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Sandia National Laboratories - Albuquerque Annual Epidemiologic Surveillance Report

Sandia National Laboratories – Albuquerque
2001 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

Sandia National Laboratories – Albuquerque 2001

At A Glance

Crafts and Manual Labor workers had the highest rate of occupational injuries among both men and women. Compared with other workers, Crafts and Manual Laborers were 9 times more likely to report an injury.

Among OSHA-recordable events, the total number of workdays lost or restricted, as well as the average number of days lost or restricted, decreased at least 40 percent from 2000 to 2001.

We saw no indication of systematic changes in the overall rates of OSHA-recordable events among Sandia workers during the 9-year period 1993-2001.

Looking at non-occupational as well as occupational health events, the age-adjusted rate for all illness and injury categories combined has continued to decline over the past 9 years.

The highest absence rate was noted in the Crafts and Manual Labor group for women (33 per 100 women) and in the Clerical group for men (26 per 100 men). Among women, this job category has had the highest rate since 1996.

The rate of 5-day absences increased with age among both men and women. The absence rate among women was about twice the absence rate among men regardless of age.

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 Sandia National Laboratories–Albuquerque (SNL-AL) from January 1, 2001 through December 31, 2001. The data were collected by a coordinator at SNL-AL 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. Epidemiologic surveillance has been conducted at SNL-AL since 1993.

The information in this report highlights the data analyses conducted. 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 1993 to 2001.

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, so comparisons of SNL-AL 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

Sandia National Laboratories-Albuquerque (SNL-AL) is located at the foot of the Manzano Mountains adjacent to the city of Albuquerque, New Mexico, and is essentially surrounded by Kirtland Air Force Base. For more than 50 years, Sandia has served as one of the major national defense research and development (R&D) laboratories. The facility began in 1945 as Z Division of what is now Los Alamos National Laboratory. As part of the Manhattan Project, the site's mission was ordnance design, testing, and assembly. The original mission of SNL-AL's R&D nuclear weapons activities later expanded to include support of the space program and work on other advanced military technologies, energy programs, arms verification, and control technology and applied research.

Today, through science and technology, people, infrastructure, and partnerships, Sandia's mission is to meet national needs in four key areas:

- Nuclear weapons — ensuring the stockpile is safe, secure, reliable, and can support the United States' deterrence policy
- Nonproliferation and materials control — reducing the proliferation of weapons of mass destruction, the threat of nuclear accidents, and the potential for damage to the environment
- Energy and critical infrastructure — enhancing the surety of energy and other critical infrastructures
- Emerging threats — addressing new threats to national security

Sandia's continuous growth is evident, as shown in their submission and receipt of approval from DOE on their largest ever proposed construction project — the Microsystems and Engineering Sciences Application (MESA) facility. In September 1999, SNL-AL received permission from DOE to proceed with a conceptual design for the MESA facility. The purpose of the MESA project is to assist in modernizing the electrical, optical, and mechanical components for the U.S. nuclear deterrent using new computationally enabled design tools. Technologies developed by MESA, as well as tools available, are expected to significantly benefit universities and U.S. businesses. In 2001, the project continued with resources from DOE to proceed with engineering design and infrastructure upgrades for the project.

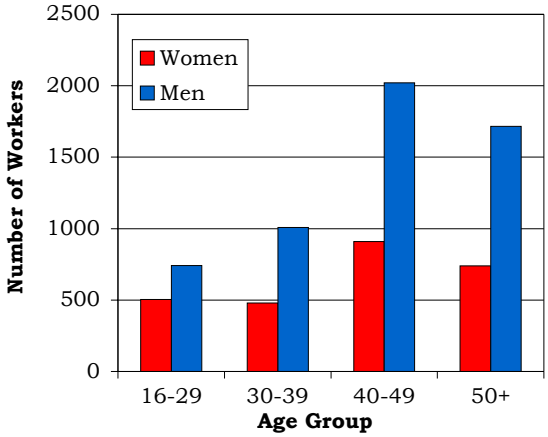
The Sandia Corporation, a Lockheed Martin Company, manages and operates the laboratory under a 1998 modified contract through September 2003.

The Sandia Work Force - 2001

A total of 8,117 SNL-AL employees were included in epidemiologic surveillance in 2001, 20 more workers than were present in 2000. There were

2,632 (32 percent) women and 5,485 (68 percent) men in the work force with an average age of 42 years for women and 43 years for men (Figure 1). Most of the workers were White (70 percent). Hispanics comprised 22 percent, and Native Americans, African Americans, and Asians made up the remaining 8 percent of the work force.

Figure 1. The Work Force by Gender and Age



Individual job titles reported by SNL-AL were grouped together into 6 job categories (Figure 2). This categorization was done because there were either too few workers or health events among workers within a particular job title, thereby limiting the type of analyses that could be conducted. Men and women were not distributed equally among the various job categories. The Professional Staff job category contained over half (57 percent) of the total SNL-AL work force. Sixty-three percent of men were Professional Staff, while 42 percent of the women were in this category. Significant numbers of the women were in the Support Staff (21 percent), Non-Regular (18 percent), and Clerical (16 percent) categories. By contrast, only 14 percent of male workers were in the Support Staff and 12 percent in the Non-Regular categories.

Figure 2. The Work Force by Job Category and Gender

Job Category	Women	Men
Professional Staff	1,109 42%	3,479 63%
Support Staff	542 20%	765 14%
Clerical	428 16%	34 1%
Crafts & Manual Labor	81 3%	433 8%
Security	8 <1%	112 2%
Non-Regular	464 18%	662 12%

Number and Length of Absences

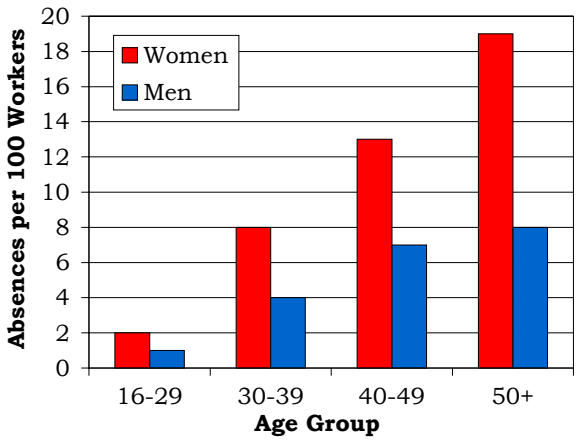
Epidemiologic surveillance examines all absences due to illness and injury. Under DOE Order 440.1, contractor management is required to notify Occupational Medicine when a worker has been absent for 5 or more consecutive workdays. If an absence on a Friday continues through Tuesday, the length of that absence includes the weekend. 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. SNL-AL, however, has chosen to report all absences, regardless of length.

One change from earlier surveillance reports is the exclusion of some types of health events resulting in an absence. These events included 50 women with 51 reported absences due to maternity leave and 5 men and 3 women with reported absences that were not related to the treatment of an illness or injury.

Throughout this report, analyses take gender, age, and occupation into account because the risk of illness and injury varies by these factors.

The rate of absences due to injury or illness varied by gender and age (Figure 3). There were 301 absences among 2,632 women, resulting in an absence rate of 11 per 100 women (301/2,632). Among the 5,485 men, 315 absences resulted in an absence rate of 6 per 100 men (315/5,485). These rates have remained constant since 1999 for both men and women. The rate of absences increased with age among both men and women. The absence rate among women was about twice the absence rate among men regardless of age. Two percent of female and 1 percent of male workers had 2 or more absences in 2001.

Figure 3. Absence Rate by Gender and Age

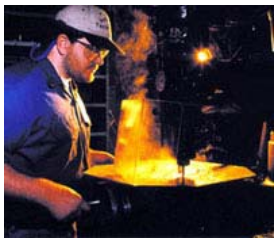


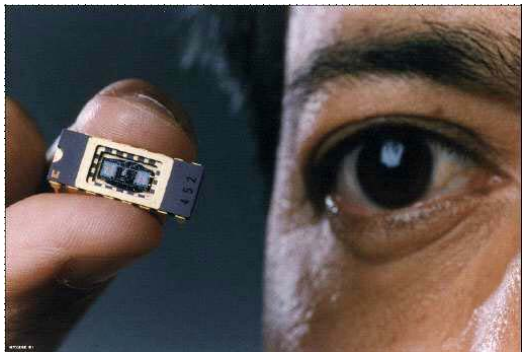
The average length of absence was 20 days for men and 24 days for women (Figure 4). The average length of absence was not related to age for men or women. We noted little change with age in the average duration of absence among women 40 years of age or older or men 30 years of age or older.

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	132	15
	30-39	39	629	16
	40-49	115	3,111	27
	50+	138	3,360	24
	Total	301	7,232	24
Men	16-29	6	79	13
	30-39	42	798	19
	40-49	132	2,326	18
	50+	135	3,074	23
	Total	315	6,277	20

The rate of absences due to illness or injury varied by job category for men and women (Figure 5). Women had higher rates of absence than did men in every job category except the Clerical group. The highest absence rate was noted in the Crafts and Manual Labor group for women (33 per 100 women) and in the Clerical group for men (26 per 100 men). Among women, this job category has had the highest rate since 1996. Among men, 3 different job categories have had the highest rate since 1997.





We also examined the average duration of absence by job category and gender (Figure 6). Women had longer absences than men in 4 of the 6 job categories; the exceptions were the Clerical and Security groups. The occupational groups with the highest rate of absence also had the longest absence duration. Women in the Craft and Manual Labor group had absences averaging 26 days. Absences among men in the Clerical group averaged 35 days.

Figure 5. Absence Rate by Job Category and Gender

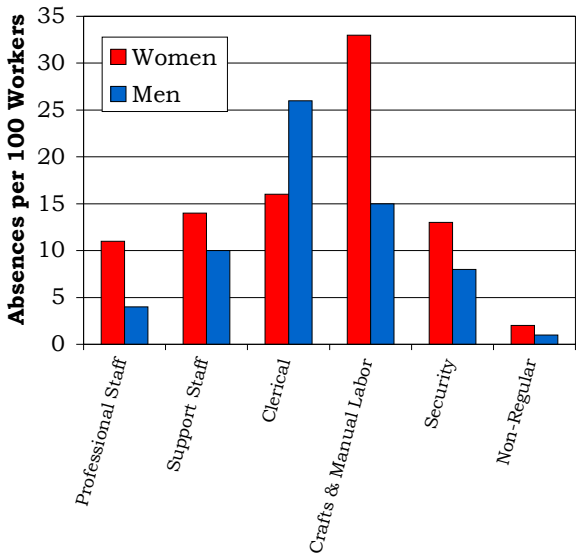
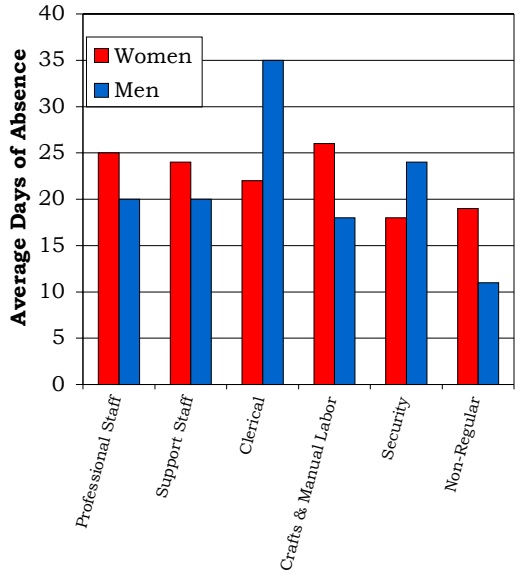


Figure 6. Average Duration of Absence by Job Category and Gender



Diagnostic Categories

Epidemiologic surveillance monitors *all* illnesses and injuries among active workers because it is not always possible to determine 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 Diseases, 9th Revision, Clinical Modification* (ICD-9-CM). This reference is used to classify diagnoses for statistical purposes. You can find specific diagnoses in the Explanation of Diagnostic Categories.

The number of reported diagnoses categorized according to the ICD-9-CM and number of lost calendar days are presented in Figure 7. Women reported 390 diagnoses and men reported 388 diagnoses in 2001.

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	16	628	6	120
Blood	0	0	0	0
Cancer	18	632	9	306
Digestive	39	919	51	670
Endocrine/ Metabolic	10	214	16	245
Existing Birth Condition	1	26	1	11
Genitourinary	42	917	9	147
Heart/ Circulatory	12	329	16	352
Infections/ Parasites	11	142	9	105
Injury	31	657	75	1,331
Miscarriage	2	36	NA	NA
Muscles & Skeleton	81	1,950	74	1,535
Nervous System	18	213	9	135
Psychological	19	600	8	341
Respiratory	58	706	79	776
Skin	7	184	4	47
Unspecified Symptoms	25	578	22	608

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 7,232 calendar days due to injury and illness. Muscles and skeleton conditions (21 percent), respiratory conditions (15 percent), genitourinary disorders (11 percent), and digestive diseases (10 percent) accounted for 57 percent of all reported diagnoses among women. Rheumatism made up 33 percent of the muscles and skeleton conditions, followed by arthritis and joint disorders (30 percent) and acquired deformities, primarily of the toes (22 percent). Over half (64 percent) of the respiratory conditions were due to upper respiratory infections, such as colds and sinusitis, followed by bronchitis

and asthma (21 percent) and flu and pneumonia (10 percent). Eighty-eight percent of the genitourinary disorders were conditions of the female reproductive organs. Of the 39 digestive system diagnoses, 38 percent were reported as gallbladder disease; 23 percent as disorders of the intestines, including colitis and gastroenteritis; and 13 percent as hernias.

Men lost 6,277 calendar days due to injury and illness. Fifty-eight percent of all reported diagnoses among men were due to conditions of the respiratory system (20 percent), injuries (19 percent), and muscles and skeleton (19 percent). Upper respiratory infections such as colds and sinusitis accounted for 62 percent of the respiratory conditions, followed by flu and pneumonia (19 percent) and bronchitis and asthma (14 percent). Among the 75 diagnoses categorized as injuries, there were sprains and strains (36 percent), dislocations (35 percent), and fractures (16 percent). Forty-six percent of the reported muscles and skeleton conditions were arthritis and joint disorders, 26 percent were disk disorders and back problems, and 18 percent were rheumatism.

These diagnoses varied to some extent by age among men. Disorders of the muscles and skeleton, conditions affecting the respiratory system, and injuries were the top 3 diagnostic categories for men in all age groups under 50 years old. Digestive disorders were commonly reported by men in the oldest age group. Twenty-two men 50 years of age or older reported 26 digestive diagnoses: 27 percent for hernias, 19 percent for intestinal disorders, and 19 percent for other digestive disorders.

The more frequently reported diagnoses among women did not vary with age. Respiratory conditions, muscles and skeleton disorders, and genitourinary diseases were among the more frequently reported diagnoses, regardless of age.

Figure 8 shows the frequency of reported diagnoses by job category for men and women. The types of diagnoses did not vary significantly by job category. Among women, conditions affecting the muscles and skeleton appeared in all job categories, and respiratory diagnoses appeared in 5 of the 6 categories. Among men, injuries and respiratory conditions appeared in all job categories. Muscles and skeleton conditions were common in most job categories.

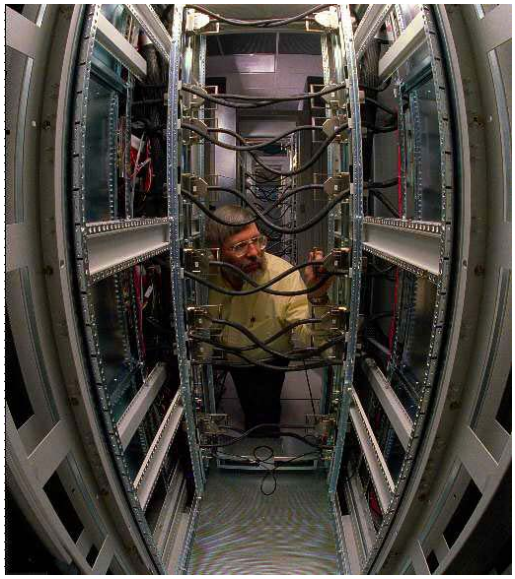


Figure 8. Most Frequently Reported Diagnoses by Job Category and Gender

Job Category	Men	Women
Professional Staff	Muscles & Skeleton (41) Respiratory (36) Injury (28)	Muscles & Skeleton (29) Genitourinary (23) Respiratory (23)
Support Staff	Injury (25) Respiratory (19) Muscles & Skeleton (17)	Respiratory (21) Muscles & Skeleton (20) Digestive (12) Genitourinary (12)
Clerical	Muscles & Skeleton (3) Digestive (2) Injury (2) Respiratory (2)	Muscles & Skeleton (20) Nervous System (8) Psychological (8) Respiratory (8)
Crafts & Manual Labor	Respiratory (17) Injury (16) Digestive (14)	Muscles & Skeleton (10) Injury (6) Respiratory (5)
Security	Muscles & Skeleton (4) Respiratory (3) Injury (2)	Muscles & Skeleton (1)
Non-Regular	Injury (2) Respiratory (2) Infections/Parasites (1) Nervous System (1)	Digestive (2) Genitourinary (1) Injury (1) Nervous System (1) Respiratory (1)

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 worker groups. For example, Figure 7 shows that men reported 75 and women reported 31 diagnoses involving injuries during 2001. Men, therefore, reported over twice as many injuries as women. As there were more than twice as many men as women at Sandia, it seems reasonable to expect more injuries among men than 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 number of injury diagnoses in a given gender by the total number of employees of that gender. Multiply this number by 1,000 to get the diagnosis rate per 1,000 workers. For example:

75 injury diagnoses ÷ 5,485 men =
.014 x 1,000 = 14 injury diagnoses per 1,000 men

31 injury diagnoses ÷ 2,632 women =
.012 x 1,000 = 12 injury diagnoses per 1,000 women

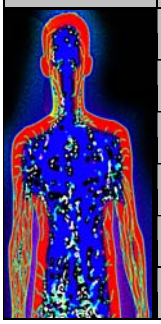
Comparing these rates now correctly suggests that the rate of reported injuries among women is about the same as the rate for men. These rates are called **crude rates** because they do not account for possible differences between men and women, such as age and other factors that might affect the individual's risk of having an injury. Because age is 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 using 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 health condition, 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 for epidemiologic surveillance.

In the following analyses, the 4 age groups previously used 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. 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. Thirteen other disease groups are also analyzed and can be found in the Supplemental Tables.

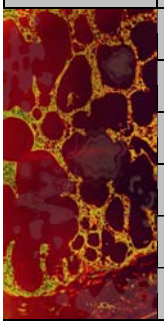
In most job categories, the rates of all illnesses and injuries combined among men and women were greater for Sandia workers 50 years of age or older than for younger workers. This pattern is similar to what was seen for both men and women in 2000 and 1998 and only men in 1997. Among women, the opposite pattern was observed in 1997 and 1999. In 1999, the relationship between age and diagnosis rates was less consistent among men. Women tended to have higher rates than did men in a given job category in 2001.

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

Diagnostic Category	Rate per 1,000			
All Illnesses & Injuries Combined	Job Category	Age	Men	Women
	Professional Staff	<50	51	113
		50+	61	195
	Support Staff	<50	100	187
		50+	141	211
	Clerical	<50	385	151
		50+	238	239
	Crafts & Manual Labor	<50	178	357
		50+	207	960
	Security	<50	143	125
		50+	0	0
	Non-Regular	<50	5	11
		50+	158	143

Cancer rates presented in this report are based on reported absences due to cancer. A worker may experience several periods of absence related to 1 cancer diagnosis due to medical complications or treatment regimens. Each absence results in the report of a cancer diagnosis. However, it does not imply that this is necessarily a new cancer. The cancer rates in this report are *not* comparable to the incidence rates frequently published in many articles on cancer with which you may be familiar. Incidence cancer rates are based on the number of *new* cancer cases diagnosed within a given time, usually 1 year.

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
	Professional Staff	<50	0	2
		50+	3	14
	Support Staff	<50	0	3
		50+	12	20
	Clerical	<50	0	5
		50+	0	24
	Crafts & Manual Labor	<50	0	0
		50+	6	40
	Security	<50	0	0
		50+	0	0
	Non-Regular	<50	0	0
		50+	0	0

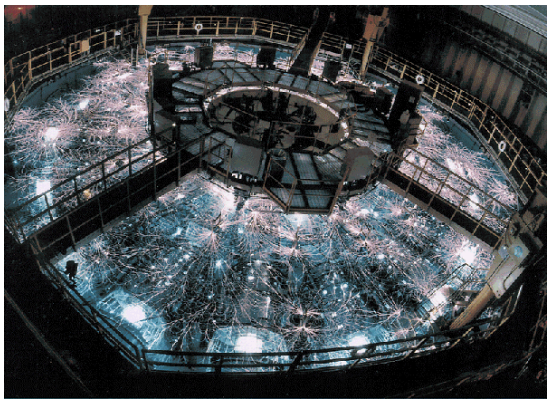
Diagnostic Category	Rate per 1,000			
Injury	Job Category	Age	Men	Women
	Professional Staff	<50	6	6
		50+	11	10
	Support Staff	<50	31	23
		50+	35	10
	Clerical	<50	154	14
		50+	0	14
	Crafts & Manual Labor	<50	45	54
		50+	24	120
	Security	<50	22	0
		50+	0	0
	Non-Regular	<50	3	2
		50+	0	0

Diagnostic Category	Rate per 1,000			
Heart/ Circulatory	Job Category	Age	Men	Women
	Professional Staff	<50	2	2
		50+	4	0
	Support Staff	<50	4	3
		50+	4	15
	Clerical	<50	0	0
		50+	0	14
	Crafts & Manual Labor	<50	4	0
		50+	18	120
	Security	<50	0	0
		50+	0	0
	Non-Regular	<50	0	0
		50+	0	0

Diagnostic Category	Rate per 1,000			
Respiratory	Job Category	Age	Men	Women
	Professional Staff	<50	13	15
		50+	5	38
	Support Staff	<50	26	32
		50+	23	50
	Clerical	<50	77	23
		50+	48	14
	Crafts & Manual Labor	<50	45	0
		50+	30	200
	Security	<50	33	0
		50+	0	0
	Non-Regular	<50	0	2
		50+	105	0

The likelihood that an individual in the U.S. will develop cancer increases with age. At SNL-AL, in all job categories in which cancer was reported, rates were higher among older workers. Twenty-six absences related to cancer were reported: 9 diagnoses among 7 men and 18 diagnoses among 16 women. Seven of the workers reporting cancer in 2001 reported cancer in previous years. Three workers reported cancer more than once in previous years and 4 reported cancer only once before. Two of the 7 workers, both males, reported a cancer at a site different from the previous cancer site: one who reported pancreatic cancer in 2001 had previously reported bladder cancer, and the other who reported lung and metastatic bone cancer in 2001 had previously reported lung cancer. The other 2 men and the 3 women reported cancer at the same site in 2001 as reported previously: bladder, breast (2 women), connective tissue, and thyroid. Among the 16 women who reported cancer in 2001, 4 Professional

Staff members, 3 Support Staff members, 1 Crafts and Manual Labor worker, and 2 Clerical workers reported breast cancer. Their ages ranged from 40 to 60 years.

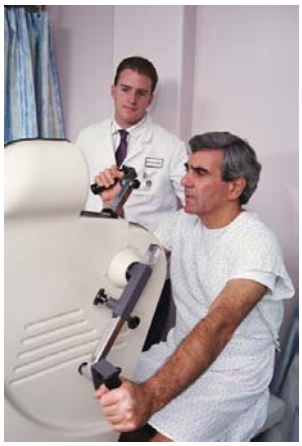


In 1996, we noted that 11 of the 20 men who reported cancer had prostate cancer. We have not seen a continuation of this frequency of prostate cancer since then. Only 1 case of prostate cancer was reported in 2001. In contrast, the 6 cases of prostate cancer reported in 2000 were the highest number of cases seen in a given year since 1996. Nine of the 11 men reporting prostate cancer in 1996 were in the 50-59 age range and 1 was in the 40-49 age group, relatively young compared with the age distribution of men with prostate cancer reported in both national and New Mexico Tumor Registry statistics. The same age distribution was observed in the 1995 Sandia cancer data, which contained prostate cancer diagnoses reported by 6 men, 5 of whom were under the age of 60. In 1997, we noted only 3 diagnoses among 3 men, all in the Professional Staff job category. These men had not reported prostate cancer previously. They ranged in age from the late 40s through early 60s, similar to the age distribution observed in previous years. In 1998, 4 men reported prostate cancer. They were all Professional Staff members who were at least 50 years old and had never reported cancer previously. Three men reported prostate cancer in 1999; 1 man had reported prostate cancer in 1996. Two were Professional Staff and 1 was Support Staff, and all were at least 50 years old. In 2000, 6 men reported prostate cancer among the 14 men who reported cancer. None of the 6 had reported cancer previously. All were Professional Staff members and ranged in age from late 40s to early 60s. One Crafts and Manual Labor worker in his mid-50s reported prostate cancer in 2001. He had not previously reported cancer. Over the 6 years we have monitored the occurrence of prostate cancer, Professional Staff workers, who comprised 65 percent of the work force over the same period, reported about 75 percent of the diagnoses. However, a close inspection of the job titles of these workers does not suggest a pattern in any particular group within the Professional Staff occupational category.

Workers aged 50 or older tended to have higher rates of heart/circulatory problems than did younger workers for both men and women. Men in the Crafts and Manual Labor group had the highest rate of heart/circulatory disorders. Fifty-six percent (9/16) of the

16 diagnoses among men occurred in workers aged 50 or older. High blood pressure and ischemic heart disease (restricted blood flow through an artery) accounted for 78 percent (7/9) of the diagnoses. Nine of the 12 heart/ circulatory diagnoses reported by women were among workers aged 50 or older. Two of the diagnoses involved high blood pressure and ischemic heart disease. The remaining 7 diagnoses included 2 heart valve disorders, 1 tachycardia (rapid heart beat), 3 phlebitis (inflammation) or thrombosis (blood clot) of arteries or veins, and 1 diagnosis for hemorrhoids. Crafts and Manual Labor workers were at over 4 times the risk of reporting a heart/ circulatory diagnosis compared with workers in other job categories. The high rate of 120 events per 1,000 workers 50 years of age or older noted among women in the Crafts and Manual Labor group resulted from 3 diagnoses reported by 2 workers.

Younger men had higher rates of respiratory disease than did older men, except among Non-Regular workers. Among women, there was no clear trend with age and respiratory disease. Crafts and Manual Labor workers had the highest rate of respiratory diagnoses among women. The same group has had the highest rate among women since 1999. This group had the highest rate among men in 2000. Crafts and Manual Laborers were almost 3 times and Support Staff almost 2 times as likely to report respiratory diagnoses compared with other workers. A similar risk increase has been noted among the Crafts and Manual Labor group since 1999.



Among men, injury rates were generally greater in younger workers than in older workers. No relationship was observed between age and injury rates for women. Among younger workers, men tended to have higher rates than women. Crafts and Manual Labor workers had the highest rate of injury among women; this group also had the highest rate in 2000. The Clerical group had the highest rate among men. Crafts and Manual Labor workers were 3 times as likely to report an injury as were workers in other job categories and were almost 4 times more likely to report a dislocation. Support Staff were twice as likely to report an injury and over 3 times more likely to report a sprain and strain other than to the back.

In other analyses, the risk of illness and injury among workers classified in 1 job category was compared with the risk to workers in the remaining 5 job categories. Crafts and Manual Labor workers were at over twice the risk compared with all other groups, while Support Staff had a 40 percent increase in risk. Compared with workers in other job categories, Clerical workers had over 3 times the risk of psychological conditions and nervous system disorders. The Crafts and Manual Labor group was at increased risk for a number of conditions: 7 times the risk for skin conditions, 6 times the risk of infectious diseases, 5 times the risk for endocrine/metabolic disorders, 4 times the risk for digestive disorders and unspecified symptoms, and twice the risk of muscles and skeleton conditions. The Security group had 3 times the risk of muscles and skeleton disorders compared with workers in other job categories.

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 groups of different ages. 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 11. It is important to note that the age-adjusted rates for the years 1993 and 1994 presented in this report differ from those reported in the 1993 and 1994 *Annual Epidemiologic Surveillance Reports* due to the exclusion of diagnoses associated with maternity leave.

The age-adjusted rates for all illness and injury categories combined continued to decline over the past 9 years, but the trends were somewhat different between women and men. The

rate for 2001 was virtually unchanged from the 1999 and 2000 rates among women. Among women, the 1999 rate rose after an overall rate decline from 1993 to 1994 and again from 1996 to 1998. Over the 9-year period, the net change reflected almost a 50 percent decline in the diagnosis rate for women. Among men, the modest decline noted from 1993 to 1994 was followed by an overall rate that remained essentially unchanged until 1998 when the rate began to decline again. Since 1996, the rate among men has steadily declined so that the 2001 rate is 32 percent less than the 1996 rate. The overall decline in the rate from 1993 through 2001 has been affected by the number of Non-Regular workers included in the roster each year. These workers have numbered from as few as 10 in 1997 to as many as 1,375 in 1999. The highest number of absences reported in a given year by these workers was 11 absences in 2001, so their addition to the roster contributed to the observed rate reduction. In the discussion that follows, any rate decreases noted from 1993 to 2001 should be considered in light of the impact of these Non-Regular workers.

Age-adjusted rates for selected illness and injury categories are presented in Figure 12. We noted no important changes in the diagnosis rates for nervous system conditions, digestive disorders, muscles and skeleton conditions, or injuries in men during 1993-2001. With the exception of conditions of the muscles and skeleton, this is also true for women. The rate of muscles and skeleton disorders has risen steadily from 15 per 1,000 female workers in 1998 to 27 per 1,000 workers in 2001, following an equally sharp decline in preceding years. An increase in the number of acquired deformities of the muscles and skeleton, especially of the toes, has contributed to this increase. All types of acquired

deformities accounted for 12 percent of all diagnoses of the muscles and skeleton in 1998 and at least 20 percent in 1999 and 2001.

Among women in the Crafts and Manual Labor group, the overall illness and injury rate declined steadily from 1993 to 1998, only to reverse this trend steadily to 2001 (Figure 13). The 2001 rate was similar to the 1996 rate among women in this group, and the number and types of diagnoses reported in 2001 were distributed like the diagnoses reported in 1996. The rate declined over the 9-year period among Clerical workers, displaying an erratic progression. We noted no evidence of significant change among women in 2001 for the Support Staff or Professional Staff job categories. Over the 9-year period, the diagnosis rate declined substantially among women in Security, with dramatic changes from year to year. Such wide fluctuations in the overall diagnosis rate were observed only among female Security personnel. The dramatic changes in rates among female Security workers reflect relatively small changes in the actual number of diagnoses from year to year, but this is a small group of workers. Over the 9-year period, the number of women in the SNL-AL Security job category has ranged from 8 to 14 individuals. In 1993, 14 diagnoses were reported among these workers; in 2001, only 1 diagnosis was reported.

Among men, we noted a modest but steady decline in the overall diagnosis rate, similar to that observed in women. The increase seen in the 2000 rate did not continue in 2001 among workers in the Crafts and Manual Labor and Support Staff groups. There was no evidence of any important change among men in the Professional Staff job category over the 9-year period. The overall diagnosis rates for men in both the Security and Clerical groups have not been consistent over the 9-year period. The 2001 rate was lower than the 2000 rate for Security workers, but the opposite was observed among Clerical workers.

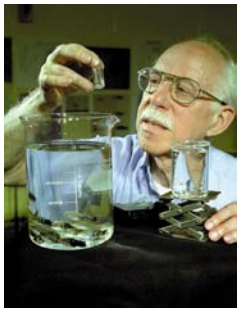


Figure 11. Age-Adjusted Rates for All Diagnoses Combined Among Women and Men from 1993 to 2001

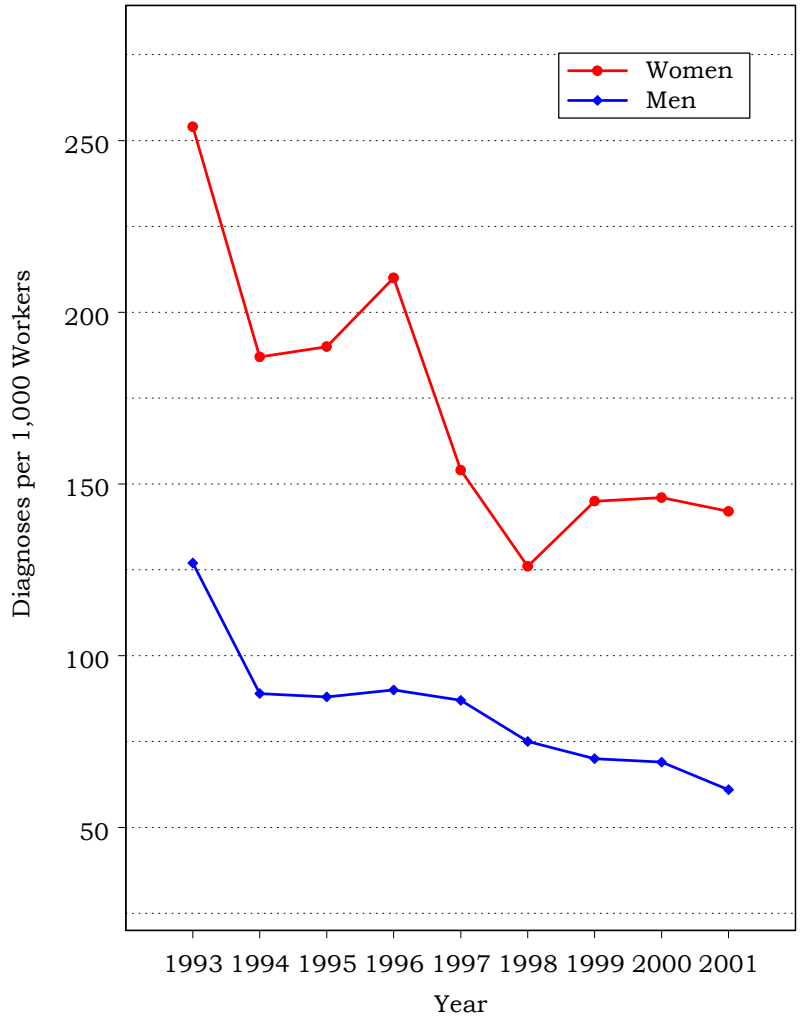


Figure 12. Age-Adjusted Rates for Selected Diagnostic Categories Among Women and Men from 1993 to 2001

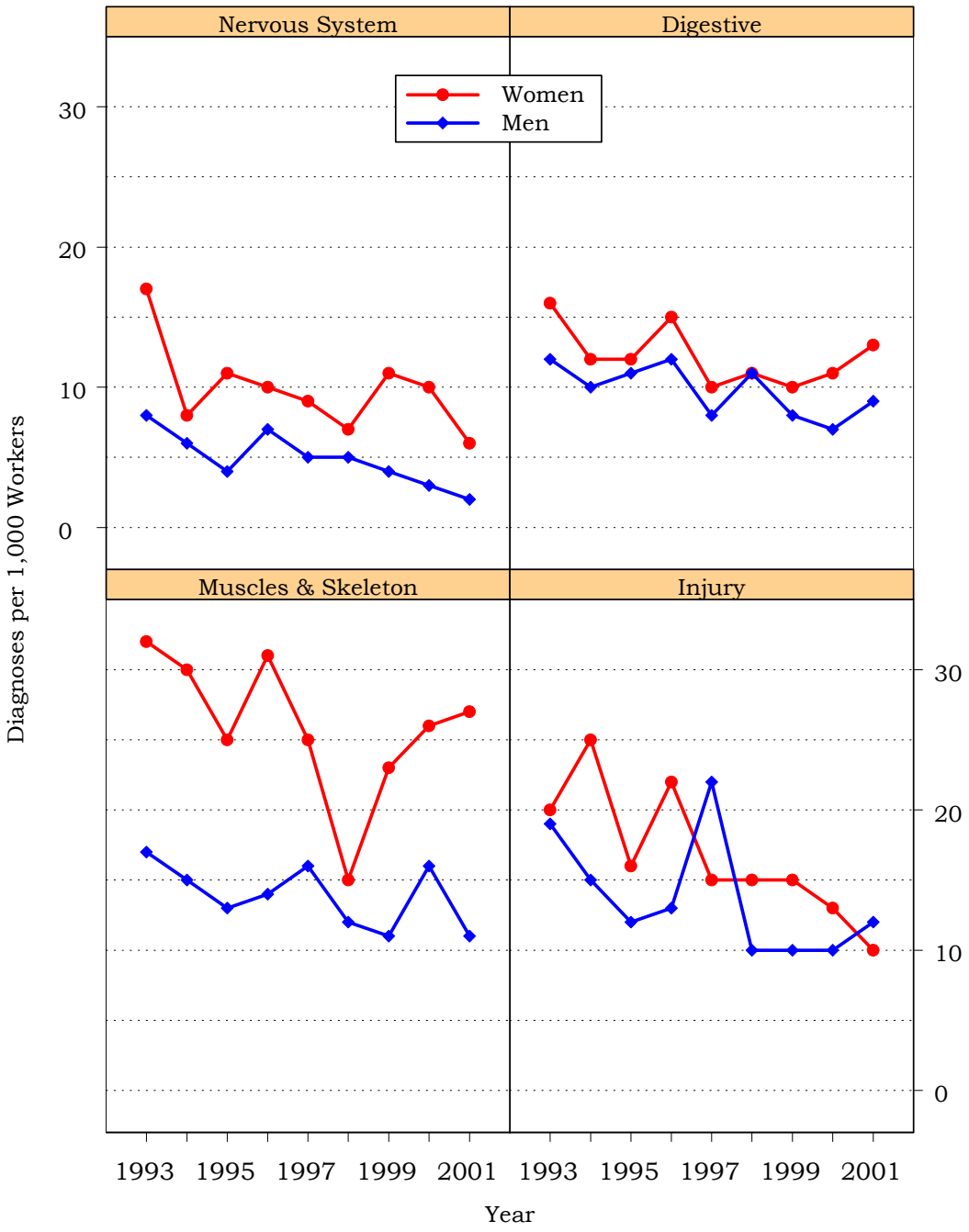
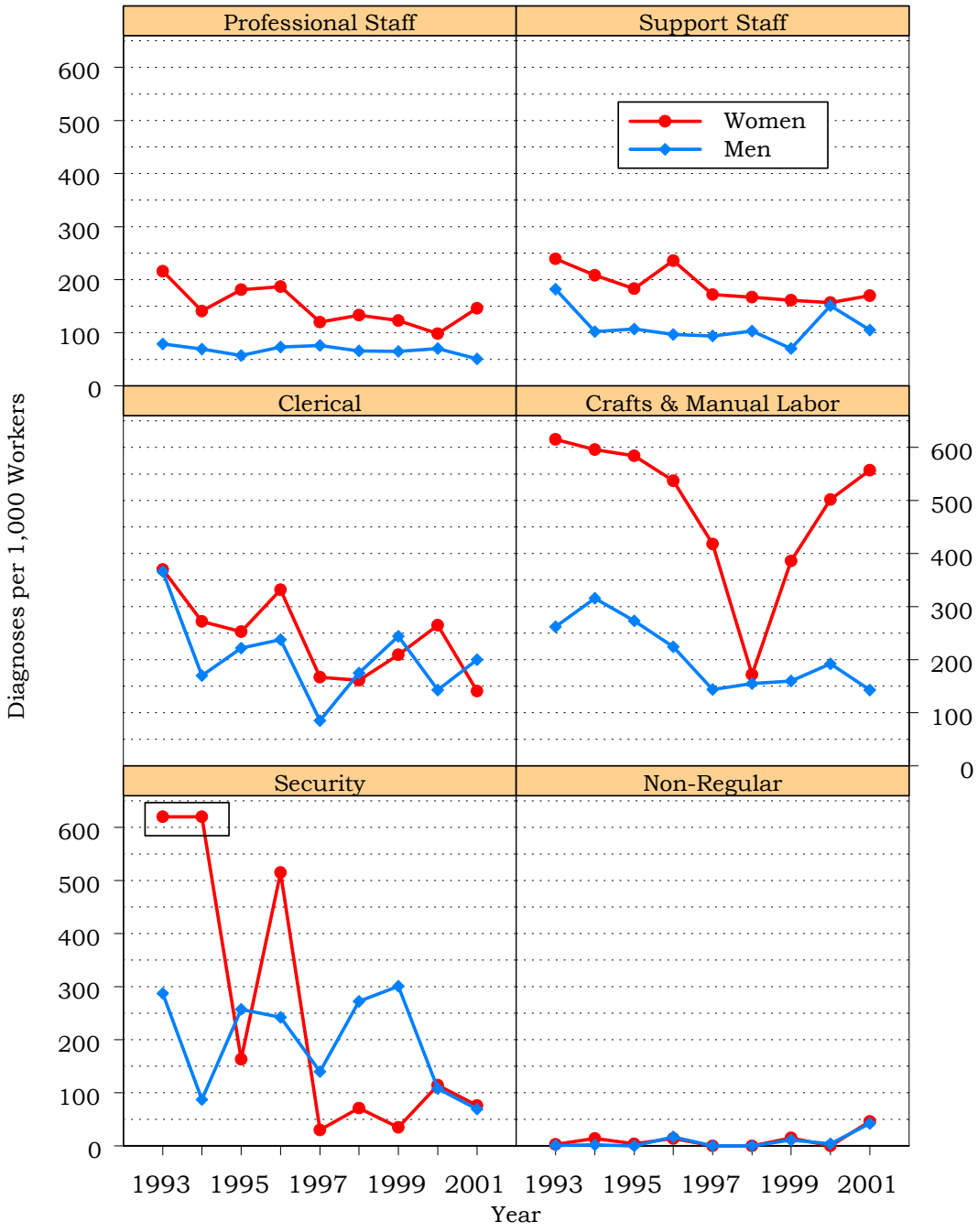


Figure 13. Age-Adjusted Rates for All Diagnoses Combined Among Women and Men by Job Category from 1993 to 2001



Note: The 1993 and 1994 Security rates for women were truncated to 620 (☐) for graphical presentation. The actual rate for 1993 was 727 and the rate for 1994 was 864.

Sentinel Health Events for Occupations

A sentinel health event for occupation (SHEO) is a disease, injury, 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 illness or injury in the work force. Sixty-four medical conditions associated with workplace exposures from studies of many different industries have been identified as sentinel health events (see Supporting Tables). 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 from cigarette 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 in 2001. Ten of 778 (1 percent) diagnoses were identified as *possible* sentinel health events (Figure 14). Four of the 10 possible sentinel health events were identified as carpal tunnel syndrome. These diagnoses, reported by 4 women, resulted in 44 lost calendar days. The workers included 2 Clerical workers and 2 Support Staff employees. Three of the carpal tunnel syndrome diagnoses occurred among workers aged 50 or older; 1 diagnosis occurred in a 30-39 year old worker.

Figure 14. 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	8	33	113
Total	2	8	33	113

Disabilities Among Active Workers

Five men and 2 women were placed on long-term disability in 2001. Medical conditions responsible for the disabilities included 2 psychological disorders, 1 cancer (large intestine), and 1 each for cerebrovascular disease, visual loss, migraine headaches, and a peripheral nervous system disorder. The disabled workers were excluded from other analyses in this report because they were not actively working. Four workers were in the Professional Staff, 2 were classified as Crafts and Manual Labor workers, and 1 was a Support Staff worker. All the disabled workers were above 40 years of age.

Deaths Among Active Workers

Four male workers and 1 female worker died during 2001. Four workers died from cancer (lung, tongue, leukemia, and melanoma), and 1 worker's cause of death was unknown.

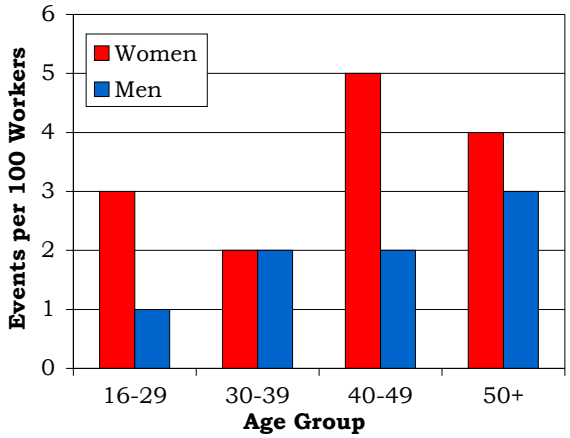
OSHA-Recordable Events

The Occupational Safety and Health Administration (OSHA) requires that employers maintain a record of occupational injuries and illnesses that have occurred among employees and to make that information available to OSHA upon request. Employers maintain the information from these OSHA-recordable events in the OSHA 200 Log. OSHA-recordable events differ from health events captured through return-to-work clearances in at least 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 distribution of OSHA events by gender and age is shown in Figure 15**.** Eighty women and 125 men had at least 1 OSHA-recordable event noted. The rate of OSHA-recordable events was 3 events per 100 for women and 2 events per 100 for men. The rate of OSHA-recordable events increased with age among men. The highest rates were among women aged 40-49 (5 per 100) and men aged 50 or older (3 per 100).

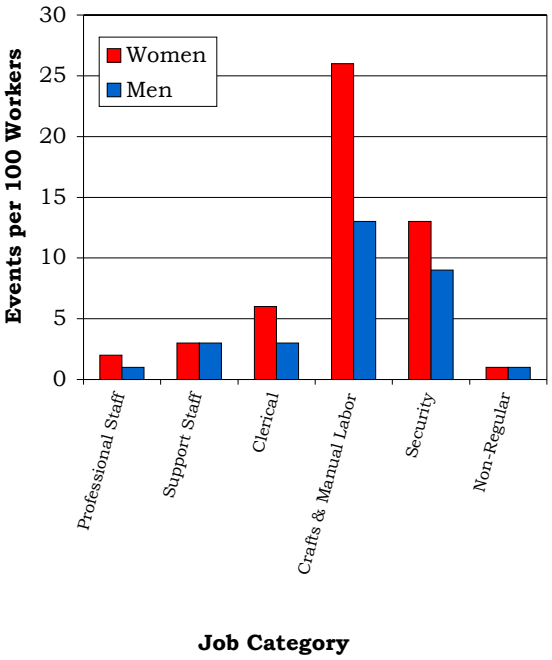
The rate was higher among women than men in all age groups examined except workers aged 30-39 years old, for whom the rates were equal.

Figure 15. OSHA-Recordable Events by Gender and Age



The rates of OSHA-recordable events by job category and gender are shown in Figure 16. The highest rates occurred among Crafts and Manual Labor workers for both women (26 per 100) and men (13 per 100). Women had higher rates than did men in all job categories except Support Staff (3 per 100 for both men and women) and Non-Regular workers (1 per 100 for both men and women).

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



The average number of workdays lost or with restricted activity due to an OSHA event was 6 days. We noted a total of 365 lost or restricted workdays among women and 885 workdays lost or restricted among men. Women averaged 4 lost or restricted workdays; men averaged 7. The total number of workdays lost or restricted, as well as the average number of days lost or restricted, decreased substantially from 2000 to 2001. The total number of workdays lost or restricted in 2000 was 937 for women and 1,310 for men. The average number of days was 12 days for women and 9 days for men in 2000. Among women and men, the longest average duration of absence in 2001 was observed among workers 50 years of age or older: 9 days for women and 8 days for men.

Overall, the average number of lost or restricted workdays was highest among workers in the Non-Regular category (9 days). Women in this job category had an average of 11 lost or restricted workdays. Only 1 of the 6 women who reported an OSHA event in this job category had any lost or restricted workdays. She had 63 days of restricted activity after falling off a desk and injuring her neck and back. The highest average lost or restricted workdays among men occurred in the Crafts and Manual Labor group (10 days).

Diagnostic and Accident Categories for OSHA-Recordable Events

The 224 OSHA events recorded on the OSHA 200 Logs involved 143 diagnoses among women and 192 diagnoses among men (Figure 17). Injuries accounted for 33 percent of the diagnoses reported among women and 40 percent of the diagnoses reported among men. The most common (42 percent) OSHA-recordable injuries were unspecified (55 percent among women and 34 percent among men). Male workers also frequently reported open wounds (24 percent). For both men and women, unspecified injuries were the most commonly reported injuries in both 2000 and 2001.

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

Diagnostic Category	Gender	
	Women	Men
Heart/Circulatory	1	0
Muscles & Skeleton	72	94
Nervous System	3	1
Respiratory	2	0
Skin	3	5
Unspecified Symptoms	15	16
Injury	47	76
Fractures – Upper Limb	1	0
Back Sprains & Strains	2	3
Other Sprains & Strains	4	8
Open Wounds – Head, Neck, Trunk	0	5
Open Wounds – Upper Limb	5	11
Open Wounds – Lower Limb	0	2
Superficial Injuries	0	5
Bruises	1	2
Foreign Bodies Entering Orifice	1	4
Burns	0	2
Unspecified Injuries	26	26
Adverse Reactions to Non-Medical Substances	5	8
Adverse Reactions to External Causes	2	0

We continued to observe the decreased number of injuries, particularly sprains and strains of the back and of other sites, that was first observed in 2000 among both men and women. Over the same time period, the number of muscles and skeleton conditions increased among men; the decrease in the number of injuries was offset by the increase in the number of muscles and skeleton disorders. This offset was not observed among women. Several changes made by the site in the capturing and reporting of OSHA events may explain the trends that we have observed in the types of diagnoses reported. Over the past 3 years, SNL-AL implemented an Incident Tracking System and at the same time decreased the length of narrative descriptions of diagnoses provided for OSHA-recordable events.

Ninety-six percent (216) of the 224 OSHA events were described as an accident in the OSHA logs (Figure 18). The majority of these events were "other accidents." Overexertion and strenuous movements made up the majority of that category. Falls comprised the second most common type of accident for both women and men. These same types of accidents were also the most common in 2000.

Figure 18. OSHA-Recordable Accidents by Type and Gender

Accident Category	Gender	
	Women	Men
	Number of Accidents	Number of Accidents
Motor Vehicle Traffic	1	0
Motor Vehicle Non-Traffic	1	4
Non-Motor Vehicle	0	1
Poisoning – Non-Medicinal	4	5
Falls	21	22
Fire	0	1
Natural/Environmental Factors	1	4
Submersion/Suffocation/ Foreign Bodies	1	2
Other Accidents	56	92
Struck by an Object	8	21
Caught Between Objects	5	2
Machinery	0	1
Cutting/Piercing Instrument/Object	3	7
Hot, Corrosive, or Caustic Material/Steam	0	3
Electric Current	1	0
Overexertion/Strenuous Movements	26	47
Noise	0	1
Repetitive Trauma	13	10
Total	85	131

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. The OSHA-recordable rates were highest among male Crafts and Manual Labor and Security workers aged 50 and above and female Crafts and Manual Labor workers regardless of age. We saw no consistent relationship between age and the rate of OSHA-recordable events among men; women less than age 50 tended to have higher rates than did older women. Crafts and Manual Labor workers had the highest rate of injuries among both men and women.

Not all workers were at equal risk for occupational injury. Compared with other workers, Crafts and Manual Laborers were 9 times more likely to report an injury. They also were at higher risk for toxic effects from something other than medicine (10 times), complications and unspecified injuries (9 times), sprains and strains other than to the back (7 times), and open wounds to an upper limb (5 times). Support Staff were also at greater risk of open wounds to an upper limb (3 times). Crafts and Manual Laborers and Security workers were at 6 times greater risk for muscles and skeleton disorders, while Clerical workers were at 2 times greater risk for these disorders. In addition, the Crafts and Manual Laborers were at 11 times greater risk of symptoms, signs, and ill-defined conditions. These increased risks are similar to those reported for this work force in 2000.

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

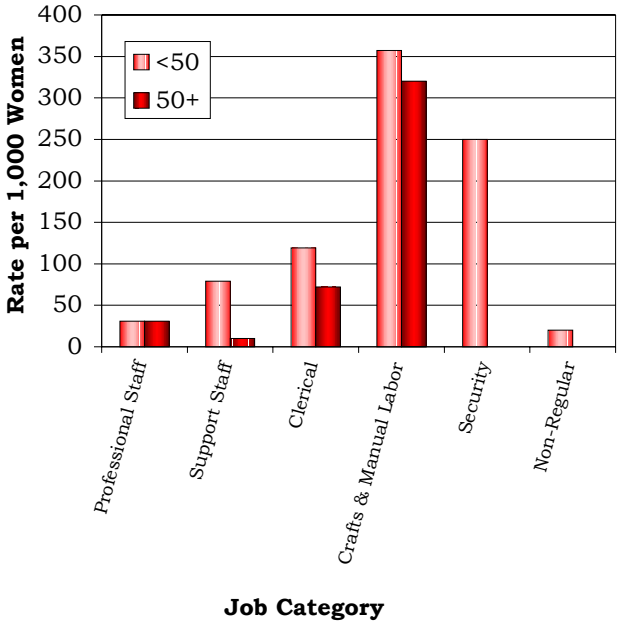
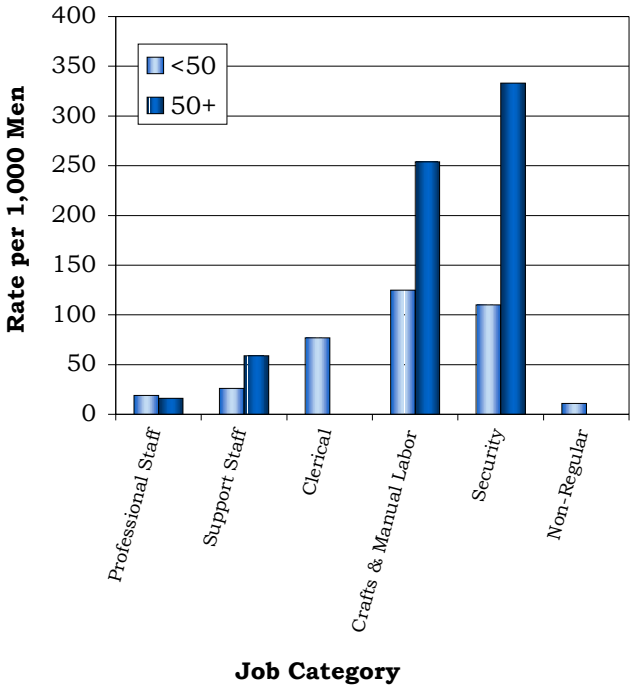


Figure 20. OSHA-Recordable Rates by Age and Job Categories Among Men, All Diagnoses Combined



Time Trends for OSHA-Recordable Events

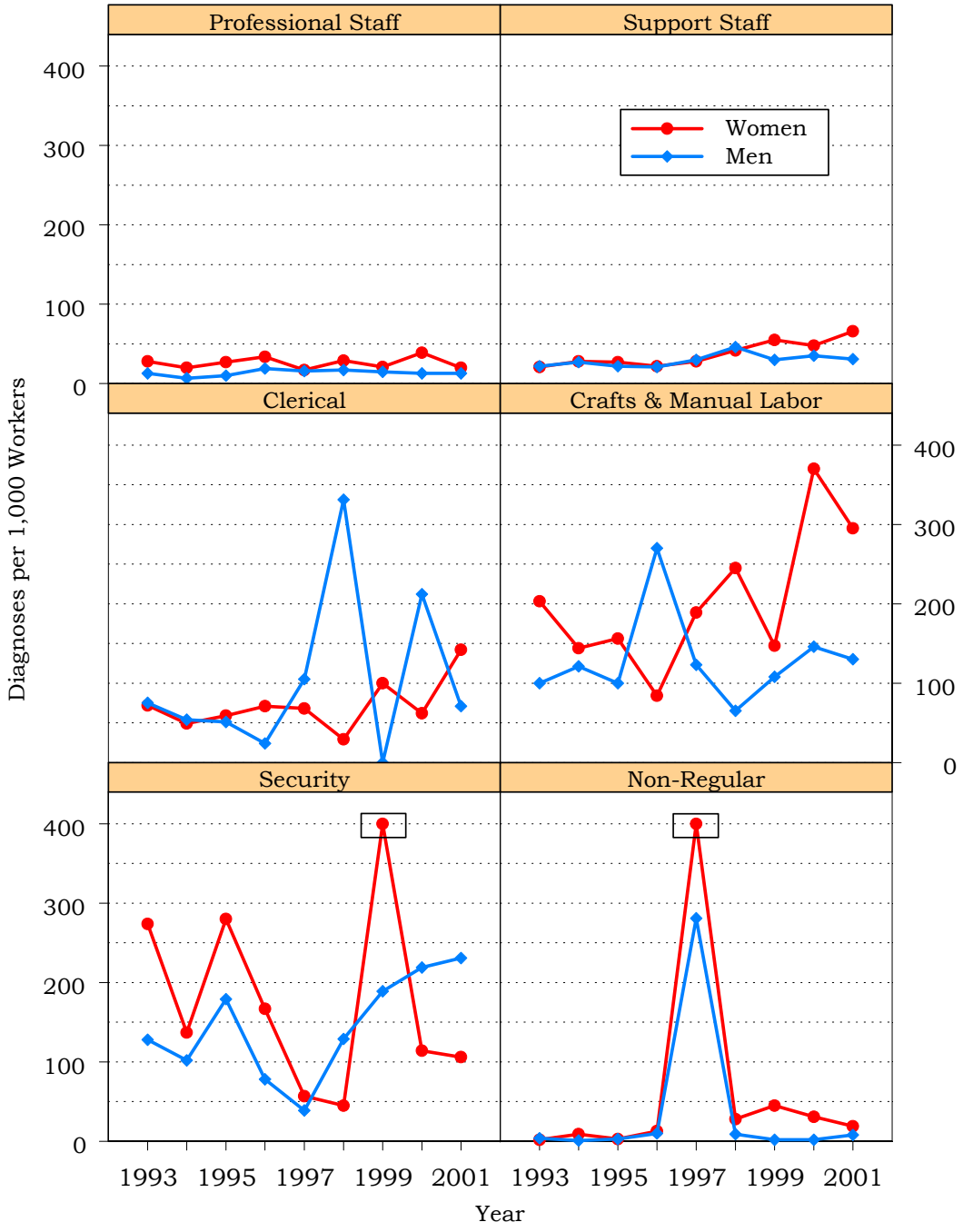
The age-adjusted rates for all OSHA-recordable diagnostic categories combined from 1993 to 2001 are shown in Figure 21**.** We observed no indication of systematic changes in the overall rates of OSHA-recordable events among Sandia workers during the 9-year period. The rate for all diagnoses combined, which increased dramatically during 1997 for men and women in the Non-Regular group, declined to close to the 1996 level beginning in 1998.

The rate remained stable over the 9-year period for women in the Professional Staff. An upward trend noted for Support Staff beginning in 1997 decreased in 2000, only to increase again in 2001. The rate among Clerical workers has tended to increase since 1998. The rates were more erratic among workers in Crafts and Manual Labor and Security; there was no evidence of a consistent trend.

Among men, Professional Staff and Support Staff had stable rates throughout the 9-year period. The OSHA-recordable rate among men in Security declined from 1995 to 1997 but has increased continuously since 1998. The rate among Crafts and Manual Laborers has remained unstable throughout the 9-year period, providing no evidence of a trend. The variation in the rate for men in the Clerical group is due to the small number of employees and events during this time.

There were no significant changes in injury rates for men and women.

Figure 21. Age-Adjusted Rates for All OSHA-Recordable Diagnoses Combined Among Women and Men by Job Category from 1993 to 2001



Note: The 1999 Security rate and 1997 Non-Regular rate for women were truncated to 400 (□) for graphical presentation. The actual rate for 1999 Security was 789 and for 1997 Non-Regular was 787.

Glossary

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Person-Year: A unit of measurement combining the number of people being studied with the time that each was observed equivalent to 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

• 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