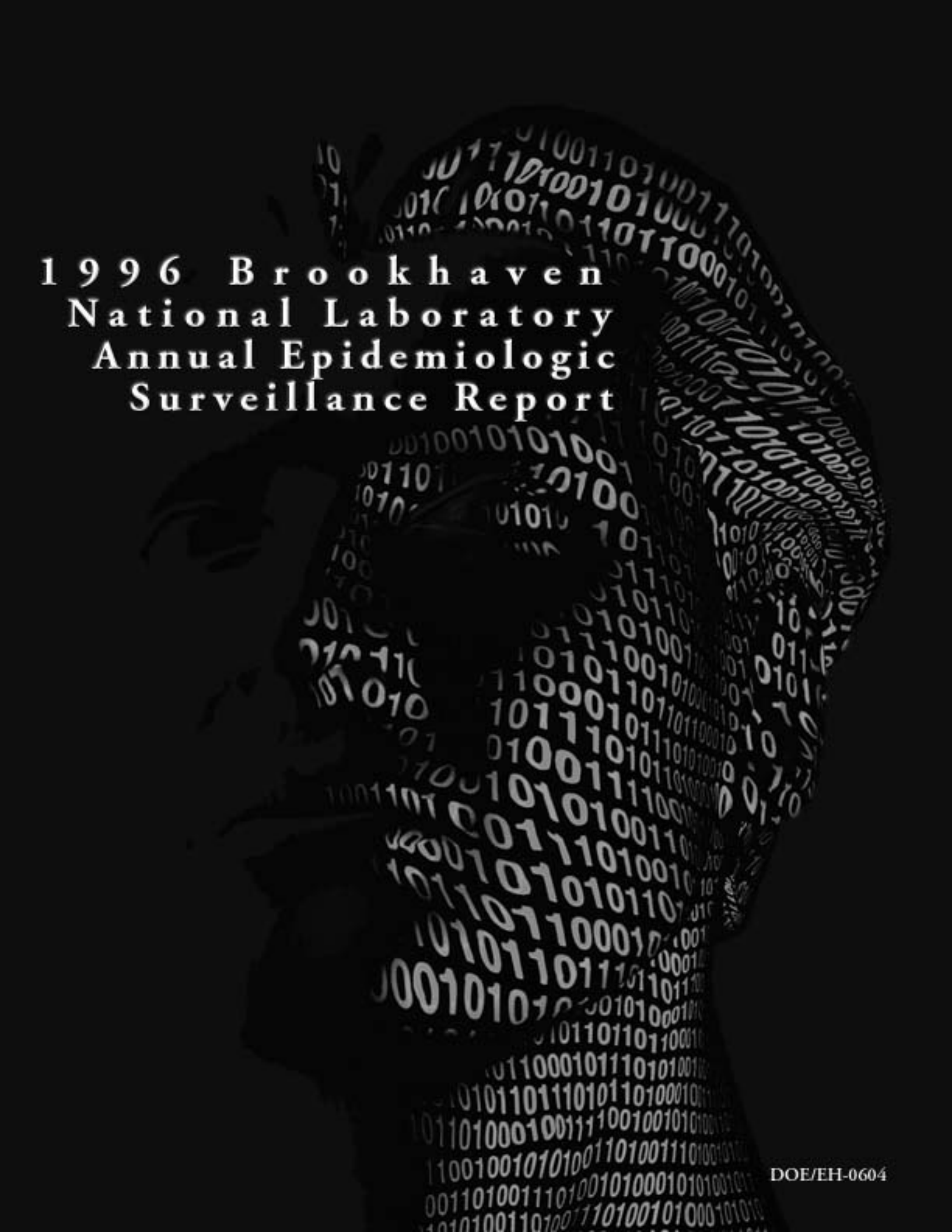
1996 Brookhaven National Laboratory Annual Epidemiologic Surveillance Report



DOE/EH-0604

BROOKHAVEN NATIONAL LABORATORY
1996 Epidemiologic Surveillance Report

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Additional information about the Department of Energy's Office of Epidemiologic Studies, the Epidemiologic Surveillance Program, and annual reports for DOE sites participating in this program can be found at:

http://www.eh.doe.gov/epi/surv

Brookhaven National Laboratory 1996

AT A GLANCE

The major categories of diagnoses reported were the same as in 1995 for both men and women. Respiratory diagnoses, injuries, and muscular and skeletal conditions accounted for 69 percent of all diagnoses reported among men, 59 percent among women.

The percentage of men and women with at least one health-related absence changed little from previous years.

In general, job categories comprised mainly of salaried staff had very low 5-day absence rates; categories with wage earners tended to have higher rates. This difference may represent a difference between hourly and salaried staff in the need to report for medical clearance.

Cancer diagnosis rates remained very low for both men and women from 1993 through 1996. In both 1994 and 1996, the predominant types of cancer reported were breast cancer among women and prostate cancer among men. In 1995, three men reported cancer involving the prostate, eye, and esophagus, but no cancers were reported among women.

Less than 1 percent of the work force was placed on long-term disability during 1996.

The most common type of occupational injury was sprains and strains. Sprains and strains comprised 47 percent of the occupational injuries among men, 29 percent among women.

In general, higher rates of OSHA-recordable events were concentrated in job categories comprised of non-exempt, or hourly employees. Among both men and women, the highest rates were observed among Bargaining Units workers, who were at 9 times higher risk of sprains and strains, 6 times higher risk of open wounds of the upper limb than other workers, and 11 times more likely to report a diagnosis involving the muscles and skeleton.

The average number of days lost or with restricted activity due to an OSHA event was low. Increasing age did not lead to increasing duration of absence.

Introduction

The U.S. Department of Energy's (DOE) commitment to assuring the health and safety of its workers includes the conduct of epidemiologic surveillance activities that provide an early warning system for health problems among workers. The Epidemiologic Surveillance

Program monitors illnesses and health conditions that result in an absence of 5 or more consecutive workdays, occupational injuries and illnesses, and disabilities and deaths among current workers.

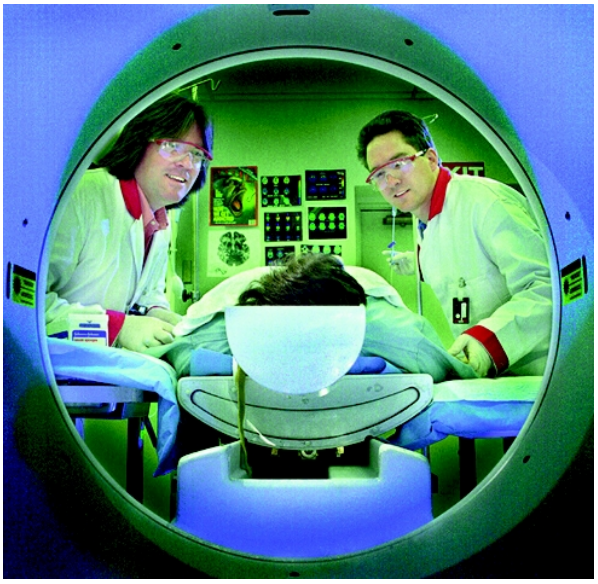
Epidemiologic Surveillance has been conducted at Brookhaven National Laboratory since 1993. This report provides a summary of epidemiologic surveillance data collected from Brookhaven National Laboratory from January 1, 1996 through December 31, 1996. The data were collected by a coordinator at Brookhaven National Laboratory and submitted to the Epidemiologic Surveillance Data Center located at Oak Ridge Institute for Science and Education, where quality control procedures and preliminary data analyses were carried out. The analyses were interpreted and the final report prepared by the Office of Epidemiologic Studies.

The Epidemiologic Surveillance report for Brookhaven National Laboratory has been redesigned for 1996. The information in this report provides highlights of the data analyses conducted. Surveillance reports and additional supporting tables for the report are posted on the Office of Epidemiologic Studies' Web site **(http://www.eh.doe.gov/epi/surv)**, or are available by request. The main sections of the report include: work force characteristics; absences due to injury or illness lasting 5 or more consecutive workdays; workplace illnesses, injuries, and deaths that were reportable to the Occupational Safety and Health Administration ("OSHA-recordable" events); and disabilities and deaths among current workers.

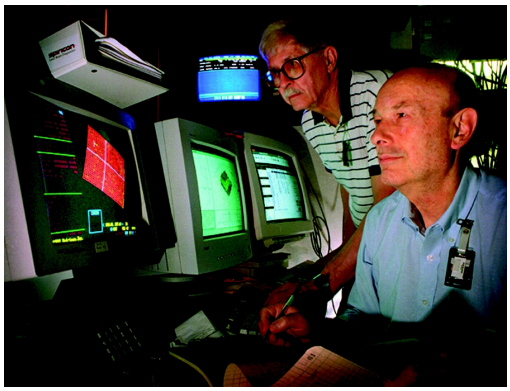
DOE sites vary by mission, function, job classification, and worker exposures, so comparisons of Brookhaven National Laboratory with other DOE sites should be made cautiously. The differences between sites and factors at each site that affect the completeness and accuracy of the health information reported can affect the patterns of illness and injury observed.

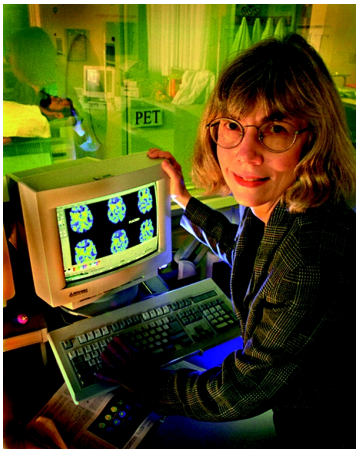
Site Overview

Brookhaven National Laboratory is a DOE multidisciplinary research laboratory located 60 miles east of New York City in Suffolk County, Long Island, New York. Associated Universities, Inc. (AUI), a non-profit research management organization originally sponsored by nine northeastern universities, founded the laboratory in 1947 under contract to the Atomic Energy Agency. The laboratory was designed to provide non-defense basic and applied research in a multitude of disciplines, from physics, chemistry, and materials science to biology and medicine.



Brookhaven National Laboratory is dedicated to basic and applied investigation in a multitude of scientific disciplines. Experimental and theoretical physics, medicine, chemistry, biology, environmental research, engineering, and many other fields are represented by the nearly 1,000 Brookhaven National Laboratory scientists and over 4,000 national and international visitors who come to Brookhaven National Laboratory every year to use the facilities. With areas of the campus contaminated from past practices, the site was added to the Federal Superfund National Priorities List in 1989; remediation is proceeding.



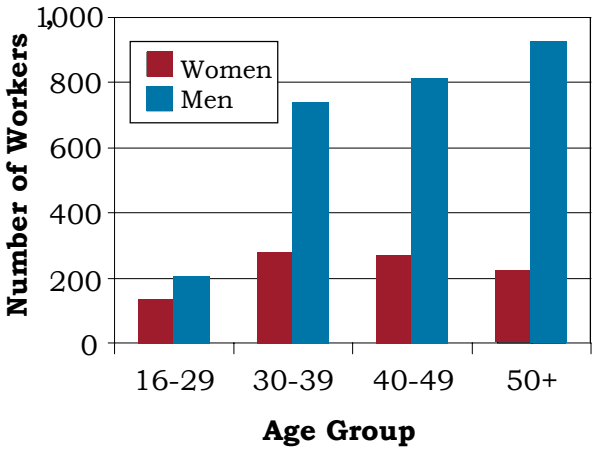


The Brookhaven Work Force - 1996

A total of 3,561 Brookhaven National Laboratory employees were included in epidemiologic surveillance in 1996, 156 fewer workers than were present in 1995. The work force declined 8 percent from its peak in 1994. The gender and

age distributions of the 1996 work force are shown in Figure 1.

Figure 1. The Work Force by Gender and Age



There were 2,671 men (75 percent) and 890 women (25 percent) with an average age of 45 years for male Brookhaven National Laboratory workers and 41 years for females. The majority of the workers was White (82 percent); African Americans and Asians each comprised about 7 percent, and Hispanics and Native Americans made up the remaining 4 percent.

For this report, individual job titles were grouped into job categories by Brookhaven National Laboratory staff. The grouping was done because there were either too few workers or too few health events among workers with a particular job title, which limited the types of analyses that could be performed. Men and women were not distributed equally among the various job categories, as shown in Figure 2. Women were heavily represented in administrative and clerical jobs; a much larger percentage of men were noted in professional, scientific, and technical support jobs. A more detailed distribution of the work force by gender, age, and job category is available at **http://www.eh.doe.gov/epi/surv**.

Figure 2. The Work Force by Job Category and Gender

Job Category	Women	Men
Management	25	88
Scientific	65	600
Professional	112	574
Administrative (E)	175	96
Tech Support/Supv (E)	10	361
Administrative (NE)	206	7
Tech Support/Supv (NE)	19	311
Clerical & Support Wage	85	6
Technical	9	82
Bargaining Units	91	501
Miscellaneous	93	45
Total	890	2,671

Number and Length of Absences

Epidemiologic surveillance examines absences of 5 or more consecutive workdays (also referred to as "5-day absences"). This threshold is based on DOE Order 440.1, which requires contractor management to notify Occupational Medicine when a worker

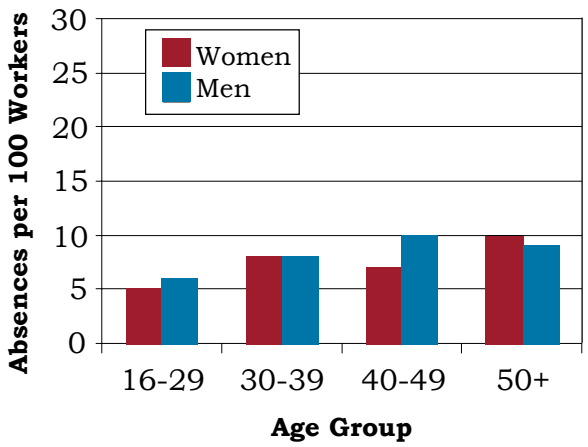
has been absent for 5 or more consecutive workdays or 40 consecutive work hours. If an absence overlaps a weekend, the weekend days are counted in the total duration of absence, but do not replace the 5 workday requirement. When an absence overlaps a weekend, the Friday and Monday surrounding that weekend are considered consecutive workdays. All work-related injuries and illnesses must be reported regardless of length of absence. Non-occupational illnesses and injuries that involve absences less than 5 days do not routinely require a medical clearance for return to work and are thus excluded from these analyses.

One change from previous reports is the exclusion of certain health events that lasted at least 5 consecutive workdays but did not result from an illness or injury. These events included six women absent for maternity leave and two workers absent for two different elective procedures not related to the treatment of an illness or injury.

Throughout this report, the analyses take gender, age, and occupation into account because the risk of illness and injury varies by these factors. This is done either by presenting the analyses in distinct age, gender, or job categories (stratification) or by statistical methods of adjustment.

Almost 7 percent of the workers reported at least one absence in 1996, little changed from the 1995 percentage. The 70 5-day absences among 890 women resulted in an absence rate of 8 absences per 100 workers. The rate among men was 9 per 100 workers (235/2,671). For men, the absence rate increased with age through the 40-49 age group (figure 3). As shown in figure 4, the average duration of absence also increased with age through the 40-49 age group for both men and women.

Figure 3. Absence Rate by Gender and Age



The average duration of absence was similar for men and women under age 50. Among older workers, women had a longer average duration of absence than did men (38 days for women, 21 days for men). This difference was due in part to one 290-day absence reported by a woman in the Professional group.

Figure 4. Number of Days Absent by Gender and Age

Gender	Age	Number of Absences	Number of Days Absent	Average Number of Days Absent
Women	16 - 29	7	93	13
	30 - 39	23	449	20
	40 - 49	19	423	22
	50 +	21	805	38
	Total	70	1,770	25
Men	16 - 29	13	202	16
	30 - 39	58	1,249	22
	40 - 49	80	1,830	23
	50 +	84	1,781	21
	Total	235	5,062	22

The number of 5-day absences varied by job category for men and women (Figure 5). The highest absence rates of 5-day absences occurred in the Bargaining Units, with 41 absences per 100 women (37/91) and 30 absences per 100 men (151/501). No absences were reported by men or women classified in the Management category. In general, job categories comprised mainly of salaried staff had very low 5-day absence rates; categories with wage earners tended to have higher rates. This difference has been observed at other sites. At least in part, it may represent a difference between hourly and salaried staff in complying with the requirement to report for medical clearance following an absence rather than a true difference in the amount of illness experienced by these groups.

As shown in Figure 6, there was no consistent difference in average duration of absence between men and women in various occupations. For the work force as a whole, the average duration of absence among women (25 days) was slightly greater than that of men (22 days). Although Bargaining Units workers had the highest absence rate and reported the greatest number of days absent, their average duration of absence (20 days for both women and men) was slightly less than that of the work force as a whole (22 days). Professionals reported few absences, but the average duration of their absences was longer than those of other groups (113 days for women, 48 days for men). Exempt Administrative and Scientific staff also had a high average duration of absence. Additional information about the number and length of absences for men and women in different age groups and job categories can be found in the supporting tables for this report at **http://www.eh.doe.gov/epi/surv**.

Figure 5. Absence Rate by Job Category and Gender

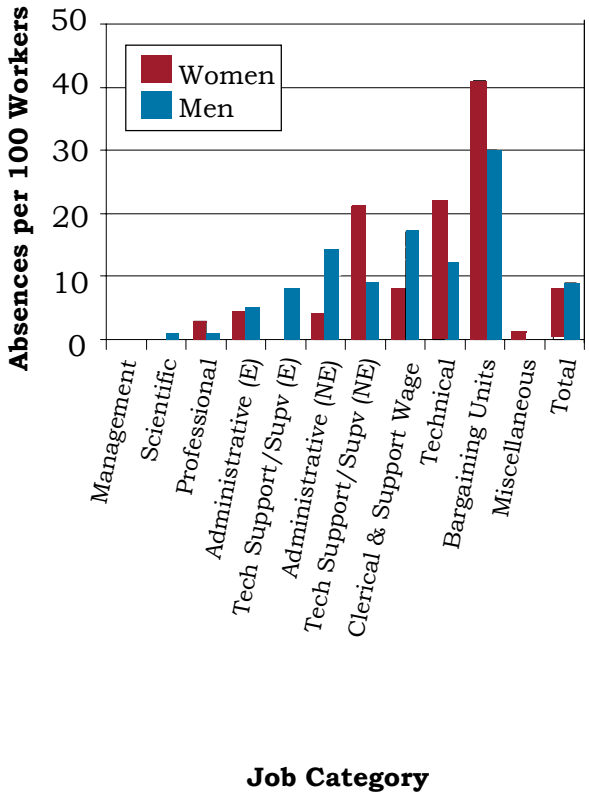
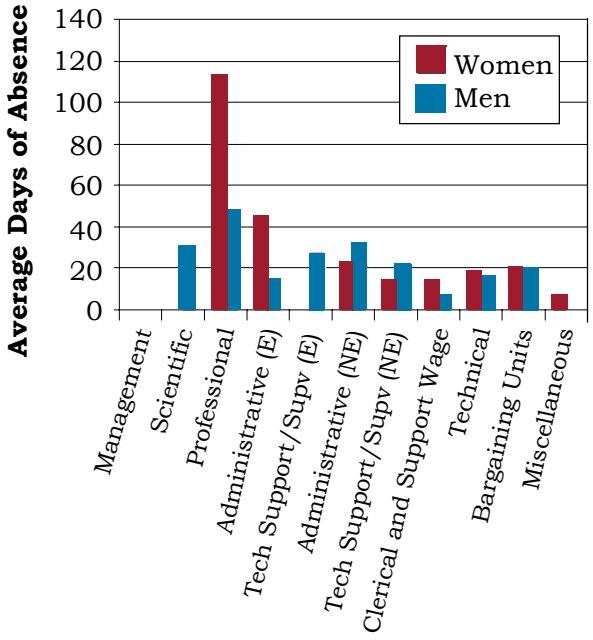


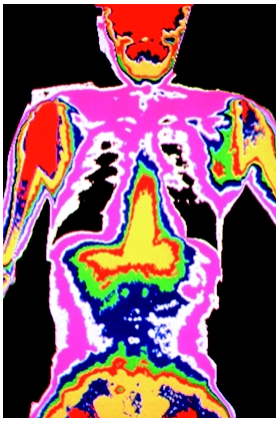
Figure 6. Average Duration of Absence by Job Category and Gender



Diagnostic Categories

Epidemiologic surveillance monitors *all* illnesses and injuries among active workers because it is not always possible to determine what health effects are due to occupational exposures and what are due to other causes. Workers who require return-to-work clearances report illness and injury diagnoses to the occupational medicine clinic. An absence due to illness or injury may involve more than one diagnosis, and epidemiologic surveillance includes all reported diagnoses. In addition, the OSHA 200 Log provides information on recorded occupational injuries and illnesses whether or not they involve absences.

This report organizes illnesses and injuries into categories based on a standard reference, the *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD-9-CM). The ICD-9-CM is used to classify diagnoses for statistical purposes. You can find specific diagnoses in the Explanation of Diagnostic Categories (page 22).



The number of reported diagnoses categorized according to the ICD-9-CM and the number of lost calendar days are presented in Figure 7. Female workers reported 86 diagnoses and accrued 2,079 days of absence related to them. Men reported 325 diagnoses and 8,022 days of absence. For both men and women, the major categories of diagnoses reported were the same as in 1995. Among women, respiratory diagnoses (29 percent), injuries (22 percent), and muscular and skeletal conditions (8 percent) accounted for 59 percent of all diagnoses reported. Most of the respiratory diagnoses consisted of acute respiratory infections such as colds (40 percent), chronic respiratory diseases (primarily bronchitis) (32 percent), and flu and pneumonia (20 percent). Sprains and strains accounted for 53 percent of the injuries among women. Disorders affecting the back (43 percent) and the joints (43 percent) comprised the majority of muscular and skeletal diagnoses, but there was no one type of muscular or skeletal condition that stood out among these diagnoses.

Men showed patterns of illness and injury similar to those of women.

Figure 7. Number of Diagnoses and Lost Calendar Days by Diagnostic Category (Categorized by ICD-9-CM) and Gender

Diagnostic Category	Women		Men	
	Number of Health Conditions	Number of Days Absent	Number of Health Conditions	Number of Days Absent
Benign Growths	2	67	3	117
Cancer	2	343	7	311
Digestive	5	78	19	394
Endocrine / Metabolic	0	0	2	153
Existing Birth Condition	2	19	0	0
Genitourinary	5	95	8	100
Heart / Circulatory	3	30	22	850
Infections / Parasites	4	84	10	101
Injury	19	552	73	1,805
Muscles and Skeleton	7	216	57	2,100
Nervous System	6	54	13	547
Psychological	4	109	2	85
Respiratory	25	400	95	1,199
Skin	1	27	4	42
Unspecified Symptoms	1	5	10	218

Note: Lost calendar days for each diagnosis are counted more than once if there are multiple diagnoses per absence.

Respiratory diagnoses were the most common, including acute respiratory infections (55 percent), flu and pneumonia (20 percent), and chronic conditions (19 percent). Bronchitis accounted for 89 percent of the chronic respiratory diagnoses. Sprains and strains comprised 49 percent of the injuries among men, with 72 percent of these sprains and strains affecting the back. Other frequently reported injuries included fractures (12 percent). Forty-nine percent of the muscular and skeletal conditions reported among men affected the back; 21 percent affected the knee.

The above diagnoses varied little by age or gender. Injury ranked among the top three diagnosis categories for women of all ages. Respiratory conditions were prominent among women in all age groups except those under age 30. Injuries and muscular and skeletal conditions were among the top three categories for men of all ages. Respiratory conditions also were among the top three categories for men over age 30.

Figure 8 shows the frequency of reported diagnoses by job category for men and women. For most job categories, the number of reported diagnoses was very small, in part because many job categories have a small number of workers (see Figure 2). The small number of diagnoses in some groups may also reflect less complete reporting in some job categories. Men in Management and the Miscellaneous job category and women in the Management, Scientific, and Technical Support/ Supervisory (E) groups did not report any diagnoses in 1996. Overall, fewer than five diagnoses were reported by men in the Scientific, Administrative (NE), and Clerical and Support Wage groups.

Injury was among the more common diagnosis categories for men in 5 of the 11 job categories (figure 8). Both respiratory and muscles and skeleton conditions were among the top two categories reported for men in 5 of the 11 job categories. Heart/Circulatory was one of the more frequently reported categories

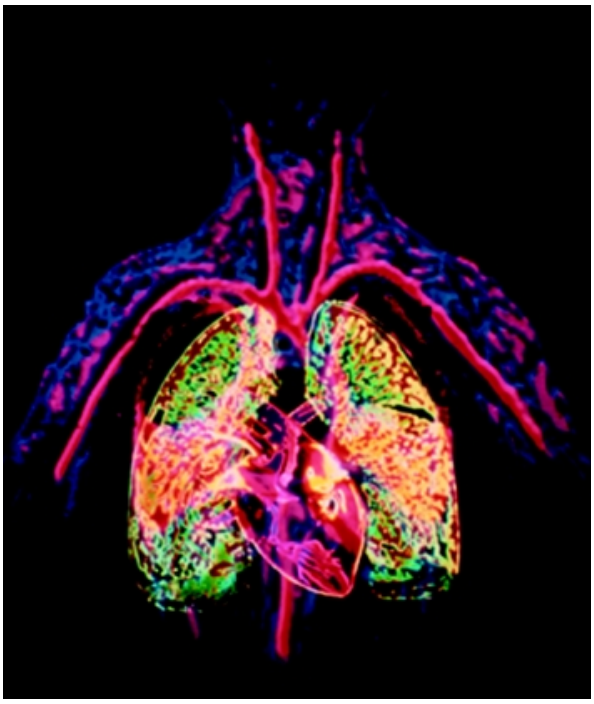
Figure 8. Most Frequently Reported Diagnoses by Job Category and Gender

Job Category	Men	Women
Management	None	None
Scientific	Respiratory (2) Infections/ Parasites (1) Muscles and Skeleton (1)	None
Professional	Respiratory (5) Heart/ Circulatory (4)	Cancer (1) Infections/ Parasites (1) Psychological (1)
Administrative (E)	Muscles and Skeleton (3) Genitourinary (2) Injury (2)	Injury (4) Respiratory (2) Infections/ Parasites (1) Cancer (1)
Tech Support/ Supv (E)	Respiratory (7) Heart/ Circulatory (6) Injury (6) Muscles and Skeleton (6)	None
Administrative (NE)	Digestive (1)	Genitourinary (3) Existing Birth Condition (2) Muscles and Skeleton (2)
Tech Support/ Supv (NE)	Respiratory (11) Muscles and Skeleton (9)	Respiratory (3) Injury (1) Psychological (1)
Clerical & Support Wage	Injury (1)	Respiratory (3) Nervous System (3)
Technical	Injury (4) Genitourinary (2) Muscles and Skeleton (2) Cancer (2)	Digestive (1) Injury (1)
Bargaining Units	Respiratory (69) Injury (57) Muscles and Skeleton (35)	Respiratory (16) Injury (12) Muscles and Skeleton (5)
Miscellaneous	None	Injury (1)

Note: Numbers in parentheses are number of diagnoses reported.

for men in the Professional and Technical Support/Supervisory (E) groups. Among the Professionals, the four reported diagnoses were for ischemic heart disease (restricted blood flow to the heart), stroke, blood clot, and varicose veins. Five of the six diagnoses reported among men in Technical Support/Supervisory (E) occupations were for ischemic heart disease; the sixth diagnosis was for a disorder of the mitral valve in the heart.

Women in job categories other than the Bargaining Units reported very small numbers of diagnoses in 1996. Those in the Management, Scientific, and Technical Support/Supervisory (E) job categories did not report any diagnoses (Figure 8). Injury and respiratory diagnoses were among the more common diagnostic categories reported. A woman in the Professional and one in the Administrative (E) groups each reported one cancer diagnosis. Both diagnoses were for breast cancer.



Rates of Disease Occurrence

A Word about Rates: The previous section considered the **number** of absences and diagnoses among various worker groups. For example, Figure 7 shows men reported 73 and women reported 19 diagnoses involving injuries in 1996. Men therefore reported over three times as many injuries as women. As there are three times as many men as women at Brookhaven National Laboratory, it seems reasonable to expect more injuries among men than women. Does this mean that men were at greater risk of injury than were women in 1996? To correctly answer the question, the total number of men and women in the work force must be considered. A more accurate way to compare men and women is to calculate the injury rate for each gender. Rates are calculated by dividing the number of injury diagnoses in a given gender by the total number of employees of that gender. Multiply this number by 1,000 to get the diagnosis rate per 1,000 workers.

For example:

(73 injuries / 2,671 men) =
.027 x 1,000 =
27 injuries per 1,000 men

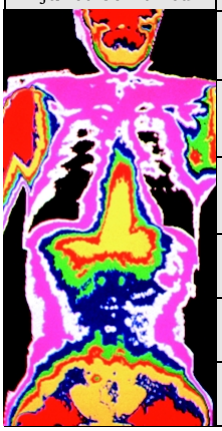
(19 injuries / 860 women) =
.022 x 1,000 =
22 injuries per 1,000 women

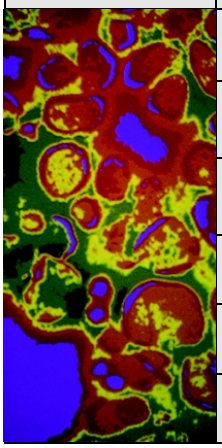
Comparing these rates now correctly suggests that reported absences due to injuries among women are somewhat lower for women than for men, but the difference is not large. These rates are called crude rates because they do not account for possible differences between men and women such as age and other factors that might affect the individual's risk of having an injury. Because age is strongly related to the risk of disease and injury, epidemiologists almost always take age into account when comparing groups. This is done by using age-specific categories, or by methods of statistical adjustment.

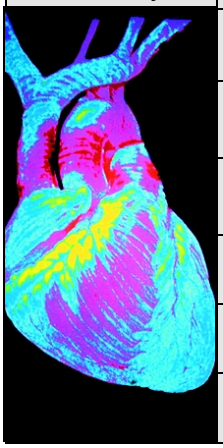
The diagnosis rate (also called the illness and injury rate) is the number of occurrences of a given disease or health condition observed over the course of a year per 1,000 workers at risk of getting that condition (see shaded box). One health condition, arthritis for example, could result in several 5-day absences over a year. Conversely, one 5-day absence may be associated with multiple diagnoses (e.g., the flu and a sprained wrist) recorded on one return-to-work form.

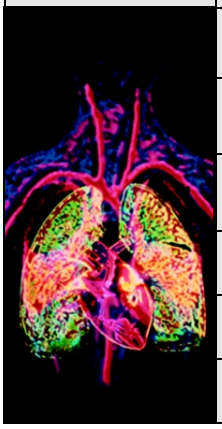
In the following analyses the four age groups were collapsed into two groups: workers younger than 50 years of age and those 50 years and older (see Figure 9). In addition, the 11 occupational groups were combined into 6 larger groups. These groups were collapsed to ensure that the number of diagnoses in each group was large enough to analyze. Five groups of diagnoses of particular interest to workers are presented: all diagnoses combined, cancer, heart/ circulatory system, respiratory system, and injury. Additional information about 8 other disease groups can be found in the Supporting Tables.

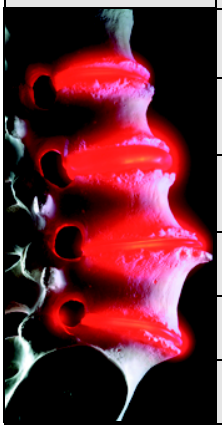
Figure 9. Illness and Injury Rates by Job Category, Gender, and Age

Diagnostic Category	Rate per 1,000			
All Illnesses & Injuries Combined	Job Category	Age	Men	Women
	Management, Administrative & Clerical	<50	40	45
		50+	73	82
	Scientific	<50	6	0
		50+	8	0
	Professional	<50	5	23
		50+	89	38
	Technical	<50	116	100
		50+	98	500
	Bargaining Units	<50	410	569
		50+	439	368
	Miscellaneous	<50	0	12
		50+	0	0

Diagnostic Category	Rate per 1,000			
Cancer	Job Category	Age	Men	Women
	Management, Administrative & Clerical	<50	0	0
		50+	0	7
	Scientific	<50	0	0
		50+	0	0
	Professional	<50	0	0
		50+	0	38
	Technical	<50	0	0
		50+	12	0
	Bargaining Units	<50	6	0
		50+	13	0
	Miscellaneous	<50	0	0
		50+	0	0

Diagnostic Category	Rate per 1,000			
Heart/ Circulatory	Job Category	Age	Men	Women
	Management, Administrative & Clerical	<50	0	3
		50+	0	0
	Scientific	<50	0	0
		50+	0	0
	Professional	<50	0	0
		50+	24	0
	Technical	<50	16	0
		50+	8	0
	Bargaining Units	<50	12	14
		50+	26	53
	Miscellaneous	<50	0	0
		50+	0	0

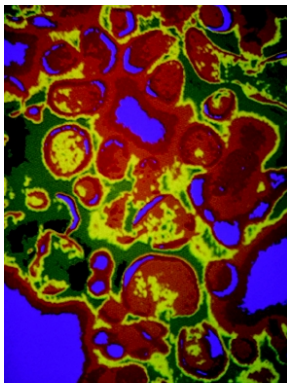
Diagnostic Category	Rate per 1,000			
Respiratory	Job Category	Age	Men	Women
	Management, Administrative & Clerical	<50	0	8
		50+	10	22
	Scientific	<50	6	0
		50+	0	0
	Professional	<50	0	0
		50+	30	0
	Technical	<50	29	0
		50+	12	375
	Bargaining Units	<50	124	181
		50+	168	158
	Miscellaneous	<50	0	0
		50+	0	0

Diagnostic Category	Rate per 1,000			
Injury	Job Category	Age	Men	Women
	Management, Administrative & Clerical	<50	10	6
		50+	21	15
	Scientific	<50	0	0
		50+	0	0
	Professional	<50	0	0
		50+	0	0
	Technical	<50	20	67
		50+	12	0
	Bargaining Units	<50	127	153
		50+	84	53
	Miscellaneous	<50	0	12
		50+	0	0

In general, the rate of all illnesses and injuries combined was greater among Brookhaven National Laboratory workers aged 50 and older. The highest rates were observed among workers in Technical Support and the Bargaining Units. Although the diagnosis rate was much higher among women aged 50 and over than among younger women in Technical Support, younger women had the higher rate in the Bargaining Units. Diagnosis rates for men in the Technical Support and Bargaining Units did not vary much by age. There was no consistent difference between men and women in the combined illness and injury rates.

Cancer rates in this report are based on reported 5-day absences during the year. A worker may experience several periods of absence from one cancer diagnosis due to medical complications or recurrent treatment. Each reported absence results in a report of a cancer diagnosis. However, it does not imply that this is a new cancer. The cancer rates in this report are *not* comparable to the *incidence* rates frequently published in many articles on cancer with which you may be familiar. Incident cancer rates are based on the number of new cancer cases diagnosed within a given time, usually a year.

The likelihood that an individual in the U.S. will develop cancer increases with age. Cancer rates at Brookhaven National Laboratory reflect this; they were higher among workers aged 50 and over than among younger workers. No cancer diagnoses were reported among workers younger than 50 except among men in the Bargaining Units. Nine 5-day absences related to cancer were reported at Brookhaven National Laboratory in 1996; 2 diagnoses by 2 women and 7 diagnoses reported among 6 men. One worker who had two absences in 1996 also had three absences for cancer in 1994. All the other workers with a cancer absence in 1996 had not reported cancer in 1994 or 1995.



Four of the eight workers who reported cancer were Bargaining Units workers, who made up 17 percent of the work force. As in 1994, the main types of cancer reported in 1996 were breast cancer among women and prostate cancer among men. In 1995, three men reported cancer involving the prostate, eye, and esophagus, but no cancers were reported among women.

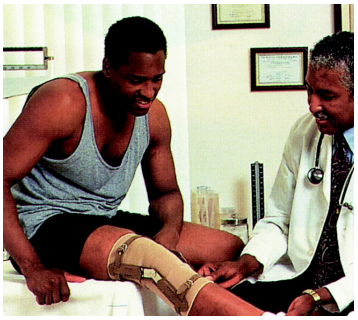
The rate of diseases of the heart/circulatory system was about twice as high in workers aged 50 and older than among younger workers. Eleven of the 25 heart/circulatory system diagnoses (44 percent) were reported by workers ages 50 and older (32 percent of the work force). Men reported 22 of the 25 diagnoses for heart and circulatory disease, and half of their diagnoses involved high blood pressure or ischemic heart disease (restricted blood flow through an artery). The three diagnoses among women involved high blood pressure, low blood pressure, and phlebitis (inflammation in a vein).

Women in the Bargaining Units and men in Technical, Professional, and Bargaining Units occupations had the highest heart/circulatory diagnosis rates. Ten (45 percent) of the 22 diagnoses were reported by Bargaining Units workers (17 percent of the work force). Workers in the Bargaining Units group were over 4 times as likely to report a heart/circulatory diagnosis than were workers in other job categories. The apparent difference may at least in part reflect the greater likelihood that Bargaining Units workers reported their absences rather than real differences in the rate of heart/circulatory disease.

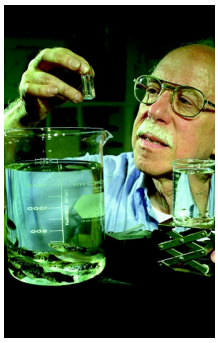
In general, respiratory diagnosis rates were higher among workers aged 50 and older, but there was no consistent difference in rates between men and women. Workers in the Bargaining Units had substantially higher rates than did most

other job categories, at all ages. The one exception was a very high rate among women in Technical Support occupations, but the rate was based on only three respiratory diagnoses among the 38 women in this job category. Workers in the Bargaining Units were 9 times more likely to report a respiratory diagnosis than were workers in other job categories. The specific diagnoses reported for this diagnosis category were similar to those reported in 1994 and 1995. About 72 percent of the respiratory diagnoses were acute infections, pneumonia, or influenza.

The injuries in this analysis include both occupational and non-occupational injuries. In general, workers under age 50 were at somewhat higher risk for injury than were older workers (Figure 9). Most injuries were reported among workers in the Bargaining Units; both women and men in this job category were at higher risk for injury than were workers in other categories. The types of injuries reported were similar for both men and women. Sprains and strains accounted for half of the 92 reported diagnoses, and fractures were another 12 percent. Twenty-three (79 percent) of the 29 back sprains and strains and 12 (71 percent) of the 17 other sprains and strains reported were among the Bargaining Units workers (17 percent of the work force). These increased risks among the Bargaining Units workers were also observed in 1995.



The risk of illness and injury among workers classified in one job category was compared with workers in the remaining job categories. In general, these comparisons emphasized the extreme differences between Bargaining Units workers and other occupations in reported diagnoses. In comparison with other job categories, Bargaining Units staff were at many times the apparent risk for all major illness and injury categories. Overall, they were almost 8 times as likely to have reported a diagnosis during 1996 and were almost 14 times more likely than other workers to have reported an injury. Although we noted that Technical staff were twice as likely to have reported an injury (5 diagnoses) or a diagnosis involving the digestive system (2 diagnoses), the number of diagnoses in each case was very small.



Time Trends

Why Are Rates Age-Adjusted?

The injury and illness rates in this section of the report are age-adjusted. Differences in the age distribution of different groups of workers are taken into consideration in the analyses and one rate is calculated for an entire group. This allows us to make comparisons between groups with different age distributions. Age-adjusted rates are calculated using the age distribution of the 1970 U.S. population as a reference.

Epidemiologic surveillance has been conducted at Brookhaven National Laboratory since 1992, but the data received for that year reflect the site's first attempt to collect worker health information in a new way. Pilot data from the first year of program implementation generally reflect various start-up issues and limitations. The 1992 data are not included in the trend analyses that follow, but the *1992 Epidemiologic Surveillance Annual Summary for Brookhaven National Laboratory* is available at our Web site, **http://www.eh.doe.gov/epi/surv**.

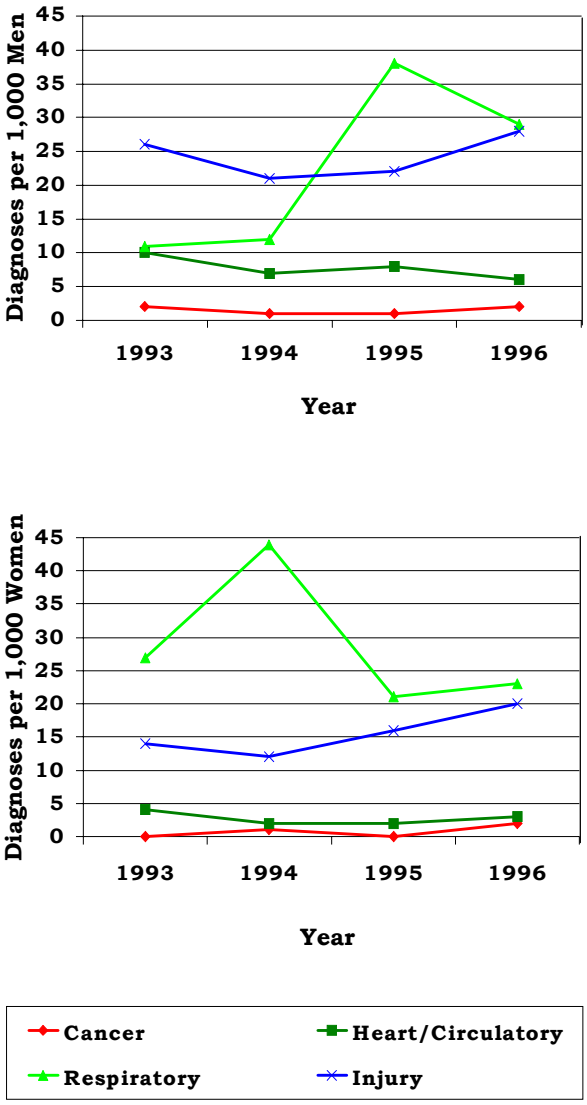
In 1995, Brookhaven National Laboratory restructured the job categories used in epidemiologic surveillance analyses to provide a better reflection of administrative distinctions used onsite. We were not able to reclassify job titles from the 1993 roster into the new system. Thus, time trends analyzed by job category assess the period 1994-1996.

Age-adjusted rates for selected illness and injury categories are presented in Figure 10. Cancer diagnosis rates remained very low for both men and women over the four-year period, and heart/circulatory diagnosis rates decreased slightly among men.

The age-adjusted rates for all illness and injury categories combined increased for both men and women in the Bargaining Units between 1994 and 1996. Men in the Management, Administrative, and Clerical group also showed an increased diagnosis rate, but the rate declined among women in this job category over the same period (Figure 11).

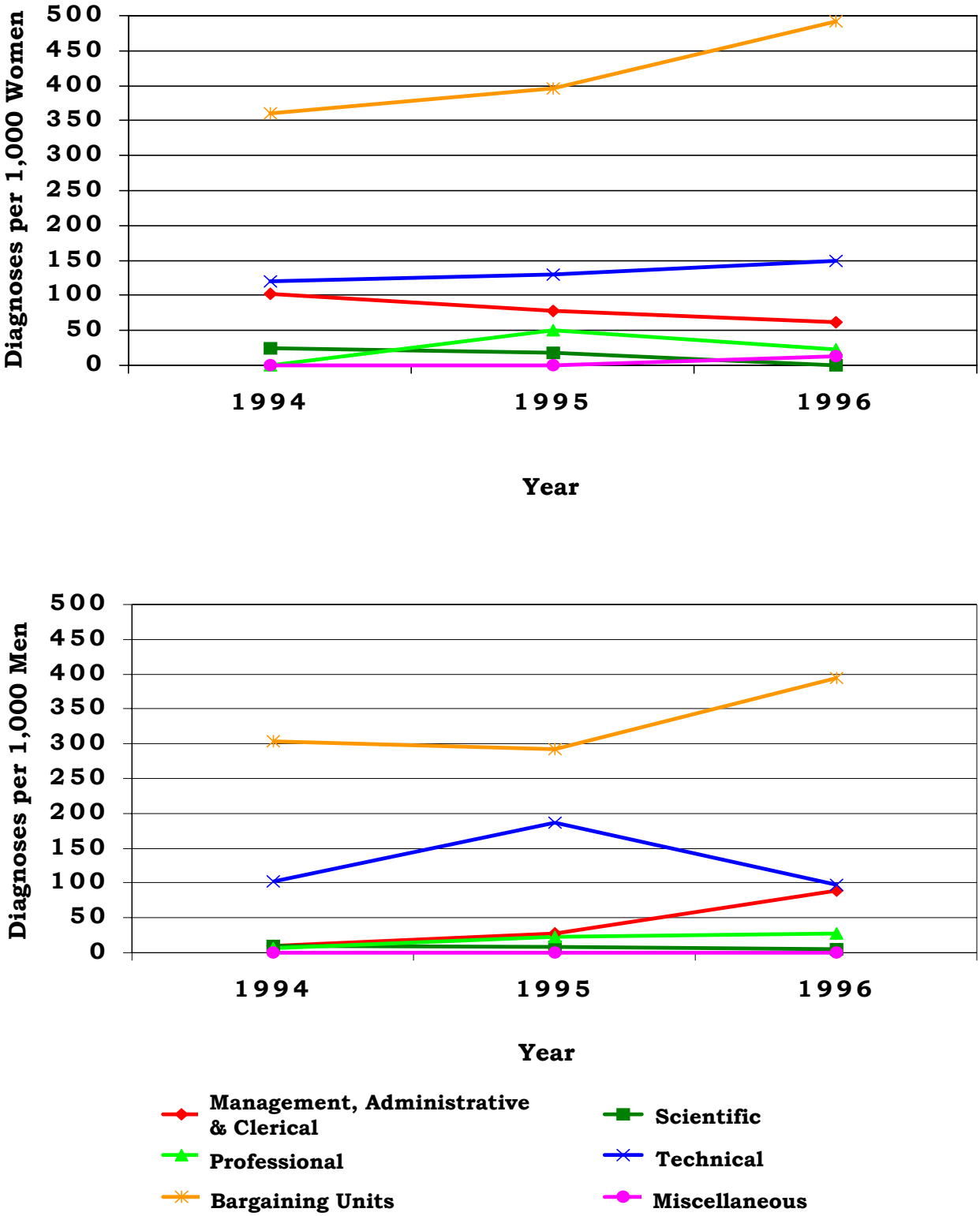
Circulatory disease remained virtually unchanged among women. Injuries

Figure 10. Age-Adjusted Rates for Selected Diagnostic Categories for Men and Women from 1993 to 1996



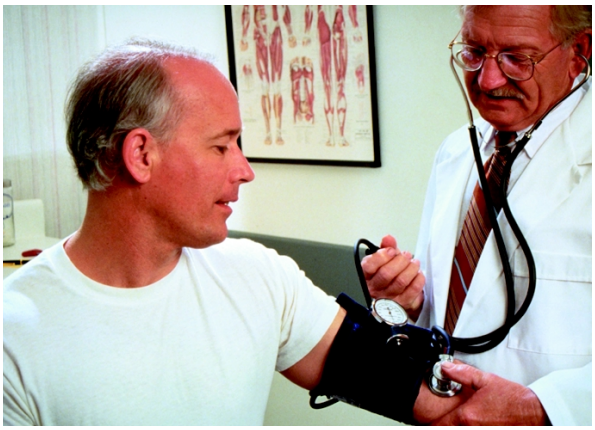
(including-non-occupational injuries) increased among women during 1994-1996, a trend that was not evident among men. The respiratory diagnosis rate peaked in 1994 among women and in 1995 for men, but declined for both men and women in 1996. The changes in respiratory disease rates often reflect changes in the occurrence of acute respiratory conditions such as colds and influenza. Part of the increase observed in 1994-1995 was due to many workers having one absence, not to a few workers having many repeated absences.

Figure 11. Age-Adjusted Rates for All Diagnoses Combined Among Women and Men by Job Category from 1994 to 1996



Sentinel Health Events for Occupations

A sentinel health event for occupation (SHEO) is a disease, disability, or death which is likely to be occupationally related. Its occurrence may serve as a warning signal that materials substitution, engineering



control, personal protection, or medical care may be required to reduce the risk of injury or illness among the work force. Sixty-four medical conditions associated with workplace exposures from studies of many different industries have been identified as sentinel health events.

Although sentinel health events may indicate an occupational exposure, many may result from non-occupational exposures. Due to this uncertainty, sentinel health events are assessed in two categories:

Definite Sentinel Health Events: Diseases that are unlikely to occur in the absence of an occupational exposure. Asbestosis, a lung condition resulting from exposure to asbestos, is an example.

Possible Sentinel Health Events: Conditions such as lung cancer or carpal tunnel syndrome may or may not be related to occupation. Detailed occupational and non-occupational information is required to determine the work-relatedness of the illness. For example, lung cancer may result from asbestos exposure or from cigarette smoking. Carpal tunnel syndrome may result from a job requiring typing or from a hobby such as playing the piano.

Twenty-five of the 411 diagnoses (6 percent) reported in 1996 were identified as *definite* sentinel health events. All of these diagnoses involved injuries, including 13 sprains and strains (11 of these involved the back) and 3 diagnoses of torn cartilage of the knee. Four other diagnoses were identified as *possible* sentinel health events, including 2 diagnoses of carpal tunnel syndrome (Figure 12). A total of 597 workdays were missed as a result of definite or possible sentinel health events.

Figure 12. Characteristics of SHEOs by Gender

	Total Number of SHEO Diagnoses		Total Number of Days Absent	
	Men	Women	Men	Women
Definite	20	5	354	141
Possible	2	2	32	70
Total	22	7	386	211

Disabilities Among Active Workers

Less than 1 percent of the work force was placed on long-term disability during 1996. Ten women and 10 men were placed on long-term disability for reasons including three cancers (leukemia, brain, and breast), three back disorders, three cases of rheumatism, two joint disorders, and one each of various other disorders, including broken ankle, multiple sclerosis, stroke, breathing problems, kidney disorder, pregnancy, and obesity. Eight of the 10 men placed on disability were aged 50 or older, while 8 of the 10 disabled women were 30 to 49 years old. Four of these 8 women were placed on disability for muscles and skeleton conditions. The disabled workers were excluded from other analyses in this report because they were not actively working.

One worker who went on disability in 1996 died before the end of the year. The reason for the disability was cancer, but the cause of death was not identified for this report. Therefore, this death was not included in the Deaths Among Active Workers section of this report.

Deaths Among Active Workers

During 1996, two deaths occurred among men who were active workers. Both workers were in the Technical Support/Supervisory (NE) job category, were above age 50, and died of heart/ circulatory disease.

OSHA-Recordable Events

The Occupational Safety and Health Administration (OSHA) requires employers to maintain a record of occupational injuries and illnesses that have occurred among employees and to make that information available to OSHA upon request. Employers maintain the information from these OSHA-recordable events in the OSHA 200 Log. OSHA-recordable events differ from health events captured through return-to-work clearances in at least two important respects: 1) they do not necessarily result in days lost from work, and 2) they are usually accompanied by a specific determination that they are work-related.

The distribution of OSHA events by gender and age is shown in Figure 13. Twenty-one women and 89 men had at least one OSHA-recordable event noted in 1996. The rate of OSHA-recordable events was higher among men (4 per hundred) than among women (2 per hundred). We observed little difference in OSHA event rates by age group among women, but the rate was about twice as high for men ages 30-39 (6 per 100) than for men in other age groups.

Figure 13. OSHA-Recordable Events by Gender and Age

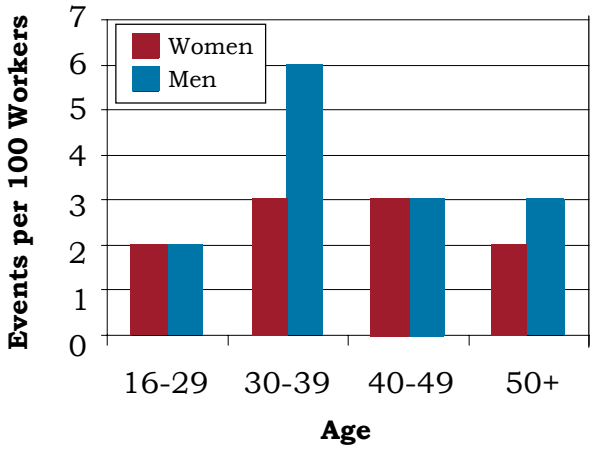
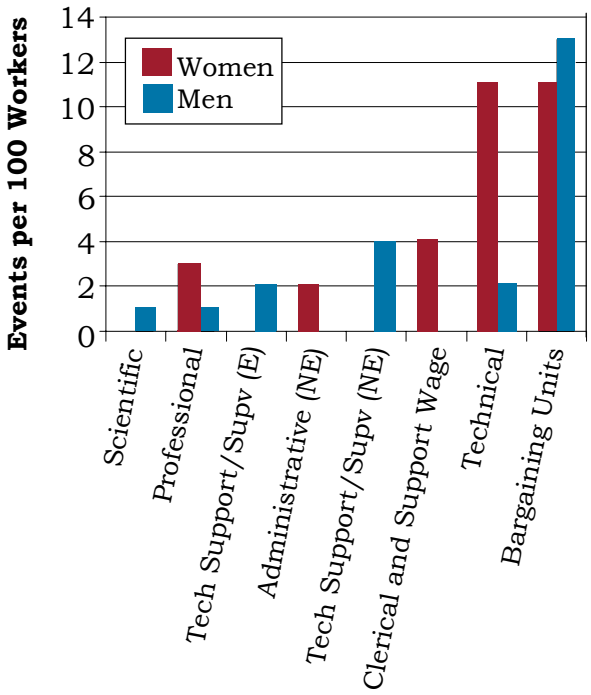


Figure 14. OSHA-Recordable Events by Job Category* and Gender



* No events were reported in the Management, Administrative (E), and Miscellaneous job categories.

The rates of OSHA-recordable events by job category and gender are shown in figure 14.

In general, the higher OSHA-recordable rates were concentrated in non-exempt, or hourly employees. Among both men and women, the highest rates were observed among Bargaining Units workers. The high rate noted among women in the Technical occupations (11 per 100 women) was based on one OSHA-recordable diagnosis among 9 women classified in this job category.

Overall, the average number of days lost or with restricted activity due to an OSHA event was low. There were a total of 72 lost or restricted workdays for women and 428 days for men. The average number of lost workdays per OSHA event was slightly less than 5 for men and about 3 for women. We saw no relationship between age and average duration of absence among either women or men. Most job categories showed an average duration of absence of 5 or fewer days for OSHA-recordable events. The one exception was among men in Technical occupations, whose average 17 days per event reflected two events involving 34 restricted or lost workdays. The Supporting Tables provide more data about OSHA events.

Diagnostic and Accident Categories for OSHA-Recordable Events

There were 117 OSHA events recorded on the OSHA 200 Logs. From these, there were 36 diagnoses among women and 124 diagnoses among men as shown in Figure 15.

Figure 15. OSHA-Recordable Diagnoses by Diagnostic Category and Gender

Diagnostic Category	Gender	
	Women	Men
Heart/Circulatory	1	0
Muscles and Skeleton	8	15
Nervous System	3	4
Respiratory	0	2
Unspecified Symptoms	0	3
Injury	24	100
Fractures - Upper Limb	0	4
Fractures - Lower Limb	0	1
Back Sprains and Strains	6	32
Other Sprains and Strains	1	15
Intracranial Injuries	2	2
Open Wounds - Head, Neck, Trunk	0	5
Open Wounds - Upper Limb	3	15
Late Effects	1	2
Superficial Injuries	1	6
Bruises	3	7
Foreign Bodies Entering Orifice	0	1
Burns	1	5
Unspecified Injuries	4	4
Adverse Reactions to Nonmedical Substances	2	0
Adverse Reactions to External Causes	0	1

Among women, injuries accounted for 67 percent of the diagnoses reported. The most common type of injury among women was sprains and strains (29 percent).

Seventeen percent of the reported injury diagnoses among women were unspecified. Among men, injuries accounted for 81 percent of the diagnoses reported, with sprains and strains comprising 47 percent of the injuries. Open wounds (20 percent) were also frequently reported among men. Following injuries, diagnoses related to the muscles and skeleton were the second most frequently reported OSHA-recordable events. The muscles and skeleton diagnoses were for arthritis and rheumatism for both men and women, and back problems for men.

Sixty-two percent (73) of the 117 OSHA events were described as an accident in the OSHA logs. This distribution is shown in Figure 16. No specific type of accident was prominent among women. Overexertion and strenuous movements were involved in 42 percent (26/62) of the accidents among men, and an additional 15 percent (9/62) of the accidents involved being struck by an object.

Figure 16. OSHA-Recordable Accidents by Type and Gender

Accident Category	Gender	
	Women	Men
	Number of Accidents	Number of Accidents
Motor Vehicle Traffic	0	1
Motor Vehicle Non-Traffic	0	1
Non-Motor Vehicle	0	1
Poisoning - Non-Medicinal	1	1
Falls	3	5
Natural / Environmental Factors	1	0
Submersion / Suffocation / Foreign Bodies	0	1
Other Accidents	4	49
Caused by Electric Current	0	1
Caused by Machinery	0	4
Cutting / Piercing Instrument / Object	0	6
Hot, Corrosive, or Caustic Material / Steam	1	4
Overexertion and Strenuous Movements	2	25
Struck by an Object	1	9
Late Effects of Accident	1	2
Drug Reaction	1	1

Rates of OSHA-Recordable Events

The rates for all diagnoses combined, for OSHA-recordable events by age, gender, and job category are shown in Figures 17 and 18. For both men and women, most job categories had similar rates regardless of age. Among workers in the Bargaining Units, women under age 50 had a somewhat lower rate of OSHA-recordable diagnoses than did older women; the pattern was reversed for men. In general, men under age 50 had somewhat higher rates than did older men.

Figure 17. OSHA-Recordable Rates by Age and Job Category Among Women, All Diagnoses Combined

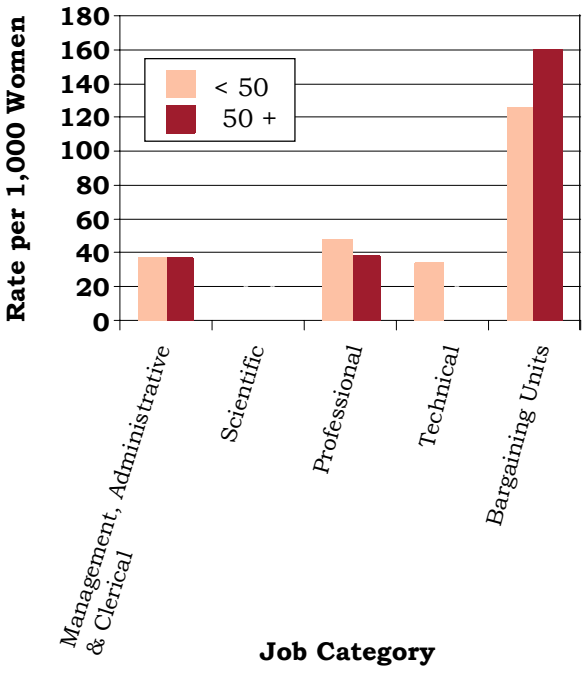
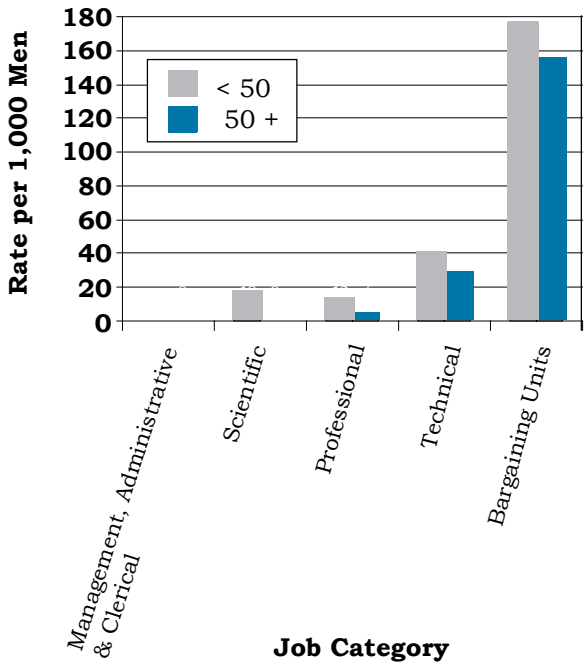


Figure 18. OSHA-Recordable Rates by Age and Job Category Among Men, All Diagnoses Combined



Workers in the Bargaining Units accounted for 17 percent of the work force but reported 64 percent of the OSHA-recordable events. They were responsible for 56 percent of the restricted workdays and 85 percent of the lost workdays. Bargaining Units workers were at a 9 times higher risk than other workers for sprains and strains and 6 times higher risk of open wounds of the upper limb compared with workers in other job categories. They

were 11 times more likely than other workers to report a diagnosis involving the muscles and skeleton.

Time Trends for OSHA-Recordable Events

From 1994 through 1996, overall rates for OSHA-recordable events among women in the Bargaining Units and Technical occupations varied greatly, perhaps because of the small number of OSHA events reported among women. Those in Management, Administrative, and Clerical occupations showed a small increase, while other job categories showed a decline in OSHA-recordable rates (Figure 19).

Figure 19. Age-Adjusted Rates for All OSHA-Recordable Diagnoses Combined Among Women by Job Category from 1994 to 1996

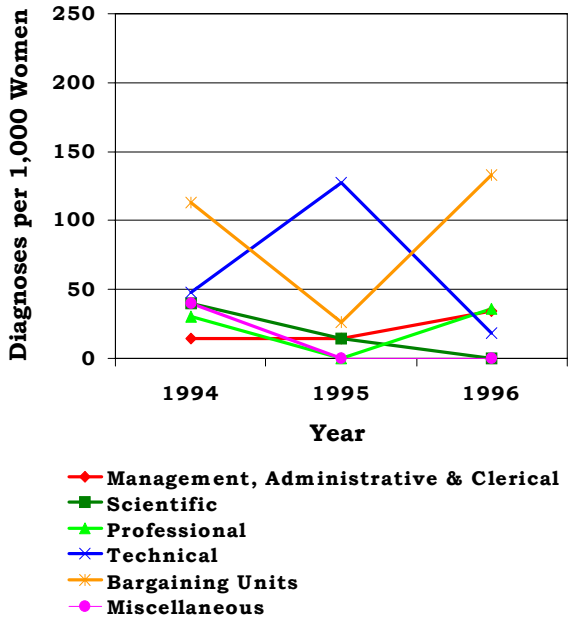
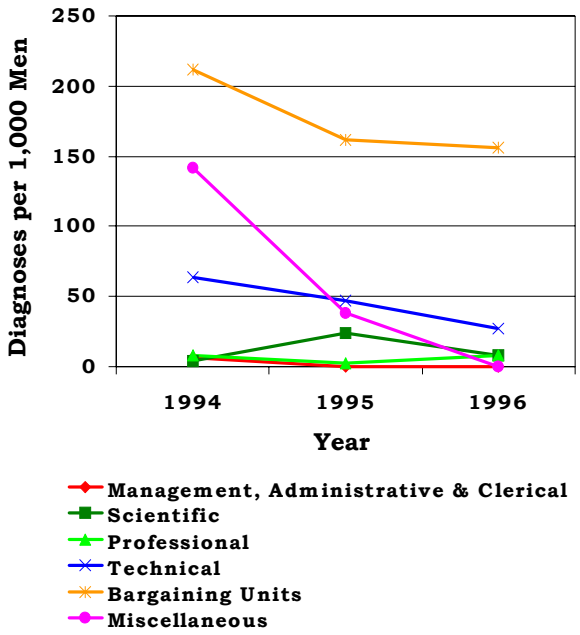


Figure 20. Age-Adjusted Rates for All OSHA-Recordable Diagnoses Combined Among Men by Job Category from 1994 to 1996



Men in the Bargaining Units, Technical occupations, and Miscellaneous job categories showed a decline in OSHA-recordable rates over the 3-year period. No major changes in rates were observed for men in other job categories (Figure 20).

Glossary

Adjustment: A mathematical procedure for rates in which the effects of differences of a characteristic (such as age or gender) between groups have been removed. The purpose of adjustment is to allow comparisons between two or more groups with the effect of the differences for the characteristic removed.

Age-Adjusted Rate: A rate that has been mathematically adjusted to account for the effects of differences in the age composition between groups.

Age-Specific Rate: A rate that is calculated for a specific age group (e.g., 16 to 29 years old). Only people in the specific age group are included in the calculation of the rate.

Confidence Interval: A range of values determined by the degree of random variability in the data. The width of the confidence interval is affected by the size of the group being studied and how often the event whose true value is sought occurs. Generally, as the size of the group or the frequency of the event increases, the width of the confidence interval decreases. The level of confidence, for example a 95 percent confidence level, indicates the percentage (e.g., 95 percent) of time that the true value is expected to fall within the confidence interval if the mathematical procedure is repeated 100 times.

Demographics: Characteristics of human populations related to their size, density, age distribution, and vital status.

Diagnosis (diagnoses): Identification of a disease or health condition from signs and symptoms.

Diagnosis Rate: The number of occurrences of a given disease or health condition observed during a given time period per the number of workers at risk of getting that disease during that time period. It is usually multiplied by 100 or 1,000 to produce a rate expressed as a convenient number.

Diagnostic Category: A particular type of disease, a group of related health conditions, or diseases that all affect the same organ system.

Epidemiologic Surveillance: The ongoing evaluation of the health of a human population which is based on the collection and interpretation of demographic and health information for that population.

Epidemiology: The study of the distribution and determinants of diseases and health conditions in human populations.

ICD-9-CM Code: An abbreviation for the *International Classification of Diseases, 9th Revision, Clinical Modification*. An internationally accepted standardized system for the classification of disease and health data collected from medical records.

OSHA: An acronym for the Occupational Safety and Health Administration.

OSHA Event: An abbreviation used throughout this report for an OSHA-recordable event.

OSHA-Recordable Event: An accident that occurs on the job and involves fatalities (regardless of time between injury and death), time lost from work, transfer of employment, medical treatment other than first aid, loss of consciousness, or restriction of work or motion. Also included is any diagnosed occupational health event reported to the employer that is neither fatal nor results in workdays lost. By law, these events are recordable in the OSHA 200 Log.

Person-Year: A unit of measurement combining the number of people being studied with the time that each was observed equivalent to one person followed for one year. For example, 5 persons followed for one year contribute five person-years, as do 10 people each followed for half a year.

Relative Risk: The ratio of the occurrence of a disease or health condition in one group compared to the rate of occurrence of that same disease or health condition in another group.

Explanation of Diagnostic Categories

Throughout this report, health conditions have been grouped into a number of diagnostic categories which come from the *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD-9-CM). For the text of this report the categories are abbreviated to make the report easier to read. The following table lists the abbreviated categories used throughout the annual report and the corresponding ICD-9-CM codes found in the Supporting Tables.

Abbreviated Categories Used in the Annual Report	ICD-9-CM Codes
Benign Growths	210-229 235-239
Blood	280-289
Cancer	140-208 230-234
Digestive	520-579
Endocrine /Metabolic	240-279
Existing Birth Condition	740-759
Genitourinary	580-629
Heart / Circulatory	390-459
Infectious /Parasites	001-139
Injury	800-999
Miscarriage	630-676
Muscles and Skeleton	710-739
Nervous System	320-389
Psychological	290-319
Respiratory	460-519
Skin	680-709
Unspecified Symptoms	780-799

ICD-9-CM Codes

All conditions	001-V82	All reported health events
Infectious and parasitic diseases	001-139	Diseases caused by bacteria, viruses, and parasites
• Intestinal infections	001-009	Infections of the bowel or gut
• Tuberculosis	010-018	TB in the lungs and other organs
• Zoonotic bacterial diseases	020-027	Bacterial diseases that animals transmit to humans
• Other bacterial diseases	030-041	Whooping cough, diphtheria, strep throat, and gangrene
• Human Immunodeficiency Virus (HIV) infection	042	AIDS
• Poliomyelitis and other nonarthropod diseases of the central nervous system	045-049	Viral meningitis (swelling of the layers covering the brain and spinal cord); viral encephalitis (swelling of the brain); and polio
• Viral diseases accompanied by exanthem	050-057	Diseases accompanied by rashes or blisters like chickenpox, measles, shingles, and herpes
• Arthropod-borne viral diseases	060-066	Encephalitis (swelling of the brain) caused by bites from virus-carrying ticks or mosquitoes
• Other diseases caused by viruses and chlamydiae	070-079	Viral hepatitis, mumps, rabies, and mononucleosis
• Rickettsioses and other arthropod-borne diseases	080-088	Rocky Mountain spotted fever, malaria, and lyme disease
• Other spirochetal diseases	100-104	Trench mouth and Weil's disease (jaundice caused by coil-shaped bacteria)
• Mycoses	110-118	Athlete's foot; fungal infections of fingernails and toenails; and thrush
• Helminthiases	120-129	Pinworms, tapeworms, roundworms, whipworms
• Other infectious and parasitic diseases	130-136	Lice, chiggers, scabies, and mites

• Late effects of infectious or parasitic diseases	137-139	Side effects of TB, chickenpox, or polio even though the disease is no longer active
Malignant neoplasms	140-208, 230-234	All cancers, regardless of the part of the body affected
• Lip, oral cavity, and pharynx	140-149	Lip, mouth, throat, and tongue
• Digestive organs and peritoneum	150-159	Stomach, esophagus (tube that transports food to the stomach), intestines, colon, rectum, anus, liver, pancreas, and gallbladder
• Respiratory system and intrathoracic organs	160-165	Sinuses, throat, voice box, lungs, and heart
• Bone, connective tissue, skin, and breast	170-176	Bone, muscle, ligament, tendon, blood vessels, fat, skin, and breast
• Genitourinary organs	179-189	Kidney, bladder, and cervix, ovary, uterus, and prostate
• Other and unspecified sites	190-199	Eye, brain, and thyroid
• Lymphatic and hematopoietic tissue	200-208	Leukemia, lymphoma, Hodgkin's disease, multiple myeloma, lymphosarcoma, and reticulum cell sarcoma
• Carcinoma in situ	230-234	A cancer that is confined to the site of origin (has not spread to neighboring tissue)
Benign neoplasms and neoplasms of uncertain behavior and unspecified nature	210-229 235-239	Tumors that are not cancerous or do not exhibit cancerous behavior, regardless of the part of the body affected
Endocrine, nutritional, and metabolic diseases and disorders of the immune system	240-279	Diseases affecting the hormone secreting glands and organs. Overactive thyroid; underactive thyroid; vitamin deficiency; diabetes; gout; and problems affecting the antibody producing system
Disorders of the blood and blood forming organs	280-289	Anemia and hemophilia (excludes leukemia)

Mental disorders	290-319	Psychiatric diagnoses - Non-psychotic disorders: depression; anxiety, fear and stress disorders; alcoholism; drug dependence; and eating disorders, such as anorexia; Psychotic disorders: dementia, schizophrenia, and manic depression
Diseases of the nervous system and sense organs	320-389	Huntington's chorea; Alzheimer's and Parkinson's disease; epilepsy; multiple sclerosis; migraine; diseases of the eye, such as cataract and glaucoma
• Inflammatory diseases of the central nervous system	320-326	Bacterial meningitis (swelling of the layers covering the brain and spine); bacterial encephalitis (swelling of the brain); and brain and spinal abscesses
• Hereditary and degenerative diseases of the central nervous system	330-337	Alzheimer's and Parkinson's disease, tremors, and Huntington's chorea
• Other disorders of the central nervous system	340-349	Multiple sclerosis (MS), cerebral palsy, epilepsy, and migraine
• Disorders of the peripheral nervous system	350-359	Nerve disorders of the face, carpal tunnel syndrome, muscular dystrophy
• Disorders of the eye	360-379	Inflammation and ulcers of the eye and eyelid; detached retina; pink eye; problems with tear ducts; glaucoma; and cataracts
• Diseases of the ear and mastoid process	380-389	Infections of the outer, middle, or inner ear; ringing of the ears; hearing loss
Diseases of the circulatory system	390-459	Rheumatic fever, heart murmurs, heart attacks, angina, hardening of the arteries, varicose veins, hemorrhoids, and phlebitis
• Acute rheumatic fever	390-392	High fever and joint pain with possible heart damage
• Chronic rheumatic heart disease	393-398	Long lasting swelling and damage to the heart which results from rheumatic fever
• Hypertensive disease	401-405	High blood pressure

• Ischemic heart disease (Restricted blood flow to the heart)	410-414	Heart attack and angina
• Diseases of pulmonary circulation	415-417	Blood clots in the lung and pulmonary aneurysm (bulge that develops in the wall of the pulmonary artery, which is the artery that carries blood to the lungs)
• Other forms of heart disease	420-429	Swelling of the inner lining, middle lining, or sac enclosing the heart; heart failure; and irregular heartbeat
• Cerebrovascular disease	430-438	Stroke, bleeding in the brain, and blockage or low blood flow in blood vessels of the brain
• Diseases of the arteries and capillaries	440-448	Hardening of the arteries; aneurysm (bulge that develops in the walls of arteries); and blood clots
• Diseases of the veins, lymphatics, and other diseases	451-459	Phlebitis (swelling of a vein), thrombophlebitis (swelling of a vein which has a blood clot), varicose veins, and hemorrhoids
Diseases of the respiratory system	460-519	Colds, sinusitis, laryngitis, pneumonia, influenza, chronic bronchitis, asthma, and emphysema
• Acute respiratory infections	460-466	Colds, sore throat, sinus infections, swollen tonsils, and bronchitis
• Other diseases of the upper respiratory tract	470-478	Allergies, hay fever, sinus infections, bronchitis, and sore throat that continue for a long time
• Pneumonia and influenza	480-487	"The flu" and pneumonia caused by a bacteria or virus
• Chronic obstructive pulmonary diseases and allied conditions	490-496	Emphysema and asthma
• Pneumoconiosis and other lung diseases caused by external agents	500-508	Black lung; miners' asthma; asbestosis; silicosis; berylliosis; and conditions caused by chemical fumes and vapors
• Other diseases of respiratory system	510-519	Pleurisy (swelling of the lining of the lungs), collapsed lung, and respiratory failure

Diseases of the digestive system	520-579	Diseases affecting the teeth and mouth, salivary glands, digestive tract, and the abdominal cavity. Examples include dental abscess, ulcers, appendicitis, hepatitis (excluding viral hepatitis), cirrhosis of the liver, gallstones, pancreatitis, abdominal hernia, and intestinal polyps
• Diseases of the oral cavity, salivary glands, and jaw	520-529	Tooth problems (too many, too few, abnormal shape or size, cavities, bleeding gums, toothaches), and infections and swelling of the mouth, jaw, and tongue
• Diseases of the esophagus, stomach, and duodenum	530-537	Ulcers of the esophagus (tube that transports food to the stomach), stomach, and small intestine; indigestion; and uncontrollable vomiting
• Appendicitis	540-543	Swelling of the appendix (rupture, surgery, or both may result)
• Hernia of the abdominal cavity	550-553	Ruptures of the groin and diaphragm (muscle which separates the chest area from the lower part of the trunk)
• Non-infectious enteritis and colitis	555-558	Crohn's disease and swelling of the intestine and colon
• Other diseases of the intestines and peritoneum	560-569	Irritable bowel syndrome, blockage of the intestine, constipation, and diarrhea
• Other diseases of the digestive system	570-579	Diseases of the liver, gallbladder, and pancreas; hepatitis; blood in stool; and bleeding in the stomach and intestine
Diseases of the genitourinary system	580-629	Diseases affecting the kidneys, the prostate, and testes; benign breast diseases; infertility (male and female); diseases of the ovary; pelvic inflammatory disease; and menstrual disorders
• Nephritis, nephrotic syndrome, and nephrosis	580-589	Swelling of the kidney; swelling of the small blood vessels in the kidney; and kidney failure
• Other diseases of the urinary system	590-599	Swelling and infection of the kidney and bladder; kidney stones; and difficulty urinating

• Diseases of the male genital organs	600-608	Enlarged prostate; swelling of the scrotum and prostate; and abscess of the prostate
• Disorders of the breast	610-611	Benign tumors, cysts, and infections of the breast
• Inflammatory disease of the female pelvic organs	614-616	Swelling of the uterus, ovary, fallopian tubes, or cervix
• Other diseases of the female genital tract	617-629	Conditions associated with menopause and postmenopause; PMS; infertility; and cramps
Complications of pregnancy, childbirth, and the puerperium	630-676	Miscarriage; complications of pregnancy, such as hemorrhage; pregnancy-related high blood pressure; preeclampsia; and premature labor or other complications of labor
• Ectopic and molar pregnancy	630-633	Development of fetus outside the uterus and growth of cysts
• Other pregnancy with abortive outcome	634-639	Miscarriage and complications associated with miscarriage
• Complications mainly related to pregnancy	640-648	Abnormal bleeding and possible miscarriage; infections; high blood pressure caused by pregnancy; and premature labor
• Normal delivery, and other indications for care in pregnancy, labor, and delivery	650-659	Delivery requiring little or no assistance; multiple births; breech birth; and problems of the fetus or placenta which affect care of mother
• Complications occurring mainly in the course of labor and delivery	660-669	Long labor; unusually fast delivery; and abnormal bleeding after delivery
• Complications of the puerperium	670-676	Infections of the breast; blood clot in lung; and varicose veins
Diseases of the skin and subcutaneous tissue	680-709	Acne, cellulitis, sunburn, psoriasis, and seborrhea

• Infections of the skin and subcutaneous tissue	680-686	Abscesses, boils, hair-containing cysts, and pus-filled blisters
• Other inflammatory conditions of skin and subcutaneous tissue	690-698	Skin rashes caused by detergents, oils, greases, solvents, sun, food, drugs, or medicine
• Other diseases of the skin and subcutaneous tissue	700-709	Corns, calluses, heat rash, swollen hair follicles, acne, and ingrown fingernails and toenails
Diseases of the musculoskeletal system and connective tissue	710-739	Arthritis, systemic lupus erythematosus, ankylosing spondylitis, herniated intervertebral disc ("slipped disc"), lumbago, sciatica, rheumatism, tendonitis, and osteoporosis
• Arthropathies and related disorders	710-719	Arthritis; joint pain and stiffness; and other diseases of the connective tissue which supports and connects internal organs, forms bones and blood vessel walls, and attaches to bones
• Dorsopathies	720-724	Swelling of the spine; herniated, slipped, and ruptured disc; rheumatoid arthritis of the spine; lumbago; and sciatica
• Rheumatism, excluding the back	725-729	Swelling and degeneration of joints, muscles, tendons; tennis elbow; and bursitis
• Osteopathies, chondropathies, and acquired musculoskeletal deformities	730-739	Fracture caused by bone disease; osteoporosis; curvature of the spine; flat foot; hammer toe; and development of deformities of the nose, toes, feet, legs, arms, and hands
Congenital anomalies	740-759	Spina bifida; cleft palate; harelip; and various chromosomal anomalies, such as Klinefelter's syndrome
Certain conditions originating in the perinatal period	760-779	Maternal high blood pressure; maternal malnutrition; ectopic pregnancy; breech birth; fetal malnutrition or slow growth; injuries related to birth trauma; and perinatal jaundice

Symptoms, signs, and ill-defined conditions	780-799	Blackout, chills, dizziness, fatigue, pallor, abnormal weight loss, undiagnosed chest pain, and heartburn
• Symptoms	780-789	Hallucinations, fainting, convulsions, dizziness, fatigue, fever, sleep disturbance, rash, headache, sore throat, chest pain, nausea, vomiting, and heartburn
• Non-specific abnormal findings	790-796	Abnormal x-ray, blood, stool, and urine test results
• Ill-defined and unknown causes of morbidity and mortality	797-799	Senility; asphyxia; respiratory arrest; nervousness; and unexplained death within 24 hours of onset of symptoms
Injury and poisoning	800-999	Dislocation of joints; sprains and strains of associated muscles; concussions; bruises; cuts; internal injuries from crushing, puncture, tearing, or blunt impact; burns; blisters; poisoning; frostbite; heatstroke; and complications of medical or surgical care
• Fractures, all sites	800-829	Cracks or breaks of any bone
• Dislocations	830-839	Separation of a bone from its normal socket or joint
• Sprains and strains of joints and adjacent muscles	840-848	Strains are injuries to muscle from overuse or stretching the muscle beyond its normal limit; sprains are injuries involving tearing or overextending the ligaments of a joint
• Intracranial injuries excluding those with skull fractures	850-854	Concussions; internal bruises; and bleeding within the head without a fracture of the bones of the skull
• Internal injuries of the thorax, abdomen, and pelvis	860-869	Bruising, crushing, tearing, or rupturing the chest, abdomen, and pelvis and the organs within these areas of the body
• Open wounds	870-897	Animal bites; cuts; lacerations; punctures; and amputations, excluding the arteries and veins

• Other injuries and late effects of external causes	900-999	Miscellaneous injuries, including injuries to the arteries and veins; problems that occur an extended period of time after the injury has taken place (”late effects”); superficial bruises and abrasions; burns; post-injury shock; poisoning; toxic side effects of chemicals; heatstroke; electrocution; and altitude sickness
Supplementary classifications related to personal or family history of disease	V10-V19	Covers situations in which the person is not ill or injured but has a personal or family history of problems, such as cancer, mental illness, allergies, or arthritis that may affect his or her risk of illness
Supplementary classifications related to health care for reproduction and child development	V20-V28	Problems related to pregnancy, postpartum care, contraception, outcome of delivery, and physical development of child
Contact with health services for reasons other than illness or injury	V50-V59	Care for workers who have been treated previously for an illness or injury that is no longer present but who receive care to complete treatment or prevent recurrence

NOTES