1	(0.
Int'l Assoc. of Heat & Frost **Insulators and Asbestos Workers**	14	(4.
Council of **Iron Workers**	1	(0.
Int'l. Assoc. of Bridge, Structural & Ornamental **Iron Workers**	4	(1.
Laborers Int'l Union	41	(12
Int'l Assoc. of **Machinist and Aerospace Workers**	13	(3.
Brotherhood of **Maintenance of Way** Employees	1	(0
Industrial Union of **Marine & Shipbuilding** Workers of America	1	(0
Marine & Shipbuilding	5	(0
Int'l **Masonry** Institute	3	(0
United **Mine Workers**	1	(0
Int'l Union of **Operating Engineers**	7	(2
Operative Plasterers' and Cement Masons Int'l Association	14	(4
Int'l Brotherhood of **Painters** and Allied Trades	5	(1
Assoc. of Journeyman & **Pipefitting** Industries	2	(0
United Assoc. of Journeyman & Apprentices of the **Plumbing and Pipefitting** Industry	63	(18
Intl. Allied **Printing** Trades	1	(0
Brotherhood of **Railway**, Airline, and Steamship Clerks, Freight Handlers..	1	(0
Sheet Metal Workers' Int'l Association	38	(11
American Federation of **State County & Municipal Employees**	1	(0
United **Steel Workers** of America	2	(0
Utility Workers' Union of America	13	(13
Unknown/Incomplete Union Name	17	(5
Total	**334**	

Table A-5 - 1771 Diagnoses Related to Abestos Exposure, 1994-1996 (N= 1740 Cases)

1771 Abestos Related Diagnoses

DIAGNOSIS GROUP	# of Dx in Group	
Diagnosis	Freq.	(% of Cases)
TUMORS	**24**	
Lung Cancer	11	(0.6)
Colon Cancer	4	(0.2)
Laryngeal Cancer	4	(0.2)
Esophageal Cancer	2	(0.2)
Mesothelioma	2	(0.2)
Laryngeal Polyps	1	(0.1)
RESPIRATORY DISORDERS	**1745**	
Asbestosis/Parenchymal Disease	1582	(90.9)
Pleural Disease*	129	(7.4)
Abnormal Chest X-Ray, NOS	8	(0.5)
Chronic Obstructive Pulmonary Disease (COPD)	8	(0.5)
Chronic Bronchitis (Incl. Asthmatic Bronchitis)	7	(0.4)
Dyspnea	4	(0.2)
Asthma	3	(0.2)
Abnormal Lung Function (Restrictive)*	2	(0.2)
Atelectasis	1	(0.1)
Mixed Dust Fibrosis/Pneumoconiosis	1	(0.1)
OTHER	**2**	
Cor Pulmonale	1	(0.1)
Polycythemia	1	(0.1)

* Pleural disease and restrictive lung function were counted as diagnoses only in the absence of asbestosis/parenchymal disease.

AOEC DATABASE, 1994 - 1996

"ENVIRONMENTAL" TABLES AND FIGURES

Cases Related to Environmental Exposures Other than Asbestos (N=105)

Table E-1 - AOEC Cases Related to Environmental Exposures (N= 105)

Demographic Characteristics

	1994	1995	1996	**Total** Subtotal	(%) (%)
Cases from Participating Clinics	**40**	**49**	**16**	**105**	**(100.0)**
CA, San Francisco Gen'l Hosp.	6	0	0	6	(5.7)
DC, George Washington Univ.	4	6	7	17	(16.2)
IL, Cook County Hospital	2	0	0	2	(1.9)
MA, Mass. Respiratory Hosp.	4	22	9	35	(33.3)
MI, St. Lawrence Hospital	0	1	0	1	(1.0)
NJ, Robert Wood Johnson	22	19	0	41	(39.0)
PA, Medical College of PA	0	1	0	1	(1.0)
RI, Brown Univ.	2	0	0	2	(1.9)
Age					
< 20	2	3	0	5	(4.8)
20 - 29	5	4	2	11	(10.5)
30 - 39	9	9	5	23	(21.9)
40 - 49	13	12	7	32	(30.5)
50 - 59	7	10	0	17	(16.2)
>60	4	11	2	17	(16.2)
Gender					
Male	9	21	7	37	(35.2)
Female	31	28	9	68	(64.8)

Figure E-1 - Ethnicity
AOEC Cases Related to Environmental Exposures, 1994-1996 (N=105)

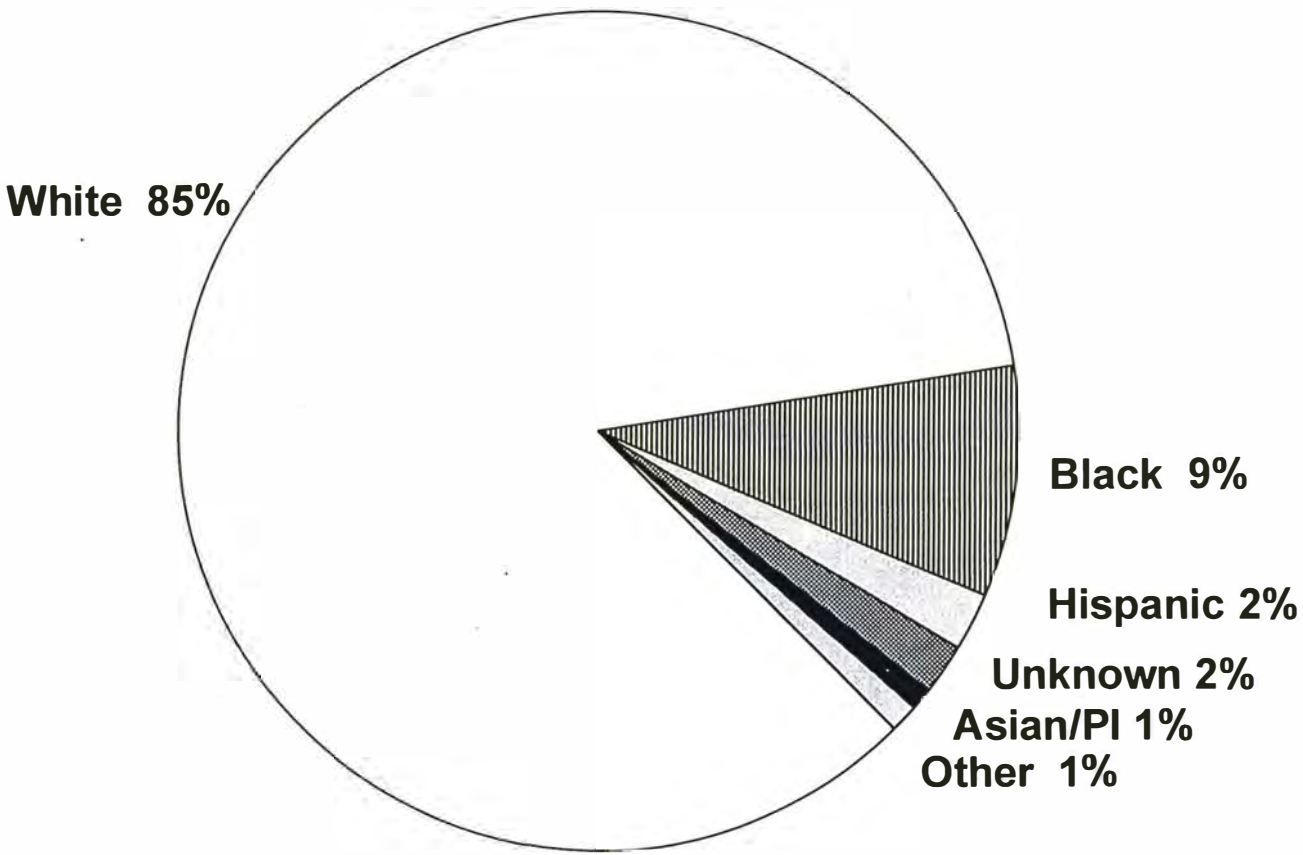


Figure E-2 - Referral Source
AOEC Cases Related to Environmental Exposure
1994-1996 (N=105)

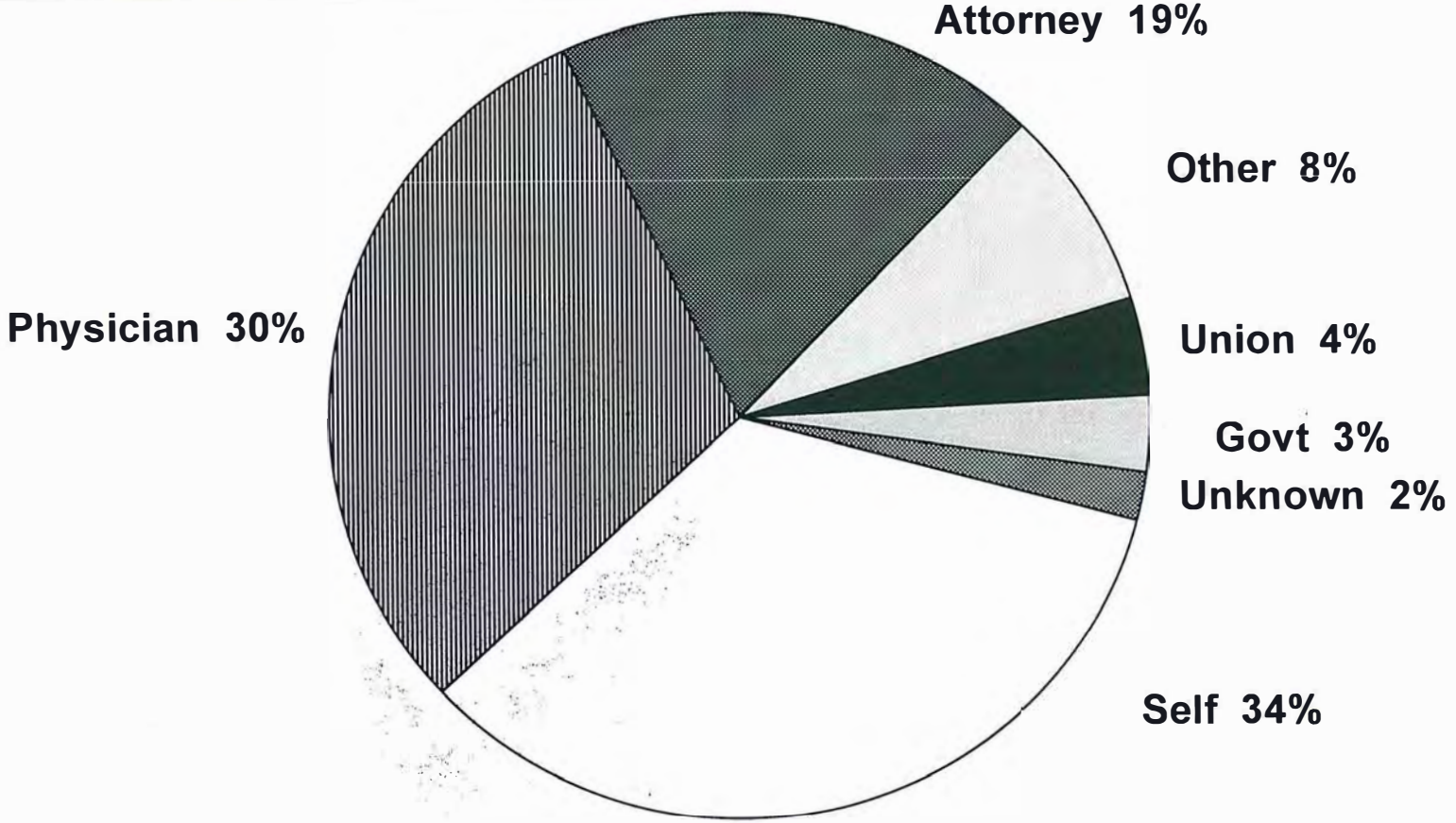


Table E-2 - AOEC Cases Related to Environmental Exposures, 1994-1996 (N= 105 cases, 118 Hazards)

Environmental Hazards

HAZ CODE	HAZARD	FREQ	(%) of HAZARDS
010	**MINERAL AND INORGANIC DUST**	**4**	**(3.4)**
010.00	Dust, NOS	4	(3.4)
020	**METALS AND METALLOIDS**	**10**	**(8.5)**
020.01	Aluminum	1	(0.8)
020.05	Arsenic	2	(1.7)
020.10	Boron	1	(0.8)
020.14	Chromium, Not Hexavalent	1	(0.8)
020.16	Copper	1	(0.8)
020.21	Lead, Inorganic	1	(0.8)
020.22	Lead, Organic	1	(0.8)
020.26	Mercury, Organic	1	(0.8)
020.31	Selenium	1	(0.8)
030	**HALOGENS (INORGANIC)**	**3**	**(2.5)**
030.02	Chlorine	3	(2.5)
040	**MISCELLANEOUS INORGANIC COMPOUNDS**	**3**	**(2.5)**
040.04	Carbon Monoxide	2	(1.7)
042.02	Sodium Nitrate	1	(0.8)
050	**ACIDS, BASES AND OXIDIZING AGENTS**	**2**	**(1.6)**
050.41	Potassium Carbonate	1	(0.8)
052.02	Ammonia Solution	1	(0.8)
060	**ALIPHATIC AND ALICYCLIC HYDROCARBONS**	**8**	**(6.8)**
060.04	Isobutane	1	(0.8)
061.02	Naphtha	1	(0.8)
061.03	Kerosene	1	(0.8)
061.04	Gasoline	2	(1.7)
061.06	Diesel Fuel	1	(0.8)
061.07	Asphalt	2	(1.7)
080	**GLYCOLS**	**1**	**(0.8)**
080.01	Ethylene Glycol	1	(0.8)
120	**ALDEHYDES AND ACETALS**	**2**	**(1.7)**
120.03	Formaldehyde	2	(1.7)

140	**ESTERS**	**1**	**(0.8)**
142	Acrylates		
142.04	Methyl Methacrylate	1	(0.8)
170	**HYDROCARBONS, NOS**	**16**	**(13.6)**
170	Hydrocarbons, NOS	4	(3.4)
171	Solvents, NOS		
171.00	Solvents, NOS	10	(8.5)
171.01	Paint	2	(1.7)
190	**HALOGENATED ALIPHATIC HYDROCARBONS (EXCEPT ORGANOCHLORINE PESTICIDES)**	**4**	**(3.4)**
190.08	Methyl Chloroform (1,1,1-Trichloroethane)	1	(0.8)
190.09	Methylene Chloride	1	(0.8)
190.13	Trichloroethylene	1	(0.8)
192	Fluorocarbons		
192.01	Freon	1	(0.8)
200	**HALOGENATED AROMATIC HYDROCARBONS**	**2**	**(1.7)**
200.04	Chlorinated Dibenzodioxins	1	(0.8)
200.11	Chlorophenoxy Herbicides, NOS	1	(0.8)
250	**AROMATIC NITRO AND AMINO COMPOUNDS (INCLUDING HETEROCYCLIC)**	**1**	**(0.8)**
250.17	Dyes, NOS	1	(0.8)
260	**ALIPHATIC (INCLUDING HETEROCYCLIC) AND MISCELLANEOUS NITROGEN COMPOUNDS**	**1**	**(0.8)**
260.25	Garlon 4	1	(0.8)
270	**POLYMERS**	**7**	**(5.9)**
270.02	Latex, Natural Rubber	6	(5.1)
270.2	Polystyrene	1	(0.8)
280	**ORGANOCHLORINE PESTICIDES**	**1**	**(0.8)**
280	Organochlorine Pesticides, NOS	1	(0.8)
290	**ORGANOPHOSPHATE PESTICIDES/ CARBAMATE PESTICIDES**	**5**	**(4.2)**
291	Organophosphate Pesticides		
291.00	Organophosphate Pesticides, NOS	2	(1.7)
291.05	Chlorpyrifos	1	(0.8)

292	Carbamate Pesticides		
292.00	Carbamate Pesticides, NOS	2	(1.7)
320	**MISCELLANEOUS CHEMICALS AND MATERIALS, REFERENCED BY USE**	**33**	**(28.0)**
320.01	Air Pollutants, Indoor	12	(10.2)
320.06	Chemicals, NOS	2	(1.7)
320.12	Hair Products	1	(0.8)
320.13	Herbicides, NOS	2	(1.7)
320.14	Lubricants, NOS	1	(0.8)
320.15	Odors	2	(1.7)
320.16	Pesticides, NOS	7	(5.9)
320.23	Perfume, NOS	3	(2.5)
321	Pharmaceutical Compounds		
321.26	Ceclor	1	(0.8)
322	Cleaning Materials		
322.01	Soap	2	(1.7)
330	**PYROLYSIS PRODUCTS**	**7**	**(5.9)**
330.01	Cigarette Smoke	4	(3.4)
330.03	Smoke, NOS	1	(0.8)
331	Exhaust		
331.00	Exhaust, NOS	1	(0.8)
331.02	Engine Exhaust	1	(0.8)
360	**ERGONOMIC FACTORS**	**2**	**(1.7)**
361	Force		
361.03	Gripping, Forceful	1	(0.8)
362	Posture		
362.01	Posture, Upper Extremity	1	(0.8)
370	**PLANT MATERIAL**	**3**	**(2.5)**
370.1	Pollen	2	(1.7)
373	Wood Dust		
373.24	Hardwood, Tropical, NOS	1	(0.8)
380	**ANIMAL MATERIALS**	**1**	**(0.8)**
382	Insect, NOS	1	(0.8)
390	**MICROORGANISMS**	**1**	**(0.8)**
390.01	Mold	1	(0.8)
	TOTAL	**118**	**(100.0)**

Table E-3 - Diagnoses and Exposures of 105 Cases Related to Environmental Exposures (Non-Asbestos), 1994-1996

112 Diagnoses and Related Environmental Exposures

DIAGNOSIS GROUP	# of Cases in Group w/ Dx	
DIAGNOSIS (DX) Hazard	**# of Cases w/ Dx*** Hazard Freq	**(% of Cases)**
INFECTIOUS DISEASE	**1**	
Lyme Disease/Arthritis	**1**	**(1.0)**
Insect, NOS	1	
TUMORS	**1**	
Lung Cancer	**1**	**(1.0)**
Cigarette Smoke	1	
PSYCHIATRIC and NEUROLOGICAL DISORDERS	**5**	
Anxiety Disorders	**2**	**(1.9)**
Boron	1	
Ethylene Glycol	1	
Pesticides, NOS	1	
Peripheral Neuropathy	**1**	**(1.0)**
Arsenic	1	
Toxic Encephalopathy	**2**	**(1.9)**
Isobutane	1	
Solvents, NOS	1	
DISORDERS OF SENSORY ORGANS*	**4**	
Conjunctivitis	**4**	**(3.8)**
Ceclor	1	
Methyl Chloroform (1,1,1-Trichloroethane)	1	
Methyl Methacrylate	1	
Polystyrene	1	
Potassium Carbonate	1	
Soap	1	

* Many cases of eye irritation have been reported in combination with upper respiratory irritation. These cases are included with the respiratory diagnoses, and are not included here.

RESPIRATORY DISORDERS	**41**	
Asthma	**16**	**(15.2)**
Latex, Natural Rubber	4	
Air Pollutants, Indoor	3	
Dust, NOS	2	
Chlorine	1	
Chromium, Not Hexavalent	1	
Cigarette Smoke	1	
Dyes, NOS	1	
Engine Exhaust	1	
Gasoline	1	
Hydrocarbons, NOS	1	
Lubricants, NOS	1	
Mold	1	
Bronchitis, Acute	**1**	**(1.0)**
Dust, NOS	1	
Bronchitis, Chronic	**1**	**(1.0)**
Air Pollutants, Indoor	1	
Perfume, NOS	1	
Bronchitis, NOS (including Asthmatic Bronchitis)	**3**	**(2.9)**
Air Pollutants, Indoor	1	
Cigarette Smoke	1	
Gasoline	1	
Reactive Airways Disease (RADS)	**6**	**(5.7)**
Asphalt	1	
Chlorophenoxy Herbicides, NOS	1	
Exhaust, NOS	1	
Pollen	1	
Smoke, NOS	1	
Solvents, NOS	1	
Upper Respiratory Irritation, Chronic or NOS (Sinusitis/rhinitis/pharyngitis/laryngitis)	**14**	**(13.3)**
Solvents, NOS	4	
Air Pollutants, Indoor	2	
Aluminum	1	
Asphalt	1	
Chlorine	1	
Dust, NOS	1	
Freon	1	
Hardwood, Tropical NOS	1	
Herbicides, NOS	1	
Methyl Methacrylate	1	
Pollen	1	
Polystyrene	1	
Trichloroethylene	1	

SKIN DISORDERS	**8**	
Dermatitis, Allergic	**3**	**(2.9)**
Latex, Natural Rubber	3	
Dermatitis, NOS	**4**	**(3.8)**
Arsenic	1	
Chlorine	1	
Garlon 4	1	
Herbicides, NOS	1	
Kerosene	1	
Pesticides, NOS	1	
Erythroderma	**1**	**(1.0)**
Ceclor	1	
Soap	1	
ACUTE and CHRONIC MUSCULOSKELETAL DISORDERS	**2**	
UPPER EXTREMITY PROBLEMS - ARM/HAND/WRIST		
Unspecified Cumulative Trauma Disorders or Musculoskeletal Pain, Upper Extremity	**2**	**(1.9)**
Gripping, Forceful	1	
Posture, Upper Extremity	1	
SYMPTOMS AND ILL-DEFINED CONDITIONS	**30**	
Dry Mouth	**1**	**(1.0)**
Methyl Chloroform (1,1,1-Trichloroethane)	1	
Headache, Chemical or NOS	**4**	**(3.8)**
Ammonia Solution	1	
Diesel Fuel	1	
Gasoline	1	
Naphtha	1	
Multiple Chemical Sensitivity and Acquired Chemical Intolerance	**21**	**(20.0)**
Air Pollutants, Indoor	4	
Perfume, NOS	3	
Pesticides	3	
Chemicals, NOS	2	
Formaldehyde	2	
Hydrocarbons, NOS	2	
Odors	2	
Solvents, NOS	2	
Chlorpyrifos	1	
Cigarette Smoke	1	

SKIN DISORDERS	**8**	
Dermatitis, Allergic	**3**	**(2.9)**
Latex, Natural Rubber	3	
Dermatitis, NOS	**4**	**(3.8)**
Arsenic	1	
Chlorine	1	
Garlon 4	1	
Herbicides, NOS	1	
Kerosene	1	
Pesticides, NOS	1	
Erythroderma	**1**	**(1.0)**
Ceclor	1	
Soap	1	
ACUTE and CHRONIC MUSCULOSKELETAL DISORDERS	**2**	
UPPER EXTREMITY PROBLEMS - ARM/HAND/WRIST		
Unspecified Cumulative Trauma Disorders or Musculoskeletal Pain, Upper Extremity	**2**	**(1.9)**
Gripping, Forceful	1	
Posture, Upper Extremity	1	
SYMPTOMS AND ILL-DEFINED CONDITIONS	**30**	
Dry Mouth	**1**	**(1.0)**
Methyl Chloroform (1,1,1-Trichloroethane)	1	
Headache, Chemical or NOS	**4**	**(3.8)**
Ammonia Solution	1	
Diesel Fuel	1	
Gasoline	1	
Naphtha	1	
Multiple Chemical Sensitivity and Acquired Chemical Intolerance	**21**	**(20.0)**
Air Pollutants, Indoor	4	
Perfume, NOS	3	
Pesticides	3	
Chemicals, NOS	2	
Formaldehyde	2	
Hydrocarbons, NOS	2	
Odors	2	
Solvents, NOS	2	
Chlorpyrifos	1	
Cigarette Smoke	1	
Hair Products	1	
Methylene Chloride	1	

Table E-4 - 19 AOEC Cases with Diagnoses Related to Environmental Solvent* Exposure, 1994-1996

22 Diagnoses Related to Environmental Solvent Exposures

DIAGNOSIS GROUP Diagnosis	# of Dx in Group Freq.	(% of Solvent Cases)
PSYCHIATRIC and NEUROLOGICAL DISORDERS	**1**	
Solvent Encephalopathy	1	(5.3)
DISORDERS OF SENSORY ORGANS	**1**	
Keratoconjunctivitis sicca	1	(5.3)
RESPIRATORY DISORDERS	**6**	
Upper Respiratory Irritation, NOS	5	(26.3)
RADS	1	(5.3)
SKIN DISORDERS	**2**	
Dermatitis, NOS	1	(5.3)
SYMPTOMS and ILL-DEFINED CONDITIONS	**10**	
Multiple Chemical Sensitivity	4	(21.1)
Headache, Chemical or NOS	3	(15.8)
Dry Mouth	1	(5.3)
Nausea	1	(5.3)
Seizure	1	(5.3)
CHEMICAL POISONINGS/SYNDROMES	**3**	
Toxic Effect of Solvent, Acute	3	(15.8)

* Organic solvents have been tagged with a special code in the AOEC exposure coding system.

Table E-5 - 17 AOEC Cases with Diagnoses Related to Environmental Pesticide* Exposure, 1994-1996

17 Diagnoses Related to Environmental Pesticide Exposures

DIAGNOSIS GROUP Diagnosis	# of Dx in Group Freq.	(% of Pesticide Cases)
PSYCHIATRIC and NEUROLOGICAL DISORDERS	**1**	
Panic Attacks	1	(5.9)
RESPIRATORY DISORDERS	**2**	
RADS	1	(5.9)
Upper Respiratory Irritation, Chronic or NOS	1	(5.9)
SKIN DISORDERS	**2**	
Dermatitis, NOS	2	(11.8)
SYMPTOMS and ILL-DEFINED CONDITIONS	**4**	
Multiple Chemical Sensitivity	4	(23.5)
CHEMICAL POISONINGS/SYNDROMES	**7**	
Toxic Effect of Pesticides	7	(41.2)
MISCELLANEOUS	**1**	
Porphyria Cutaneatarda	1	(5.9)

* Pesticides have been tagged with a special code in the AOEC exposure coding system.

AOEC DATABASE, 1994 - 1996

"POSSIBLE" TABLES AND FIGURES

Cases Possibly Related to
Occupational or Environmental Exposures
(N=100)

Table P-1 - AOEC Cases Possibly Related to Environmental and/or Occupational Exposures (N=100)

Demographic Characteristics

	1994	1995	1996	**Total** Subtotal	(%) (%)
Cases from Participating Clinics	**65**	**25**	**10**	**100**	**(100.0)**
DC, George Washington Univ.	6	5	8	19	(19.0)
MA, Cambridge Hospital	1	0	0	1	(1.0)
MA, Mass. Respiratory Hosp.	3	4	1	8	(8.0)
MI, St. Lawrence Hospital	0	0	1	1	(1.0)
NJ, Robert Wood Johnson	55	16	0	71	(71.0)
Age					
< 20	1	0	0	1	(1.0)
20 - 29	5	3	0	8	(8.0)
30 - 39	16	6	2	24	(24.0)
40 - 49	20	4	4	28	(28.0)
50 - 59	17	10	3	30	(30.0)
>60	6	2	1	9	(9.0)
Gender					
Male	30	7	2	39	(39.0)
Female	35	18	8	61	(61.0)
Union Member (Occupational cases only, N=85)					
Yes	18	9	0	27	(31.8)
No	32	12	0	44	(51.8)
Unknown	2	2	10	14	(16.5)

Figure P-1 - Ethnicity
All Possible AOEC Cases, 1994-1996 (N=100)

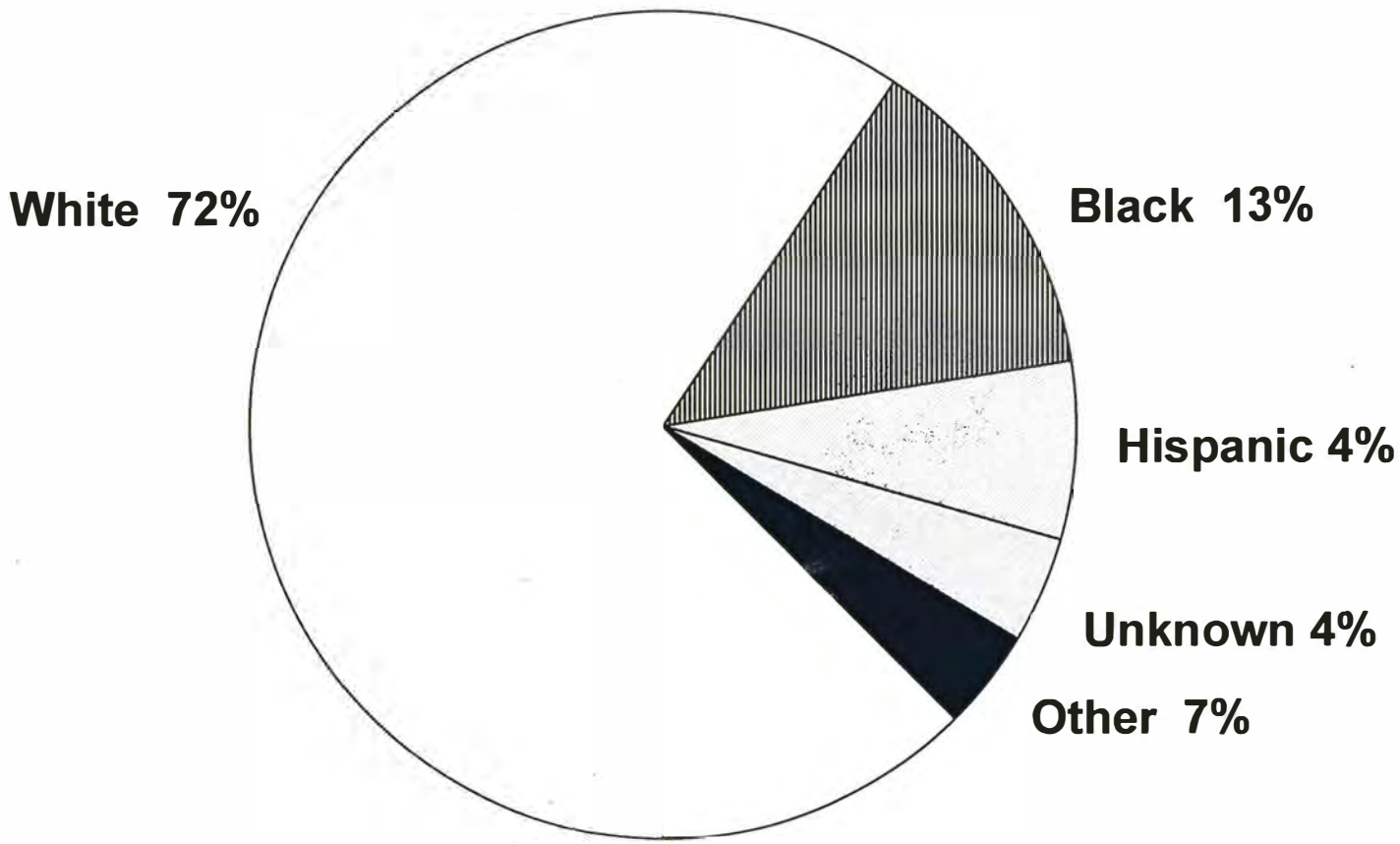


Figure P-2 - Referral Source
Possible AOEC Cases, 1994-1996 (N=100)

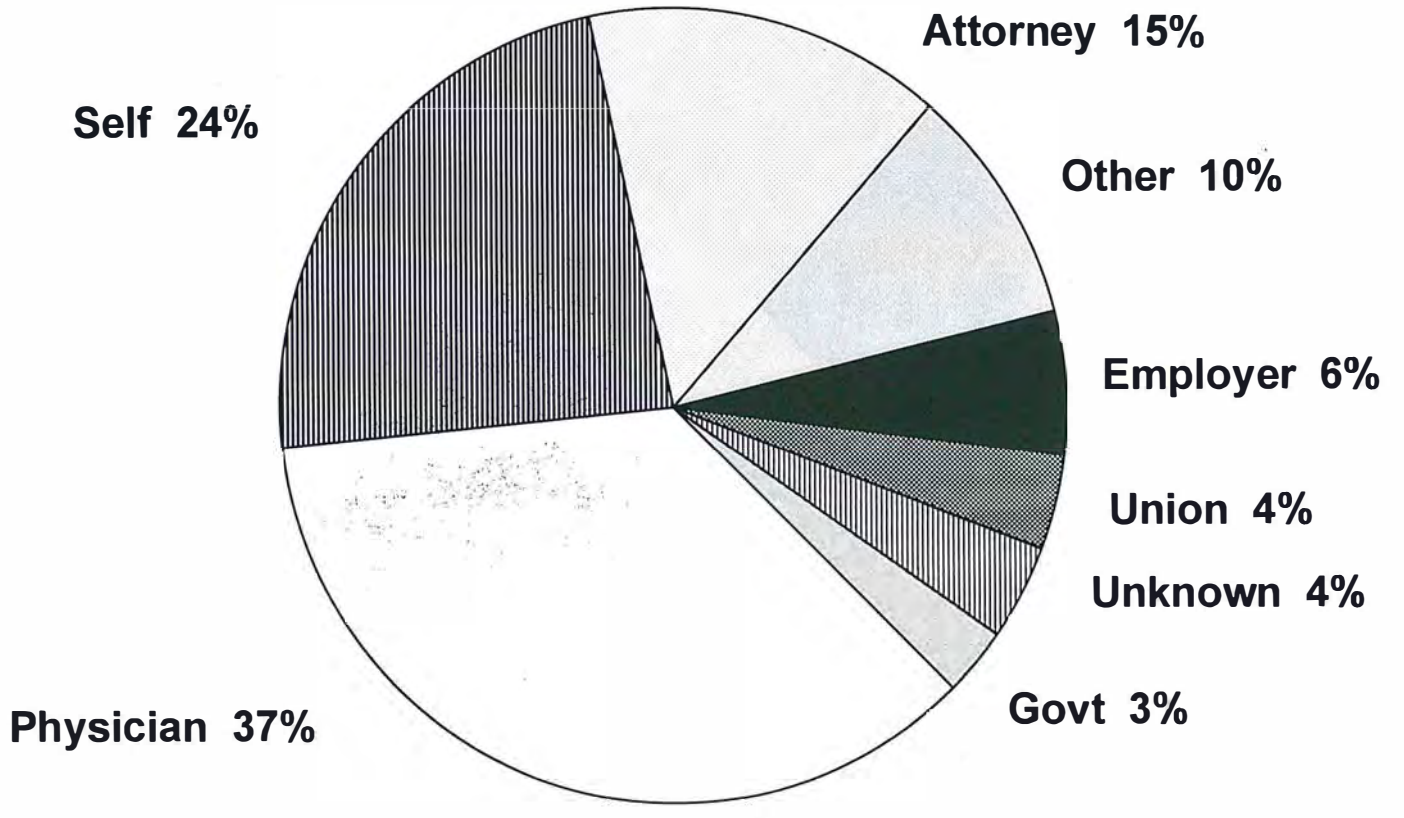
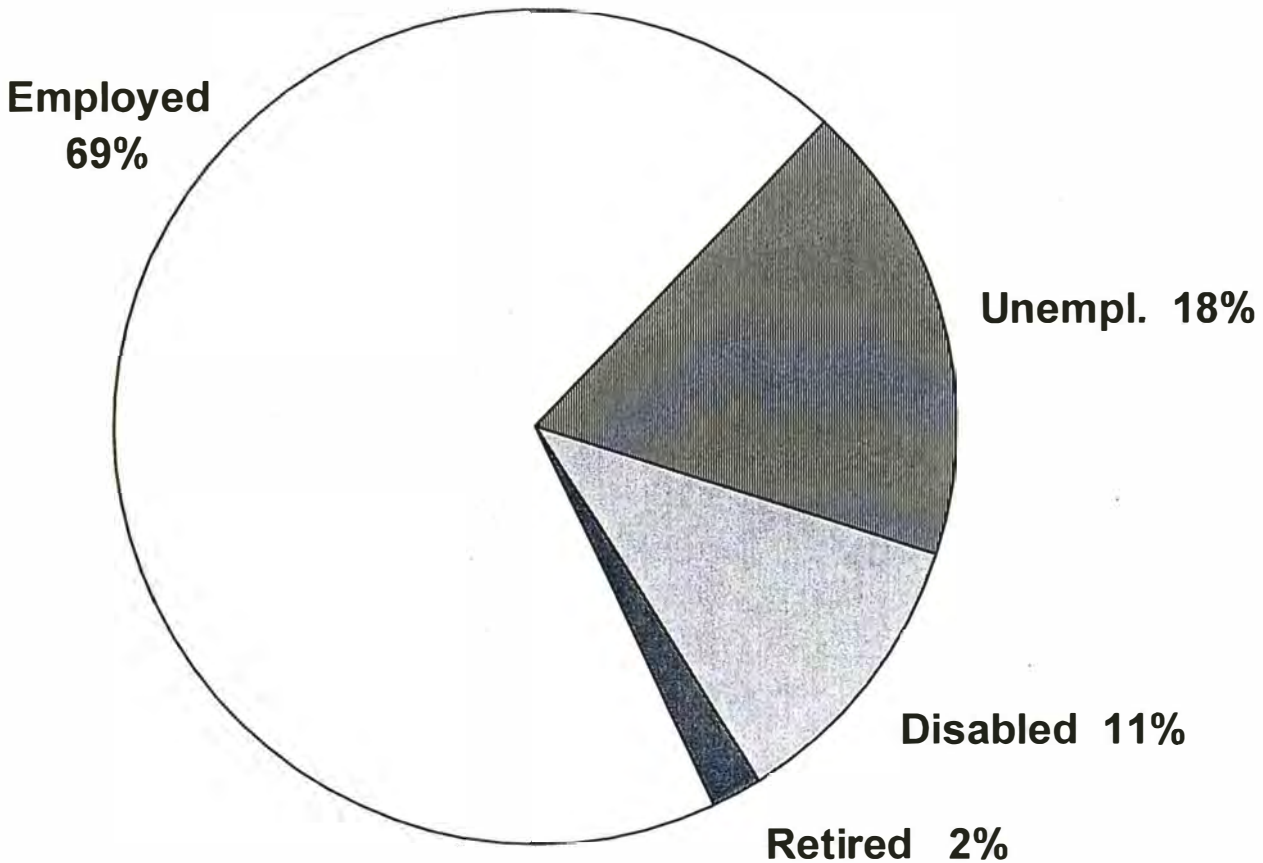


Figure P-3 - Job Status
Possible AOEC Cases, 1994-1996 (N=85*)



*** Occupational Cases Only**

Table P-2 - AOEC Cases Possibly Related to Occupational Exposures (N=85)

Current or Most Relevant Industry

SIC CODE	INDUSTRY	1994	1995	1996	TOTAL	(%)
01-08	**Agriculture**	**2**	**0**	**0**	**2**	**(2.4)**
	Veterinary Services				2	
15-17	**Construction**	**2**	**2**	**1**	**5**	**(5.9)**
	Building Construction-gen'l contractors & operative builders				3	
	Construction - special trade contractors				1	
	Heavy Construction, other than building construction				1	
20-39	**Manufacturing**	**18**	**7**	**1**	**26**	**(30.6)**
	Chemicals and Allied Products				6	
	Industrial and Commercial Machinery and Computer Equipt.				5	
	Electronic and Other Electric Equipment & Components, except Computer Equipment				3	
	Textile Products				3	
	Transportation Equipment				3	
	Printing, Publishing, & Allied Industries				2	
	Miscellaneous Manufacturing Industries				2	
	Primary Metal Industries				1	
	Rubber and Miscellaneous Plastic Products				1	
40-49	**Transportation, Communication, Electric, Gas and Sanitary Services**	**8**	**1**	**1**	**10**	**(11.8)**
	Electric, Gas and Sanitary Services				4	
	Motor Freight Transportation & Warehousing				3	
	Air Transportation				1	
	Water Transportation				1	
	Transportation, NOS				1	
52-59	**Retail Trade**	**1**	**0**	**0**	**1**	**(1.2)**
	Miscellaneous Retail				1	
60-67	**Finance, Insurance and Real Estate**	**3**	**1**	**0**	**4**	**(4.7)**
	Depository Institutions				3	
	Insurance Carriers				1	
70-89	**Services**	**10**	**11**	**5**	**26**	**(30.6)**
	Educational Services				7	
	Health Services				7	
	Business Services				4	
	Membership Organizations				3	
	Legal Services				2	
	Personal Services				1	
	Social Services				1	
	Miscellaneous Services				1	
91-97	**Public Administration**	**4**	**1**	**2**	**7**	**(8.2)**
	Executive, Legislative & General Gov't, except finance				3	
	Justice, Public Order and Safety				2	
	Administration of Environmental Quality & Housing Programs				1	
	National Security and International Affairs				1	
	Missing	**4**	**0**	**0**	**4**	**(4.7)**
	Total	**52**	**23**	**10**	**85**	

Table P-3 - AOEC Cases Possibly Related to Occupational Exposures, (N=85)

Current or Most Relevant Occupation

SOC CODE	OCCUPATION	1994	1995	1996	Total	(%)*
11-14	**Executive, Administrative, and Managerial**	3	4	3	10	(11.8)
	Officials and Administrators, Government Agencies				3	
	Other Officials and Administrators				6	
	Other Management Related Occupations				1	
16	**Engineers and Architects**	2	1	1	4	(4.7)
17-18	**Natural Scientists and Mathematicians**	2	0	0	2	(2.4)
19-21	**Social Scientists, Social Workers and Lawyers**	0	1	0	1	(1.2)
22-25	**Teachers, Librarians and Counselors**	1	2	1	4	(4.7)
29-30	**Registered Nurses, Pharmacists and Therapists**	1	1	0	2	(2.4)
	Registered Nurses				2	
32-33	**Writers, Artists and Entertainers**	3	0	0	3	(3.5)
37-39	**Technologists and Technicians, Except Health**	1	0	0	1	(1.2)
45-47	**Administrative Support Occupations, Including Clerical**	8	3	4	15	(17.6)
	Secretaries, Stenographers and Typists				7	
	Clerks				2	
	Other Adminstrative Support Occupations				6	
50-52	**Service Occupations**	1	1	0	2	(2.4)
56	**Agriculture-Related Occupations**	4	0	0	4	(4.7)
	Animal Caretakers, Groundskeepers and Gardeners				4	
60-61	**Mechanics and Repairers**	2	0	0	2	(2.4)
63-65	**Construction and Extractive Occupations**	5	2	0	7	(8.2)
	Painters				3	
	Electricians				2	
	Other Construction Workers				2	
67-69	**Precision Production Occupations**	5	0	0	5	(5.9)
	Supervisors; Precision Production Occupations				2	
	Other Precision Production Occupations				3	
71-78	**Production Working Occupation**	8	6	0	14	(16.5)
	Machine Operators and Tenders				7	
	Assemblers				3	
	Welders and Solderers				3	
	Production Inspectors, Checkers and Examiners				1	

SOC CODE	OCCUPATION	1994	1995	1996	Total	(%)*
81-83	**Transportation and Material Moving Occupations**	**4**	**1**	**0**	**5**	**(5.9)**
	Motor Vehicle Operators				4	
	Material Moving Equipment Operators				1	
86-87	**Handlers, Equipment Cleaners, Helpers and Laborers**	**1**	**1**	**1**	**3**	**(3.5)**
99	**Miscellaneous/Missing Occupations**	**1**	**0**	**0**	**1**	**(1.2)**
	Total	**52**	**23**	**10**	**85**	

Table P-4 - AOEC Possibly-Related Occupational Cases Belonging to Unions, 1994-1996 (N=27)

Union Membership

Union Name	Total	(%)*
United **Automobile**, Aerospace & Agricultural Implement Workers of America	4	(14.8)
Bakery, Confectionery and Tobacco Workers Int'l Union	1	(3.7)
Amalgamated **Clothing and Textile** Workers Union	2	(7.4)
Communication Workers of America	2	(7.4)
National **Education** Association	1	(3.7)
Int'l Brotherhood of **Electrical Workers**	2	(7.4)
National Federation of **Federal Employees**	2	(7.4)
Massachusetts **Nurses Association**	1	(3.7)
Oil, Chemical, Atomic Workers	1	(3.7)
Int'l Union of **Operating Engineers**	1	(3.7)
Int'l Brotherhood of **Painters** and Allied Trades	1	(3.7)
Intl. **Security Officers,** Police,and Guards Union	1	(3.7)
United **Steelworkers** of America	1	(3.7)
American Federation of **Teachers**	1	(3.7)
Int'l Brotherhood of **Teamsters,** Chauffers, Warehouseman and Helpers of America	2	(7.4)
Utility Workers' Union of America	1	(3.7)
Unknown/Incomplete Union Name	3	(3.7)
Total	**27**	

* Percents do not total to 100 due to rounding.

Table P-5- AOEC Cases Possibly Related to Occupational or Environmental Exposures, 1994-1996 (100 Cases, 116 Hazards)

116 Possibly Related Hazards

HAZ CODE	HAZARD	FREQ	(%) of HAZARDS
010	**MINERAL AND INORGANIC DUST**	**6**	**(5.2)**
010.02	Asbestos	2	(1.7)
010.03	Cement Dust	1	(0.9)
010.13	Silica, Crystalline	3	(2.6)
020	**METALS AND METALLOIDS**	**14**	**(12.1)**
020.05	Arsenic	2	(1.7)
020.12	Cadmium	4	(3.4)
020.14	Chromium, Not Hexavalent	1	(0.9)
020.21	Lead, Inorganic	2	(1.7)
020.25	Mercury, Inorganic	1	(0.9)
020.28	Nickel	1	(0.9)
021	Metal Dust, NOS		
021.00	Metal Dust, NOS	1	(0.9)
022	Hexavalent Chromium Compounds		
022.00	Chromium, Hexavalent, NOS	1	(0.9)
023	Welding Exposures		
023.00	Welding, NOS	1	(0.9)
040	**MISCELLANEOUS INORGANIC COMPOUNDS**	**3**	**(2.6)**
040.04	Carbon Monoxide	1	(0.9)
040.06	Hydrogen Sulfide	1	(0.9)
040.20	Sulfur Oxides	1	(0.9)
050	**ACIDS, BASES, AND OXIDIZING AGENTS**	**2**	**(1.7)**
050.00	Acids, Bases, Oxidizers, NOS	1	(0.9)
050.02	Bleach	1	(0.9)
060	**ALIPHATIC AND ALICYCLIC HYDROCARBONS**	**6**	**(5.2)**
061	Petroleum Derivatives		
061.00	Petroleum Fractions, NOS	1	(0.9)
061.01	Petroleum Spirits	1	(0.9)
061.02	Naphtha	1	(0.9)
061.04	Gasoline	1	(0.9)
061.06	Diesel Fuel	1	(0.9)
061.07	Asphalt	1	(0.9)
070	**ALCOHOLS**	**1**	**(0.9)**
070.06	Isopropyl Alcohol	1	(0.9)

080	**GLYCOLS**	**1**	**(0.9)**
080.01	Ethylene Glycol	1	(0.9)
100	**ETHERS**	**1**	**(0.9)**
100.08	Methyl Tertiary Butyl Ether	1	(0.9)
110	**EPOXY COMPOUNDS**	**1**	**(0.9)**
110.02	Epoxy Resins	1	(0.9)
120	**ALDEHYDES AND ACETALS**	**1**	**(0.9)**
120.03	Formaldehyde	1	(0.9)
130	**KETONES**	**1**	**(0.9)**
130.01	Acetone	1	(0.9)
170	**HYDROCARBONS, NOS**	**10**	**(8.6)**
171	Solvents, NOS		
171.00	Solvents, NOS	7	(6.0)
171.01	Paint	2	(1.7)
171.03	Stripper	1	(0.9)
181	Chlorinated Phenols		
181.00	Chlorinated Phenols, NOS	1	(0.9)
190	**HALOGENATED ALIPHATIC HYDROCARBONS (EXCEPT ORGANOCHLORINE PESTICIDES)**	**1**	**(0.9)**
190.08	Methyl Chloroform (1,1,1-Trichloroethane)	1	(0.9)
200	**HALOGENATED AROMATIC HYDROCARBONS**	**2**	**(1.7)**
200.04	Chlorinated Dibenzodioxins	1	(0.9)
250	**AROMATIC NITRO AND AMINO COMPOUNDS (INCLUDING HETEROCYCLIC)**	**2**	**(1.7)**
250.17	Dyes, NOS	2	(1.7)
270	**POLYMERS**	**5**	**(4.3)**
270.02	Latex, Natural Rubber	2	(1.7)
270.07	Polyurethane	1	(0.9)
270.15	Resin Systems, NOS	1	(0.9)
270.20	Polystyrene	1	(0.9)
280	**ORGANOCHLORINE PESTICIDES**	**3**	**(2.6)**
280.00	Organochlorine Pesticides, NOS	2	(1.7)
280.02	Chlordane	1	(0.9)

290	**ORGANOPHOSPATE PESTICIDES/ CARBAMATE PESTICIDES**	6	**(5.2)**
291	Organophosphate Pesticides		
291.00	Organophosphate Pesticides, NOS	4	(3.4)
291.05	Chlorpyrifos	1	(0.9)
291.11	Acephate	1	(0.9)
320	**MISCELLANEOUS CHEMICALS AND MATERIALS REFERENCED BY USE**	**35**	**(30.2)**
320.01	Air Pollutants, Indoor	22	(19.0)
320.06	Chemicals, NOS	1	(0.9)
320.08	Fungicide, NOS	1	(0.9)
320.12	Hair Products	1	(0.9)
320.16	Pesticides, NOS	3	(2.6)
320.17	Photo Developing Chemicals, NOS	1	(0.9)
320.23	Perfume, NOS	1	(0.9)
322	Cleaning Materials		
322.01	Soap	2	(1.7)
323	Waste		
323.01	Waste, Hazardous	1	(0.9)
323.02	Leachate	1	(0.9)
323.03	Sewer Water	1	(0.9)
330	**PYROLYSIS PRODUCTS**	**4**	**(3.4)**
330.01	Cigarette Smoke	1	(0.9)
331	Exhaust		
331.00	Exhaust, NOS	1	(0.9)
331.01	Diesel Exhaust	1	(0.9)
331.02	Engine Exhaust	1	(0.9)
350	**PHYSICAL FACTORS**	**2**	**(1.7)**
352	Non-Ionizing Radiation		
352.01	Radiation, Electromagnetic	1	(0.9)
353	Trauma-Related Exposures		
353.03	Fall, NOS	1	(0.9)
360	**ERGONOMIC FACTORS**	6	**(5.2)**
360.00	Ergonomic Factors, NOS	1	(0.9)
360.02	Keyboard Use	4	(3.4)
360.03	Repetitive Motion	1	(0.9)
390	**MICROORGANISMS**	**3**	**(2.6)**
390.01	Mold	3	(2.6)
TOTAL		**116**	**(100.0)**

Table P-6 - Diagnoses and Possibly Related Exposures of 100 AOEC Cases, 1994-1996

111 Diagnoses and Related Environmental Exposures

DIAGNOSIS GROUP	# of Cases in Group w/ Dx	
DIAGNOSIS (DX) Hazard	**# of Cases w/ Dx** Hazard Freq	**(% of Cases)**
TUMORS	**3**	
Brain Tumor	**1**	**(1.0)**
Chlordane	1	
Bladder Cancer	**1**	**(1.0)**
Acetone	1	
Acute Myelogenous Leukemia	**1**	**(1.0)**
Ethylene Glycol	1	
PSYCHIATRIC and NEUROLOGICAL DISORDERS	**8**	
Depression, NOS	**1**	**(1.0)**
Keyboard Use	1	
Mood Disorder, NOS	**1**	**(1.0)**
Air Pollutants, Indoor	1	
Organic Brain Syndrome/Cognitive Problems	**3**	**(3.0)**
Chlorinated Phenols, NOS	1	
Lead, Inorganic	1	
Organophosphate Pesticides	1	
Peripheral/Poly Neuropathy Due to Toxic Agents	**3**	**(3.0)**
Arsenic	1	
Cement Dust	1	
Chlorinated Dibenzodioxins	1	
Gasoline	1	
CARDIOVASCULAR DISEASE	**5**	
Hypertension	**2**	**(2.0)**
Acid, Bases, Oxidizers, NOS	1	
Chemicals, NOS	1	
Dyes, NOS	1	

Tachycardia	**2**	**(2.0)**
Asbestos	1	
Lead, Inorganic	1	
Solvents, NOS		
Vascular Disease (Leukocytoclastic Vasculitis)	**1**	**(1.0)**
Leachate	1	
RESPIRATORY DISORDERS	**27**	
Asthma	**10**	**(10.0)**
Air Pollutants, Indoor	3	
Asbestos	1	
Dyes, NOS	1	
Latex, Natural Rubber	1	
Metal Dust, NOS	1	
Naphtha	1	
Silica, Cystalline	1	
Solvents, NOS	1	
Polyurethane	1	
Waste, Hazardous	1	
Bronchitis, NOS	**3**	**(3.0)**
Air Pollutants	1	
Asbestos	1	
Exhaust, NOS	1	
Lead, Inorganic	1	
Chronic Obstructive Pulmonary Disease (COPD)	**1**	**(1.0)**
Cigarette Smoke	1	
Interstitial Pulmonary Fibrosis	**1**	**(1.0)**
Bleach	1	
Fungicide, NOS	1	
Acute Inhalation Injury, NOS	**1**	**(1.0)**
Sulfur Oxides	1	
Upper Respiratory Irritation, Chronic or NOS (Sinusitis/rhinitis/pharyngitis/laryngitis)	**11**	**(11.0)**
Air Pollutants, Indoor	7	
Mold	3	
Latex, Natural Rubber	1	
Pesticides, NOS	1	
GASTROINTESTINAL DISORDERS	**1**	
Peptic Ulcer Disease	**1**	**(1.0)**
Acids, Bases, Oxidizers, NOS	1	
Dyes, NOS	1	

LIVER DISORDERS	**2**	
Chemical Hepatitis	**1**	**(1.0)**
Methyl Chloroform (1,1,1-Trichloroethane)	1	
Liver Disorder, NOS	**1**	**(1.0)**
Solvents, NOS	1	
REPRODUCTIVE DISORDERS	**4**	
Impotence	**3**	**(3.0)**
Cadmium	3	
Infertility	**1**	
Pesticides	1	
SKIN DISORDERS	**7**	
Dermatitis, Allergic	**2**	**(2.0)**
Latex, Natural Rubber	2	
Dermatitis, NOS	**2**	**(2.0)**
Chromium, Hexavalent, NOS	1	
Solvents, NOS	1	
Rash/Urticaria	**2**	**(2.0)**
Paint	1	
Petroleum Spirits	1	
Soap	1	
Other Skin Abnormalities	**1**	
Sewer Water	1	
ACUTE and CHRONIC MUSCULOSKELETAL DISORDERS	**8**	
UPPER EXTREMITY PROBLEMS - ARM/HAND/WRIST		
Carpel Tunnel Syndrome	**2**	**(2.0)**
Arsenic	1	
Keyboard Use	1	
Tendinitis/Tenosynovitis/Burstitis - Forearm/Wrist/Hand/Fingers	**1**	
Keyboard Use	1	

CTDs OR MUSCULOSKELETAL PAIN, LOCATION NOT SPECIFIED

Arthritis	**2**	**(2.0)**
Fall, NOS	1	
Photo Developing Chemicals, NOS	1	
Osteoporosis	**1**	
Chromium, Not Hexavalent	1	
Unspecified Cumulative Trauma Disorders, Fibromyalgia, or Musculoskeletal Pain, Location not Specified	**2**	**(2.0)**
Keyboard Use	1	
Soap	1	

SYMPTOMS AND ILL-DEFINED CONDITIONS	**41**	
Chest Pain	**1**	**(1.0)**
Resin Systems, NOS	1	
Chronic Fatigue	**9**	**(9.0)**
Air Pollutants, Indoor	4	
Asphalt	1	
Cadmium	1	
Diesel Exhaust	1	
Engine Exhaust	1	
Isopropyl Alchol	1	
Methyl Tertiarty Butyl Ether	1	
Pesticides, NOS	1	
Polystyrene	1	
Cough	**1**	**(1.0)**
Air Pollutants, Indoor	1	
Dizziness	**1**	**(1.0)**
Organophosphate Pesticides	1	
Dysthesia	**1**	**(1.0)**
Nickel	1	
Fever	**2**	**(2.0)**
Organophosphate Pesticides	1	
Solvents, NOS	1	
Flushing	**1**	**(1.0)**
Mercury, Inorganic	1	
Headache, Chemical or NOS	**5**	**(5.0)**
Air Pollutants, Indoor	1	
Diesel Exhaust	1	
Engine Exhaust	1	
Formaldehyde	1	
Methyl Tertiary Butyl Ether	1	
Organochlorine Pesticides	1	
Polystyrene	1	

Multiple Chemical Sensitivity and Acquired Chemical Intolerance	**9**	**(9.0)**
Air Pollutants, Indoor	1	
Carbon Monoxide	1	
Hair Products	1	
Organochlorine Pesticides, NOS	1	
Organophosphate Pesticides, NOS	1	
Paint	1	
Perfume, NOS	1	
Radiation, Electromagnetic	1	
Solvents, NOS	1	
Nausea/Vomiting	**1**	**(1.0)**
Isopropyl Alcohol	1	
Polystyrene	1	
Shortness of Breath	**3**	
Epoxy Resins	1	
Exhaust	1	
Petroleum Fractions, NOS	1	
Welding, NOS	1	
Sick Building Syndrome and Other General Symptoms	**4**	**(4.0)**
Air Pollutants, Indoor	2	
Formaldehyde	1	
Solvents, NOS	1	
Sleep Disorder	**2**	**(2.0)**
Organophosphate Pesticides, NOS	1	
Stripper	1	
Weight Loss	**1**	**(1.0)**
Silica, Crystalline	1	
CHEMICAL POISONINGS/SYNDROMES	**1**	
Toxic Effects of Pesticides	**1**	**(1.0)**
Acephate	1	
MISCELLANEOUS CONDITIONS	**4**	
Anaphylactic Reaction	**1**	**(1.0)**
Air Pollutants, Indoor	1	
Anemia	**1**	**(1.0)**
Silica, Crystalline	1	
Angioedema	**1**	**(1.0)**
Hydrogen Sulfide	1	
Sarcoidosis	**1**	**(1.0)**
Air Pollutants, Indoor	1	

Table P-7 - 15 AOEC Cases with Diagnoses Possibly Related to Occupational and/or Environmental Solvent* Exposure, 1994-1996

16 Diagnoses Possibly Related to Occupational/Environmental Solvent Exposures

DIAGNOSIS GROUP Diagnosis	# of Dx in Group Freq.	(% of Solvent Cases)
TUMORS	**1**	
Bladder Cancer	1	(6.7)
PSYCHIATRIC and NEUROLOGICAL DISORDERS	**1**	
Toxic Neuropathy	1	(6.7)
CARDIOVASCULAR DISEASE	**1**	
Tachycardia	1	(6.7)
RESPIRATORY DISORDERS	**2**	
Asthma	2	(13.3)
LIVER DISORDERS	**2**	
Abnormal Liver Function	1	(6.7)
Hepatitis	1	(6.7)
SKIN DISORDERS	**2**	
Dermatitis, NOS	1	(6.7)
Urticaria	1	(6.7)
SYMPTOMS and ILL-DEFINED CONDITIONS	7	
Multiple Chemical Sensitivity	2	(13.3)
Fatigue	1	(6.7)
Fever	1	(6.7)
Nausea	1	(6.7)
Sick Building Syndrome	1	(6.7)
Sleep Disorder	1	(6.7)

* Organic solvents have been tagged with a special code in the AOEC exposure coding system.

Table P-8- 13 AOEC Cases with Diagnoses Possibly Related to Occupational and/or Environmental Pesticide* Exposure, 1994-1996

14 Diagnoses Possibly Related to Occupational/Environmental Pesticide Exposures

DIAGNOSIS GROUP Diagnosis	# of Dx in Group Freq.	(% of Pesticide Cases)
TUMORS	**1**	
Ependymoma, benign	1	(7.7)
PSYCHIATRIC and NEUROLOGICAL DISORDERS	**2**	
Organic Brain Syndrome	1	(7.7)
Peripheral Neuropathy	1	(7.7)
RESPIRATORY DISORDERS	**2**	
Interstitial Pulmonary Fibrosis	1	(7.7)
Upper Respiratory Irritation, Chronic or NOS	1	(7.7)
REPRODUCTIVE DISORDERS	**1**	
Infertility	1	(7.7)
SYMPTOMS and ILL-DEFINED CONDITIONS	**7**	
Multiple Chemical Sensitivity	2	(15.4)
Chronic Fatigue Syndrome	1	(7.7)
Dizziness	1	(7.7)
Headaches	1	(7.7)
Hyperthermia	1	(7.7)
Sleep Disorder	1	(7.7)
CHEMICAL POISONINGS/SYNDROMES	**1**	
Toxic Effect of Pesticides	1	(7.7)

* Pesticides have been tagged with a special code in the AOEC exposure coding system.