

2001

Brookhaven National Laboratory Annual Epidemiologic Surveillance Report



Brookhaven National Laboratory 2001 Epidemiologic Surveillance Report

Questions or comments about this report or the Epidemiologic Surveillance Program may be directed to:

Dr. Cliff Strader at **cliff.strader@eh.doe.gov**
or Dr. Bonnie Richter at **bonnie.richter@eh.doe.gov**
United States Department of Energy
Office of Occupational Health
270CC/EH-53/Germantown Building
1000 Independence Avenue, SW
Washington, DC 20585-1290

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

www.eh.doe.gov/health/epi/surv

ACKNOWLEDGEMENT

LifeART images copyright 2000 Lippincott Williams & Wilkins. All rights reserved.

Brookhaven National Laboratory 2001

At A Glance

Prior to the 2000 report, epidemiologic surveillance at BNL examined illness and injury absences of 5 or more consecutive workdays. As indicated in DOE Order 440.1, 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, were excluded from these analyses. Beginning with the 2000 Epidemiologic Surveillance Report, BNL chose to include absences of shorter duration. This decision has impacted many of the rates, proportions, and trends presented in the Epidemiologic Surveillance reports beginning with 2000. The reader is cautioned to take this into account when interpreting the data presented in this report. Rates of OSHA-recordable events, reportable regardless of whether or not an absence is involved, in general, have not been affected by the change in reporting.

Illness and Injury

The dramatic increase in the overall rate of illness and injury noted among both men and women in the Bargaining Units job category in 1999 and 2000 continued into 2001.

Bargaining Units workers had the highest rate of respiratory diagnoses compared with other job categories. Sixty-five percent (74/113) of the respiratory diagnoses were among Bargaining Units workers, who made up 16 percent of the work force. Workers in this group were 9 times more likely to report a respiratory diagnosis than were other workers, a trend observed since 1995.

Among absences lasting fewer than 5 days, diagnoses affecting muscles and skeleton, unspecified conditions, and injuries were the most frequently reported.

Among the more frequently reported conditions, no specific diagnosis appeared linked to a particular job category.

Sentinel Health Events

A sentinel health event for occupations (SHEO) is a disease, disability, or death that is likely to be occupationally related. Thirty-four definite sentinel health events were reported at BNL in 2001. Diagnoses included among these events were muscles and skeleton disorders (joint disorders, back conditions) and numerous injuries (fractures, dislocations, bruises, burns, and various sprains and strains). Nine of 750 diagnoses (1 percent) were identified as possible sentinel health events. The possible sentinel health events were identified as 8 diagnoses of carpal tunnel syndrome and 1 lung cancer.

OSHA

We saw no consistent relationship between OSHA-recordable rates and gender across the various job categories. Among women, the Bargaining Units workers had the highest rate of OSHA-recordable events. Women in the Management job category also had a noticeably higher rate than did women in other job categories. Men in the Technical Support/Supervisory (NE) job category had higher rates than did men in other job categories.

Injuries accounted for 61 percent (14/23) of the OSHA-recordable diagnoses reported among women. The most common type of work-related injury women reported was sprains and strains (36 percent). Among men, injuries accounted for 69 percent of the 83 diagnoses reported, primarily due to sprains and strains (37 percent) and open wounds (37 percent).

When the rates for OSHA-recordable injuries were considered separately, Bargaining Units workers had the highest rates among men. Scientific workers had the highest injury rates among women. Bargaining Units workers were 16 percent of the work force but accounted for 55 percent of the OSHA-recordable events. They had 86 percent of the days restricted and 39 percent of the days lost from work.

Introduction	1	Most Frequently Reported Diagnoses by Job Category and Gender	10
Site Overview	2		
The Brookhaven Work Force – 2001	3	Rates of Disease Occurrence	10
The Work Force by Gender and Age	3	Rates for All Illnesses and Injuries Combined by Job Category, Gender, and Age.....	11
The Work Force by Job Category and Gender.....	3	Rates for Selected Diagnostic Categories by Job Category, Gender, and Age.....	12
Number and Length of Absences	4	Time Trends	14
Absence Rate by Gender and Age	5	Age-Adjusted Rates for All Diagnoses Combined Among Women and Men from 1994 to 2001	15
Number of Days Absent by Gender and Age	6	Age-Adjusted Rates for Selected Diagnostic Categories Among Women and Men from 1994 to 2001	16
Absence Rate by Job Category and Gender	6	Age-Adjusted Rates for All Diagnoses Combined Among Women and Men by Job Category from 1994 to 2001.....	17
Average Duration of Absence by Job Category and Gender	7		
Diagnostic Categories	7	Sentinel Health Events for Occupations	18
Number of Diagnoses and Lost Calendar Days by Diagnostic Category (Categorized by ICD-9-CM) Among Women.....	8	Characteristics of SHEOs by Gender	18
Number of Diagnoses and Lost Calendar Days by Diagnostic Category (Categorized by ICD-9-CM) Among Men.....	8	Disabilities Among Active Workers	18

Deaths Among Active Workers 18

OSHA-Recordable Events..... 19

OSHA-Recordable Events by Gender and Age 19

OSHA-Recordable Events by Job Category and Gender 19

Diagnostic and Accident Categories for OSHA-Recordable Events 20

OSHA-Recordable Diagnoses by Diagnostic Category and Gender 20

OSHA-Recordable Accidents by Type and Gender 21

Rates of OSHA-Recordable Events 21

OSHA-Recordable Rates by Age and Job Categories Among Women, All Diagnoses Combined..... 22

OSHA-Recordable Rates by Age and Job Categories Among Men, All Diagnoses Combined..... 22

Time Trends for OSHA-Recordable Events 22

Age-Adjusted Rates for All OSHA-Recordable Diagnoses Combined Among Women and Men by Job Category from 1994 to 2001..... 23

Glossary 24

Explanation of Diagnostic Categories 25

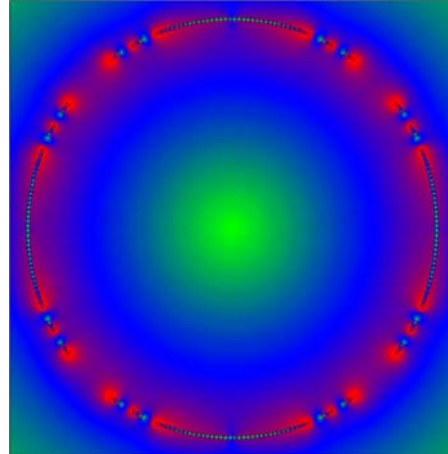
ICD-9-CM Codes 26

Introduction

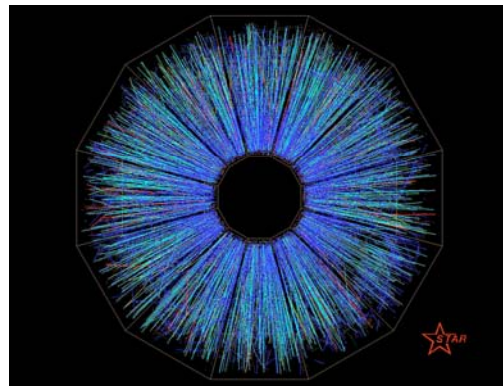
The U.S. Department of Energy's (DOE) commitment to assuring the health and safety of its workers includes the conduct of epidemiologic surveillance activities that provide an early warning system to detect health problems among workers. The Epidemiologic Surveillance Program monitors illnesses and health conditions that result in an absence, 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, 2001 through December 31, 2001. The data were collected by a coordinator at BNL 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 Occupational Health. Epidemiologic surveillance has been ongoing at BNL 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 Occupational Health's Web site (www.eh.doe.gov/health/epi/surv) 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 2001.



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 9 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 that was completed in 1999, became operational in 2000 and was brought to full collision energy in 2001. 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 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.

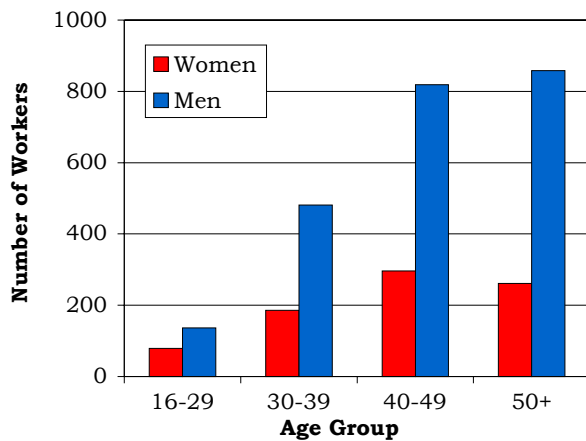
In 1998, Brookhaven Science Associates (BSA) became the new managing contractor of BNL. BSA is a partnership led by the State University of New York at Stony Brook and Battelle Memorial Institute, a nonprofit applied science and technology organization.



The Brookhaven Work Force – 2001

A total of 3,116 BNL employees were included in epidemiologic surveillance in 2001, 138 fewer workers than were present in 2000. The age and gender distribution of the 2001 work force is shown in Figure 1. The majority (72 percent) of the work force was over 39 years of age.

Figure 1. The Work Force by Gender and Age



There were 822 (26 percent) women and 2,294 (74 percent) men in the BNL work force. The average age of women



in the work force was 44 years and 46 years for men. The majority of the workers was White (81 percent). Asians made up 8 percent of the work force, African Americans made up 7 percent, and the remaining 4 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 BNL were grouped together into 11 job categories. The grouping was done 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. However, most of the workers were employed in 4 of the 11 job categories. Eighty-eight percent of the men were employed in the Scientific, Technical Support/Supervisory (E), Bargaining Units, and Professional job categories. Seventy-eight percent of the women were Administrative (E), Scientific, Bargaining Units, and Professional workers.

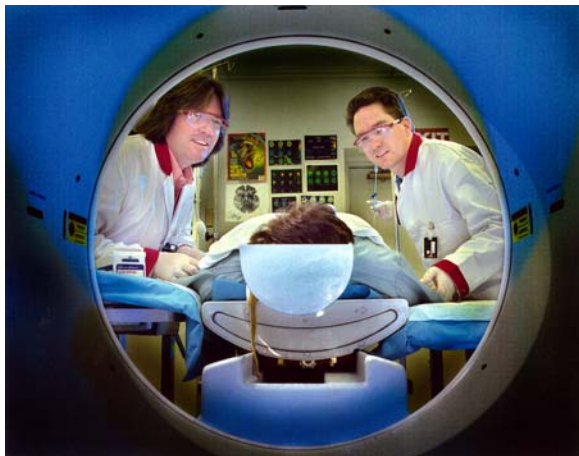
Figure 2. The Work Force by Job Category and Gender

Job Category	Women	Men
Management	34 4%	119 5%
Scientific	134 16%	661 29%
Professional	75 9%	382 17%
Administrative (E)	353 43%	74 3%
Tech Support/Supv (E)	28 3%	561 24%
Administrative (NE)	1 <1%	0 0%
Tech Support/Supv (NE)	1 <1%	3 <1%
Clerical & Support Wage	40 5%	6 <1%
Technical	5 1%	33 2%
Bargaining Units	85 10%	423 18%
Miscellaneous	66 8%	32 1%

Number and Length of Absences

A Note to the Reader:

Prior to the 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, which 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, were excluded from these analyses until report year 2000. Beginning with the 2000 Epidemiologic Surveillance Report, BNL chose to include absences of shorter duration. This decision has impacted many of the rates, proportions, and trends presented in

the Epidemiologic Surveillance reports beginning with 2000. Some of the rates showed an 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, in general have not been affected by the 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 of workdays. In this report, 1 woman with a reported absence due to maternity leave and 3 men 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.

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 continuous increases beginning in 1999. In 1996, 305 absences were reported, which decreased to 224 in 1997 and then increased beginning in 1998 to 229, in 1999 to 279, in 2000 to 439, and in 2001 to 469. The 68 percent increase in the number of absences from 1999 to 2001 is, in part, due to the inclusion of absences that lasted fewer than 5 days starting in 2000. Absences lasting fewer than 5 days included in the report numbered 125 in 2000 and 136 in 2001; none were included in 1999. The increase in the number of absences through 2001 can still be observed when absences of less than 5 days are excluded.

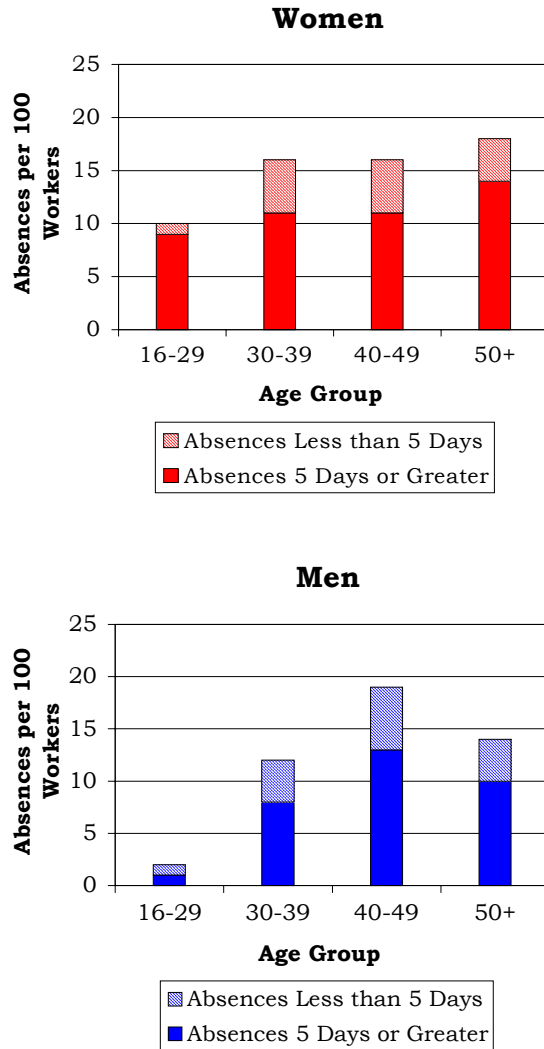


Eighty-seven women reported 131 absences; 236 men reported 338 absences. Four percent of women (30/822) and 2 percent of men (52/2,294) reported 2 or more absences. The average absence rate was almost the same for both males and females: 15 per 100 workers for men and 16 per 100 workers for women. Including absences of less than 5 days increased the absence rate 50 percent among men (from 10 absences per 100 workers for absences 5 days or greater) and 33 percent among women (from 12 absences per 100 workers for absences 5 days or greater). The greatest effect was seen among workers aged 30-49, for whom approximately 30 percent of all absences were less than 5 days.

The rate of absences due to injury or illness varied by gender and age (Figure 3). The absence rate increased with age among women. For men, the absence rate increased with age up to age 50.



Figure 3. Absence Rate by Gender and Age



The average length of absence of 25 days for women was 56 percent higher than the 16-day average for men (Figure 4). Compared with 2000, the average length of absence increased only slightly for men (14 days in 2000), but for women, the average length increased 56 percent (16 days in 2000). This increase among women was partially the result of 2 absences lasting 349 and 404 days. The 2001 average for women is comparable with their 1999 average length of absence of 24 days. The average duration of absence was not related to age among men or women.

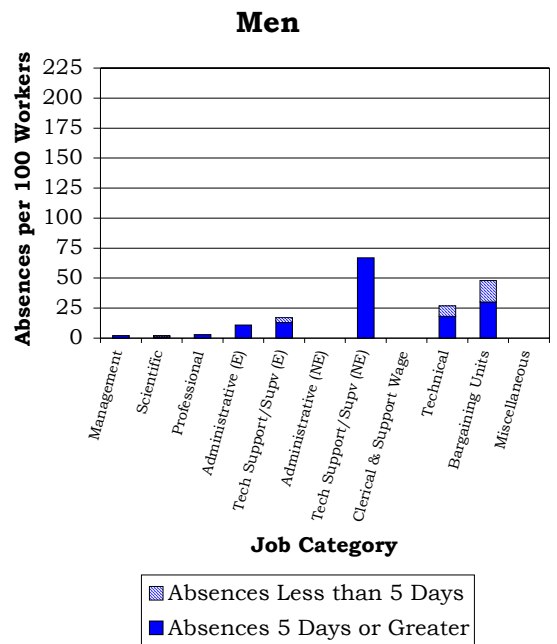
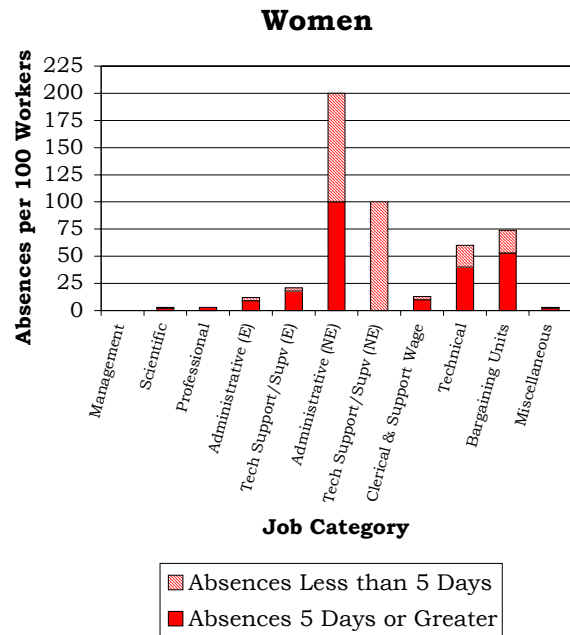
Figure 4. Number of Days Absent by Gender and Age

Gender	Age	Number of Absences		Number of Days Absent	
		< 5 Days	≥ 5 Days	Total	Average
Women	16-29	1	7	280	35
	30-39	10	20	638	21
	40-49	14	33	1,185	25
	50+	10	36	1,136	25
	Total	35	96	3,239	25
Men	16-29	1	2	34	11
	30-39	20	38	830	14
	40-49	47	110	2,079	13
	50+	33	87	2,492	21
	Total	101	237	5,435	16

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. The highest absence rates among women and men reflect the small number of workers in those job categories. In 2001, the highest absence rate among women was in the Administrative (NE) and Technical Support/Supervisory (NE) job categories that each had only 1 worker, and each of those workers had at least 1 health event. Among men, the Technical Support/Supervisory (NE) workers had the highest absence rate: 67 per 100 men, with 2 health events reported by 3 workers in this group.

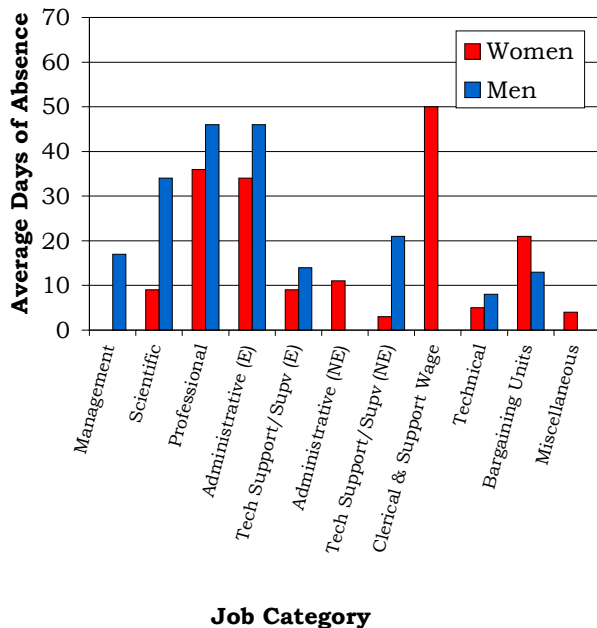
Absence rates among Technical and Bargaining Unit workers were affected most by including absences less than 5 days; the rate increased at least 40 percent among men and women in these job categories.

Figure 5. Absence Rate by Job Category and Gender



Both male and female Bargaining Units workers had high absence rates: 74 per 100 women and 48 per 100 men. Sixty-three health events were reported among 85 female workers and 202 events among 423 male workers in the Bargaining Units job category. The higher rates among 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. Women in the Management group and men in the Clerical and Support Wage and Miscellaneous groups did not report any absences in 2001.

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



Men tended to have longer average absence duration than did women within a job category (Figure 6). Among men, Professional and Administrative (E) workers had the longest average duration of absence (46 days). Among women, the Clerical and Support Wage group had the longest average absence (50 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.

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 1 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 Disease, 9th Revision, Clinical Modification* (ICD-9-CM). This reference is used to classify health events for statistical purposes. The Explanation of Diagnostic Categories details specific health conditions.

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 226 diagnoses reported by women and 524 diagnoses reported by men in 2001. Twenty-seven percent (143) of diagnoses among men and 24 percent (55) of diagnoses among women were associated with absences less than 5 days. The large increase in the percentage of diagnoses reported from 1999 to 2000 by women (79 percent) and by men (48 percent) did not continue into 2001 for men. The number of reported diagnoses increased 20 percent for women and 6 percent for men from 2000 to 2001. The most frequently reported diagnoses have varied little by gender since 1995.

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

Diagnostic Category	Women		
	Number of Diagnoses		Number of Lost Calendar Days
	<5 Days	≥ 5 Days	
Benign Growths	0	5	268
Blood	0	0	0
Cancer	0	3	408
Digestive	1	17	342
Endocrine/ Metabolic	1	2	39
Existing Birth Condition	0	1	104
Genitourinary	0	11	239
Heart/ Circulatory	1	7	621
Infections/ Parasites	3	7	55
Injury	7	15	675
Miscarriage	0	0	0
Muscles & Skeleton	12	38	657
Nervous System	0	11	644
Psychological	2	3	170
Respiratory	5	31	171
Skin	1	3	65
Unspecified Symptoms	22	17	817

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

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

Diagnostic Category	Men		
	Number of Diagnoses		Number of Lost Calendar Days
	<5 Days	≥ 5 Days	
Benign Growths	0	2	87
Blood	0	1	18
Cancer	3	4	182
Digestive	5	31	435
Endocrine/ Metabolic	2	6	111
Existing Birth Condition	0	2	13
Genitourinary	3	15	216
Heart/ Circulatory	5	39	754
Infections/ Parasites	3	10	154
Injury	19	53	1,253
Miscarriage	NA	NA	NA
Muscles & Skeleton	46	81	1,945
Nervous System	8	11	276
Psychological	4	17	153
Respiratory	13	64	491
Skin	1	6	88
Unspecified Symptoms	31	39	615

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 3,239 calendar days due to injury and illness, a 67 percent increase from the 1,937 days reported in 2000. The additional 1,302 days absent in 2001 were due, in part, to 4 female workers absent for a total of 1,205 days; 2 women had injuries, 1 woman had a heart condition and a nerve disorder affecting balance, and 1 woman had breast cancer. In 2000, only 1 absence of extended length (547 days) was reported. Muscles and skeleton conditions (22 percent), unspecified symptoms (17 percent), and respiratory conditions (16 percent) accounted for 55 percent of all reported diagnoses among women. The muscles

and skeleton conditions were due to back pain and disk disorders (34 percent), joint disorders (30 percent), and rheumatism (28 percent). Unspecified symptoms were due to a wide variety of general disorders. The respiratory conditions were due to upper respiratory infections (44 percent), bronchitis and asthma (42 percent), and flu and pneumonia (14 percent). Among absences lasting less than 5 days, diagnoses of unspecified symptoms (40 percent), muscles and skeleton (22 percent), and injuries (13 percent) were the most frequently reported. Conditions for unspecified symptoms and the muscles and skeleton were similar to those among all absences regardless of length. The most frequently reported injuries among absences less than 5 days were sprains and strains.

Men lost 5,435 calendar days due to injury and illness, a 23 percent increase from 2000. Seven absences in excess of 100 days each contributed to the 1,012 additional days absent in 2001 compared with 2000, when only 2 absences of this length were reported. Among male workers, 66 percent of all reported diagnoses were due to muscles and skeleton conditions (24 percent), respiratory conditions (15 percent), injuries (14 percent), and unspecified symptoms (13 percent). Frequently reported muscles and skeleton conditions were back pain and disk disorders (54 percent), joint disorders (29 percent), and rheumatism (15 percent). Upper respiratory infections accounted for 58 percent of the respiratory conditions, followed by bronchitis (25 percent) and pneumonia and flu (16 percent). A closer look at diagnoses for injuries showed that 51 percent were sprains and strains, 11 percent were fractures, and 8 percent each were for dislocations and open wounds. Three diagnoses for complications of medical care and 2 drug reactions were reported among the 72 injury diagnoses. The number of injury diagnoses (72) remained almost unchanged from the 73

diagnoses in 2000, after increasing from 42 in 1998 to 60 in 1999. Among absences lasting less than 5 days, diagnoses of muscles and skeleton (32 percent), unspecified symptoms (22 percent), and injuries (13 percent) were the most frequently reported. As for women, the conditions for these 3 diagnostic categories were similar to those among all absences regardless of length.

Among women, the most frequently reported diagnoses varied somewhat by age. Muscles and skeleton conditions were frequently reported in all age groups; injuries, respiratory conditions, and unspecified symptoms were reported in 3 of the 4 age groups among women. Among men, injuries and muscles and skeleton conditions were frequently reported diagnoses in all age groups. Unspecified symptoms were common among workers in all age groups except workers aged 40-49.

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 BNL workers, many job categories reported few diagnoses. Among women, 7 of the job categories (Management, Scientific, Professional, Administrative (NE), Technical Support/Supervisory (NE), Technical, and Miscellaneous workers) reported 5 or fewer diagnoses in 2001. In the remaining 4 job categories, muscles and skeleton conditions were reported in all categories, and respiratory conditions, digestive disorders, and unspecified symptoms were common. Among men, 6 of the 11 job categories reported more than 5 diagnoses in 2001. Among these 6 job categories, heart/circulatory conditions and muscles and skeleton disorders were reported in 5 of the groups. 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	Muscles & Skeleton (3) Respiratory (1)	None
Scientific	Heart/Circulatory (8) Digestive (6) Muscles & Skeleton (3)	Infections/Parasites (2) Muscles & Skeleton (2) Benign Growth (1)
Professional	Muscles & Skeleton (8) Unspecified Symptoms (6) Digestive (2) Heart/Circulatory (2)	Injury (1) Nervous System (1) Unspecified Symptoms (1)
Administrative (E)	Unspecified Symptoms (5) Heart/Circulatory (4) Muscles & Skeleton (2)	Muscles & Skeleton (17) Respiratory (15) Digestive (14)
Tech Support/Supv (E)	Muscles & Skeleton (31) Injury (19) Heart/Circulatory (18)	Digestive (2) Muscles & Skeleton (2) Respiratory (2)
Administrative (NE)	None	Injury (2) Digestive (1)
Tech Support/Supv (NE)	Injury (1) Respiratory (1) Unspecified Symptoms (1)	Respiratory (1)
Clerical & Support Wage	*	Muscles & Skeleton (6) Injury (2) Nervous System (1) Skin (1) Unspecified Symptoms (1)
Technical	Unspecified Symptoms (5) Injury (2) Cancer (1) Digestive (1) Heart/Circulatory (1) Psychological (1) Respiratory (1)	Muscles & Skeleton (2) Respiratory (1)
Bargaining Units	Muscles & Skeleton (80) Respiratory (57) Injury (50)	Unspecified Symptoms (23) Muscles & Skeleton (18) Respiratory (17)
Miscellaneous	None	Muscles & Skeleton (3)

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

* There were no men in this job category in 2001.

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 72 and women reported 22 diagnoses involving injuries during 2001. Men therefore reported over 3 times as many injuries as women. As there were almost 3 times as many men as women at BNL, it seems reasonable to expect more injuries among men than among women. Does this mean that men were at greater risk of injuries compared with women in 2001? 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 injury rate for each gender. Rates are calculated by dividing the 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:

$$72 \text{ injury diagnoses} \div 2,294 \text{ men} = .031 \times 1,000 = 31 \text{ injury diagnoses per 1,000 men}$$

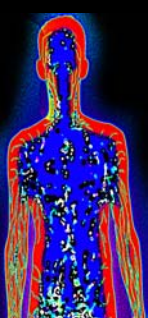
$$22 \text{ injury diagnoses} \div 822 \text{ women} = .027 \times 1,000 = 27 \text{ injury diagnoses per 1,000 women}$$

Comparing these rates now correctly suggests that the rates of reported diagnoses due to injury conditions were almost the same among women and 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 injury. 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, 1 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 4 age groups were collapsed into 2 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. The rates of all illnesses and injuries combined are presented in Figure 9. Four groups of diagnoses of particular interest to workers are presented in Figure 10: cancer, heart/circulatory system, respiratory system, and injury.

Figure 9. Rates for All Illnesses and Injuries Combined by Job Category, Gender, and Age

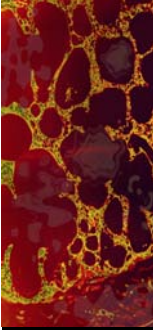
Diagnostic Category	Rate per 1,000			
	Job Category	Age	Men	Women
	Management, Administrative, & Clerical	<50	10	168
		50+	162	337
	Scientific	<50	5	29
		50+	71	69
	Professional	<50	47	18
		50+	65	100
	Technical	<50	249	200
		50+	255	1,000
	Bargaining Units	<50	757	1,182
		50+	728	1,211
	Miscellaneous	<50	0	63
		50+	0	0


The rates for all illnesses and injuries combined tended to be higher for BNL workers aged 50 or older compared with younger workers in most job categories. Women also tended to have higher rates than men in the same age and job categories. The highest illness and injury rates for all employees were among workers classified as Bargaining Units workers. This trend has been observed since 1997.


Cancer rates presented in this report are based on reported absences due to cancer. A worker may experience several periods of absence from 1 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.


Ten absences for cancer were reported by 7 males and 2 females. One woman reported 2 absences for cancer of the uterus, and the other woman reported 1 absence for breast cancer. Four men reported 4 diagnoses for prostate cancer, 2 men each reported colon cancer, and 1 man reported lung cancer. None of the workers reporting cancer in 2001 reported cancer in prior years. The likelihood that an individual in the U.S. develops cancer increases with age. Our data tends to reflect this observation for men and women. All but 1 of the cancer diagnoses were reported by workers over the age of 50. No particular occupational group reported an excessive number of cancer diagnoses.

Figure 10. Rates for Selected Diagnostic Categories by Job Category, Gender, and Age

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+	8	0
	Professional	<50	0	0
		50+	0	0
	Technical	<50	0	0
		50+	14	0
	Bargaining Units	<50	0	15
		50+	14	105
	Miscellaneous	<50	0	0
		50+	0	0

Diagnostic Category	Rate per 1,000			
Injury	Job Category	Age	Men	Women
	Management, Administrative, & Clerical	<50	0	23
		50+	0	12
	Scientific	<50	0	0
		50+	0	0
	Professional	<50	0	18
		50+	0	0
	Technical	<50	42	0
		50+	27	0
	Bargaining Units	<50	123	182
		50+	109	53
	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	15
		50+	40	6
	Scientific	<50	0	0
		50+	30	0
	Professional	<50	4	0
		50+	8	0
	Technical	<50	21	0
		50+	50	0
	Bargaining Units	<50	14	30
		50+	48	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	11
		50+	10	72
	Scientific	<50	0	0
		50+	4	0
	Professional	<50	4	0
		50+	0	0
	Technical	<50	29	40
		50+	27	333
	Bargaining Units	<50	167	197
		50+	75	211
	Miscellaneous	<50	0	0
		50+	0	0

Among women, only workers in the Administrative (E) and Bargaining Units job categories reported heart/circulatory problems. Six women reported 8 diagnoses; 4 of the women were under the age of 50. Five of the 8 diagnoses involved hypertension and ischemic heart disease (restricted blood flow through an artery). As in 2000, men in the Technical and Bargaining Units groups had the highest rates of heart/circulatory disorders in 2001. Older workers had higher rates than younger workers. Thirty-one of the 44 diagnoses among 27 men occurred in workers aged 50 or older, and 61 percent (19/31) of the diagnoses among these older workers involved hypertension or ischemic heart disease. Among the 10 men under the age of 50, 8 of the 13 diagnoses (62 percent) reported were for hypertension or ischemic heart disease. Workers in the Technical Support/Supervisory (E) group were almost 3 times more likely to report a heart/circulatory diagnosis compared with workers in other job categories.

Respiratory rates were higher among older workers compared to younger workers in the same job category for women. For men, the rates tended to be higher for younger men in the same job category. Among both women and men, Bargaining Units workers had the highest rate of respiratory diagnoses compared with other job categories. Sixty-five percent (74/113) of the respiratory diagnoses were among Bargaining Units workers, who made up 16 percent of the work force. Workers in this group were 9 times more likely to report a respiratory diagnosis than were other workers. This trend has been observed since 1995, when Bargaining Units workers were at 8 times greater risk of reporting a respiratory diagnosis. Technical Support/Supervisory (NE) workers were at 23 times the risk of a respiratory condition compared with workers in other job categories.

Injury rates were higher for workers under the age of 50 in job categories reporting an injury. Bargaining Units workers had the highest injury rates. Workers in a number of job categories were at an increased risk of an injury compared with other workers: 93 times for Administrative (NE), 13 times for Technical Support/Supervisory (NE), and 9 times for Bargaining Units. In addition, Bargaining Units workers were at least 8 times more likely to report a sprain or strain, and Technical Support/Supervisory (NE) workers were 46 times more likely to report a sprain or strain other than to the back as workers in other job categories. These risk rates are high in the Technical Support/Supervisory (NE) and Administrative (NE) groups because of the small number of workers in these job categories.

The risk of illness and injury among workers classified in 1 job category was compared with workers in the remaining job categories.

Administrative (NE) workers were at almost 11 times the risk, Technical Support/Supervisory (NE) workers over 7 times the risk, Technical workers over 2 times the risk, and Bargaining Units workers over 5 times the risk of all injuries and illnesses compared with all other groups. The increased risks have been seen in the Technical Support/Supervisory (NE) and Bargaining Units groups since 1998 and in the Technical group since 1999. Administrative (NE) workers were 62 times more likely to report a digestive disorder. The risk of reporting an unspecified symptom was about 9 times more likely among Technical Support/Supervisory (NE) workers compared with workers in other job categories.



Technical workers were 13 times more likely and Bargaining Units workers 10 times more likely to report a psychological disorder. Bargaining Units workers were also at increased risk of reporting other conditions compared with workers in other job categories: over 11 times the risk of an infection or genitourinary condition and 6 times the risk of muscles and skeleton disorders and unspecified symptoms. 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 1 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 diagnoses combined and selected illness and injury categories are presented in Figures 11 and 12. 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 increase in age-adjusted rates for all illness and injury categories combined that have been observed since 1999 continued in 2001. Muscles and skeleton conditions and digestive diagnoses contributed to the increase in the rate.

Age-adjusted rates for selected diagnostic categories are presented in Figure 12. The increase in chronic respiratory diseases among women was due to an increase in bronchitis (not specified as acute or chronic). 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 all types of diagnoses contributed to the increased rate in muscles and skeleton conditions in 2001. The injury rate changed very little from 2000 to 2001 for men. The

increased injury rate for women was due to contusions and sprains and strains other than to the back.

The addition of absences of less than 5 days resulted in a noticeable increase in the rates of muscles and skeleton conditions among men and women. Little or no effect was seen for nervous conditions among women and chronic respiratory conditions among men. Among men, the rates of nervous system conditions and injuries increased with the addition of absences less than 5 days.

Age-specific rates for all illness and injuries combined are shown for the various job categories in Figure 13. The increases in the rates for women in the Management, Administrative, and Clerical group and the Technical group resulted from increases in a number of diagnostic categories. The dramatic increase observed in 1999 and 2000 among both men and women in the Bargaining Units job category continued into 2001. The increase in the rate among female Bargaining Units workers was partially due to an increase in reported infectious diseases and injuries. The rate including absences less than 5 days was further increased due to unspecified symptoms. The increase in rates for male Bargaining Units workers was due to genitourinary illnesses, muscles and skeleton conditions, psychological disorders, and injuries. The increased genitourinary illnesses were related to urinary tract diagnoses. No particular disorder contributed to the increase in muscles and skeleton conditions, and an increase in anxiety and stress diagnoses contributed to the increase in psychological disorders. Unspecified symptoms further increased the rate that included absences of less than 5 days.

Figure 11. Age-Adjusted Rates for All Diagnoses Combined Among Women and Men from 1994 to 2001

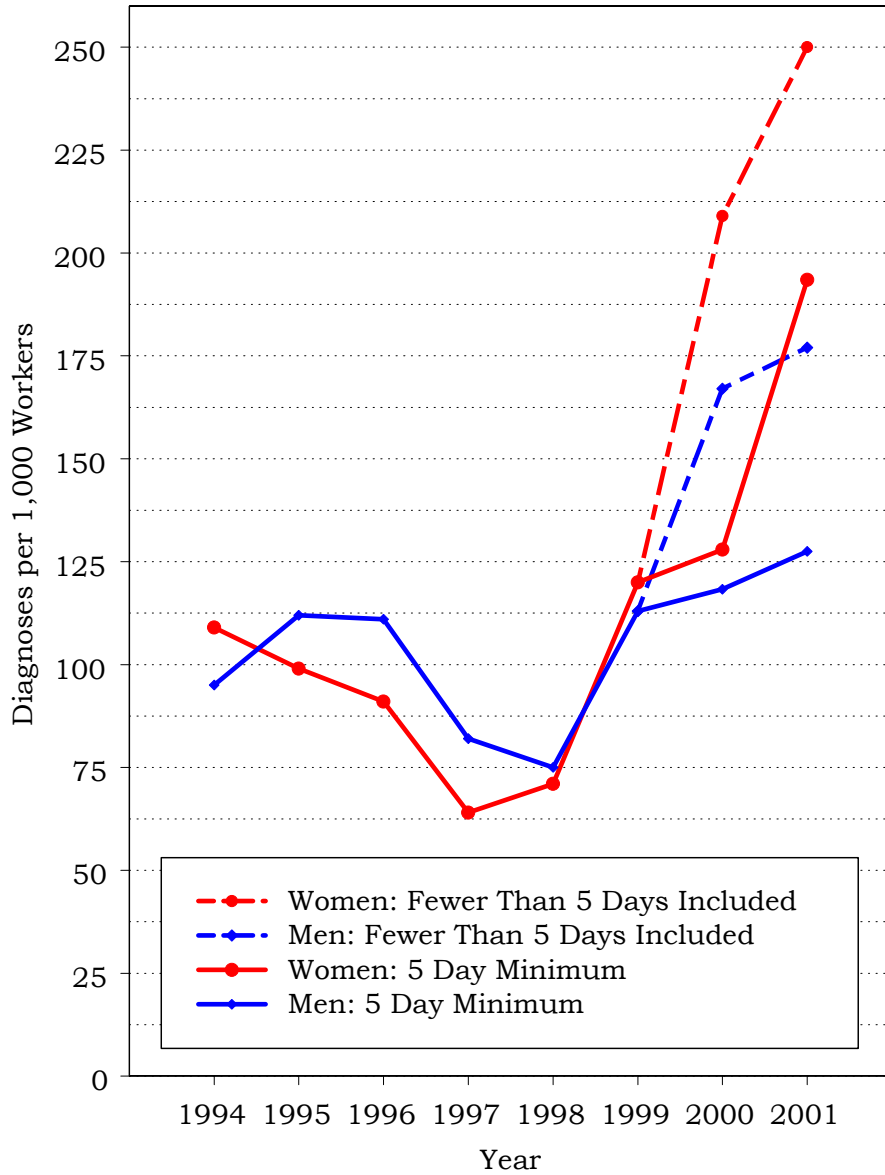


Figure 12. Age-Adjusted Rates for Selected Diagnostic Categories Among Women and Men from 1994 to 2001

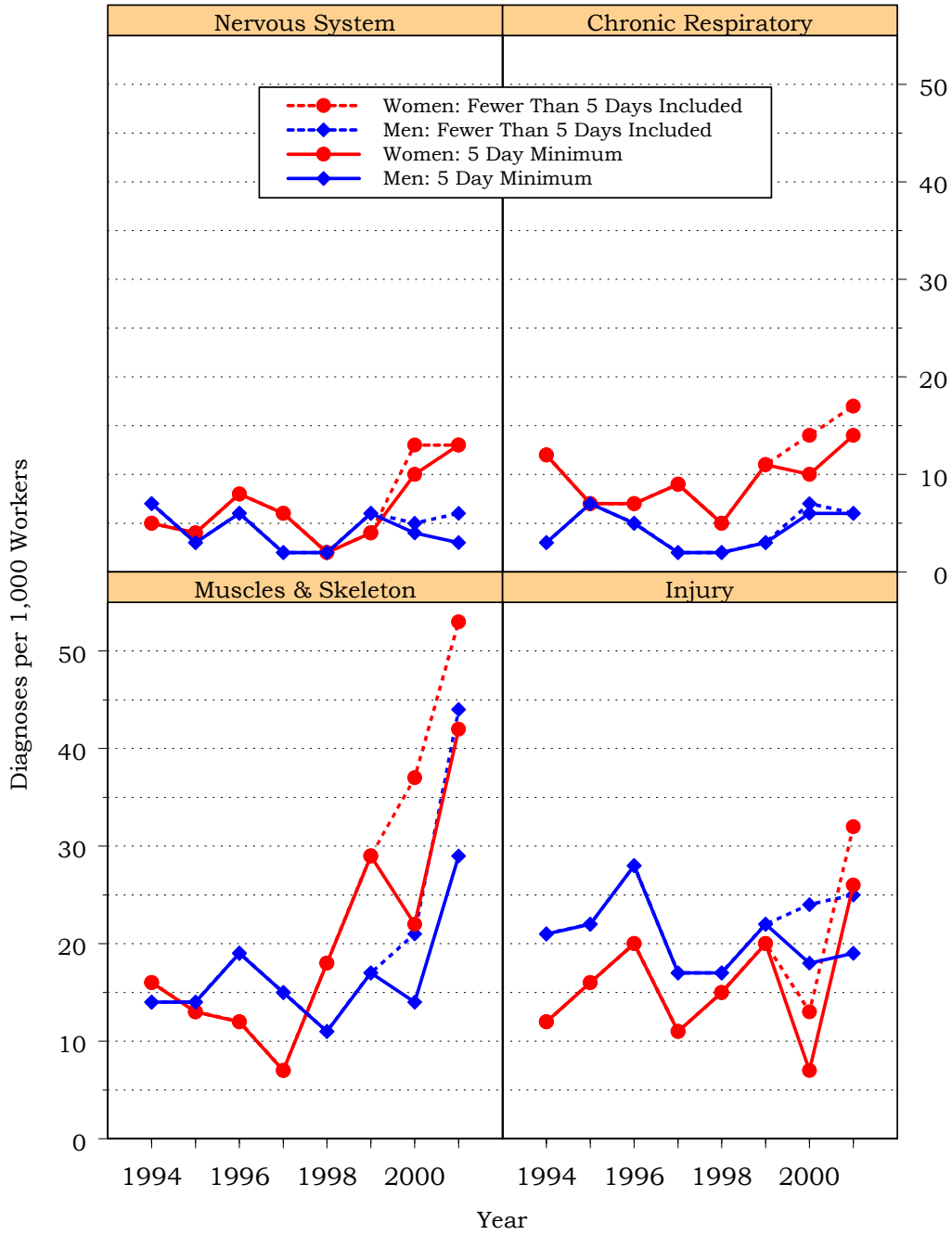
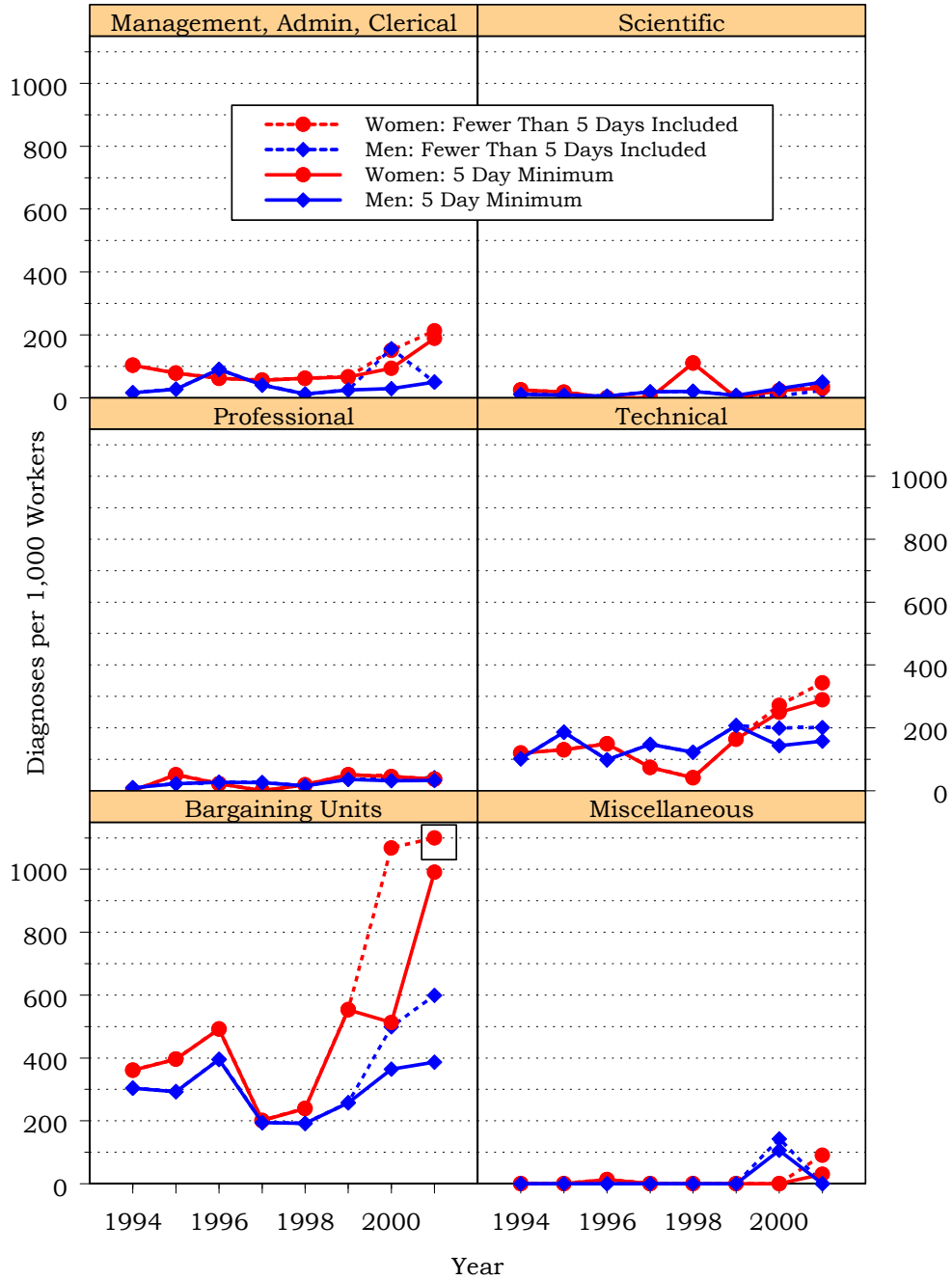


Figure 13. Age-Adjusted Rates for All Diagnoses Combined Among Women and Men by Job Category from 1994 to 2001



Note: The 2001 age-adjusted rate for women in the Bargaining Units job category was truncated to 1,100 (□) for graphical presentation. The actual rate was 1,350.

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 2 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.

Thirty-four definite sentinel health events, which resulted in 49 diagnoses, were reported at BNL in 2001 (Figure 14). Diagnoses included among these events were muscles and skeleton

disorders (joint disorders, back conditions, and rheumatism other than of the back), unspecified symptoms, and numerous injuries (fractures, dislocations, bruises, burns, and various sprains and strains).

Nine of 750 diagnoses (1 percent) were identified as possible sentinel health events (Figure 14). The possible sentinel health events were identified as 8 diagnoses of carpal tunnel syndrome and 1 lung cancer. The carpal tunnel diagnoses were reported by 2 male Bargaining Units workers (1 aged 40-49 and 1 aged 50 or older), 1 female Bargaining Units worker (aged 16-29), and 1 female Administrative (E) worker (aged 50 or older). These 8 carpal tunnel events were responsible for a total of 157 days absent.

Figure 14. Characteristics of SHEOs by Gender

	Total Number of SHEO Diagnoses		Total Number of Days Absent	
	Men	Women	Men	Women
Definite	30	19	238	114
Possible	6	3	63	107
Total	36	22	301	221

Disabilities Among Active Workers

At BNL, a worker is placed on long-term disability when he or she is absent 6 months. Two male workers, both over 49 years of age, were placed on long-term disability in 2001. The disabilities were due to 1 diagnosis of cancer of the appendix and 1 psychological disorder.

Deaths Among Active Workers

There were 5 deaths among BNL workers in 2001. The deaths were reported among 5 different job categories and were due to 3 heart conditions, 1 cancer diagnosis, and 1 hemorrhage condition.

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 2 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 15. Sixteen women and 67 men had at least 1 OSHA-recordable event. The rate of OSHA-recordable events was 3 percent for men and 2 percent for women. The rate tended to increase with age for men but did not vary significantly by age for women. Women in the 40-49 and 50 or older age groups shared the same rate of OSHA-recordable events, while men in the 40-49 age group had the highest rate of OSHA-recordable events. Men in the 16-29 age group reported no OSHA-recordable events; women in that age group reported only 1 event.



The rates of OSHA-recordable events by job category and gender are shown in Figure 16. Among women, the Bargaining Units workers had the highest rate of OSHA-recordable events.

Figure 15. OSHA-Recordable Events by Gender and Age

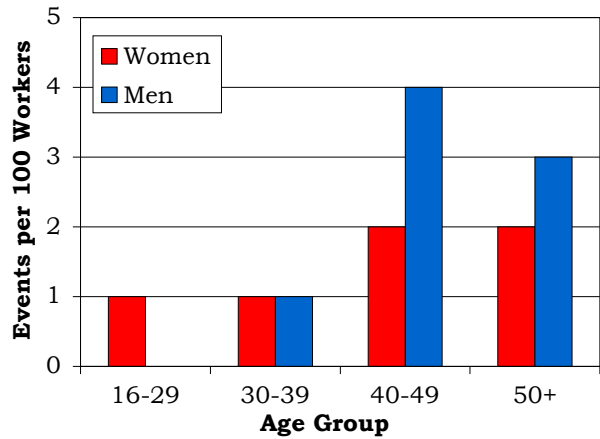
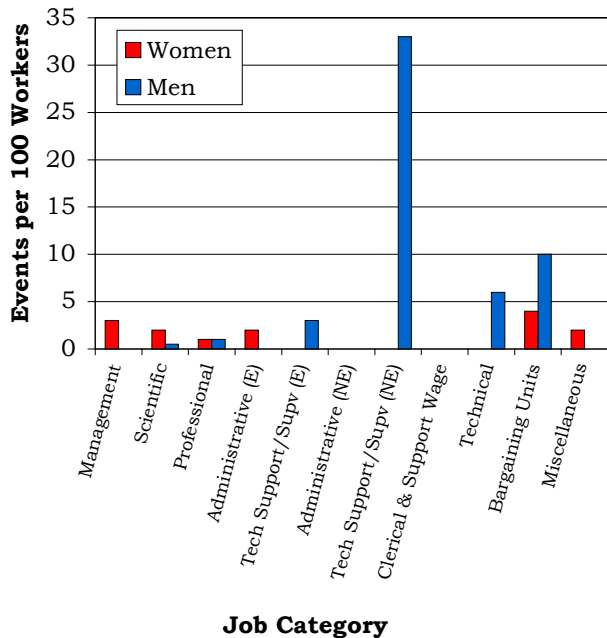


Figure 16. OSHA-Recordable Events by Job Category and Gender



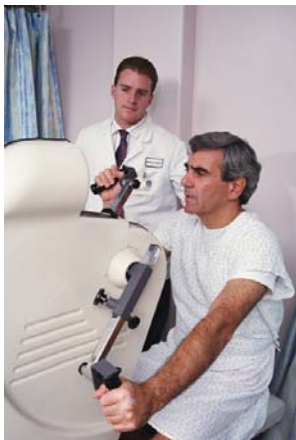
Men in the Technical Support/Supervisory (NE) job category had higher rates than did men in other job categories. There was no consistent relationship between OSHA-recordable rates and gender across the various job categories.

Clerical and Support Wage workers did not report any OSHA-recordable events. Men in the Management, Administrative (E), and Miscellaneous job categories and women in the Technical Support/Supervisory (E) and (NE), Administrative (NE), and Technical job categories did not report any OSHA-recordable events.

Women had a total of 409 lost or restricted workdays, and 955 lost or restricted workdays were recorded for men. Women averaged 26 lost or restricted workdays compared with 14 lost or restricted workdays for men. The highest average number of lost/restricted workdays among women was in the 30-39 age group and among men aged 50 or older.

Men in the Technical Support/Supervisory (E) group had the highest average number of lost or restricted workdays (17 days), while women in the Miscellaneous group had the highest average number of lost or restricted workdays (133 days). However, the high average for women was based on 1 event.

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 85 OSHA events recorded in the OSHA 200 Logs included 23 diagnoses among women and 83 diagnoses among men (Figure 17). Among women, injuries accounted for 61 percent (14/23) of the diagnoses reported. The most common type of OSHA-recordable injury women reported was sprains and strains (36 percent). Among men, injuries accounted for 69 percent (57/83) of the diagnoses reported, primarily due to sprains and strains (37 percent) and open wounds (37 percent).

Figure 17. OSHA-Recordable Diagnoses by Diagnostic Category and Gender

Diagnostic Category	Gender	
	Women	Men
Genitourinary	0	1
Muscles & Skeleton	4	7
Nervous System	1	16
Psychological	1	0
Respiratory	0	1
Skin	1	1
Unspecified Symptoms	2	0
Injury	14	57
Fractures – Neck, Trunk	0	1
Fractures – Upper Limb	1	1
Fractures – Lower Limb	0	1
Dislocations	0	1
Back Sprains & Strains	2	9
Other Sprains & Strains	3	12
Open Wounds – Head, Neck, Trunk	0	4
Open Wounds – Upper Limb	1	15
Open Wounds – Lower Limb	0	2
Superficial Injuries	0	1
Bruises	3	4
Foreign Bodies Entering Orifice	0	2
Burns	0	3
Unspecified Injuries	3	0
Adverse Reactions to Non-Medical Substances	1	0
Adverse Reactions to External Causes	0	1

Eighty-one percent (69) of the 85 OSHA events were described as an accident in the OSHA logs (Figure 18). The majority of events were described



as “Other Accidents,” 73 percent (8/11) among women and 84 percent (49/58) among men.

Overexertion and strenuous movements were the most frequently reported other accidents for

both women and men. Thirteen accidents involved noise, 8 accidents involved machinery, and 6 accidents involved cutting or piercing with an instrument or object; all 27 of these occurred among men. Repetitive trauma accounted for 7 percent of the “Other Accidents” category, 3 among women and 1 among men.

Figure 18. OSHA-Recordable Accidents by Type and Gender

Accident Category	Gender	
	Women Number of Accidents	Men Number of Accidents
Motor Vehicle Traffic	0	1
Poisoning – Non-Medicinal	1	1
Falls	2	4
Natural/Environmental Factors	0	1
Submersion/Suffocation/ Foreign Bodies	0	2
Other Accidents	8	49
Struck by an Object	0	3
Machinery	0	8
Cutting/Piercing Instrument/Object	0	6
Hot, Corrosive, or Caustic Material/Steam	0	3
Overexertion/Strenuous Movements	5	15
Noise	0	13
Repetitive Trauma	3	1
Total	11	58

Rates of OSHA-Recordable Events

The rates of all OSHA-recordable events by age and job categories and gender are shown in Figures 19 and 20. Among men, OSHA-recordable rates were highest for Bargaining Units workers and among women were highest for Scientific workers. We saw little relationship between rates for women 50 years or older and women under age 50. Rates were higher for men 50 or older, with the exception of the Scientific workers. 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. Scientific workers had the highest injury rates among women.

Bargaining Units workers were 16 percent of the work force but accounted for 55 percent of the OSHA-recordable events. They had 86 percent of the days restricted and 39 percent of the days lost from work.

Technical Support/Supervisory (NE) workers were almost 10 times more likely to have an OSHA-recordable event than were other workers. Bargaining Units workers were at almost 7 times the risk of an event than other groups of workers. Technical Support/Supervisory (NE) workers were 74 times more likely to report a nervous system disorder than were other workers. Bargaining Units workers also had at least a 6-fold increased risk of disorders of the nervous system, muscles and skeleton conditions, and injuries. The overall risk of sprains and strains was 8 times greater among these workers. In addition, Bargaining Units workers had an increased risk of open wounds to the upper limbs (more than 4 times higher).

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

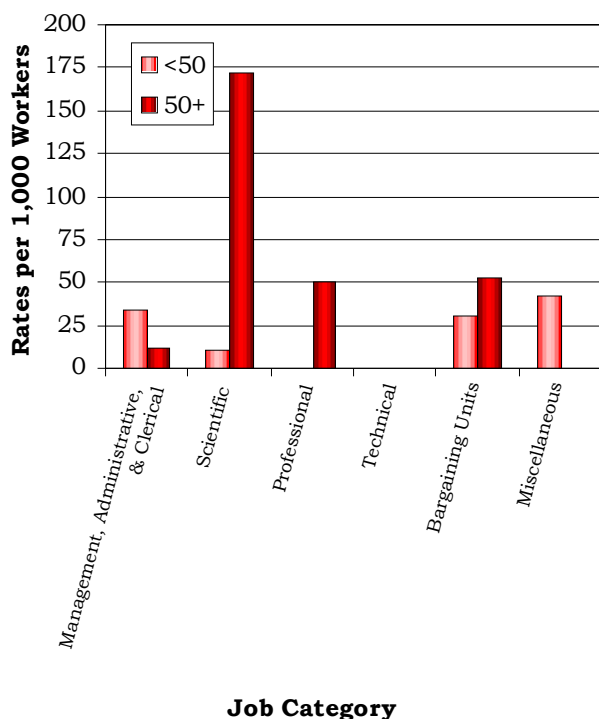
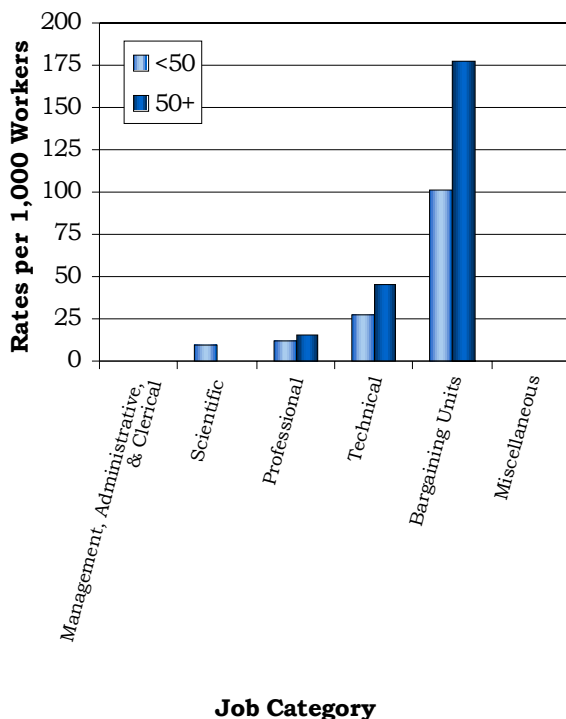


Figure 20. OSHA-Recordable Rates by Age and Job Categories Among Men, All Diagnoses Combined



Time Trends for OSHA-Recordable Events

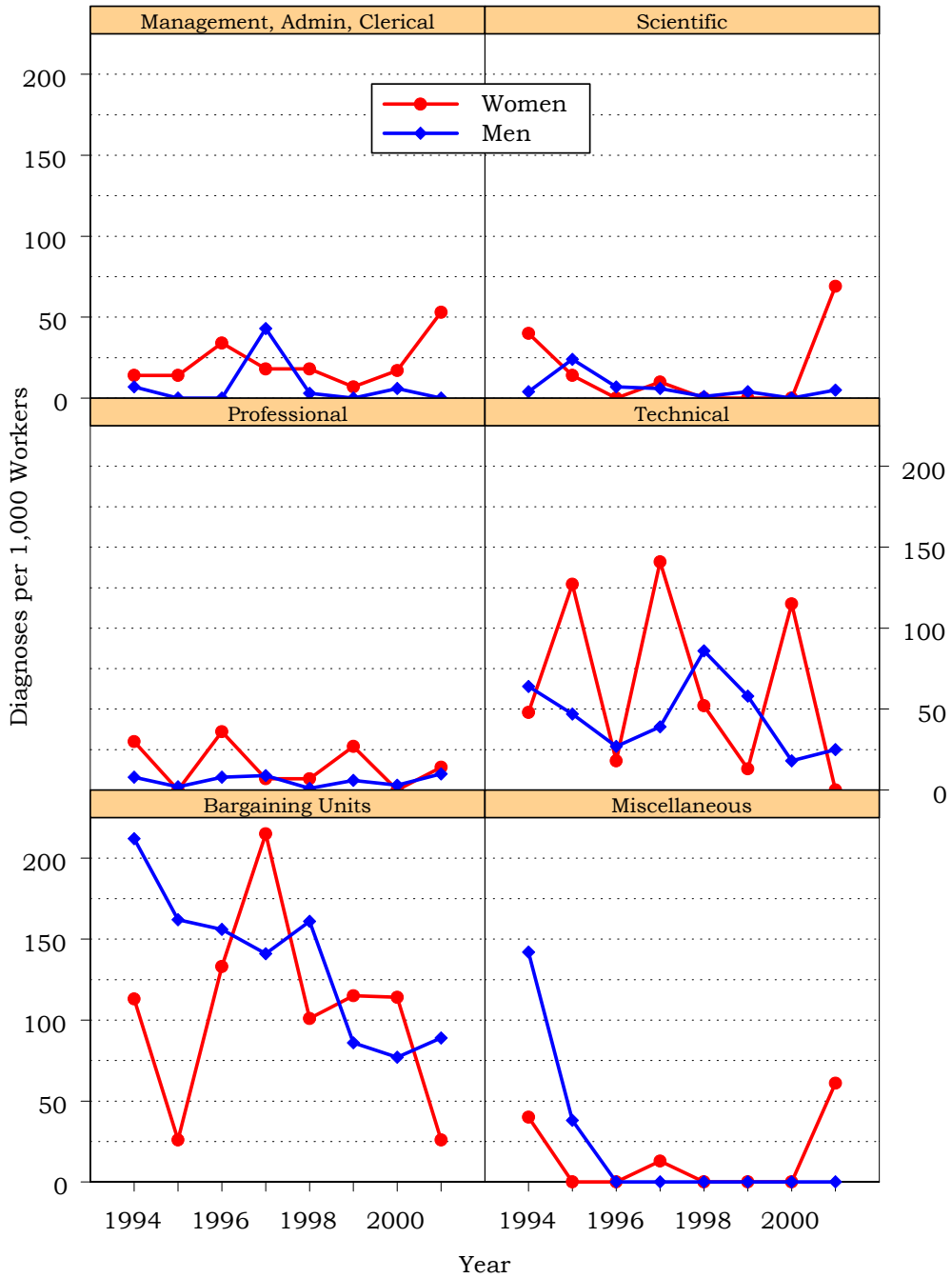
The age-adjusted OSHA-recordable rates from 1994 to 2001 are shown in Figure 21. We found no consistent trends for women in any job category. Even though the OSHA-recordable rate among women in the Bargaining Units group varied between 1994 and 2001, the rate for 2001 was the same as it was in 1995. Except for a sharp increase in 1996, the rates for the Management, Administrative, and Clerical group remained reasonably stable until a substantial decrease in 1999 that did not continue in 2000; the rate again rose substantially in 2001. Rates among women in the Scientific and Miscellaneous job categories also rose sharply in 2001. Professional and Technical job categories were erratic throughout the 8-year period.

Among men, the decline in the 2000 rate of OSHA-recordable diagnoses for Bargaining Units workers did not continue in 2001. Rates among male Technical workers varied greatly over the 8 years, with no apparent trend in rates. There was little change in other job categories over the 8-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; in addition, no diagnoses were reported in 2001 for the Management, Administrative, and Clerical job category. Overall, the 2001 OSHA-recordable rates rose slightly in all categories where rates were reported.

There were no statistically significant changes in injury rates for women during this 8-year period; however, there was a significant decrease in injury rates for men over the same period.

BNL employees experienced an overall 31 percent increase in the number of OSHA events reported from 2000 to 2001. This increase appears mainly as a general increase in the number of events reported in 2 job categories for 2001: Technical Support/Supervisory (E) and Scientific.

Figure 21. Age-Adjusted Rates for All OSHA-Recordable Diagnoses Combined Among Women and Men by Job Category from 1994 to 2001



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 2 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 5 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

<ul style="list-style-type: none"> • Other injuries and late effects of external causes 	<p>900-999</p>	<p>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</p>
<p>Supplementary classifications related to personal or family history of disease</p>	<p>V10-V19</p>	<p>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</p>
<p>Supplementary classifications related to health care for reproduction and child development</p>	<p>V20-V28</p>	<p>Problems related to pregnancy, postpartum care, contraception, outcome of delivery, and physical development of child</p>
<p>Contact with health services for reasons other than illness or injury</p>	<p>V50-V59</p>	<p>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</p>

NOTES