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Brookhaven National Laboratory Annual Epidemiologic Surveillance Report

Brookhaven National Laboratory
2000 Epidemiologic Surveillance Report

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

http://tis.eh.doe.gov/health/epi/surv/index.html

ACKNOWLEDGEMENT

Brookhaven National Laboratory 2000

At A Glance

Beginning with the year 2000, BNL chose to include absences with durations shorter than 5 days. This decision will affect many of the rates, proportions, and trends presented in this and subsequent Epidemiologic Surveillance reports. It is likely that many rates will increase, and the reader is cautioned to take this into account when interpreting the report. Rates of OSHA events, reportable regardless of whether or not an absence is involved, will in general not be affected by this change in reporting.

Bargaining Units workers had the highest absence rate. The higher rates we have seen in the Bargaining Units since 1995 may in part reflect more complete reporting of absences among these workers than among workers in job categories comprised primarily of salaried staff.

Among men, OSHA-recordable rates were highest for Bargaining Units workers and among women were highest for Bargaining Units and Technical workers.

Bargaining Units workers were 17 percent of the work force but accounted for 68 percent of the OSHA-recordable events. They had 91 percent of the days restricted and 83 percent of the days lost from work. Bargaining Units workers were 10 times more likely to have an OSHA-recordable event than other groups of workers. Their risk of occupational injury was 10 times greater than that of other workers. Back sprains and strains were 21 times more likely among Bargaining Units workers; they were also at higher risk for sprains and strains to areas other than the back and open wounds to the upper limb.

Workers in the Management, Scientific, and Miscellaneous job categories did not report any OSHA-recordable events.

Half of the OSHA-recordable injuries reported by women were sprains and strains. Among men, injuries were primarily open wounds and sprains and strains.

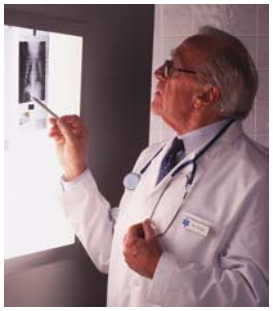
We found no consistent trend in OSHA-recordable diagnoses among women in most job categories between 1994 and 2000. Among men, the rate of OSHA-recordable diagnoses declined among Bargaining Units workers over the 7-year period, although not consistently.

BNL employees experienced an overall 23 percent decrease in the number of OSHA events reported from 1999 to 2000, primarily attributable to a decline in the number of events reported by men in the Technical Support/Supervisory (NE) and Technical job categories.

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 to detect health problems among workers. The Epidemiologic Surveillance Program monitors illnesses and health conditions that result in absences, occupational injuries and illnesses, and disabilities and deaths among current workers.

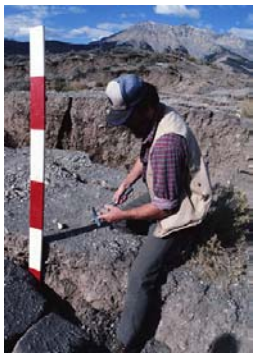
This report provides a summary of epidemiologic surveillance data collected from Brookhaven National Laboratory (BNL) from January 1, 2000 through December 31, 2000. The data were collected by a coordinator at Brookhaven and submitted to the Epidemiologic Surveillance Data Center, located at Oak Ridge 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 DOE Office of Health Programs. Epidemiologic surveillance has been ongoing at Brookhaven since 1992.

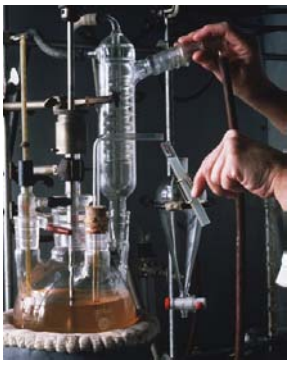


The information presented in this report provides highlights of the data analyses conducted. Earlier surveillance reports and additional supporting tables are posted on the Office of Health Studies' Web site (**http://tis.eh.doe.gov/health/epi/surv/index.html**) or are available by request. The main sections of the report include: work force characteristics; absences due to injury or illness; workplace injuries, illnesses, and deaths that were reportable to the Occupational Safety and Health Administration ("OSHA-recordable" events); and disabilities and deaths among current workers. The report also includes sections on time trends that provide comparative information on the health of the work force from 1994 to 2000.

Note: In the figures and calculations that follow, percentages have been rounded to the nearest whole number.

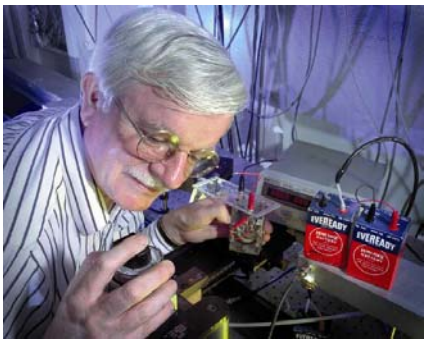
DOE sites vary by mission, function, job classification, and worker exposures. Comparisons of Brookhaven with other DOE sites should be made with caution. In addition, many factors can affect the completeness and accuracy of health information reported at the sites, thereby affecting the observed patterns of illness and injury.



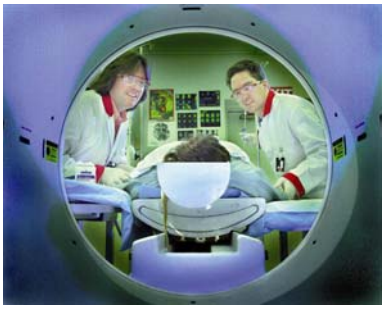


Site Overview

BNL 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.



Today, BNL 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 BNL scientists and over 4,000 national and international visitors who come to BNL every year to use the facilities. The Relativistic Heavy Ion Collider (RHIC), a particle accelerator facility at BNL, was completed in the summer of 1999 after 10 years of construction and became operational in 2000. Many physicists from around the world use the RHIC to study what the universe might have looked like in the first few moments after its creation. What physicists learn from experiments conducted at the RHIC may better our understanding of why the physical world works the way it does, from the smallest subatomic particles to the largest stars.

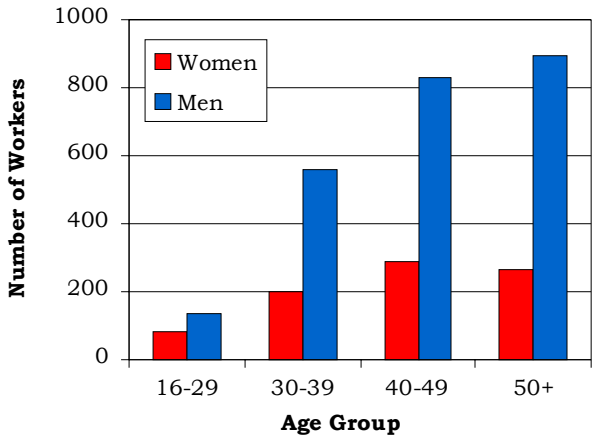


With areas of the site contaminated from past practices, BNL was added to the Federal Superfund National Priorities List in 1989. Remediation is proceeding. In 1998, Brookhaven Science Associates (BSA) became the new managing contractor of BNL. BSA is a partnership led by the State University of New York at Stony Brook and Battelle Memorial Institute, a nonprofit applied science and technology organization. In June 2000, DOE, the Environmental Protection Agency, and the New York State Department of Environmental Conservation agreed on remedies to address groundwater contamination at BNL. The agreement, reached after extensive regulator and public review and comment, allows DOE and BNL to move forward with design, construction, and implementation of proposed remedies.

The Brookhaven Work Force – 2000

A total of 3,254 Brookhaven employees were included in epidemiologic surveillance in 2000, 73 fewer workers than were present in 1999. The age and gender distribution of the 2000 work force is shown in Figure 1. The majority (70%) of the work force was 40 years of age or older.

Figure 1. The Work Force by Gender and Age



There were 835 (26 percent) women and 2,419 (74 percent) men in the Brookhaven work force. The average age of women in the work force was 44 years; the average age for men was 46 years. The majority of the workers was White (81 percent). African Americans and Asians each made up 8 percent of the work force; the remaining 3 percent were Hispanics and Native Americans.

The distribution of workers by job category and gender is shown in Figure 2. Individual job titles reported by Brookhaven were grouped together into 11 job categories. This is because there were either too few workers or too few absences among workers with a particular job title, thereby limiting the types of analyses that could be conducted. Men and women were not distributed equally among the various job categories. Sixty percent of the women were employed in the Administrative (exempt and non-exempt) and Professional job categories. Sixty-two percent of the men were in the Scientific, Professional, and Bargaining Units job categories.

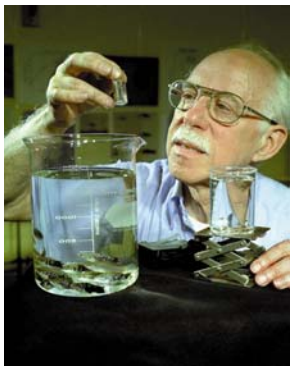
Figure 2. The Work Force by Job Category and Gender

Job Category	Women	Men
Management	33 4%	123 5%
Scientific	59 7%	504 21%
Professional	109 13%	539 22%
Administrative (E)	196 23%	92 4%
Tech Support/Supv (E)	10 1%	308 13%
Administrative (NE)	192 23%	8 <1%
Tech Support/Supv (NE)	24 3%	293 12%
Clerical & Support Wage	58 7%	5 <1%
Technical	4 <1%	53 2%
Bargaining Units	91 11%	453 18%
Miscellaneous	59 7%	41 2%

A Note to the Reader:

Prior to the Year 2000 report, Epidemiologic surveillance at BNL examined illness and injury absences of 5 or more consecutive workdays (also referred to as “5-day absences”). This approach is based on DOE Order 440.1 that requires contractor management to notify Occupational Medicine when a worker has been absent for 5 or more consecutive workdays. Eligible health events would also include those with an absence on a Friday that continued through Tuesday, the length of that absence including the weekend.

As indicated in Order 440.1, all injuries and illnesses due to a work-related incident must be reported. Non-occupational illnesses and injuries that involve absences of fewer than 5 days do not routinely require a medical clearance for return to work and, as noted above, have been excluded from these analyses until now. Beginning with the year 2000, BNL chose to include absences of shorter duration. This decision will affect many of the rates, proportions, and trends presented in this and subsequent Epidemiologic Surveillance reports. It is likely that many rates will increase, and the reader is cautioned to take this into account when interpreting the data presented in the pages that follow. Rates of OSHA-recordable events, reportable regardless of whether or not an absence is involved, will in general not be affected by this change in reporting.



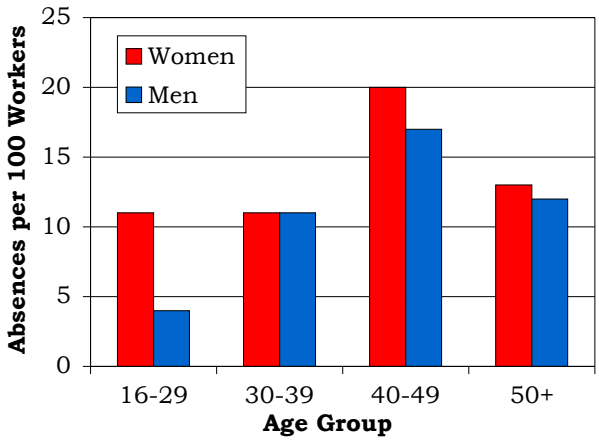
A change from surveillance reports issued prior to 1996 is the exclusion of some types of health events resulting in an absence. In this report, five women with a reported absence due to maternity leave and one man with a reported absence due to elective surgery not related to the treatment of an illness or injury were excluded. As in previous reports, analyses in this report take gender, age, and job category into account because the risk of illness and injury varies by these factors.

Number and Length of Absences

The noteworthy decrease in the number of health events involving return-to-work clearances observed from 1996 to 1997 leveled off in 1998 and then reversed direction, with an increase in 1999 that continued into 2000. Brookhaven reported 439 absences in 2000 compared with 279 absences in 1999, 229 absences in 1998, 224 absences reported in 1997, and 305 absences in 1996. The 57 percent increase in the number of absences in 2000 compared to 1999 cannot be explained by an increase in the number of workers reporting absences. Part of this increase is due to the inclusion of absences that lasted fewer than 5 days. In 2000, 125 absences lasting fewer than 5 days were included; none were included in 1999.

The rate of absences due to injury or illness varied by gender and age (Figure 3). The absence rate was 13 per 100 workers for men and 15 per 100 workers for women. Eighty-one women reported 122 absences; 232 men reported 317 absences. The absence rate was not related to age among men or women. Three percent of women (29/835) and 2 percent of men (59/2,419) reported two or more absences in 2000.

Figure 3. Absence Rate by Gender and Age



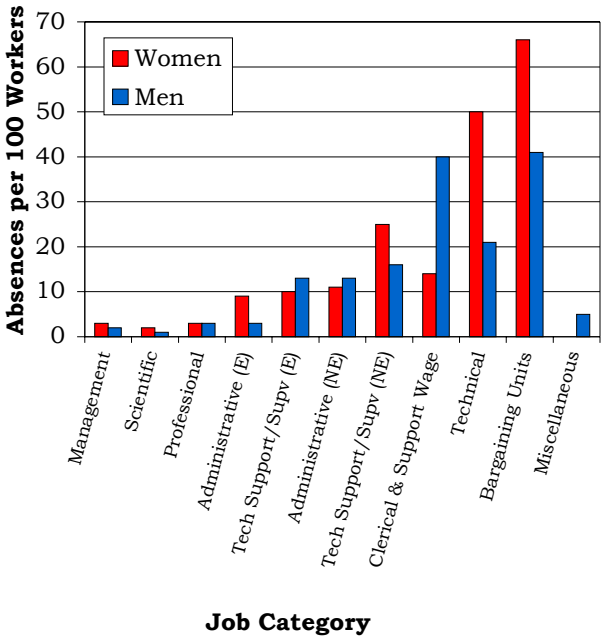
The average length of absence of 16 days for women was slightly longer than the 14-day average for men (Figure 4). Compared with 1999, the average length of absence in 2000 decreased 33 percent for women (24 days in1999) and 50 percent for men (28 days in 1999). This reduction resulted from the inclusion of absences of fewer than 5 days in 2000. The average duration of absence was not related to age among men or women.

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	9	40	4
	30-39	21	160	8
	40-49	57	1,271	22
	50+	35	466	13
	Total	122	1,937	16
Men	16-29	5	72	14
	30-39	62	821	13
	40-49	140	1,576	11
	50+	110	1,954	18
	Total	317	4,423	14

The rate of absences due to illness or injury varied by job category (Figure 5). Women tended to have higher rates of absence than men within the same job category. Bargaining Units workers had the highest absence rate: 66 per 100 among women and 41 per 100 among men. Women in the Miscellaneous job category have not reported any absences since 1997. The higher rates we have seen in the Bargaining Units since 1995 may in part reflect more complete reporting of absences among these workers than among workers in job categories comprised primarily of salaried staff.

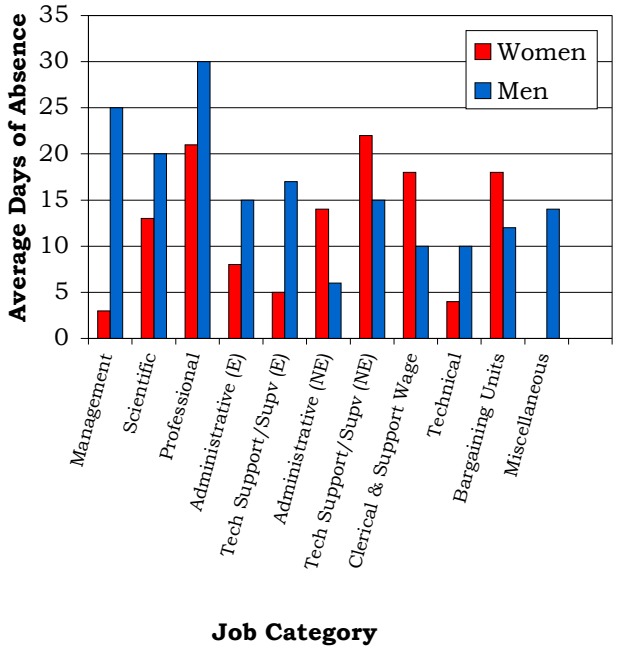
Figure 5. Absence Rate by Job Category and Gender



Men generally had longer average absence durations than did women in similar job categories (Figure 6). Among men, Professional workers had the longest average duration of absence (30 days). Among women, the Technical Support/Supervisory (NE) group had

the longest average absence (22 days). Additional information about the number and length of absences for men and women in different age and job categories can be found in the Supplemental Tables.

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 which health effects are due to occupational exposures and which ones are due to other causes. Most illness and injury diagnoses were reported to the occupational medicine clinic by workers who required return-to-work clearances. 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 illness and injury categories based on a standard reference, the *International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM)*. This reference is used to classify health events for statistical purposes. You can find specific health conditions in the Explanation of Diagnostic Categories.

The number of reported diagnoses categorized according to the ICD-9-CM and the number of lost calendar days are presented in Figure 7. There were 188 diagnoses reported by women and 495 diagnoses reported by men in 2000. Compared with 1999, the number of diagnoses reported by women increased 79 percent and the number reported by men rose 48 percent. The inclusion of all absences, regardless of the length of absence, contributed to this increase in the number of diagnoses. The most frequently reported diagnoses have varied little by gender since 1995.

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 Diagnoses	Number of Lost Calendar Days	Number of Diagnoses	Number of Lost Calendar Days
Benign Growths	2	71	7	137
Blood	1	21	1	45
Cancer	1	547	3	100
Digestive	4	23	28	361
Endocrine/ Metabolic	4	63	10	130
Existing Birth Condition	0	0	1	95
Genitourinary	6	139	12	113
Heart/ Circulatory	7	116	33	682
Infections/ Parasites	7	52	22	149
Injury	12	156	73	1,064
Miscarriage	0	0	NA	NA
Muscles & Skeleton	33	319	70	773
Nervous System	6	69	16	225
Psychological	9	183	8	291
Respiratory	54	392	138	636
Skin	1	8	7	88
Unspecified Symptoms	41	185	66	605

Note: Lost calendar days for each absence are counted more than once when multiple diagnoses occur in different diagnostic categories for the same absence.

Women lost 1,937 calendar days due to injury and illness. Respiratory conditions (29 percent), unspecified conditions (22 percent), and muscles and skeleton conditions (18 percent) accounted for 69 percent of all reported diagnoses among women. The respiratory conditions were due to upper respiratory infections (52 percent), bronchitis and asthma (30 percent), and flu and pneumonia (19 percent). Thirty-nine percent of unspecified symptoms were general symptoms (fever, dizziness, fatigue, sleep disturbance) followed by symptoms of the digestive organs (24 percent). The muscles and skeleton conditions were almost evenly divided between back pain and disk disorders (36 percent), joint disorders (33 percent), and rheumatism (30 percent).

Men lost 4,423 calendar days due to injury and illness. Among male workers, 57 percent of all reported diagnoses were due to respiratory conditions (28 percent), injuries (15 percent), and muscles and skeleton conditions (14 percent). Upper respiratory infections accounted for 65 percent of the respiratory conditions, followed by pneumonia and flu (18 percent) and bronchitis and asthma (15 percent). A closer look at diagnoses for injuries showed that 41 percent were sprains and strains, 15 percent were dislocations, 15 percent were open wounds, and 11 percent were bruises. One diagnosis related to complications of medical care was reported among the 73 injury diagnoses. The number of injury diagnoses increased from 60 in 1999 to 73 in 2000 after a decline from 1997 (55) to 1998 (42). Frequently reported muscles and skeleton conditions were back pain and disk disorders (51 percent), joint disorders (34 percent), and rheumatism (13 percent).

The most frequent diagnoses did not vary by age among women except in women under 30 years old. Among the youngest women, diagnoses for nervous system conditions outnumbered respiratory diagnoses. Among men, respiratory conditions were the most frequently reported diagnoses in all age groups. Injuries were common among workers over age 30.

Figure 8 shows the frequency of reported diagnoses by job category for women and men. With 11 job categories defined and the small number of diagnoses reported among Brookhaven workers, many job categories had few diagnoses reported. Among women, 1 of the job categories (Miscellaneous workers) reported no diagnoses in 2000. Among the other 10 groups, respiratory diagnoses, unspecified symptoms, and muscles and skeleton conditions were common. Among men, respiratory conditions, muscles and skeleton conditions, injuries, unspecified symptoms, and heart/circulatory diagnoses appeared frequently. Twenty-four men reported 33 diagnoses for heart/circulatory conditions; 23 diagnoses were for hypertension or ischemic heart disease. Among the most frequently reported conditions, no specific diagnosis appeared linked to a particular job category.

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

Job Category	Men	Women
Management	Heart/Circulatory (2) Psychological (1) Respiratory (1)	Muscles & Skeleton (1)
Scientific	Unspecified Symptoms (2) Digestive (1) Respiratory (1)	Genitourinary (1)
Professional	Heart/Circulatory (4) Digestive (3) Injury (3) Muscles & Skeleton (3) Psychological (3)	Respiratory (4) Injury (1) Psychological (1)
Administrative (E)	Genitourinary (3) Heart/Circulatory (2) Respiratory (1)	Respiratory (12) Muscles & Skeleton (7) Unspecified Symptoms (4)
Tech Support/ Supv (E)	Respiratory (13) Injury (10) Muscles & Skeleton (8) Heart/Circulatory (8)	Unspecified Symptoms (1)
Administrative (NE)	Endocrine/Metabolic (2)	Respiratory (10) Unspecified Symptoms (10) Muscles & Skeleton (6)
Tech Support/ Supv (NE)	Respiratory (22) Unspecified Symptoms (17) Injury (15)	Heart/Circulatory (3) Psychological (2) Unspecified Symptoms (2)
Clerical & Support Wage	Respiratory (4) Injury (1)	Respiratory (4) Infections/Parasites (2) Muscles & Skeleton (2) Unspecified Symptoms (2)
Technical	Respiratory (5) Unspecified Symptoms (5) Injury (3) Muscles & Skeleton (3)	Infections/Parasites (1) Respiratory (1)
Bargaining Units	Respiratory (88) Muscles & Skeleton (42) Injury (39) Unspecified Symptoms (39)	Respiratory (23) Unspecified Symptoms (22) Muscles & Skeleton (17)
Miscellaneous	Injury (2) Respiratory (2)	None

Note: Numbers in parentheses represent the number of reported diagnoses.

Rates of Disease Occurrence

A Word about Rates: The previous section considered the number of absences and diagnoses among various job categories. For example, Figure 7 shows that men reported 70 and women reported 33 diagnoses involving muscles and skeleton during 2000. Men therefore reported over twice as many muscles and skeleton conditions as women. As there were almost 3 times as many men as women at Brookhaven, it seems reasonable to expect more muscles and skeleton conditions among men than among women. Does this mean that men were at greater risk of muscles and skeleton conditions compared with women in 2000? To correctly answer the question, the total number of men and women in the work force must be considered. To compare risk among men and women, it is necessary to calculate the muscles and skeleton rate for each gender. Rates are calculated by dividing the number of muscles and skeleton 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:

70 muscles and skeleton diagnoses ÷
2,419 men = .029 x 1,000 =
29 muscles and skeleton diagnoses
per 1,000 men

33 muscles and skeleton diagnoses ÷
835 women = .040 x 1,000 =
40 muscles and skeleton diagnoses
per 1,000 women

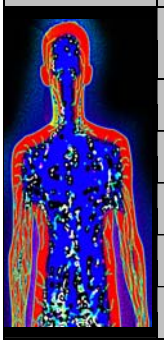
Comparing these rates now correctly suggests that the rates of reported absences due to muscles and skeleton conditions were almost 40 percent higher among women compared to men. They are called **crude rates** because they do not account for possible differences between men and women such as age and other factors that might affect the individual's risk of having a condition of the muscles and skeleton. Because age is so 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 statistical methods of adjustment.

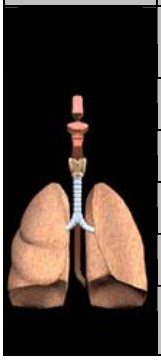
The diagnosis rate, also called the illness and injury rate, is the number of occurrences of a given disease or health condition observed over the course of a year per 1,000 workers at risk of getting that condition (see shaded box). One diagnosis, arthritis for example, may result in several absences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

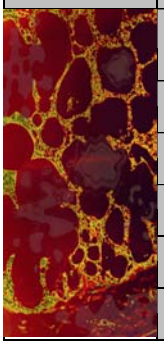
In the following set of analyses, the four age groups were collapsed into two groups: workers younger than 50 years of age and those 50 or older. These groups were collapsed to ensure that the number of diagnoses in each group was large enough to analyze. In addition, the 11 job categories were combined into 6 larger groups. Five groups of diagnoses of particular interest to workers are presented in Figure 9: all illnesses and injuries combined, cancer, heart/circulatory system, respiratory system, and injury.

The rates for all illnesses and injuries combined tended to be higher for male Brookhaven workers aged 50 or older compared with younger workers. Among women, the rate was not related to age. The highest illness and injury rates for all employees were among workers classified as Bargaining Units. This trend has been observed since 1995.

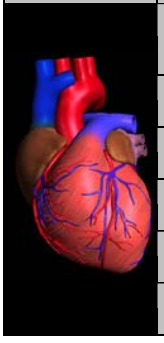
Figure 9. Illness and Injury Rates by Job Category, Gender, and Age

Diagnostic Category	Rate per 1,000			
All Illnesses & Injuries Combined	Job Category	Age	Men	Women
	Management, Administrative, & Clerical	<50	47	147
		50+	99	208
	Scientific	<50	7	22
		50+	9	0
	Professional	<50	46	66
		50+	53	30
	Technical	<50	202	286
		50+	355	500
	Bargaining Units	<50	682	1,129
		50+	470	381
	Miscellaneous	<50	103	0
		50+	0	0

Diagnostic Category	Rate per 1,000			
Respiratory	Job Category	Age	Men	Women
	Management, Administrative, & Clerical	<50	37	56
		50+	17	52
	Scientific	<50	0	0
		50+	5	0
	Professional	<50	3	53
		50+	0	0
	Technical	<50	47	0
		50+	88	100
	Bargaining Units	<50	225	286
		50+	132	143
	Miscellaneous	<50	51	0
		50+	0	0

Diagnostic Category	Rate per 1,000			
Cancer	Job Category	Age	Men	Women
	Management, Administrative, & Clerical	<50	0	0
		50+	0	0
	Scientific	<50	0	0
		50+	0	0
	Professional	<50	0	0
		50+	0	0
	Technical	<50	4	0
		50+	0	0
	Bargaining Units	<50	13	14
		50+	0	0
	Miscellaneous	<50	0	0
		50+	0	0

Diagnostic Category	Rate per 1,000			
Injury	Job Category	Age	Men	Women
	Management, Administrative, & Clerical	<50	9	3
		50+	0	17
	Scientific	<50	0	0
		50+	0	0
	Professional	<50	5	13
		50+	6	0
	Technical	<50	42	0
		50+	44	0
	Bargaining Units	<50	79	100
		50+	99	0
	Miscellaneous	<50	51	0
		50+	0	0

Diagnostic Category	Rate per 1,000			
Heart / Circulatory	Job Category	Age	Men	Women
	Management, Administrative, & Clerical	<50	0	7
		50+	33	0
	Scientific	<50	0	0
		50+	0	0
	Professional	<50	0	0
		50+	24	0
	Technical	<50	9	0
		50+	48	300
	Bargaining Units	<50	30	29
		50+	7	0
	Miscellaneous	<50	0	0
		50+	0	0

Cancer rates presented in this report are based on reported absences due to cancer. A worker may experience several periods of absence from one cancer diagnosis due to medical complications or treatment. Each absence results in the 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 *incident* 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.

Two absences for cancer were reported by two men. One man reported one diagnosis for pancreatic cancer, and the other man had cancer of two different sites – esophagus and an unspecified site. The latter worker also reported cancer of the esophagus in 1999. One woman reported one diagnosis for breast cancer in 2000. No particular occupational group reported an excessive number of cancer diagnoses.

Women in only four job categories reported heart/circulatory problems. Four women reported 7 heart/ circulatory diagnoses. Five of the 7 diagnoses involved hypertension and ischemic heart disease (restricted blood flow through an artery). The high rate noted among older women in the Technical group reflects 2 absences with 3 diagnoses reported by 1 woman; 2 diagnoses were for ischemic heart disease. Among men, workers aged 50 or older had the highest rates of heart/circulatory problems, with the exception of the Bargaining Units group. Sixteen of the 26 absences among men occurred in workers aged 50 or older, and 65 percent (13/20) of the diagnoses among these older workers involved hypertension or ischemic heart disease.

Men in the Technical and Bargaining Units groups had the highest rates of heart/circulatory disorders. Four men in the Technical group and 6 men in the Bargaining Units group reported all 13 heart/circulatory diagnoses among men younger than 50 years old. Ten (77 percent) of these diagnoses were for hypertension or ischemic heart disease. Among 14 workers who were 50 years of age or older and reported heart/ circulatory diagnoses, 9 were Technical workers and 1 was a Bargaining Units worker. Workers in the Technical Support/Supervisory (NE) group were 3 times more likely to report a heart/circulatory diagnosis compared to workers in other job categories.

Younger workers tended to have higher respiratory disease rates compared with workers 50 years of age or older. Among both women and men, Bargaining Units workers had the highest rate of respiratory diagnoses compared with other job categories. Workers in this group were 8 times more likely to report a respiratory diagnosis than were other workers. Fifty-eight percent (111/192) of the respiratory diagnoses were among Bargaining Units workers, who made up 17 percent of the work force. This trend has been observed since

1995, when Bargaining Units workers were at 8 times greater risk of reporting a respiratory diagnosis.

Age was not related to the rate of injuries among men or women. Bargaining Units workers had the highest injury rates among men and women. The risk of illness and injury among workers classified in one job category was compared with workers in the remaining job categories. Workers in the Bargaining Units job category were 5 times more likely to report an injury, 22 times more likely to report a back sprain or strain, 3 to 4 times more likely to report a sprain or strain other than to the back, and almost 4 times more likely to report a dislocation as workers in other job categories. Technical Support/Supervisory (NE) workers were twice as likely to report an injury and were over 5 times more likely to report a dislocation compared with other job categories.

Technical Support/Supervisory (NE) workers were at almost twice the risk, Technical workers were at twice the risk, and Bargaining Units workers were at over 5 times the risk of all injuries and illnesses compared with all other groups. These increased risks have also been seen in the Technical Support/ Supervisory (NE) and Bargaining Units groups since 1998 and in the Technical group since 1999. Technical Support/Supervisory (NE) workers were twice as likely to report an unspecified symptom. Technical Support/Supervisory (E) workers were at almost 5 times the risk of a nervous system condition. Clerical and Support Wage workers were at almost 7 times the risk of reporting an infection and at almost 8 times the risk of reporting a sprain or strain to areas other than the back. Technical workers were 4 times more likely to report an unspecified symptom compared with workers in other job categories. Bargaining Units workers were at increased risk of reporting a variety of conditions compared with workers in other job categories: 9 times the risk of muscles and skeleton disorders, 6 times the risk of nervous and digestive system diagnoses and unspecified symptoms, and 5 times the risk of infections/parasites and endocrine/ metabolic conditions. Among the Bargaining Units workers, 28 of the 59 diagnoses related to the muscles and skeleton were disk and back problems, 4 of the 12 nervous system diagnoses were carpal tunnel syndrome, all of the 7 endocrine/metabolic diagnoses were thyroid conditions or diabetes, 3 of the 18 digestive diagnoses were hernias, and 7 of the 14 infections reported were viral infections.

In part, these apparently higher risks among Bargaining Units workers probably reflect more complete reporting of illness and injury than is found among workers in some other job categories, particularly those categories made up primarily of salaried employees.

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 composition among 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 different groups. Age-adjusted rates are calculated using the age distribution of the 1970 U.S. population as a reference.

Age-adjusted rates for all illness and injury categories combined are presented in Figure 10. It is important to note that the age-adjusted rates for the years 1994 and 1995 presented in this report differ from those reported in the *1994* and *1995 Annual Epidemiologic Surveillance Reports* due to the exclusion of diagnoses resulting from maternity leave.

The age-adjusted rates for all illness and injury categories combined continued the increase in 2000 that was observed in 1999. Unspecified symptoms contributed to the increase in the rate.

Age-adjusted rates for selected diagnostic categories are presented in Figure 11. The increase in nervous system diagnoses among women resulted from an increase in carpal tunnel syndrome; three diagnoses were reported in 2000, with none reported since 1997. The increase in chronic respiratory diseases was due to an increase in asthma among women and an increase in bronchitis among men. An increase in all types of muscles and skeleton conditions has produced the steady increase in this rate among women since 1998. Among men, an increase in joint disorders and back problems in 1999 and 2000 has contributed to the increased rate in muscles and skeleton diagnoses. All types of injuries have increased among men in the past 2 years.

Age-adjusted rates for all illnesses and injuries combined are shown for the various job categories in Figure 12. Among the Technical workers, an increase in all types of diagnoses was responsible for the increase observed among women in 2000. The dramatic increase observed in 1999 among both men and women in the Bargaining Units job category continued into 2000. The increase in the rate among Bargaining Units workers was partially due to an increase in reported respiratory diagnoses and unspecified symptoms.

Figure 10. Age-Adjusted Rates for All Diagnoses Combined Among Men and Women from 1994 to 2000

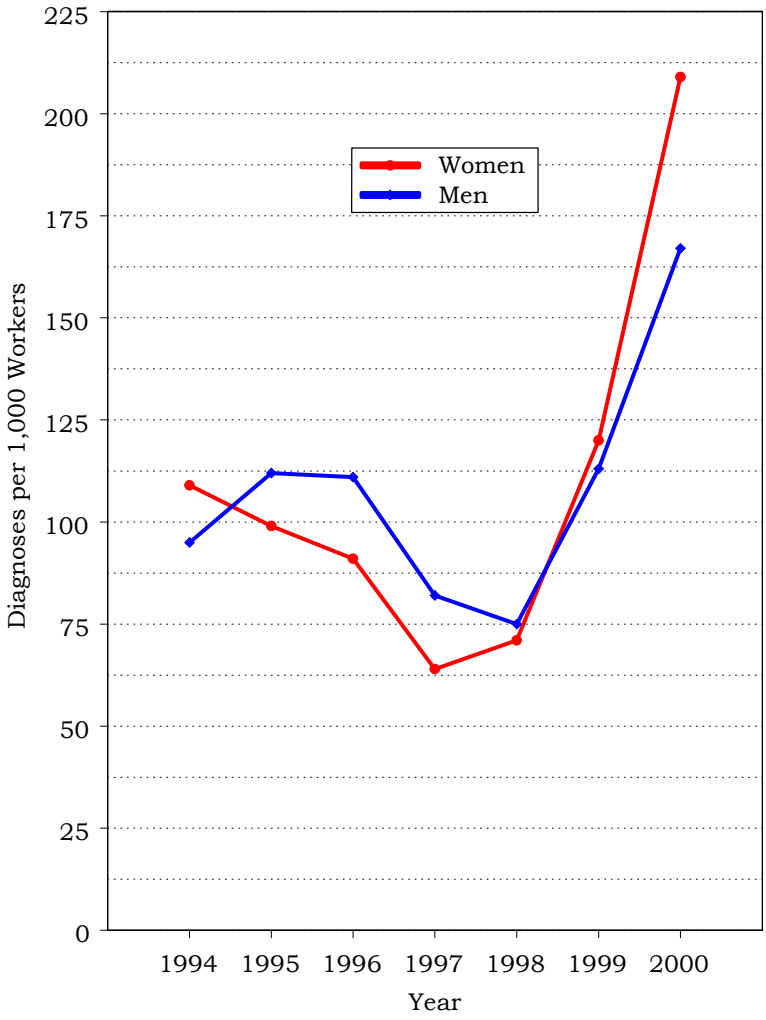


Figure 11. Age-Adjusted Rates for Selected Diagnostic Categories Among Women and Men from 1994 to 2000

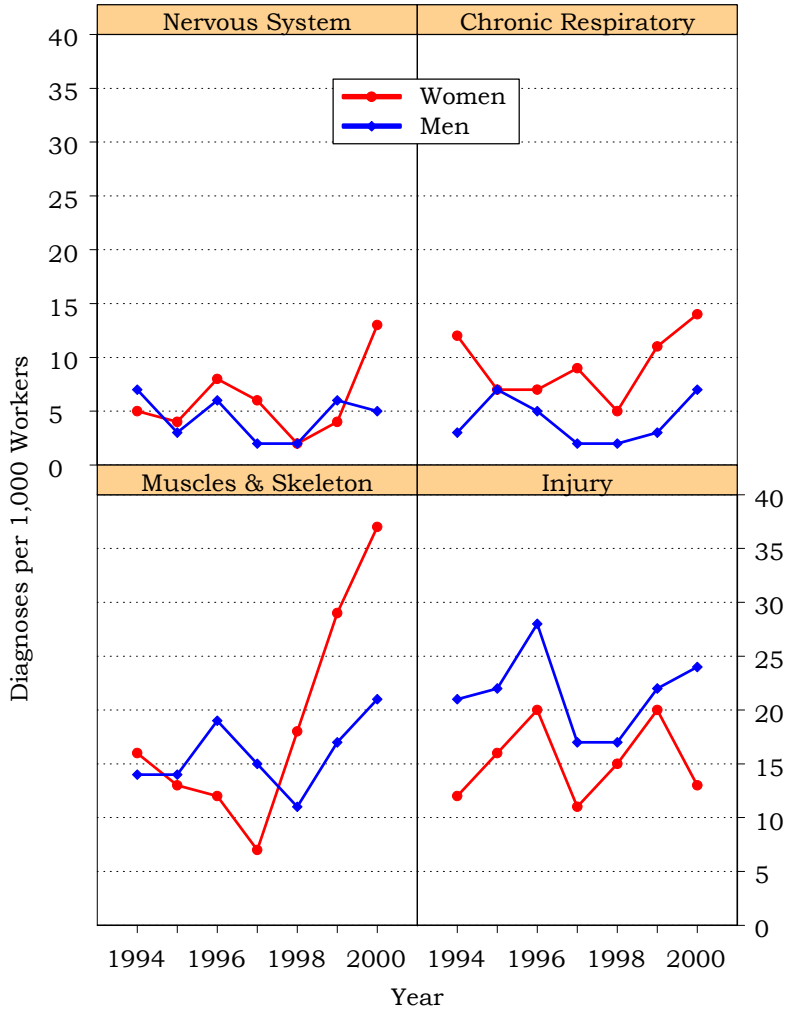
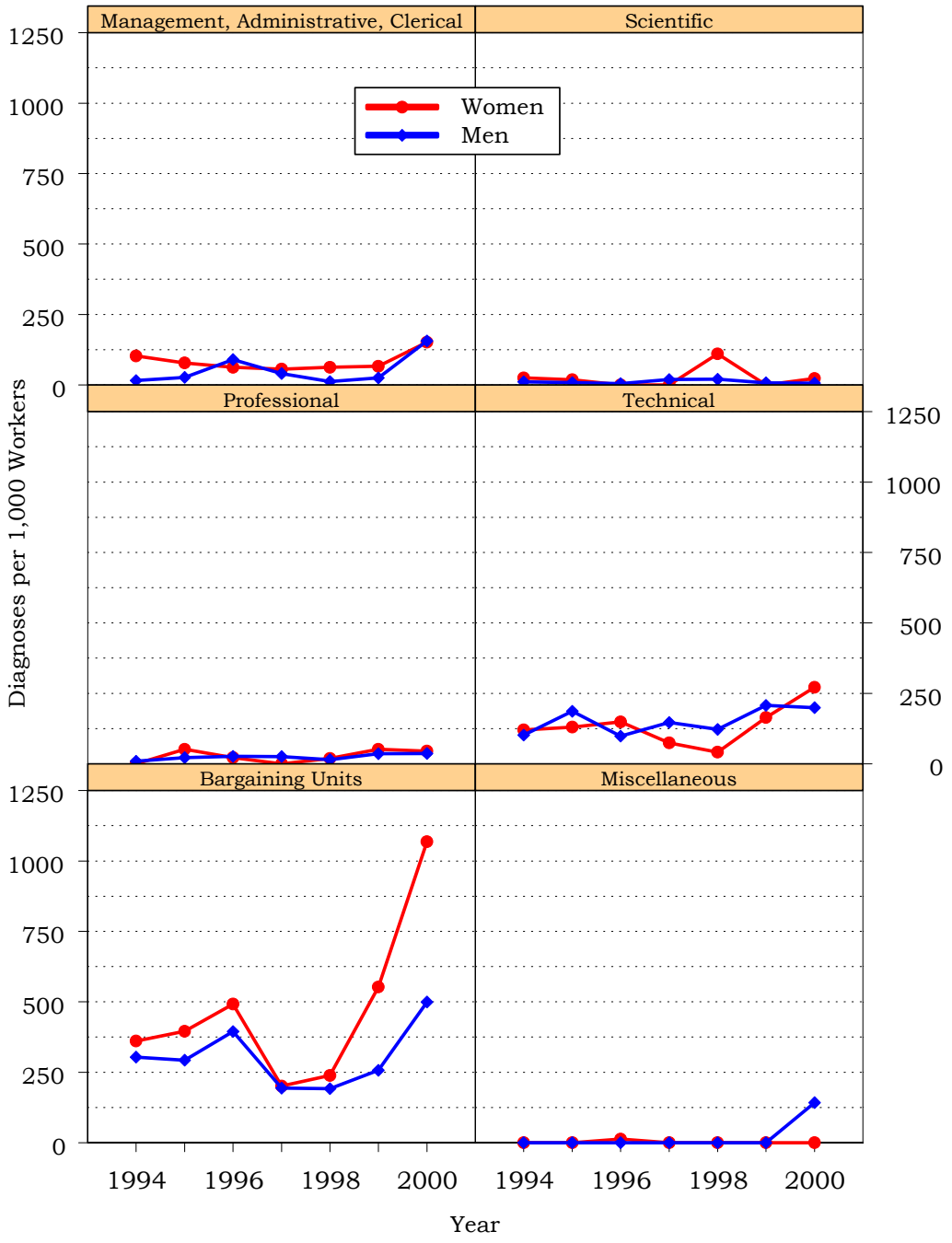


Figure 12. Age-Adjusted Rates for All Diagnoses Combined Among Women and Men by Job Category from 1994 to 2000



Sentinel Health Events for Occupations

A sentinel health event for occupations (SHEO) is a disease, disability, or death that 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 disease 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 smoking. Carpal tunnel syndrome may result from a job requiring typing or from a hobby such as playing the piano.

No definite sentinel health events were reported at BNL in 2000. Six of 683 diagnoses (1 percent) were identified as possible sentinel health events (Figure 13). The possible sentinel health events were identified as 4 diagnoses of carpal tunnel syndrome and 2 skin conditions. The carpal tunnel diagnoses were reported by Bargaining Units workers, one male aged 30-39 and two females, one aged 16-29 and one aged 40-49 years old. These four carpal tunnel events were responsible for a total of 52 days absent.

Figure 13. Characteristics of SHEOs by Gender

	Total Number of SHEO Diagnoses		Total Number of Days Absent	
	Men	Women	Men	Women
Definite	0	0	0	0
Possible	2	4	24	50
Total	2	4	24	50

Disabilities Among Active Workers

At Brookhaven, a worker is placed on long-term disability when absent 6 months. Thirteen workers (9 men and 4 women) were on long-term disability in 2000. The reasons for the disabilities were three disorders of the muscles and skeleton, two cancers, two nervous system conditions, two psychological conditions, two heart/circulatory conditions, and one each for diabetes and Lyme's disease. Twelve of the 13 workers (3 women and 9 men) were aged 50 years or older. The remaining worker was a woman in the 30-39 age group. Bargaining Units workers, comprising about 17 percent of the BNL work force, experienced almost 31 percent (4/13) of the disabilities.

Deaths Among Active Workers

Three deaths occurred among Brookhaven workers in 2000: 1 woman died from lung cancer, and 2 men died from a heart/circulatory condition and a gunshot wound to the chest.

OSHA-Recordable Events

The Occupational Safety and Health Administration (OSHA) requires employers to maintain a record of occupational injuries and illnesses occurring 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 rates of OSHA events by gender and age are shown in Figure 14. Fifteen women and 48 men had at least one OSHA-recordable event. The rate of OSHA-recordable events was the same for women and men (2 percent) and did not vary significantly by age group. Women aged 40 to 49 and men in the 50+ age group had the highest rates of OSHA-recordable events. Men in the 16-29 age group reported no OSHA-recordable events; females in that age group reported only one OSHA-recordable event.

The rates of OSHA-recordable events by job category and gender are shown in Figure 15. Among women, the Bargaining Units workers had the highest rate of OSHA-recordable events. Women in the Technical Support/

Figure 14. OSHA-Recordable Events by Gender and Age

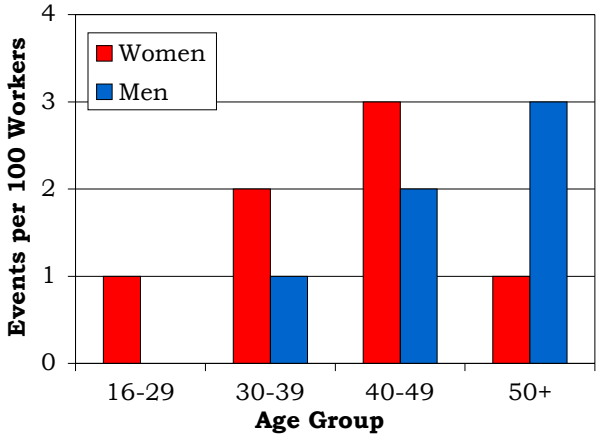
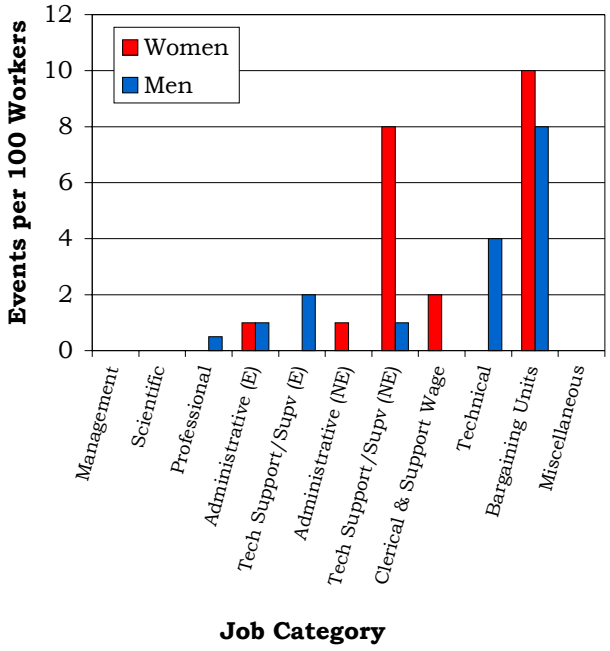


Figure 15. OSHA-Recordable Events by Job Category and Gender



Supervisory (NE) group also had a noticeably higher rate than did women in other job categories.

Men in the Bargaining Units job category had higher rates than did other men, but there was no consistent relationship between OSHA-recordable rates and gender across the various job categories.

Workers in the Management, Scientific, and Miscellaneous job categories did not report any OSHA-recordable events.

Women had a total of 232 lost or restricted workdays, and 414 lost or restricted workdays were recorded for men. Women averaged 15 lost or restricted workdays compared with 8 lost or restricted workdays for men. The highest average number of lost/ restricted workdays among women was in the 40-49 age group and among men aged 30 to 39.

Men in the Technical job category had the highest average number of lost or restricted workdays (19 days). Women in the Bargaining Units group had the highest average number of lost or restricted workdays (23 days).

We saw no consistent relationship between gender and average number of lost or restricted workdays across job categories.

Diagnostic and Accident Categories for OSHA-Recordable Events

The 65 OSHA events recorded on the OSHA 200 Logs included 24 diagnoses among women and 66 diagnoses among men (Figure 16). Among women, injuries accounted for 75 percent (18/24) of the diagnoses reported. The most common type of OSHA-recordable injury women reported was sprains and strains (50 percent). Among men, injuries accounted for 83 percent (55/66) of the diagnoses reported, primarily due to open wounds (31 percent) and sprains and strains (29 percent).

Figure 16. OSHA-Recordable Diagnoses by Diagnostic Category and Gender

Diagnostic Category	Gender	
	Women	Men
Genitourinary	0	1
Muscles & Skeleton	3	6
Nervous System	2	1
Respiratory	1	0
Skin	0	1
Unspecified Symptoms	0	2
Injury	18	55
Fractures – Neck, Trunk	0	3
Fractures – Upper Limb	0	1
Dislocations	0	1
Back Sprains & Strains	7	7
Other Sprains & Strains	2	9
Intracranial Injuries	0	1
Open Wounds – Head, Neck, Trunk	0	6
Open Wounds – Upper Limb	1	10
Open Wounds – Lower Limb	0	1
Superficial Injuries	0	5
Bruises	6	7
Foreign Bodies Entering Orifice	1	1
Burns	0	1
Unspecified Injuries	0	2
Adverse Reactions to Non-Medical Substances	1	0

Ninety-four percent (61) of the 65 OSHA events were described as an accident in the OSHA logs; this distribution is shown in Figure 17. The majority of events were described as "other accidents," 57 percent (8/14) among women and 74 percent (35/47) among men. Overexertion and strenuous movements made up the majority of that category for both women and men. Ten accidents involved cutting or piercing instruments or objects; 9 of the 10 accidents occurred among men. Eight accidents involved being struck by an object; all but one of these occurred among men.

Figure 17. OSHA-Recordable Accidents by Type and Gender

Accident Category	Gender	
	Women	Men
	Number of Accidents	Number of Accidents
Motor Vehicle Traffic	1	0
Non-Motor Vehicle	0	1
Poisoning – Non-Medicinal	1	0
Falls	3	9
Submersion/Suffocation/Foreign Bodies	1	1
Drug Reaction	0	1
Other Accidents	8	35
Struck by an Object	1	7
Caught Between Objects	0	3
Cutting/Piercing Instrument/Object	1	9
Hot, Corrosive, or Caustic Material/Steam	0	1
Overexertion/Strenuous Movements	5	15
Repetitive Trauma	1	0
Total	14	47

Rates of OSHA-Recordable Events

The rates of all OSHA-recordable events by age and job categories and gender are shown in Figures 18 and 19. Among men, OSHA-recordable rates were highest for Bargaining Units workers and among women were highest for Bargaining Units and Technical workers. Rates tended to be somewhat higher among women 50+ years of age than among women under age 50. Most of the OSHA health conditions involved injuries. When the rates for OSHA-recordable injuries were considered separately, Bargaining Units workers had the highest rates among men. Technical workers had the highest injury rates among women.

Bargaining Units workers were 17 percent of the work force but accounted for 68 percent of the OSHA-recordable events. They had 91 percent of the days restricted and 83 percent of the days lost from work. Bargaining Units workers were 10 times more likely to have an OSHA-recordable event than other groups of workers. Their risk of injury was 10 times greater than other workers. Back sprains and strains were 21 times more likely among Bargaining Units workers; they were also at higher risk for sprains and strains to areas other than the back (19 times) and open wounds to the upper limb (11 times).

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

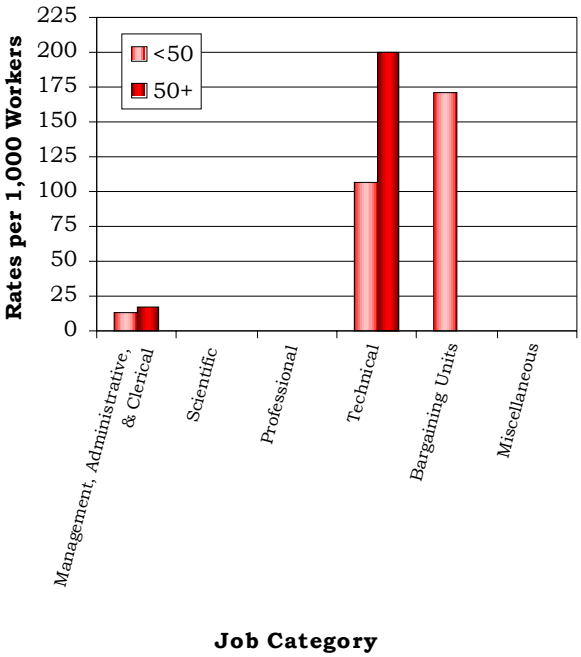
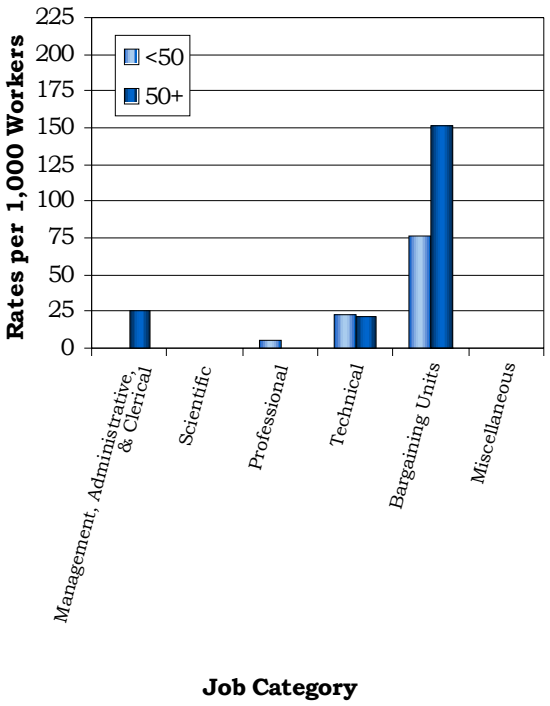


Figure 19. OSHA-Recordable Rates by Age and Job Categories Among Men, All Diagnoses Combined



Time Trends for OSHA-Recordable Events

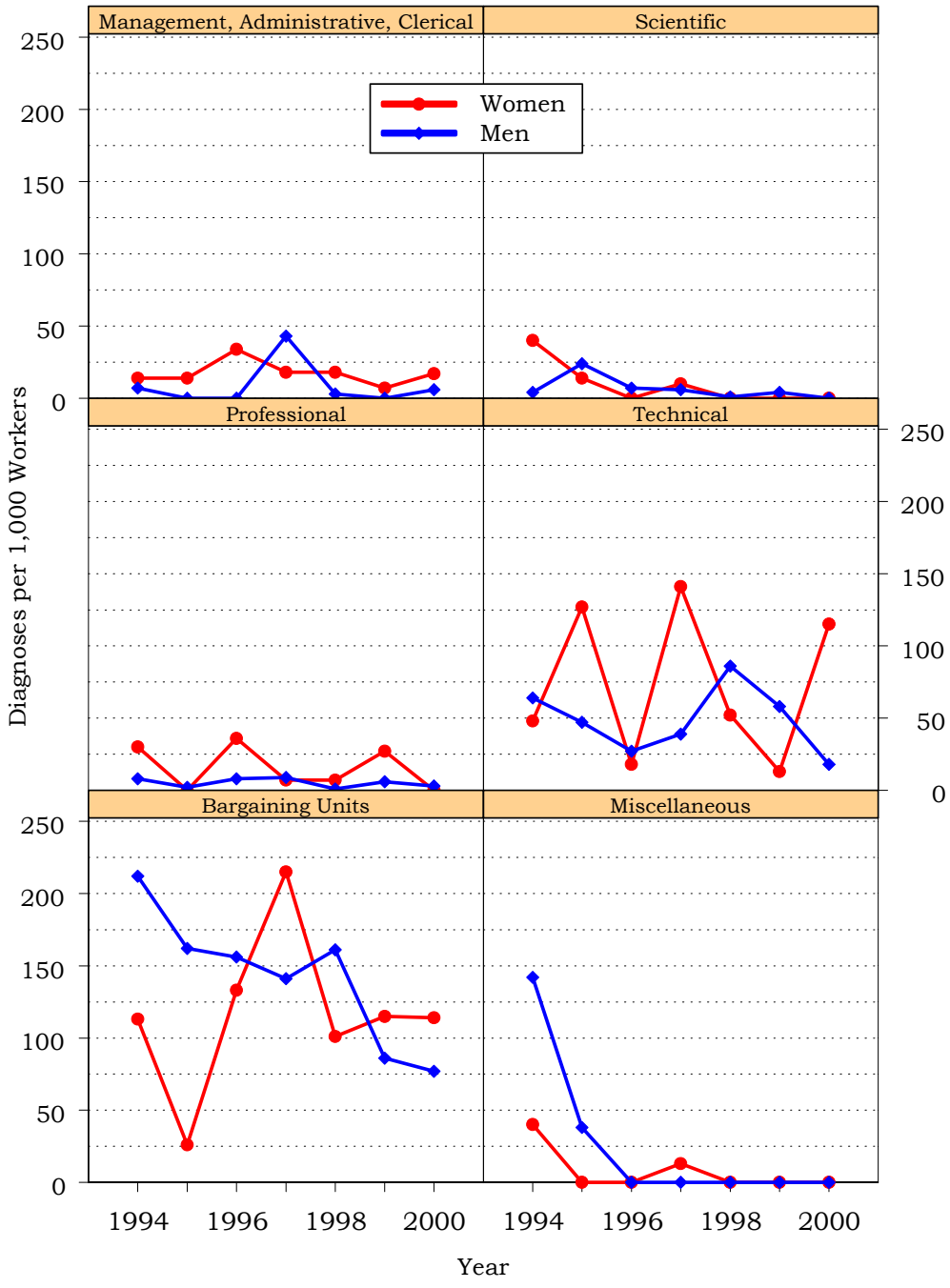
The age-adjusted OSHA-recordable rates from 1994 to 2000 are shown in Figure 20. We found no consistent trends for women in most job categories. Although the OSHA-recordable rate among women in the Bargaining Units job category varied between 1994 and 2000, the rate for 2000 was almost the same as it was in 1994. Except for a small increase in 1996, the rates for the Management, Administrative, and Clerical group remained reasonably stable until a substantial decline in 1999 that did not continue in 2000. Rates among women in the Professional and Technical job categories were erratic throughout the 7-year period.

Among men, the rate of OSHA-recordable diagnoses declined among Bargaining Units workers over the 7-year period, although not consistently; an increase was observed in 1998. Male Technical workers experienced a decline in rates from 1994 to 1996, then an increase the following 2 years before declining again in 1999 and 2000. There was little change in other job categories over the 7-year period, with the exception of a decline in the rate from 1994 to 1996 among men in the Miscellaneous job category. No OSHA-recordable diagnoses have been reported for men in this job category since 1996.

There were no statistically significant changes in injury rates for women during this 7-year period; however, there was a significant decrease in injury rates for men over the same time period.

BNL employees experienced an overall 23 percent decrease in the number of OSHA events reported from 1999 to 2000. This decrease appears mainly in the number of events reported by men in the Technical Support/Supervisory (NE) and Technical job categories.

Figure 20. Age-Adjusted Rates for All OSHA-Recordable Diagnoses Combined Among Women and Men by Job Category from 1994 to 2000



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 that 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 1 person followed for 1 year. For example, 5 people followed for 1 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 Conditions	740-759
Genitourinary	580-629
Heart / Circulatory	390-459
Infections / 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 non-arthropod 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, and 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 circulatory system 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 the 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 disk ("slipped disk"), 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 disk; 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