



# 1997 Hanford Site Annual Epidemiologic Surveillance Report

## **HANFORD SITE**

### **1997 Epidemiologic Surveillance Report**

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**<http://www.eh.doe.gov/epi/surv>**

## **HANFORD SITE 1997**

### **At a Glance**

The most frequently reported adverse health conditions among men were injuries, muscles and skeleton conditions, and respiratory disorders. Women most frequently reported muscle and skeletal conditions, injuries, and digestive system problems.

Approximately 6% of the work force had at least one absence due to illness or injury in 1997, about the same as in 1994 to 1996.

The rates of illness and injury were highest among men classified as Service and Nuclear workers. Among women, the highest rates were among those classified as Crafts and Manual Labor and Service workers.

Occupational injuries (OSHA-recordables) resulted in a total of 3,786 lost or restricted workdays at Hanford in 1997.

Twenty-two workers reported one or more diagnoses of cancer in 1997. There was no evidence that any one particular type of cancer appeared more frequently, nor was any one occupation at particularly high risk.

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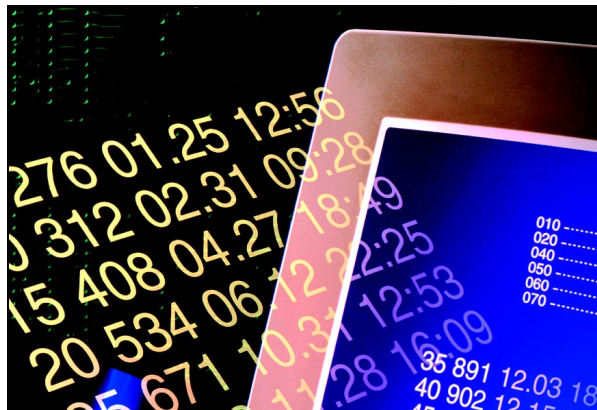
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## Introduction

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



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

This report provides a summary of epidemiologic surveillance data collected from the Hanford site from January 1, 1997 through December 31, 1997. The data were collected by a coordinator at Hanford 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 ongoing at Hanford since 1992.

The information presented in this report provides highlights of the data analyses conducted. Earlier surveillance reports and additional supporting tables are posted on the Office of Health

Studies' Web site (<http://www.eh.doe.gov/epi/surv>), or are available by request. The main sections of the report include: work force characteristics; absences of 5 or more consecutive workdays 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 1997 report includes sections on time trends that provide comparative information on earlier years.



**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; therefore, comparisons of Hanford 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 patterns of illness and injury observed.





## Site Overview

The Hanford site covers 560 square miles in the southeastern portion of Washington State, near the city of Richland. Construction of the site began in March 1943. Hanford's original mission was to produce plutonium for the world's first atomic bombs.

Construction of the world's first large-scale nuclear reactor, the B Reactor, began in 1943 and was completed in 1944. The plutonium from the B Reactor was used in the Trinity test bomb in New Mexico and in the "Fat Man" bomb that was dropped on Nagasaki, Japan in 1945.



After World War II, a gigantic nuclear arms race began between the United States and the Soviet Union resulting in what became known as the Cold War. The increased tensions between the two countries eventually lead to the addition of eight reactors to the Hanford Site. Defense production at the site peaked during the years 1956 to 1963.

In 1964, as a result of a decreased need for special nuclear materials, all of the defense reactors at Hanford were shutdown with the exception of the N Reactor, the newest reactor at Hanford that also produced electricity.

During the 1970s, the mission of the Hanford site began to diversify with the addition of energy research and development and technology development. The Hanford site was selected as the location for the Fast Flux Breeder Reactor prototype in January 1967 and construction of the facility began in December 1970. Initial startup occurred in February 1980 for the purpose of testing oxide fuels and addressing other fuel performance issues.

From 1980 to 1989, defense production was increased at Hanford's N Reactor to bolster the nation's military power. Waste management was added to the site mission during this time, but it remained secondary to the defense production.

By the 1990s, changing world conditions eventually halted defense production at Hanford. Hanford's current mission includes the safe cleanup and management of the site's legacy wastes and the development and deployment of science and technology. The Hanford site is operated through a management and integration contract with Fluor Daniel Hanford, Inc. which was signed on October 1, 1996. Fluor Daniel and Project Hanford are the management contractor team.



## The Hanford Work Force - 1997

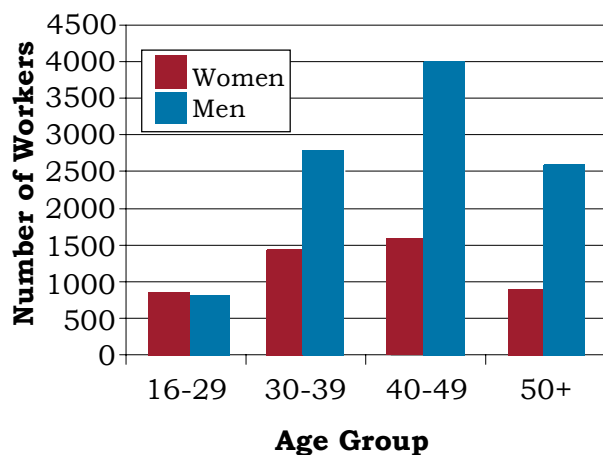
A total of 14,847 Hanford employees were included in epidemiologic surveillance in 1997, 897 fewer workers than were present in 1996. The gender and age distribution of the 1997 work force is shown in Figure 1. There were 4,720 (32%) women and 10,127 (68%) men in the work force. The average age of male



Hanford workers was 43 years of age and 40 years for females. No information was available from the site concerning the racial/ethnic composition of the work force.

The distribution of workers by job categories and gender is shown in Figure 2. Individual job titles as reported by Hanford were grouped together into nine occupational categories. This is because there were either too few workers or

**Figure 1. The Work Force by Gender and Age**



absences 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 occupational groups. Fifty percent of female workers were Administration workers, while only 23 percent of male employees were in this job category. An additional one-third of men working at Hanford were Professional employees.

**Figure 2. The Work Force by Job Category and Gender**

Job Category	Women	Men
Administration	2,343 50%	2,339 23%
Professional	611 13%	3,331 33%
Technical	404 9%	830 8%
Other/Unknown Salaried	224 5%	616 6%
Service	104 2%	267 3%
Security	14 < 1%	200 2%
Craft & Manual Labor	44 1%	833 8%
Nuclear	158 3%	691 7%
Other/Unknown	818 17%	1,020 10%



## Number and Length of Absences

Epidemiologic surveillance examines absences of 5 or more consecutive workdays (also referred to as “5-day absences”). It is based on DOE Order 440.1 that requires contractor management to notify Occupational Medicine when a worker has been absent for 5 or



more consecutive workdays. 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 regardless of the length of absence. Non-occupational illnesses and injuries that involve absences less than 5 days do not routinely require a medical clearance for return to work and are therefore excluded from these analyses. Specific absences of 5 or more consecutive workdays that were not the result of an injury or illness were excluded. In 1997, these included 78 women with reported absences due to maternity leave and 4 men and 8 women with reported absences due to elective surgical procedures 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.

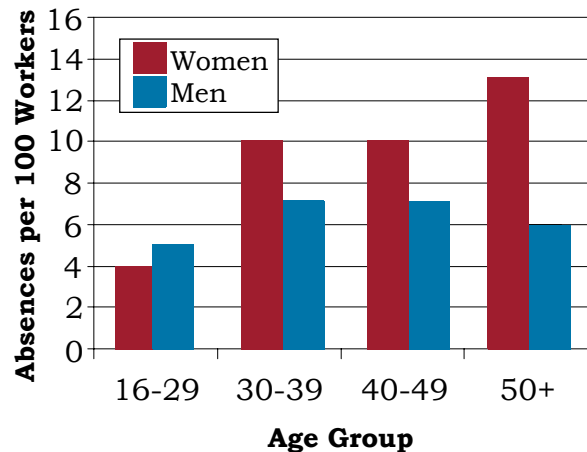
The rate of 5-day absences due to injury or illness varied by gender and age as shown in Figure 3. There were 450 5-day absences reported by 384 women, resulting in an absence rate of 10 per 100 workers (450/4,720). Among the 10,127 men, there were 652 absences resulting in an absence rate of 6 per 100 workers (652/10,127). Among women, the rate of 5-day absences tended to increase with increasing age. The absence rate was constant for men 30 years and older with the rate slightly less for the youngest group of men.

The average length of absence by gender and age is shown in Figure 4.

The average length of absence was 27 days for men and 38 days for women. Within each age group, the average length of absence for women was longer than for men. Among men, the average length of absence tended to increase with increasing age. This trend was not seen for women whose average length of absence was fairly constant regardless of age.



**Figure 3. Absence Rate by Gender and Age**



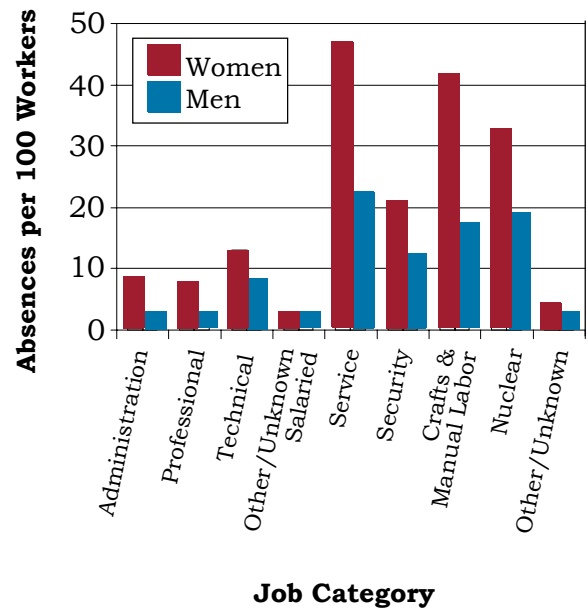
**Figure 4. Number of Days Absent by Gender and Age**

Gender	Age	Number of Absences	Number of Days Absent	Average Number of Days Absent
Women	16 - 29	34	1,482	44
	30 - 39	142	4,967	35
	40 - 49	162	6,656	41
	50 +	112	4,068	36
	Total	450	17,173	38
Men	16 - 29	38	562	15
	30 - 39	188	4,565	24
	40 - 49	263	7,339	28
	50 +	163	5,141	32
	Total	652	17,607	27

The rate of 5-day absences due to illness or injury varied by job category for men and women as shown in Figure 5. Women tended to have higher rates of absence across similar job categories compared with men. Among both men and women, Service workers had the highest rates of 5-day absences, 22 per 100 workers for men (59/267) and 46 per 100 workers for women (48/104). Workers in the Other/Unknown Salaried category had the lowest rates of 5-day absences.

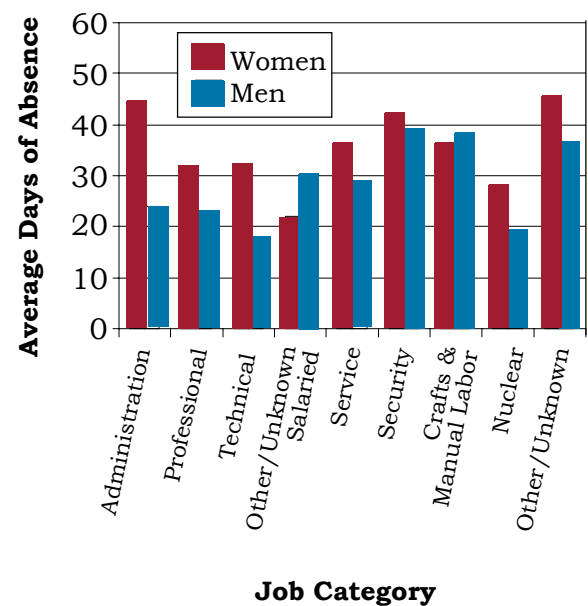
The average duration of absence by gender and job category is shown in Figure 6. In a given job category, the average length of absence was longer for women than for men except for the Other/Unknown Salaried and Crafts and Manual Labor groups.

**Figure 5. Absence Rate by Job Category and Gender**



Men in the Security group had the longest duration of absence (39 days), while men in the Technical group had the shortest absence (18 days). Among women, the job categories with the lowest 5-day absence rates, Other/Unknown Salaried and Other/Unknown, had the shortest (Other/Unknown salaried, 22days) and longest (Other/Unknown, 45 days) durations of absence.

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



## Diagnostic Categories

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

This report organizes illness and injury categories based on a standard reference, the *International Classification of Diseases, 9th Revision Clinical Modification (ICD-9-CM)*. This reference is used to classify health events for statistical purposes. You can find specific health conditions in the Explanation of Diagnostic Categories at the back of this report.

The number of reported diagnoses categorized according to the ICD-9-CM and number of lost calendar days are presented in Figure 7. There were 618 diagnoses reported by female and 856 diagnoses reported by male Hanford employees in 1997.

Female employees lost 17,173 calendar days due to injury and illness. Among women, muscles and skeleton conditions (15 percent), injuries (13 percent), and digestive conditions (13 percent) accounted for 41 percent of all reported diagnoses. Back pain and disk injuries made up 33 percent of the muscles and skeleton conditions followed by rheumatism (32 percent) and joint

disorders (30 percent). The majority of the injuries (52 percent) were reported as sprains and strains (31 percent) and as fractures (21 percent). Among the 80 injury diagnoses, 5 were allergic reactions or poisonings and 2 were complications of medical care. Digestive disorders included gallbladder disease (29 percent), disorders of the stomach (19 percent), hernias (14 percent), and enteritis and colitis (13 percent).

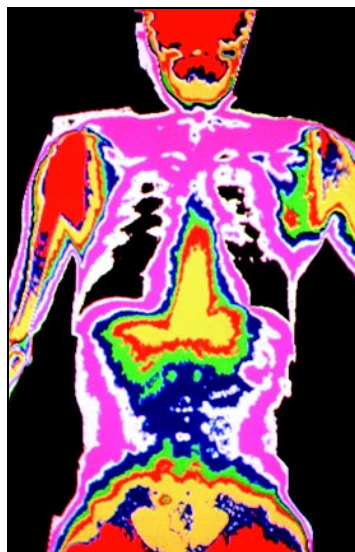
**Figure 7. Number of Diagnoses and Lost Calendar Days by Diagnostic Category (Categorized by ICD-9-CM) and Gender**

Diagnostic Category	Women		Men	
	Number of Diagnoses	Number of Lost Calendar Days	Number of Diagnoses	Number of Lost Calendar Days
Benign Growths	21	980	5	79
Blood	4	111	0	0
Cancer	12	743	13	645
Digestive	79	2,489	113	2,030
Endocrine / Metabolic	13	984	10	612
Existing Birth Condition	3	86	4	169
Genitourinary	74	2,387	26	456
Heart / Circulatory	19	756	55	2,197
Infections / Parasites	22	670	33	363
Injury	80	2,211	189	4,925
Miscarriage	5	147	NA	NA
Muscles & Skeleton	93	3,051	156	4,254
Nervous System	39	2,068	38	1,567
Psychological	39	2,962	26	1,020
Respiratory	73	965	140	1,692
Skin	5	66	10	208
Unspecified Symptoms	37	1,048	38	481

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

Men lost 17,607 calendar days due to injury and illness. Among male workers, 56 percent of all reported diagnoses were due to injuries (22 percent), muscle and skeletal conditions (18 percent), and respiratory conditions (16 percent). Frequently reported injuries were sprains and strains (39 percent), fractures (21 percent), and dislocations (11 percent). There were 2 allergic reactions or poisonings and 8 diagnoses related to complications of medical care reported among the 189 diagnoses categorized as injuries. A closer look at diagnoses affecting the muscles and skeleton showed that about 53 percent were back problems, 29 percent were joint disorders, and 12 percent were rheumatism. Acute respiratory infections accounted for 32 percent of the respiratory conditions, followed by pneumonia and flu (31 percent) and bronchitis (21 percent).

The above diagnoses did not vary much by age. Injuries, conditions affecting the respiratory system, and diagnoses of the muscles and skeleton ranked as the top three categories for men of all ages, except those over 50



years. Among workers aged 50 and older, reported diagnoses of the digestive system outnumbered respiratory conditions. Twenty-seven men reported 30 diagnoses of the digestive system; 40 percent were hernias, 20 percent were gallbladder disease, and 40 percent were gastroenteritis and colitis, intestinal disorders and ulcers.

Among women, the most frequently reported diagnoses were not as consistent among the various age groups. For those younger than age 50, injuries were among the most frequently reported diagnoses. Diagnoses related to the muscles and skeleton system were among the top three diagnoses reported by women aged 30 and older. Digestive system diagnoses were among the most frequently reported disorders for women of all ages, except the 40-49 group. Gallbladder disease and hernias accounted for most digestive system diagnoses. Six women younger than age 30 reported seven psychological diagnoses. All diagnoses were for anxiety and stress, or depression.

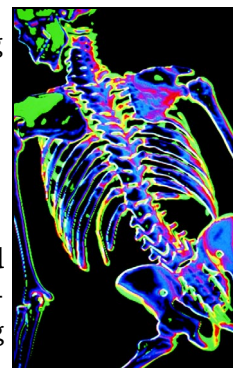
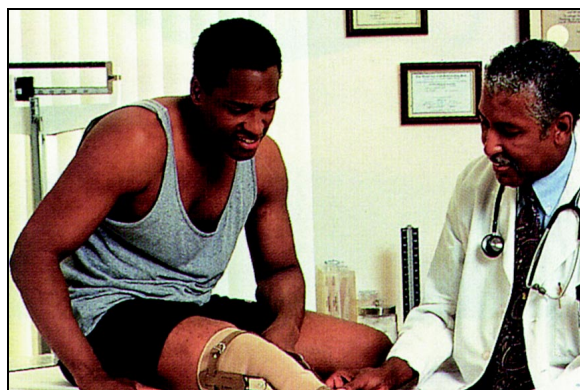


Figure 8 shows the frequency of reported diagnoses by job category for men and women. The types of diagnoses did not vary significantly by job category. Among men, muscles and skeleton conditions, injuries, and digestive and respiratory conditions frequently appeared in most occupational groups. Women commonly reported these diagnostic categories plus genitourinary diagnoses across job categories. Most of the genitourinary diagnoses were for disorders of the female reproductive organs.





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

Job Category	Men	Women
Administration	Injury (30) Muscles and Skeleton (24) Digestive (16)	Genitourinary (40) Digestive (39) Injury (33)
Professional	Injury (37) Digestive (20) Respiratory (20) Muscles and Skeleton (17)	Muscles and Skeleton (11) Injury (8) Digestive (6) Genitourinary (6)
Technical	Digestive (21) Respiratory (15) Injury (14) Muscles and Skeleton (14)	Muscles and Skeleton (17) Respiratory (12) Digestive (7) Injury (7) Nervous System (7)
Other/ Unknown Salaried	Cancer (2) Injury (2) Respiratory (2) Nervous System (2)	Digestive (2) Respiratory (2) Muscles and Skeleton (2)
Service	Muscles and Skeleton (19) Injury (17) Digestive (12) Respiratory (12)	Injury (13) Respiratory (8) Digestive (7)
Security	Muscles and Skeleton (13) Digestive (7) Respiratory (5)	Genitourinary (3) Nervous System (1)
Crafts & Manual Labor	Injury (44) Muscles and Skeleton (39) Respiratory (38)	Muscles and Skeleton (8) Injury (7) Respiratory (7) Genitourinary (5)
Nuclear	Respiratory (34) Injury (33) Muscles and Skeleton (28)	Respiratory (13) Digestive (10) Muscles and Skeleton (10) Injury (8)
Other/ Unknown	Injury (8) Respiratory (7) Heart/ Circulatory (6)	Muscles and Skeleton (9) Digestive (7) Psychological (4)

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

## Rates of Disease Occurrence

**A Word about Rates:** The previous section considered the **number** of absences and health conditions among various worker groups. For example, Figure 7 shows that men reported 140 and women reported 73 diagnoses involving respiratory diseases during 1997. Men, therefore, reported almost twice as many respiratory diagnoses as women. As there are more than twice as many men than women at Hanford, it seems reasonable to expect more respiratory diagnoses among men than women. Does this mean that men were at greater risk of respiratory disorders compared with women in 1997? To correctly answer that 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 respiratory diagnoses rate for each gender. Rates are calculated by dividing the number of respiratory 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:

$$140 \text{ respiratory diagnoses} \div 10,127 \text{ men} = .014 \times 1,000 = 14 \text{ respiratory diagnoses per 1,000 men}$$

$$73 \text{ respiratory diagnoses} \div 4,720 \text{ women} = .015 \times 1,000 = 15 \text{ respiratory diagnoses per 1,000 women}$$

Comparing these rates now correctly suggest that reported absences due to respiratory diseases among women are similar to rates for men. They are called crude rates because they do not account for possible differences between men and women, such as age and other factors that might affect the individual's risk of having a respiratory disorder. 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.

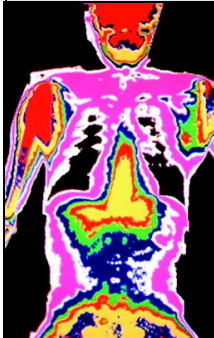


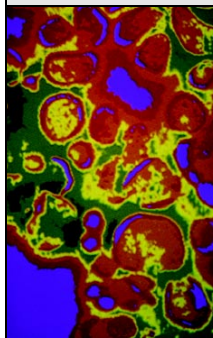
The diagnosis rate, also called the illness and injury rate, is the number of occurrences of a given disease or health condition observed over the course of a year per 1,000 workers at risk of getting that condition (see shaded box). One health condition, arthritis for example, may result in several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

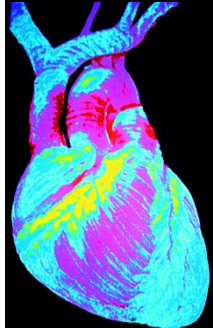
In the following set of analyses, the four age groups were collapsed into two groups: workers less than 50 years of age and those 50 or older. Five groups of diagnoses of particular interest to workers are presented in Figure 9: all illnesses and injuries combined; cancer; heart/circulatory system; respiratory system; and injury.

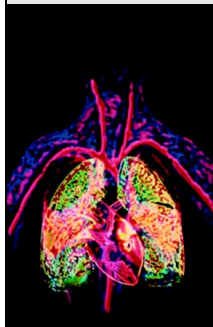
The rates for all illnesses and injuries combined were greater for female Hanford workers aged 50 and older compared with those younger than 50 with one exception. Women Service workers younger than age 50 had an overall illness and injury rate greater than those women aged 50+.

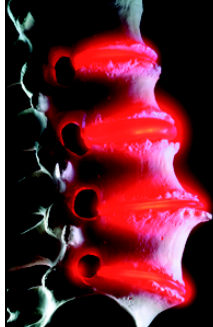
**Figure 9. Illness and Injury Rates by Job Category, Gender, and Age**

Diagnostic Category	Rate per 1,000			
	Job Category	Age	Men	Women
	Administration	<50	45	111
		50+	50	123
	Professional	<50	44	70
		50+	42	256
	Technical	<50	109	180
		50+	100	217
	Service	<50	305	672
		50+	250	595
	Security	<50	174	111
		50+	318	600
	Crafts & Manual Labor	<50	208	486
		50+	246	2,143
	Nuclear	<50	236	419
		50+	254	500
	Other/Unknown	<50	23	39
		50+	52	71

Diagnostic Category	Rate per 1,000			
	Occupational Group	Age	Men	Women
	Administration	<50	0	4
		50+	0	4
	Professional	<50	0	4
		50+	4	0
	Technical	<50	1	0
		50+	8	0
	Service	<50	0	0
		50+	0	0
	Security	<50	0	0
		50+	0	0
	Crafts & Manual Labor	<50	0	0
		50+	8	0
Nuclear	<50	0	0	
	50+	0	45	
Other/Unknown	<50	0	0	
	50+	13	0	

Diagnostic Category	Rate per 1,000			
	Occupational Group	Age	Men	Women
	Administration	<50	3	2
		50+	3	8
	Professional	<50	2	0
		50+	4	24
	Technical	<50	3	6
		50+	23	33
	Service	<50	5	75
		50+	31	0
	Security	<50	17	0
		50+	45	0
	Crafts & Manual Labor	<50	16	27
		50+	8	0
Nuclear	<50	13	0	
	50+	32	0	
Other/Unknown	<50	3	0	
	50+	7	0	

Diagnostic Category	Rate per 1,000			
	Occupational Group	Age	Men	Women
	Administration	<50	3	8
		50+	3	19
	Professional	<50	6	4
		50+	5	37
	Technical	<50	20	32
		50+	8	17
	Service	<50	54	90
		50+	16	54
	Security	<50	22	0
		50+	45	0
	Crafts & Manual Labor	<50	47	189
		50+	43	0
Nuclear	<50	49	74	
	50+	48	136	
Other/Unknown	<50	6	5	
	50+	4	0	

Diagnostic Category	Rate per 1,000			
	Occupational Group	Age	Men	Women
	Administration	<50	9	14
		50+	21	15
	Professional	<50	13	13
		50+	6	12
	Technical	<50	14	20
		50+	31	0
	Service	<50	74	194
		50+	31	0
	Security	<50	22	0
		50+	0	0
	Crafts & Manual Labor	<50	54	108
		50+	51	429
Nuclear	<50	53	51	
	50+	0	45	
Other/Unknown	<50	5	5	
	50+	9	0	

Those in Crafts and Manual Labor had the highest rates. Among men, illness and injury rates were generally greater among older workers, with three exceptions: workers in the Professional, Technical, and Service groups. The highest illness and injury rates among men were individuals classified as Service and Nuclear. Rates for female employees were higher than rates for males in the same job category, regardless of age, with the exception of Security workers younger than 50 years.

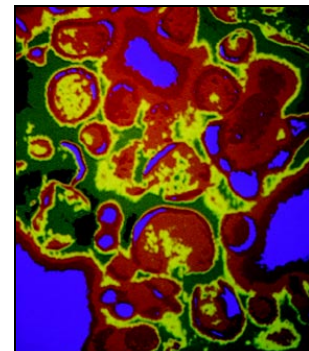
Cancer rates presented in this report are based on reported 5-day absences during the year. A worker may experience several periods of absence from one cancer diagnosis due to medical complications or treatment regimens. Each absence results in the report of a cancer diagnosis; however, it does not imply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

The likelihood that an individual in the U.S. develops cancer increases with age. Our data reflect this observation. Cancer rates in most occupational categories were highest among older workers. There were 23 5-day absences related to cancer reported, 13 diagnoses among 12 men and 12 diagnoses among 10 women. Five women, all younger than age 50, reported six diagnoses of breast cancer. Four were in



the Administration group and one in the Professional group. Five men each reported prostate cancer. They were all at least 50 years old, and worked in four different occupational groups.

Three men and two women reporting cancer in 1997 reported cancer previously in 1994-1996. Two of the men (one with prostate cancer, one with malignant melanoma) reported the same cancers in 1996. The man with melanoma also reported cancers at secondary sites in 1996 and 1997 (brain and lung). The third man reported skin cancer in 1997 and had malignant melanoma reported in 1994. Among women who previously reported cancer, one reported secondary brain cancer in 1995 and 1997. She had an additional diagnosis for breast cancer in 1997. The other woman reported ovarian cancer in 1995 and 1997 and also reported colon cancer in 1995 and 1996.



Men aged 50 or greater had higher rates of heart/circulatory problems than younger men, with the exception of Crafts and Manual Labor workers. Seventeen of the 50 absences among men occurred in workers aged 50 and older; 13 of 55 diagnoses involved hypertension and 23 were due to ischemic heart disease (restricted blood flow through an artery). The Security group aged 50+ had the highest rate of heart/circulatory diagnoses (1 absence).

The rate of heart/circulatory problems was not related to age among women. Eight of 19 heart/circulatory diagnoses were among women aged 50

or more. Eight of the 19 diagnoses involved hypertension and 3 were for ischemic heart disease. Service workers less than age 50 had the highest rate of heart/circulatory diagnoses (4 absences). Workers in the Service, Crafts and Manual Labor, and Nuclear groups were at 3 to 4 times greater risk of heart/circulatory problems than other groups.

Male workers younger than age 50 generally had higher rates of respiratory disease than did older workers. This relationship was not seen among women. For men and women, Service, Crafts and Manual Labor, and Nuclear workers had the highest rates of respiratory disease compared with other occupational groups. Workers in these three occupational groups were 3 to 5 times more likely to report a respiratory condition compared with other workers.

For men and women, the rates of injury tended to be higher among younger workers. The Service and Crafts and Manual Labor groups had the highest injury rates among men. Among women, Crafts and Manual Labor workers had the highest rates. Service, Crafts and Manual Labor, and Nuclear workers were at least 3 times more likely to report an injury compared with workers in other occupational groups. Service workers were at least 5 times more likely to report a fracture of the neck, trunk, or leg, 12 times more likely to report a back sprain or strain, and 8 times more likely to report an unspecified injury than other groups. Crafts and Manual Labor workers were at least 3 times more likely to report a broken arm, a dislocation, sprain or strain, late



effect of an injury, or complication of medical care. Nuclear workers were at least twice as likely to report a dislocation, sprain or strain, or an unspecified injury. In another set of analyses, the risk of all illnesses and injuries combined among workers classified in one occupational group was compared with workers in the remaining eight occupational categories. Workers in the Service, Crafts and Manual Labor, and Nuclear groups were at least 3 times or more greater risk of illness and injury compared to workers in all other groups. The increased risk was not confined to diseases in any particular body system. Workers in the Technical group were at 40 percent greater risk and Security workers were at 90 percent greater risk of reporting an illness or injury compared to all other groups.

## Time Trends

### Why Are Rates Age-Adjusted?

The injury and illness rates in this section of the report are age-adjusted. Differences in the age composition among groups of workers are taken into consideration in the analyses and one rate is calculated for an entire group. This allows us to make comparisons between different groups 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 selected illness and injury categories from 1993 to 1997 are presented in Figure 10. It is important to note that the age-adjusted rates for the years 1994 and 1995 presented in this report differ from the *1994 and 1995 Annual Epidemiologic*



*Surveillance Reports* due to the elimination of health conditions resulting from maternity leave.

The age-adjusted rates for all illnesses and injuries combined have not changed markedly for men and women during the past 5 years. Decreases were



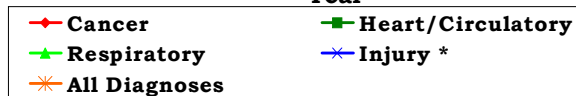
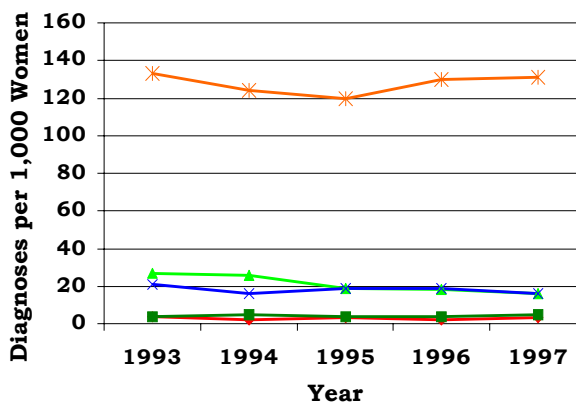
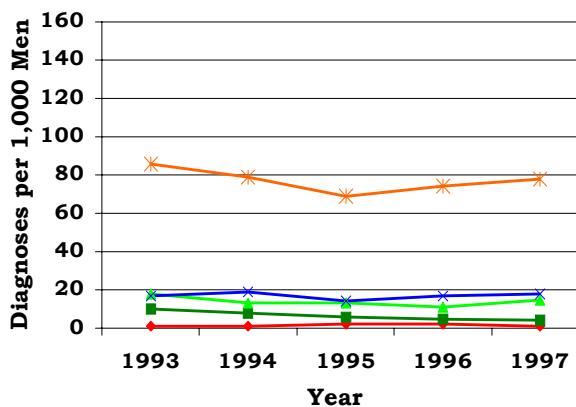
noted in the rates of heart/circulatory diagnoses among men, and in the rates of respiratory conditions among women. These decreases were not the result of a reduction in any particular disease type or reduction within any one age group.

The age-adjusted rates for all illnesses and injuries by job category from 1993 to 1997 are shown in Figure 11. Among both men and women, the rates for all illness and injuries combined increased over time in the Service and Crafts and Manual Labor groups and among men in the Security group. Among male employees in the Crafts and Manual Labor group, the increase was due to muscles and skeleton conditions, particularly joint disorders. The increase among men in the Service group appears related to an increase in reported diagnoses for workers aged 40-49. Among women in the Crafts and Manual Labor group, injuries increased among workers of all ages, and diagnoses of all types reported by workers 50+ years of age contributed to the increase in the rate over the time period.

For women in the Service group, and men in the Security group, the increased rate was not associated with any particular illness or injury or age group.

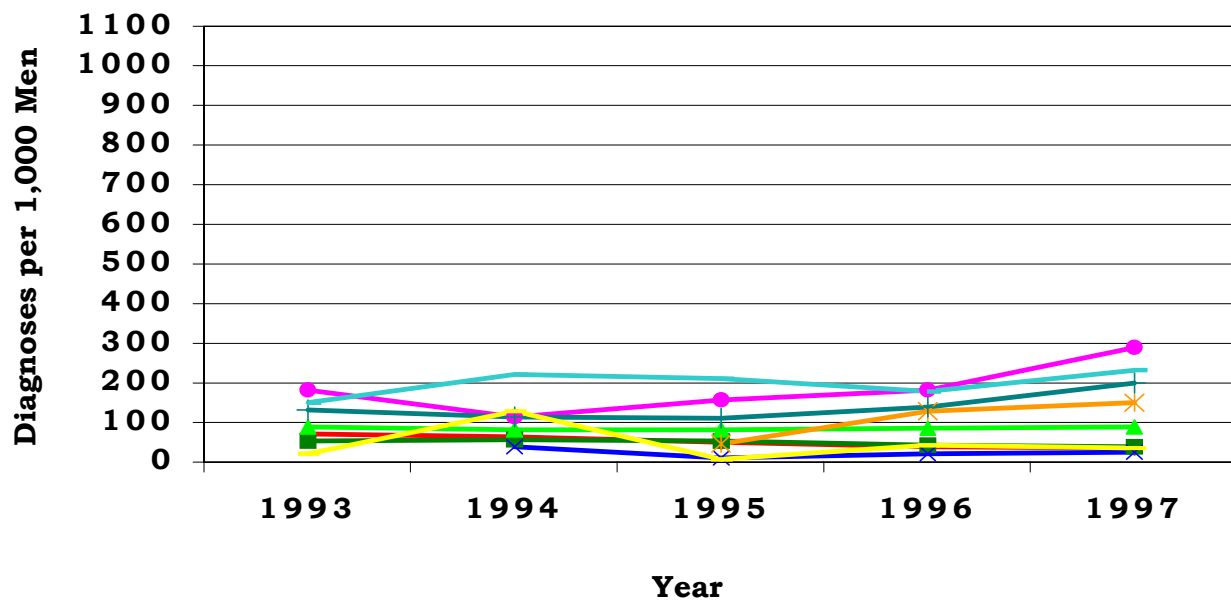
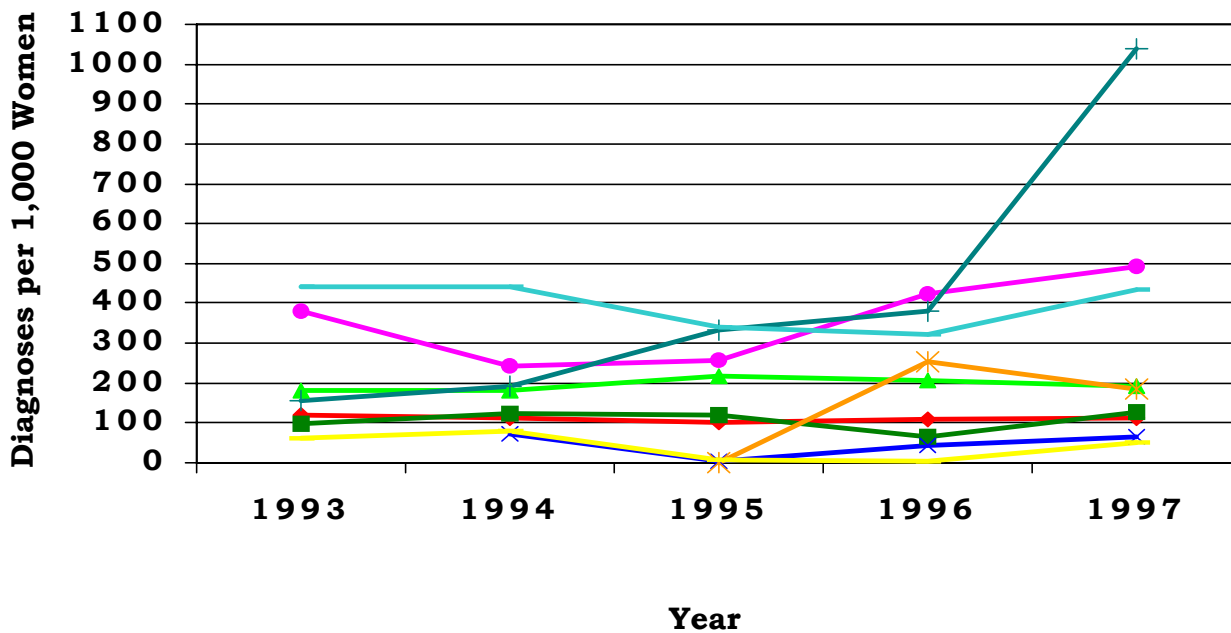


**Figure 10. Age-Adjusted Rates for Selected Diagnostic Categories for Men and Women from 1993 to 1997**



\*For 1993, rate based on external causes of injury data.

**Figure 11. Age-Adjusted Rates for all Diagnoses Combined Among Women and Men by Job Category from 1993 to 1997**



- ◆ Administration
- ▲ Technical
- Service
- + Crafts and Manual Labor
- + Other/Unknown
- Professional
- × Other/Unknown Salaried
- \* Security
- + Nuclear



## Sentinel Health Events for Occupations

A sentinel health event for occupation (SHEO) is a disease, disability, or death, which is likely to be occupationally related. Its occurrence may serve as a warning signal that materials substitution, engineering control, personal protection, or medical care may be required to reduce the risk of injury or illness among the work force. Sixty-four medical conditions associated with workplace exposures from studies of many different industries have been identified as sentinel health events (refer to the 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 two categories:

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

*Possible Sentinel Health Events:* Conditions such as lung cancer or carpal tunnel syndrome may or may not be related to occupation. Detailed occupational and non-occupational information



is required to determine the work-relatedness of the illness. For example, lung cancer may result from asbestos exposure or smoking. Carpal tunnel syndrome may result from a

job requiring typing or from a hobby such as playing the piano.

Of the 1,102 health events reported by Hanford workers in 1997, 8 definite and 32 possible sentinel health events were identified. Forty-six diagnoses were reported among these events (Figure 12). Twenty-seven of 32 possible sentinel health events, reported by 26 workers (16 women, 10 men), involved carpal tunnel syndrome. They resulted in an absence of 1,502 days. Workers in the Administration group reported 10 (37 percent) diagnoses of carpal tunnel. Workers aged 40 to 49 reported 11 (41 percent) diagnoses of carpal tunnel and 10 (37 percent) were reported by workers in the 30-39 age group.

**Figure 12. Characteristics of SHEOs by Gender**

	Total Number of SHEO Diagnoses		Total Number of Days Absent	
	Men	Women	Men	Women
Definite	8	6	363	25
Possible	11	21	448	1,322
Total	19	27	811	1,347

## Disabilities Among Active Workers

The site did not report disability data for the 1997 Hanford work force.

## Deaths Among Active Workers

The site did not report death data for the 1997 Hanford work force.

## OSHA-Recordable Events

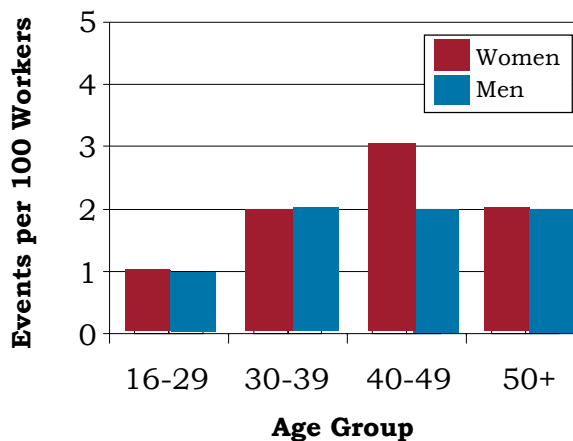
The Occupational Safety and Health Administration (OSHA) requires employers to maintain a record of occupational injuries and illnesses that have occurred among employees and to make that information available to OSHA on request. Employers maintain the information from these OSHA-recordable events in the OSHA 200 Log. OSHA-recordable events differ from health



events captured through return-to-work clearances in at least two important respects: 1) they do not necessarily result in days lost from work, and 2) they are usually accompanied by a specific determination that they are work-related.

The distribution of OSHA events by age and gender is shown in Figure 13. There were 105 OSHA-recordable events among women and 200 OSHA-recordable events among men. The rate of OSHA-recordables was the same for men and women, 2 per 100 workers, and did not differ significantly by age group.

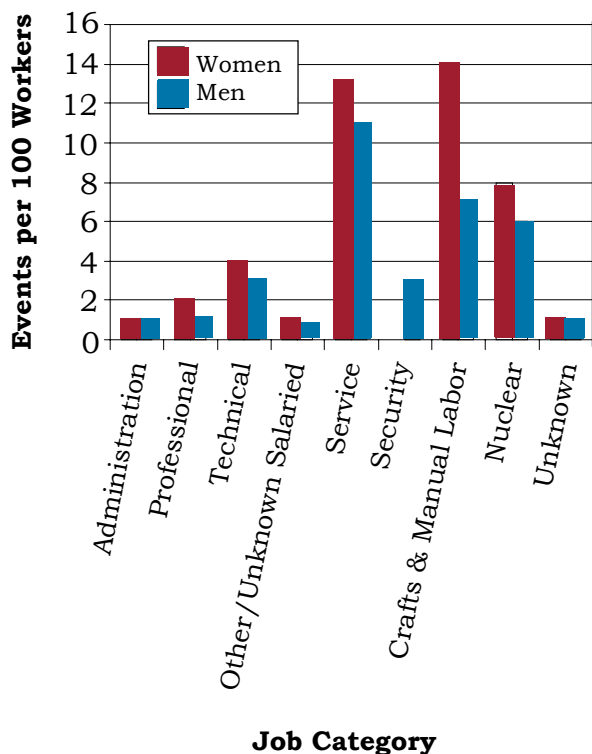
**Figure 13. OSHA-Recordable Events by Gender and Age**



The distribution of rates for OSHA-recordable events by job category and gender is shown in Figure 14. Service workers had the highest rate of OSHA events among men, 11 per 100 workers. Crafts and Manual Labor workers had the highest rate of OSHA events among women, 14 per 100 workers. Women had higher rates of OSHA events compared with men for all occupational categories except Security.

The average number of workdays lost or with restricted activity due to an OSHA event was similar for men (13 days) and women (12 days). Male workers in the Other/Unknown Salaried group averaged 31 days of restricted or lost workdays based on 2 OSHA events. Service workers averaged 21 lost and restricted workdays among male and 25 lost or restricted workdays among female employees. Female nuclear workers average 27 lost or restricted workdays compared with 12 among male workers. There was no apparent relationship between age and the number of lost or restricted workdays due to an OSHA event.

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

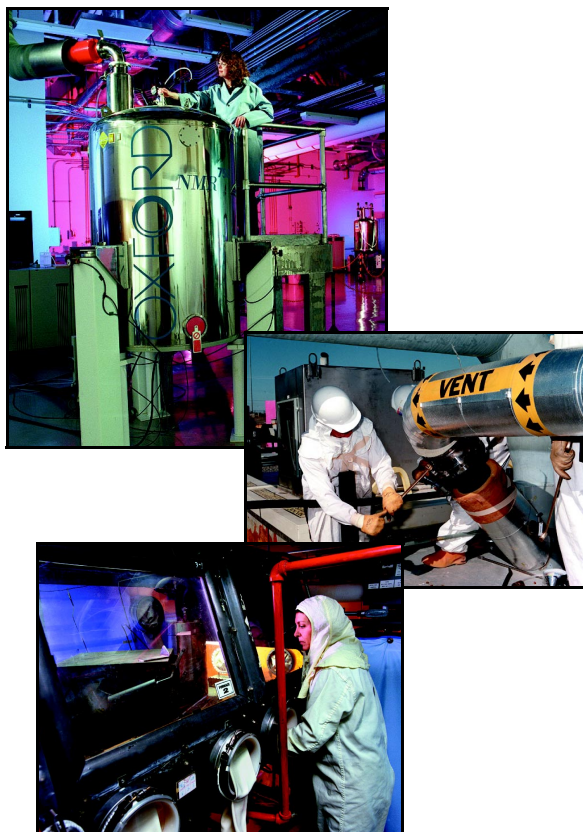


## Diagnostic and Accident Categories for OSHA-Recordable Events

There were 305 OSHA events recorded on the OSHA 200 Logs. There were 150 diagnoses among women and 245 diagnoses among men as shown in Figure 15.

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

Diagnostic Category	Gender	
	Women	Men
Digestive	2	0
Muscles and Skeleton	51	37
Nervous System	14	8
Skin	1	3
Psychological	0	1
Unspecified Symptoms	9	5
Injury	73	191
Fractures-Skull	0	1
Fractures-Neck, Trunk	1	3
Fractures-Upper Limb	0	7
Fractures-Lower Limb	3	0
Dislocations	0	2
Back Sprains and Strains	14	55
Other Sprains and Strains	21	31
Open Wounds-Head, Neck, Trunk	1	9
Open Wounds-Upper Limb	5	21
Open Wounds-Lower Limb	0	1
Injuries to Blood Vessels	1	0
Superficial Injuries	4	9
Bruises	5	15
Crushing Injuries	1	0
Foreign Bodies Entering Orifice	1	14
Burns	4	9
Unspecified Injuries	3	10
Adverse Reactions to Non-Medical Substances	5	2
Adverse Reactions to External Causes	4	2



Injuries accounted for 49 percent of the diagnoses reported by women and 78 percent of the diagnoses reported by men. The most common type of OSHA-recordable injury was sprains and strains, 48 percent among women and 45 percent among men. Open wounds (16 percent) were also frequently reported injuries among men. Women frequently reported disorders of the muscles and skeleton (34 percent). There were 14 cases of carpal tunnel syndrome reported among men and women.

Ninety-five percent, 289 of the 305 OSHA events, were described as “an accident” in the OSHA logs and this distribution is shown in Figure 16. The majority of events were described as “other accidents,” 83/101 (82 percent) among women and 143/188 (76 percent) among men. Overexertion and strenuous movements made up the majority of that category. Falls made up the second most common type of accident.

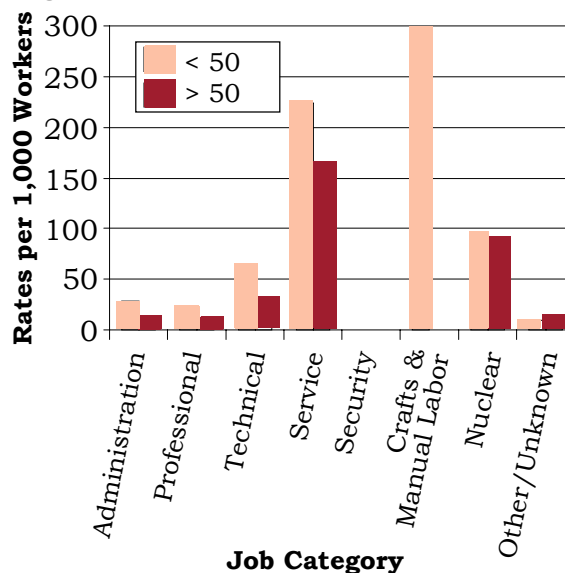
**Figure 16. OSHA-Recordable Accidents by Type and Gender**

Accident Category	Gender	
	Women Number of Accidents	Men Number of Accidents
Motor Vehicle Traffic	0	3
Poisoning-Non-Medicinal	4	0
Falls	7	22
Natural/Environmental Factors	6	6
Submersion/Suffocation/Foreign Bodies	1	14
Other Accidents	83	143
Caught Between Objects	3	5
Cutting/Piercing Instrument/Object	3	16
Electric Current	0	1
Hot, Corrosive, or Caustic Material/Steam	4	8
Machinery	0	1
Noise	0	2
Overexertion and Strenuous Movements	42	77
Repetitive Trauma	24	10
Struck by an Object	7	22
Unspecified	0	1

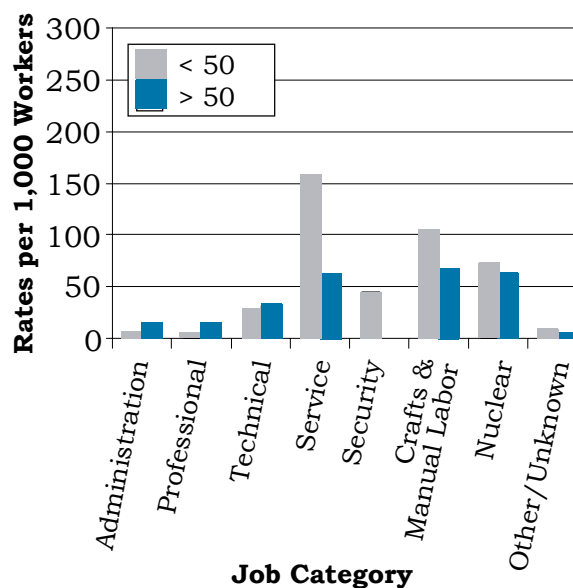
## Rates of OSHA-Recordable Events

The rates for OSHA-recordable events by age category, job category and gender are shown in Figures 17 and 18.

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



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



The OSHA-recordable rates for men and women were highest among workers in Service and Crafts and Manual Labor.



Most of the OSHA diagnoses involved injuries. Service workers and Crafts and Manual Labor workers made up 8 percent of the work force, but accounted for 36 percent of the OSHA-recordable events.

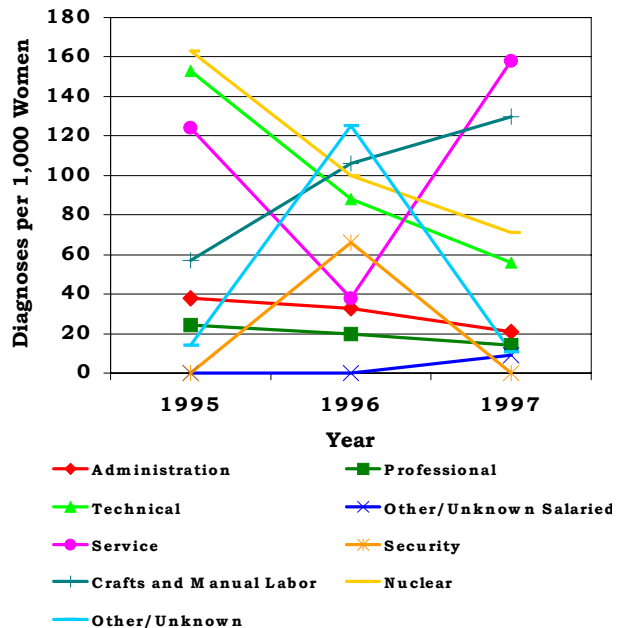
Service workers were at a 10 times higher risk of sprains and strains compared with all other workers. Nuclear workers showed an 8 times higher risk for back sprains and strains, and Crafts and Manual Laborers were almost 6 times more likely to report sprains and strains other than the back. Open wounds of the head, neck, trunk, and upper limb were at least 8 times more likely among Crafts and Manual Laborers and more than 4 times more likely among Nuclear workers compared with all other workers. Service workers and Crafts and Manual Laborers were more likely than other workers to suffer burns, superficial injuries, and a foreign body in a body opening. Bruises were at least 8 times more likely to occur among Nuclear and Service workers. Service workers were at higher risk (13-fold) for nervous system disorders than other groups, while Crafts and Manual Laborers (6-fold risk) and Nuclear workers (3-fold risk) were more likely to report disorders of the muscles and skeleton.

### Time Trends for OSHA-Recordable Events

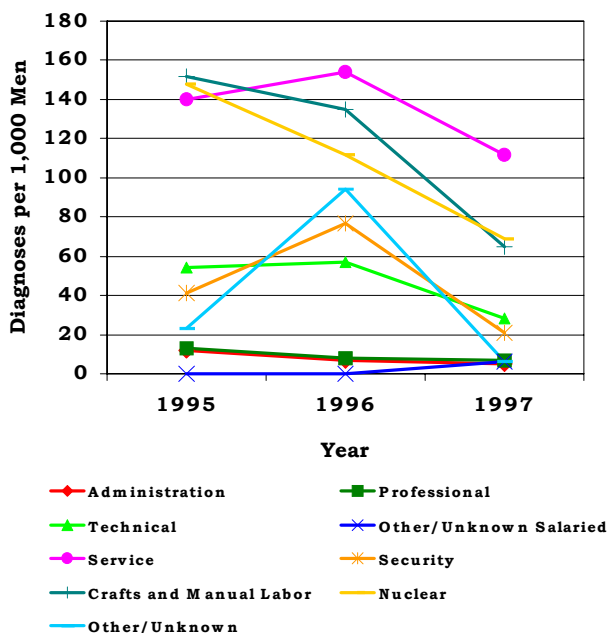
The age-adjusted rates for OSHA-recordable events by job category among women and men from 1995 to 1997 are shown in Figures 19 and 20. The rates for OSHA-recordable events among men and women did not change greatly for many of the occupational groups. The rates for men in the Crafts and Manual Labor group showed a significant decline from 1996 to 1997 and rates for men and women in the Other/Unknown

group showed a significant increase in 1996 followed by a decline in 1997. There was also a decrease in the rates between 1995 and 1996 among female Technical workers. Injury rates decreased significantly from 1996 to 1997 for both men and women.

**Figure 19. Age-Adjusted Rates for All OSHA-Recordable Diagnoses Combined Among Women by Job Category from 1995 to 1997**



**Figure 20. Age-Adjusted Rates for All OSHA-Recordable Diagnoses Combined Among Men by Job Category from 1995 to 1997**





## Glossary

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

### **Explanation of Diagnostic Categories**

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

<b>Abbreviated Categories Used in the Annual Report</b>	<b>ICD-9-CM Codes</b>
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**

<b>All conditions</b>	001-V82	All reported health events
<b>Infectious and parasitic diseases</b>	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

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• 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
<b>Malignant neoplasms</b>	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)
<b>Benign neoplasms and neoplasms of uncertain behavior and unspecified nature</b>	210-229 235-239	Tumors that are not cancerous or do not exhibit cancerous behavior, regardless of the part of the body affected
<b>Endocrine, nutritional, and metabolic diseases and disorders of the immune system</b>	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
<b>Disorders of the blood and blood forming organs</b>	280-289	Anemia and hemophilia (excludes leukemia)

<b>Mental disorders</b>	290-319	Psychiatric diagnoses - Non-psychotic disorders: depression; anxiety, fear, and stress disorders; alcoholism; drugdependence;and eating disorders, such as anorexia; Psychoticdisorders: dementia, schizophrenia, and manic depression
<b>Diseases of the nervous system and sense organs</b>	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
<b>Diseases of the circulatory system</b>	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



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- 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

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• 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
<b>Complications of pregnancy, childbirth, and the puerperium</b>	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
<b>Diseases of the skin and subcutaneous tissue</b>	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
<b>Diseases of the musculoskeletal system and connective tissue</b>	710-739	Arthritis, systemic lupus erythematosus, ankylosing spondylitis, herniated intervertebral disc (“slipped disc”), lumbago, sciatica, rheumatism, tendonitis, and osteoporosis
• Arthropathies and related disorders	710-719	Arthritis; joint pain and stiffness; and other diseases of the connective tissue which supports and connects internal organs, forms bones and blood vessel walls, and attaches to bones
• Dorsopathies	720-724	Swelling of the spine; herniated, slipped, and ruptured disc; rheumatoid arthritis of the spine; lumbago; and sciatica
• Rheumatism, excluding the back	725-729	Swelling and degeneration of joints, muscles, tendons; tennis elbow; and bursitis
• Osteopathies, chondropathies, and acquired musculoskeletal deformities	730-739	Fracture caused by bone disease; osteoporosis; curvature of the spine; flat foot; hammer toe; and development of deformities of the nose, toes, feet, legs, arms, and hands
<b>Congenital anomalies</b>	740-759	Spina bifida; cleft palate; harelip; and various chromosomal anomalies, such as Klinefelter’s syndrome
<b>Certain conditions originating in the perinatal period</b>	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

<b>Symptoms, signs, and ill-defined conditions</b>	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
<b>Injury and poisoning</b>	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

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