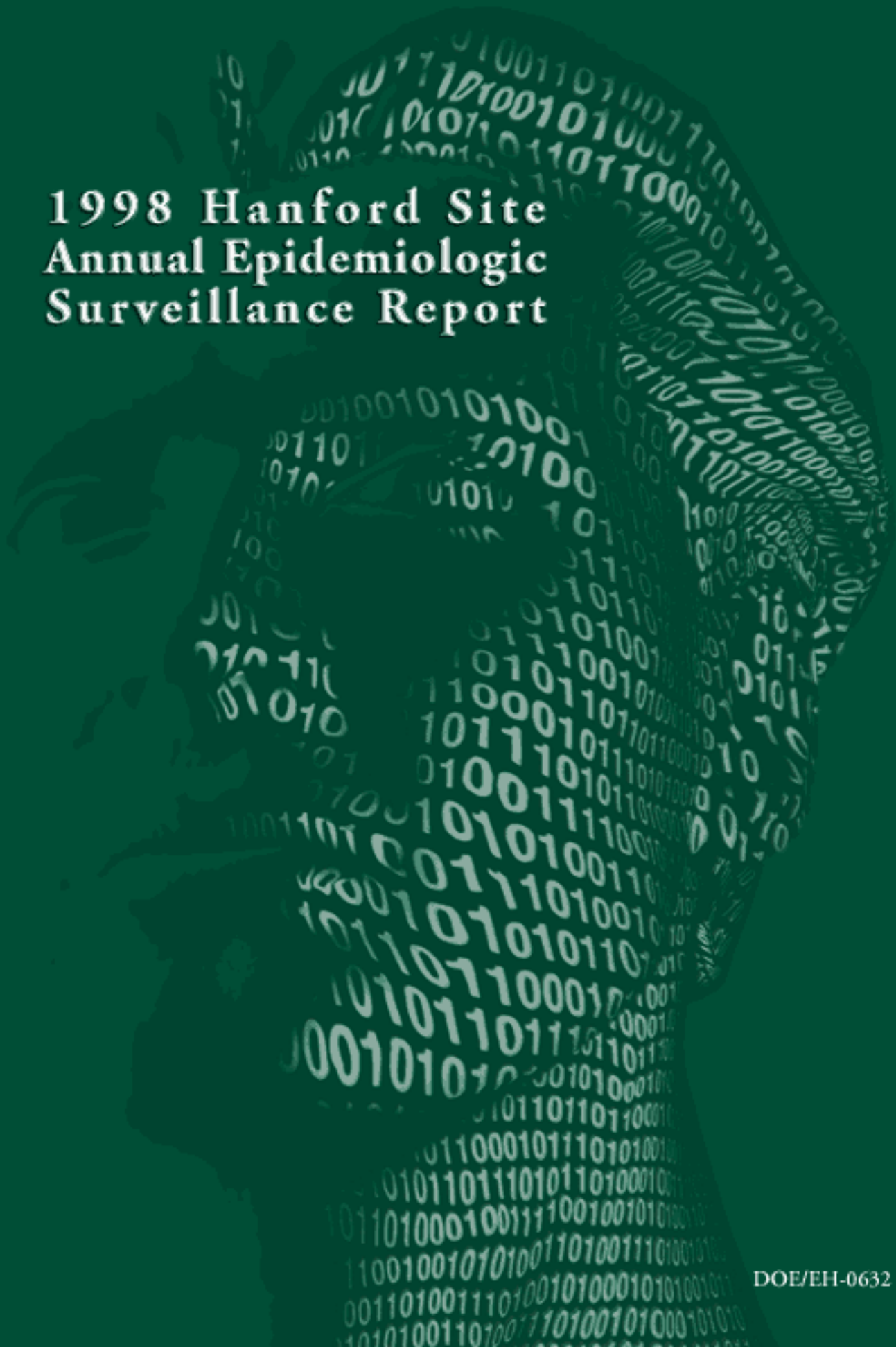
1998 Hanford Site Annual Epidemiologic Surveillance Report



DOE/EH-0632

HANFORD SITE

1998 Epidemiologic Surveillance Report

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

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

HANFORD SITE 1998

At a Glance

The most frequently reported adverse health conditions among men were injuries, muscles and skeleton conditions, and digestive disorders. One male worker reported a diagnosis of berylliosis related to past exposure to beryllium. Women most frequently reported muscles and skeleton conditions, injuries, digestive system problems and genitourinary conditions.

There was a slight decrease in the percentage of workers who reported at least one absence due to injury or illness in 1998, 5.1 percent, compared with 6.4 percent in 1997.

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

Occupational injuries (OSHA-recordables) resulted in a total of 2,812 lost or restricted workdays at Hanford in 1998.

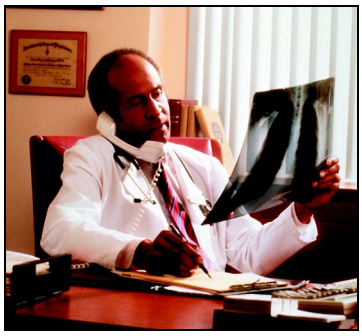
Thirty workers reported one or more diagnoses of cancer in 1998. There was no evidence that any one particular type of cancer was unusually frequent, nor any one occupation at particularly high risk.

Introduction

The U.S. Department of Energy's (DOE) commitment to assuring the health and safety of its workers includes the conduct of epidemiologic surveillance activities that provide an early warning system for health problems among workers. The Epidemiologic Surveillance Program monitors illnesses and health conditions that result in an absence of 5 or more consecutive workdays, occupational injuries and illnesses, and disabilities and deaths among current workers. Epidemiologic surveillance has been ongoing at Hanford since 1992.

This report provides a summary of epidemiologic surveillance data collected from Hanford during the period January 1, 1998 through December 31, 1998. 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. The analyses were interpreted and the final report prepared by the DOE Office of Health Programs.

The information in this report provides highlights of the data analyses conducted on the 1998 data collected from Hanford. Surveillance reports and additional supporting tables are posted on the Office of Health Programs' Web Site **(http://www.eh.doe.gov/epi/surv)**, or are available by request. The main sections of the report include: work force characteristics; absences due to injury or illness lasting 5 or more consecutive workdays; workplace injuries, illnesses, and deaths that were reportable to the Occupational Safety and Health Administration ("OSHA-recordable" events); and disabilities and deaths among current workers. This 1998 report includes a section on time trends that provides comparative information on the health of the work force from 1993 through 1998.



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

DOE sites vary by mission, function, job classification, and worker exposures. Comparisons of 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 observed patterns of illness and injury.

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 first atomic bombs. Construction of the first large-scale nuclear reactor, the B Reactor, began in 1943 and was completed in 1944. 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 former Soviet Union resulting in the Cold War. Increased tensions between the two countries eventually led 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.

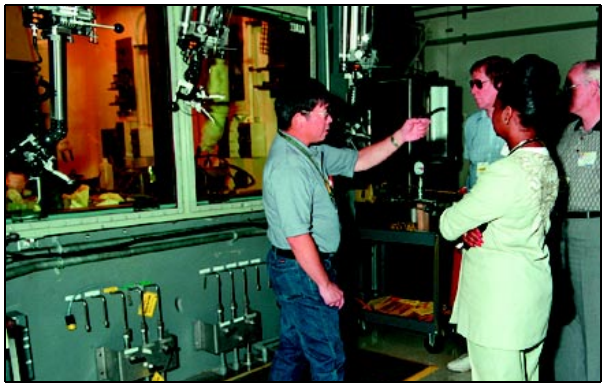
During the 1970s, the mission of the Hanford site began to diversify with the addition of energy research and development and technology development. The Hanford site was selected as the location for the Fast Flux Breeder Reactor prototype in January 1967. Construction of the facility began in December 1970 and 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 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 clean up and management of the site's legacy wastes and the development and deployment of science and technology. In 1998, Hanford's last plutonium production reactor, N Reactor, was deactivated.

The Hanford Site is operated through a management and integration contract with Fluor Daniel Hanford, Inc. which became effective on October 1, 1996. Fluor Daniel and the Project Hanford are the management contractor team.

The Hanford Work Force - 1998

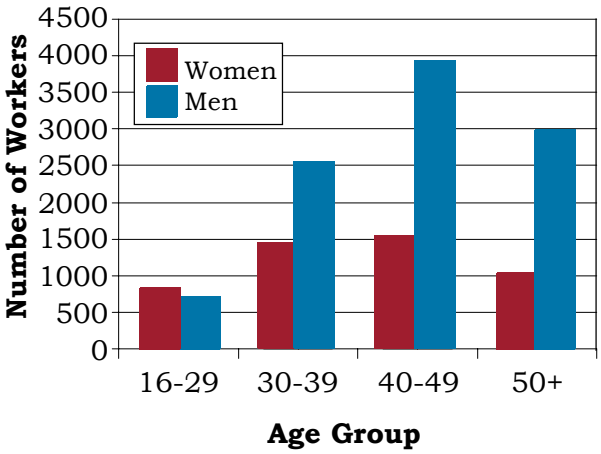
A total of 14,874 Hanford employees were included in epidemiologic surveillance in 1998, 27 more workers than were present in 1997. The gender and age distribution of the 1998 work force is shown in Figure 1. There were 4,774 (32 percent) women and 10,100 (68 percent) men in the work force. The average age



of male workers at Hanford was 44 years and 40 years for women. There was no information on the distribution of workers by race.

Surveillance data have been collected at Hanford since 1992. The Hanford work force decreased 24 percent from a high of 19,655 employees in 1994 to a low of 14,847 in 1997. Women have consistently made up about a third of the work force.

Figure 1. The Work Force by Gender and Age



There has been a gradual shift in the age of the work force; the percentage of workers under age 30 decreased and the percentage of workers aged 40 or more increased.

Hanford reported Service and Security occupations as two separate job categories starting in 1995. Individual job titles as reported by Hanford were grouped together into job categories. This is because there were either too few workers or health events within a particular job title, thereby limiting the type of analyses that could be conducted. The distribution of workers by job category and gender are shown in Figure 2. Men and women were not distributed equally among the various job categories. Forty-six percent of the women were administration workers, while one-fourth of the male workers were in this category. The largest percentage of male workers (32 percent) were classified as Professional workers.

Figure 2. The Work Force by Job Category and Gender

Job Category	Women	Men
Administration	2,210 46%	2,193 22%
Professional	597 13%	3,222 32%
Technical	376 8%	789 8%
Other/Unknown Salaried	177 4%	510 5%
Service	101 2%	262 3%
Security	13 < 1%	204 2%
Crafts & Manual Labor	42 1%	837 8%
Nuclear	154 3%	648 6%
Other/Unknown	1,104 23%	1,435 14%

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. One change from earlier surveillance reports is the exclusion of specific health events resulting in an absence of 5 or more consecutive workdays, but did not result from injury or illness. These include 68 absences among women due to maternity leave and absences for 5 individuals that were due to elective surgery or 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 absences among male and female workers is shown in Figure 3. There were 359 5-day absences among women, resulting in an absence rate of 8 per 100 workers (359/4,774). The 5-day absence rate among men was about 5 per 100 workers (496/10,100). The distribution of 5 or more consecutive workday absences due to injury or illness varied by age and gender. Women had a greater rate of 5-day absences than men did. The rates of absence increased with age among men and among women less than 50 years old.

The average length of absence by gender and age is shown in Figure 4. The average length of absence was 40 days for women and 37 days for men. Absences among women averaged 2 to 10 days longer than absences among men in the same age group except in workers aged 50 or older. Although there was no clear-cut trend, the length of absence tended to increase with age, with the exception of women in the oldest age group.

Figure 3. Absence Rate by Gender and Age

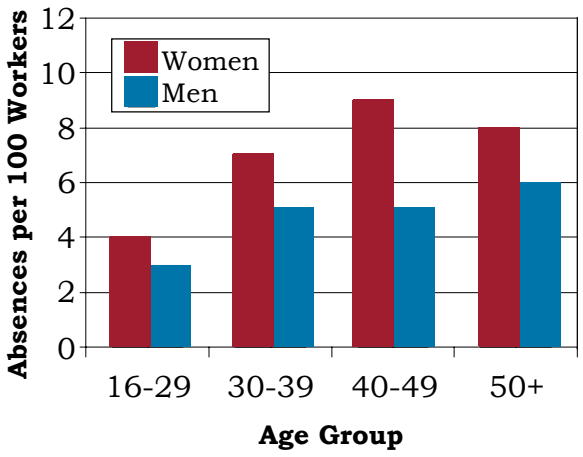
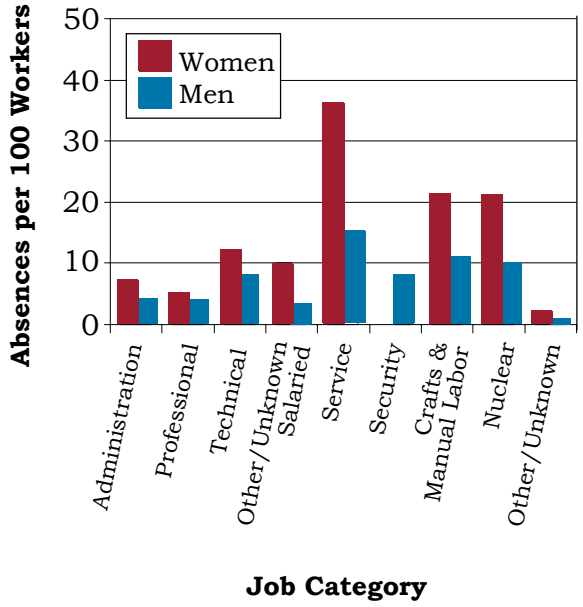


Figure 4. Number of Days Absent by Gender and Age

Gender	Age	Number of Absences	Number of Days Absent	Average Number of Days Absent
Women	16 - 29	31	870	28
	30 - 39	101	4,438	44
	40 - 49	143	6,362	45
	50 +	84	2,784	33
	Total	359	14,454	40
Men	16 - 29	18	474	26
	30 - 39	121	4,281	35
	40 - 49	195	6,755	35
	50 +	162	6,960	43
	Total	496	18,470	37

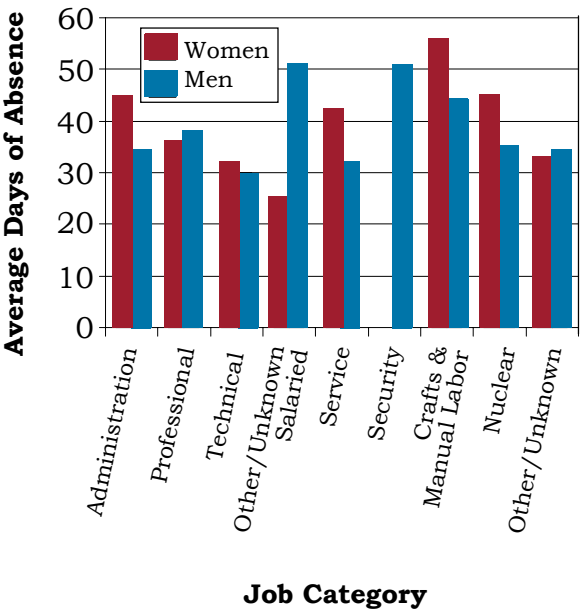
Figure 5 presents the 5-day absence rate by job category for men and women. With the exception of the Security group, women had higher rates of absence for every job category compared with men. Women in the Security group did not report any 5-day absences in 1998. In most job categories, the absence rate among women was about twice the rate among men. The 5-day absence rate among women was highest for Service workers (36/100). Among men, the absence rates were highest for Service (15/100), Crafts and Manual Labor (11/100), and Nuclear workers (10/100).

Figure 5. Absence Rate by Job Category and Gender



The average length of absence also varied by job category as shown in Figure 6. Among women, Crafts and Manual Laborers averaged the longest number of days absent, 56 days. Workers classified as Other/Unknown Salaried and as Security had the longest average absence (51 days) among men.

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. Epidemiologic surveillance includes all reported diagnoses in the analyses. In addition, the OSHA 200 Log provides information on recorded occupational injuries and illnesses whether or not they involve absences.

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

The number of reported diagnoses categorized according to the ICD-9-CM and number of lost calendar days (may include weekends or holidays) are presented in Figure 7. Lost calendar days for each absence are counted more than once when multiple diagnoses occur in different diagnostic categories for the same absence. There were 501 diagnoses reported by female workers and 652 diagnoses reported by male Hanford employees in 1998.

Female employees accrued 14,454 lost calendar days due to injury and illness. Four diagnostic categories, muscles and skeleton (18 percent), injuries (17 percent), digestive (12 percent), and genitourinary (11 percent) accounted for 58 percent of all reported conditions. Disc disorders and back pain accounted for 35 percent of all muscles and skeleton conditions. Sprains and strains (40 percent) and fractures (13 percent) were the most common injuries. Digestive conditions were primarily due to diseases of the gallbladder (47 percent), hernias (17 percent), and intestinal disorders (14 percent). Conditions of the female reproductive organs accounted for 75 percent of the genitourinary conditions.

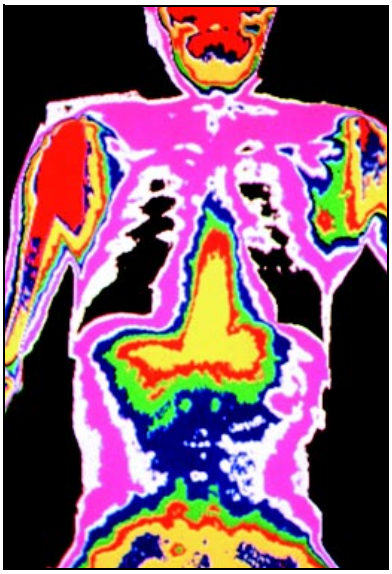
Figure 7. Number of Diagnoses and Lost Calendar Days by Diagnostic Category (Categorized by ICD-9-CM) and Gender

Diagnostic Category	Women		Men	
	Number of Diagnoses	Number of Lost Calendar Days	Number of Diagnoses	Number of Lost Calendar Days
Benign Growths	16	710	12	875
Blood	0	0	1	154
Cancer	9	451	24	2,250
Digestive	58	1,813	69	1,466
Endocrine / Metabolic	10	712	5	265
Existing Birth Condition	1	25	3	184
Genitourinary	56	2,163	12	270
Heart / Circulatory	11	316	40	1,701
Infections / Parasites	9	254	18	429
Injury	86	2,684	154	4,245
Miscarriage	4	105	NA	NA
Muscles & Skeleton	91	3,908	134	5,213
Nervous System	42	1,549	36	1,095
Psychological	31	2,175	34	1,264
Respiratory	52	914	58	886
Skin	9	275	14	420
Unspecified Symptoms	16	943	38	883

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

The most frequent number of lost calendar days of work among women was due to muscles and skeleton conditions, injuries, and psychological (primarily non-psychotic) conditions. Thirty-one diagnoses for psychological disorders were reported by 27 workers, with 23 diagnoses related to stress, anxiety, or depression. Women aged 30-49 years old frequently reported psychological disorders.

Men accrued 18,470 lost calendar days due to injury and illness. The most frequently reported conditions were injuries (24 percent), muscles and skeleton conditions (21 percent), and digestive conditions (11 percent). Sprains and strains accounted for 40 percent of the injuries. Fractures and dislocations made up most of the remainder. Fifty-three percent of the muscles and skeleton problems were dorsopathies (back, disc, or neck problems), 26 percent were arthritis, and 17 percent were rheumatism. At Hanford, hernias accounted for 42 percent of the digestive conditions reported by men. Gallbladder disease, intestinal disorders, and appendicitis accounted for 51 percent. The most frequent number of lost calendar days among men was due to muscles and skeleton conditions, injuries, and cancer.



The more frequently reported health conditions varied little with age among men. Injuries and muscles and skeleton conditions showed up in all age categories for men. Digestive disorders were reported frequently by men in all age groups except 40-49. Among women, the types of diagnoses varied little with age. Muscles and skeleton diagnoses were present in each age group; injuries, respiratory diseases, and genitourinary conditions were also frequently reported. Injuries were frequently reported by women aged 30 or older.

Figure 8 shows the frequency of reported diagnoses by job category for men and women. Conditions of the muscles and skeleton and injuries were common in nearly all occupational groups.

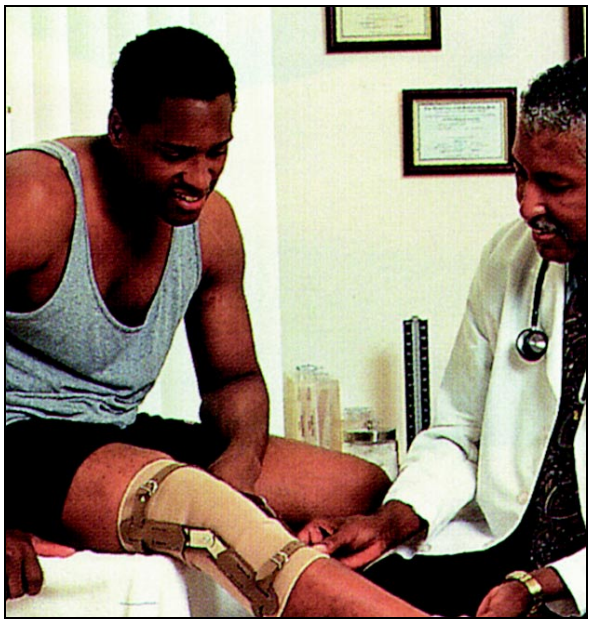


Figure 8. Most Frequently Reported Diagnoses by Job Category and Gender

Job Category	Men	Women
Administration	**Muscles & Skeleton (27)** **Injury (19)** **Digestive (11)**	**Digestive (40)** **Muscles & Skeleton (35)** **Genitourinary (25)**
Professional	**Injury (35)** **Muscles & Skeleton (25)** **Digestive (21)**	**Injury (12)** **Respiratory (7)** **Muscles & Skeleton (7)**
Technical	**Injury (15)** **Muscles & Skeleton (13)** **Respiratory (11)**	**Genitourinary (14)** **Injury (14)** **Muscles & Skeleton (13)** **Respiratory (7)**
Other/ Unknown Salaried	**Injury (4)** **Psychological (4)** **Heart / Circularory (3)** **Muscles & Skeleton (3)**	**Genitourinary (5)** **Injury (5)** **Respiratory (4)**
Service	**Injury (18)** **Muscles & Skeleton (13)** **Digestive (7)**	**Muscles & Skeleton (17)** **Injury (12)** **Respiratory (5)**
Security	**Injury (6)** **Muscles & Skeleton (4)** **Respiratory (3)**	**None**
Crafts & Manual Labor	**Injury (31)** **Muscles & Skeleton (27)** **Digestive (11)**	**Injury (7)** **Muscles & Skeleton (3)** **Endocrine / Metabolic (2)** **Genitourinary (2)**
Nuclear	**Injury (21)** **Muscles & Skeleton (18)** **Digestive (8)** **Respiratory (8)** **Unspecified Symptoms (8)**	**Injury (10)** **Muscles & Skeleton (10)** **Respiratory (5)**
Other/ Unknown	**Injury (5)** **Muscles & Skeleton (4)** **Unspecified Symptoms (3)**	**Injury (8)** **Genitourinary (5)** **Digestive (4)** **Psychological (4)** **Muscles & Skeleton (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 154 diagnoses of injuries and women reported 86 diagnoses involving injuries during 1998. Men, therefore, reported 79 percent more injuries than women. As there are more than twice as many men than women at Hanford, 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 1998? To correctly answer that question, the total number of men and women in the work force must be considered. A more accurate way to compare risk among men and women is to calculate the injury rate for each gender. Rates are calculated by dividing the number of injury diagnoses in a given gender by the total number of employees of that gender. Multiply this number by 1,000 to get the diagnosis rate per 1,000 workers.

For example:

154 injury diagnoses ÷ 10,100 men =
.015 x 1,000 =
15 injury diagnoses per 1,000 men

86 injury diagnoses ÷ 4,774 women =
.018 x 1,000 =
18 injury diagnoses per 1,000 women

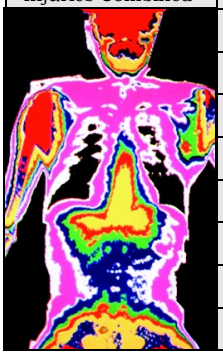
Comparing these rates now correctly suggests that reported absences due to injuries among women are higher than the rates for men. They are called **crude rates** because they do not account for possible differences between men and women, such as age and other factors that might affect the individual's risk of having 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 statistical methods of adjustment.

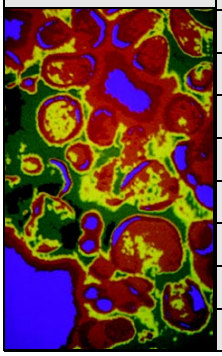
The diagnosis rate, also called the illness and injury rate, is the number of occurrences of a given disease or health condition observed over the course of a year per 1,000 workers at risk of getting that condition (see shaded box). One health condition, arthritis for example, may result in several 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.

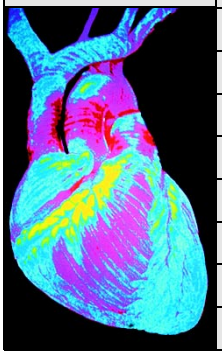
In the following set of analyses, the four age groups were collapsed into two groups, workers less than 50 years of age and those 50 or older. These groups were collapsed to ensure that the number of diagnoses in each group was large enough to analyze. The "Other/Unknown Salaried" and "Other/Unknown" groups were combined into one job category. Five groups of diagnoses of particular interest to workers are presented: all illnesses and injuries combined, cancer, heart/circulatory system, respiratory system, and injury.

Women generally had higher rates for all diagnoses combined than men for all occupational categories regardless of age. Among women, rates tended to be higher among the younger workers.

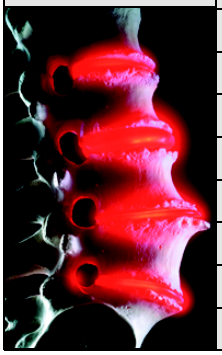
Figure 9. Illness and Injury Rates by Job Category, Gender, and Age

Diagnostic Category	Rate per 1,000			
All Illnesses & Injuries Combined	Job Category	Age	Men	Women
	Administration	<50	42	109
		50+	52	82
	Professional	<50	40	61
		50+	67	121
	Technical	<50	100	187
		50+	92	133
	Service	<50	208	556
		50+	243	316
	Security	<50	105	0
		50+	91	0
	Crafts & Manual Labor	<50	111	486
		50+	193	0
	Nuclear	<50	130	240
		50+	128	400
	Other/Unknown	<50	20	49
		50+	21	43

Diagnostic Category	Rate per 1,000			
Cancer	Job Category	Age	Men	Women
	Administration	<50	1	1
		50+	4	3
	Professional	<50	2	4
		50+	5	0
	Technical	<50	2	0
		50+	7	0
	Service	<50	0	0
		50+	0	53
	Security	<50	6	0
		50+	0	0
	Crafts & Manual Labor	<50	0	0
		50+	3	0
	Nuclear	<50	2	0
		50+	26	0
	Other/Unknown	<50	1	2
		50+	2	0

Diagnostic Category	Rate per 1,000			
Heart/Circulatory	Job Category	Age	Men	Women
	Administration	<50	3	1
		50+	4	13
	Professional	<50	4	0
		50+	3	11
	Technical	<50	5	3
		50+	0	0
	Service	<50	5	0
		50+	29	0
	Security	<50	0	0
		50+	0	0
	Crafts & Manual Labor	<50	6	0
		50+	24	0
	Nuclear	<50	2	0
		50+	26	0
	Other/Unknown	<50	1	0
		50+	4	0

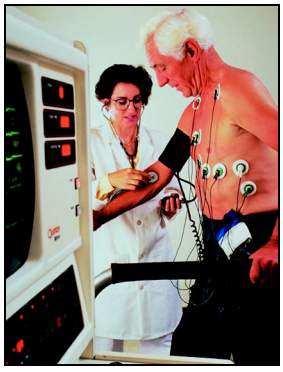
Diagnostic Category	Rate per 1,000			
Respiaratory	Job Category	Age	Men	Women
	Administration	<50	4	11
		50+	1	5
	Professional	<50	5	2
		50+	4	66
	Technical	<50	14	16
		50+	13	33
	Service	<50	16	32
		50+	14	79
	Security	<50	12	0
		50+	30	0
	Crafts & Manual Labor	<50	11	29
		50+	10	0
	Nuclear	<50	12	39
		50+	13	0
	Other/Unknown	<50	1	5
		50+	2	11

Diagnostic Category	Rate per 1,000			
Injury	Job Category	Age	Men	Women
	Administration	<50	8	10
		50+	9	3
	Professional	<50	8	20
		50+	19	22
	Technical	<50	20	35
		50+	13	50
	Service	<50	63	175
		50+	86	26
	Security	<50	35	0
		50+	0	0
	Crafts & Manual Labor	<50	33	200
		50+	44	0
	Nuclear	<50	33	39
		50+	26	200
	Other/Unknown	<50	5	11
		50+	4	5

Men tended to have higher rates in the older age group compared with younger men. Male and female workers in the Service, Nuclear, and Crafts and Manual Labor groups were at highest risk for illness or injury.

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. *Incident cancer rates* are based on the number of new cancer cases diagnosed within a given time, usually a year. The cancer rates in this report can appear substantially higher than the actual incidence of cancer due to the number of associated absences from work. The cancer rates in this report are not, therefore, comparable to the incidence rates frequently published in many articles on cancer with which you may be familiar.

The likelihood that an individual in the U.S. develops cancer increases with age. Cancer rates tended to be higher among older men compared to younger men. This trend was not as apparent among women. Thirty-three 5-day absences were reported involving 9 diagnoses among 7 women and 24 diagnoses among 23 men. Prostate cancer was the most frequently reported cancer diagnosis among men. Four prostate cancer diagnoses were reported by 4 men, aged 50 years or older. The 20 remaining cancer diagnoses reported by men were for 16 different sites. Two men who reported cancer in 1998 reported the same cancer previously; one man reported pancreatic cancer in 1997 and the other man reported kidney cancer in 1996. None of the women who reported cancer in 1998 had reported cancer in the period 1994-1997. In 1998, 3 women reported 4 diagnoses for breast cancer; all 3 women were at least 50 years old. Of the remaining 5 cancer diagnoses, 2 diagnoses were for cervical cancer, 2 for lymphoma (reported by 1 woman), and 1 for skin cancer. There was no evidence of an excess of any one particular type of cancer for either men or women by job category.



Women reported 11 heart/circulatory diagnoses; 2 were among women under 50 years old. Two of the 11 diagnoses involved hypertension or ischemic heart disease (restricted blood flow through an artery). Among men, workers aged 50 or older tended to have the highest rates of heart/circulatory problems. Nineteen of the 39 absences among men occurred in workers aged 50 or older; 47 percent (9/19) of the diagnoses among these older workers were for ischemic heart disease. Seven of the 19 diagnoses were in the Crafts and Manual Labor group, who as a group were 3 times more likely to report heart/circulatory diagnoses compared to workers in other job categories.

Respiratory disease rates did not change consistently with age. Among women, 49 of the 52 diagnoses for respiratory disease were upper respiratory infections, influenza and pneumonia, and bronchitis and asthma. Women in the Service group had the highest rates of respiratory disease. Among men, 54 of the 58 respiratory diagnoses were for upper respiratory infections, influenza and pneumonia, and bronchitis. Two diagnoses, both reported by one worker, were for berylliosis, due to exposure to beryllium. Respiratory disease risk among men of all ages was highest

among workers in the Service and Security groups. Respiratory disease was over 2 times more common among Technical and Nuclear workers and over 4 times more common among Service workers compared to workers in other job categories.

Injury rates were not related to age among either men or women. The variation in the rates among the women was probably due to the small number of diagnoses reported in some of the job categories. Workers in the Service, Crafts and Manual Labor, and Nuclear groups were 3 or more times more likely to report an injury than other workers. The risk of specific injuries varied by job category. Technical workers were 6 times more likely to fracture an upper limb compared to workers in other job categories. Service workers were at 5 times greater risk of a dislocation, 9 times greater risk of a back sprain or strain, and 6 times greater risk of a sprain or strain other than to the back compared with other workers. Lower limb fractures were 5 times more common among Security workers compared with other workers. Crafts and Manual Labor workers had 4 times the risk of a sprain or strain than other workers. The risk of a lower limb fracture or a sprain or strain other than to the back was 3 times, of a dislocation 4 times, and of late effects from an injury 15 times greater for workers in the Nuclear group compared to other job categories.

The risk of illness and injury among workers classified in one job category was compared with other workers in the remaining job categories. Technical and Crafts and Manual Labor workers were at twice the risk, and Service and Nuclear workers at 3 times the risk of all injuries and illnesses compared with workers in other groups. Technical workers were at 2 to 3 times the risk of psychological and genitourinary disorders compared to other job categories. Among Service workers, the risk of nervous system disorders and muscles and skeleton conditions was 6 times; symptoms, signs, and ill-defined conditions 4 times; and digestive diseases 3 times greater than other workers. Nuclear workers were at 9 times greater risk of endocrine and metabolic disorders; 3 times the risk of genitourinary diseases and muscles and skeleton conditions; and 4 times the risk of symptoms, signs, and ill-defined conditions as workers in other jobs.

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 are presented in Figure 10. It is important to note that the age-adjusted rates for the year 1994 presented in this report differ from the *1994 Annual Epidemiologic Surveillance*

Report due to the elimination of health conditions resulting from maternity leave.

The age-adjusted rates for all illness and injury categories have generally decreased among men and women during the past 6 years. Cancer and injury rates remained about the same during this period for both sexes. Respiratory rates declined from 1993 through 1998 among both men and women, and heart/circulatory disease rates steadily declined among men. These decreases were not due to a decline of any one particular diagnosis.

Age-adjusted rates for all illnesses and injuries combined are shown for the various job categories in Figure 11. Hanford reported Service and Security occupations as two separate categories starting in 1995. From 1993 through 1998, the rates for all diagnostic categories combined remained fairly constant within each occupational group with two exceptions. Rates for all diagnostic categories combined show a steady decrease among men in the Administration group due to a decline of heart/circulatory, respiratory, and digestive diagnoses. A similar but smaller decline is also seen for men in the Professional category, however this decrease does not appear to result from a decline in any particular diagnostic category, but rather a general decline in all diagnostic categories. Rates have also decreased among women in the Nuclear group. The decline from 1997 to 1998 resulted from a general decline in most diagnoses. The steady decline from 1993 through 1996 resulted from a decrease in reported injury occurrence. Since 1996, injury occurrence has increased among female Nuclear workers. The dramatic change in the rates for all illnesses and injuries among women in the Crafts and Manual Labor group between 1997 and 1998 resulted from a decrease in most diagnostic categories with the exception of injuries. Although these decreases reflect a decline in illness or injury, other events should also be considered, such as changes in reporting requirements for absenteeism or policies related to the administration of sick leave.

Figure 10. Age-Adjusted Rates for Selected Diagnostic Categories for Men and Women from 1993 to 1998

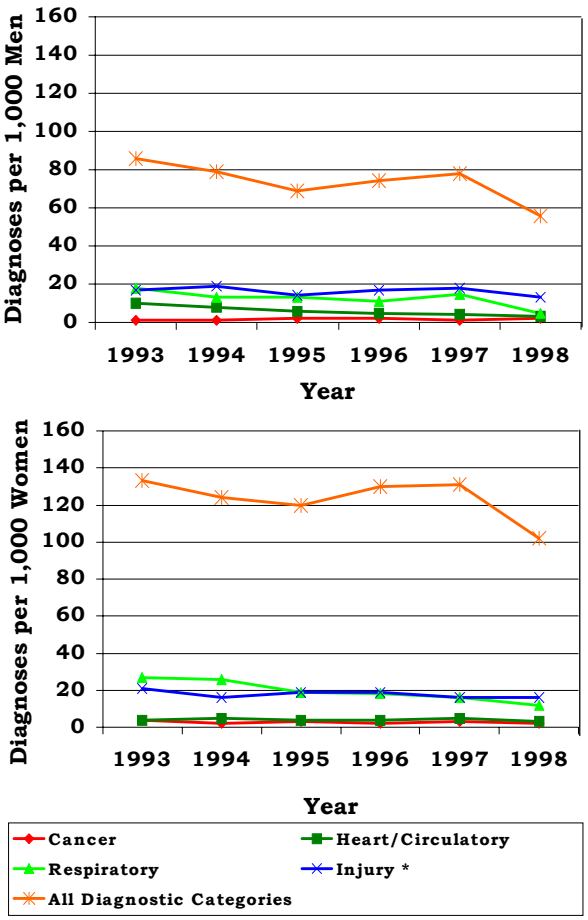
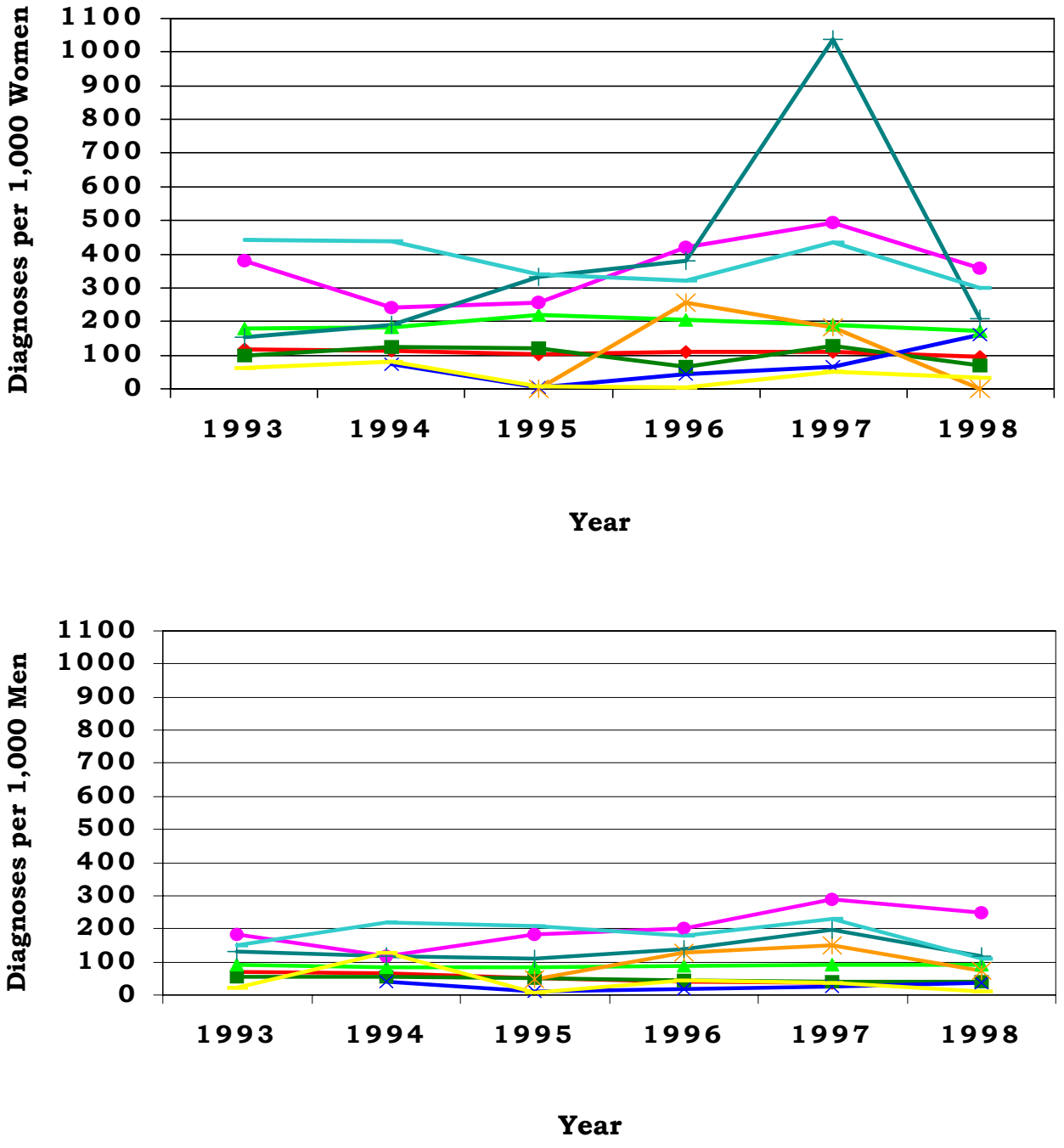


Figure 11. Age-Adjusted Rates for All Diagnoses Combined Among Women and Men by Job Category from 1993 to 1998

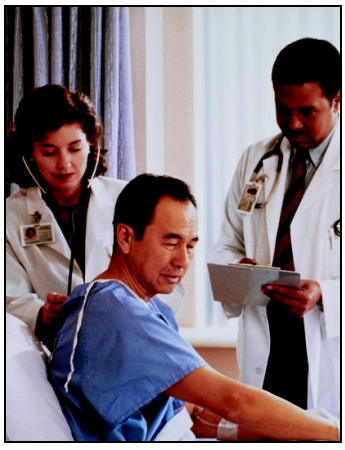


Sentinel Health Events for Occupations

A sentinel health event for occupations (SHEO) is a disease, disability, or death that is likely to be occupationally related. Its occurrence may serve as a warning signal that material substitution, engineering control, personal protection, or medical care may be required to reduce the risk of injury or illness among the work force. Sixty-four medical conditions associated with workplace exposures from studies of many different industries have been identified as sentinel health events. Although sentinel health events may indicate an occupational exposure, many may result from non-occupational exposures. Due to this uncertainty, sentinel health events are assessed in two categories:

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

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



Nine *definite* sentinel health event diagnoses affecting four workers were identified in 1998 (Figure 12). Two of the definite SHEO diagnoses were for berylliosis reported by a male Crafts and Manual Laborer aged 46. Twenty-nine of 1,153 (3 percent) diagnoses were identified as *possible* sentinel health events. Twenty-five of the 29 diagnoses were carpal tunnel syndrome, reported by 22 workers and resulting in 1,555 lost calendar days. Administration workers reported 8 of the carpal tunnel diagnoses, followed by 7 diagnoses among Crafts and Manual Labor workers.

Figure 12. Characteristics of SHEOs by Gender

	Total Number of SHEO Diagnoses		Total Number of Days Absent	
	Men	Women	Men	Women
Definite	8	1	68	56
Possible	14	15	1,109	1,057
Total	22	16	1,177	1,113

Disabilities Among Active Workers

There were no disability data reported in 1998.

Deaths Among Active Workers

There were no death data reported in 1998.

OSHA-Recordable Events

The Occupational Safety and Health Administration (OSHA) requires that employers maintain a record of occupational injuries and illnesses occurring 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 job-related.

The distribution of OSHA events per 100 workers by gender and age is shown in Figure 13. Occupational injuries resulted in a total of 2,812 lost or restricted workdays at Hanford in 1998. There were 81 women and 172 men who had one recordable OSHA event and 1 woman and 5 men with two or more OSHA events. Men reported over 2 times as many OSHA events as women, although the rate of workers with an OSHA event was the same for men and women (2 per 100 workers).

The occurrence of OSHA-recordable injuries did not appear related to age. The average number of workdays lost or with restricted activity was similar for women (10.7 days) and men (10.6 days) and appeared to increase with increasing age among women.

There was a 13 percent decrease in the number of OSHA-recordable events in 1998 (265) compared to the recordable events in 1997 (305). The overall reduction in occupational injuries reported may reflect changes in the types of work being done at the site or changes in the availability of OSHA data. The rates of OSHA-recordable events by job category and gender are shown in Figure 14. Among female workers, those in the Crafts and Manual Labor category had the highest rate of OSHA events, 12 per 100 workers. Among male workers, the highest rates of OSHA events were among Service, Crafts and Manual Labor, and Nuclear workers, 7 per 100. Service workers had the highest average number of workdays lost or with restricted activity for OSHA events among women (46 days). One worker, aged 42, reported a rotator cuff sprain; this event accounted for 138 lost and restricted workdays. The second highest average number of lost or restricted workdays among women occurred in the Nuclear category (26 days). One event involved a worker with sprains and strains to the upper limb and back and a total of 169 workdays were lost or restricted. Among men, Nuclear workers reported the highest average number of lost or restricted workdays (16 days). The Supporting Tables contain more detailed data about the number of OSHA events and days of work lost or with restricted activity.

Figure 13. OSHA-Recordable Events by Gender and Age

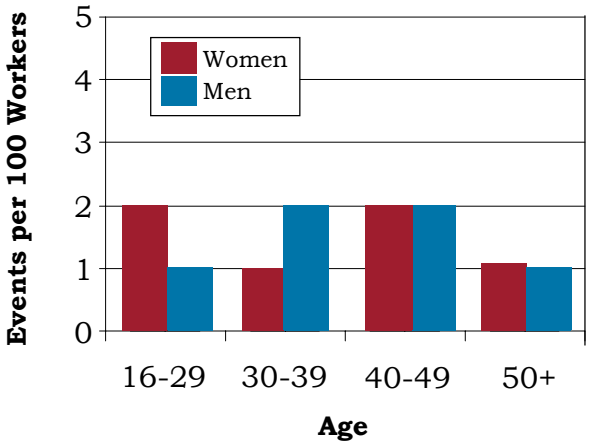


Figure 14. OSHA-Recordable Events by Job Category and Gender

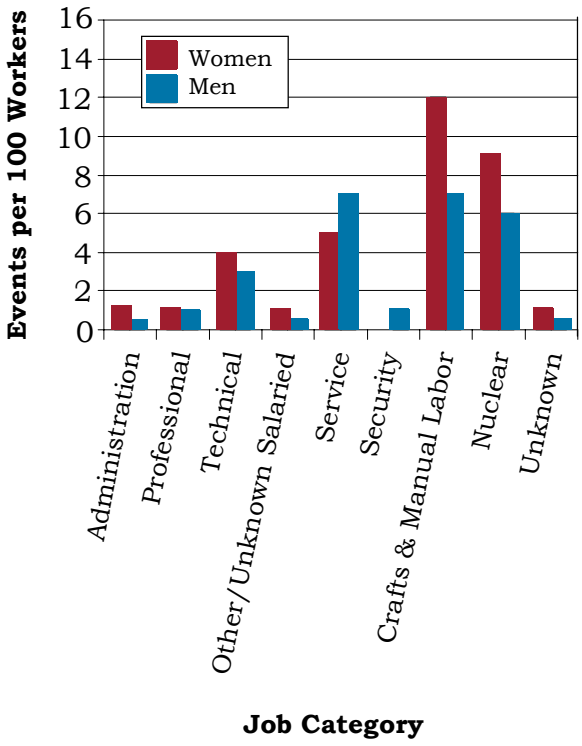


Figure 15. OSHA-Recordable Diagnoses by Diagnostic Category and Gender

Diagnostic Category	Gender	
	Women	Men
Digestive	0	5
Muscles and Skeleton	30	46
Nervous System	14	4
Psychological	0	1
Respiratory	0	1
Skin	4	2
Unspecified Symptoms	16	4
Injury	75	191
Fractures-Skull	0	1
Fractures-Upper Limb	1	4
Fractures-Lower Limb	3	2
Dislocations	1	5
Back Sprains and Strains	16	55
Other Sprains and Strains	20	36
Intracranial Injuries	0	1
Open Wounds-Head, Neck, Trunk	2	11
Open Wounds-Upper Limb	5	20
Open Wounds-Lower Limb	2	4
Superficial Injuries	5	6
Bruises	9	19
Foreign Bodies Entering Orifice	1	7
Burns	1	10
Injuries to Nerves and Spinal Cord	1	1
Unspecified Injuries	1	5
Adverse Reactions to Non-Medical Substances	5	2
Adverse Reactions to External Causes	2	2

Diagnostic and Accident Categories for OSHA-Recordable Events

There were a total of 265 OSHA events recorded on the OSHA 200 Logs. From these, there were 139 diagnoses among women and 254 diagnoses among men as shown in Figure 15. Sixty-eight percent of the health conditions reported were for injuries. Sprains and strains were the most common type of OSHA-recordable injuries among both men and women, followed by open wounds for men and open wounds and bruises for women.

Sprains and strains accounted for 48 percent of all OSHA-recordable injuries in 1998 (46 percent in 1997).

Sixty percent of the sprains and strains were associated with overexertion and strenuous movements, and an additional 21 percent were associated with falls. Conditions related to the muscles and skeleton also occurred frequently.

An accident is defined as an injury diagnosis that resulted from the OSHA event. Ninety-seven percent (258/265) of the OSHA events were the result of an accident (Figure 16). The accident type was reported for 258 OSHA events. The type of accident reported most often was "other accidents," a broad category that includes being struck by an object, injuries from cutting or piercing objects, overexertion, and contact with hot or corrosive material. Overexertion and

strenuous movements accounted for 51 percent of these accidents. The injuries reported most often by men and women were sprains and strains, followed by open wounds and bruises.

Among the seven events not attributed to a particular accident, five events resulted in contact dermatitis. A joint disorder was reported for one event, and one event was caused by a psychological disorder.

Figure 16. OSHA-Recordable Accidents by Type and Gender

Accident Category	Gender	
	Women	Men
	Number of Accidents	Number of Accidents
Motor Vehicle Traffic	0	5
Vehicle NEC	0	1
Poisoning-Non-Medicinal	5	1
Falls	12	24
Natural/Environmental Factors	5	5
Submersion/ Suffocation/Foreign Bodies	1	6
Other Accidents	56	137
Caught Between Objects	5	5
Cutting/Piercing Instrument/Object	2	14
Electric Current	0	1
Hot, Corrosive, or Caustic Material/ Steam	0	8
Overexertion and Strenuous Movements	25	73
Repetitive Trauma	20	5
Struck by an Object	4	31

Rates of OSHA-Recordable Events

The rates of all diagnoses combined for OSHA-recordable events by age and-job categories, and gender are shown in Figures 17 and 18. Workers in the Service, Crafts and Manual Labor, and Nuclear groups tended to have higher rates than other job categories for all diagnoses combined.

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

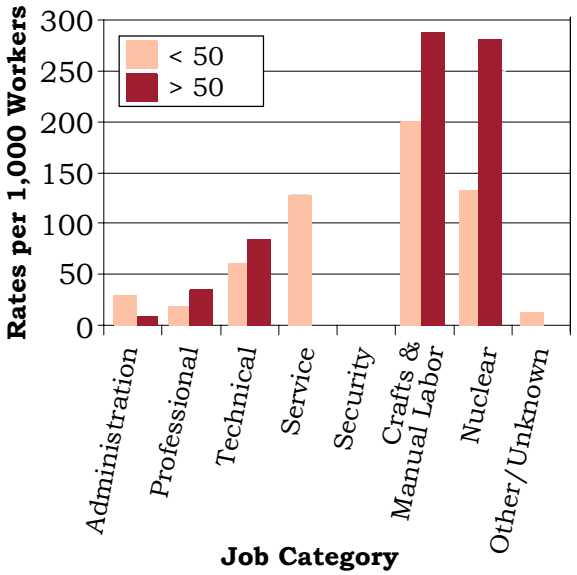
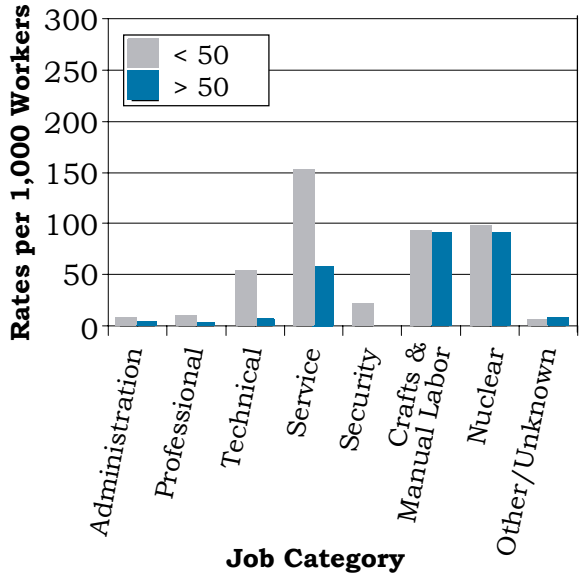


Figure 18. OSHA-Recordable Rates by Age and Job Categories Among Men, All Diagnoses Combined



Among men, younger workers tended to have higher diagnosis rates, but among women, there was no consistent pattern between rates and age. Most of the OSHA health conditions involved occupational injury. When these diagnoses were considered separately, the same job categories listed above for all diagnoses combined had the highest rates for injuries among men and women.

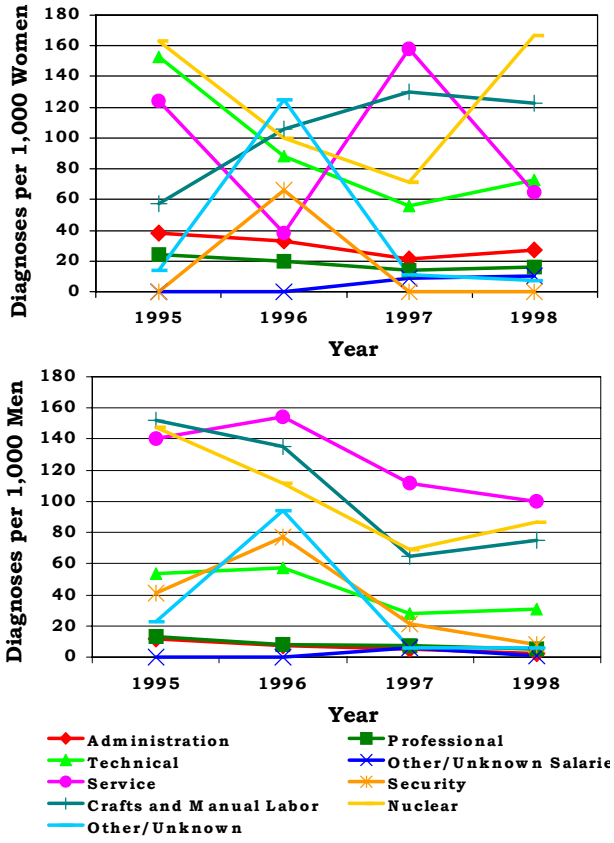
Hanford workers missed 633 workdays and had 2,179 days restricted as a result of occupational injuries. Four job categories experienced 84 percent of the lost workdays and 96 percent of the days restricted. These four job categories comprised 21 percent of the work force: Technical (8 percent); Service (2 percent); Crafts and Manual Labor (6 percent); and Nuclear (5 percent). The two largest groups, Administration (30 percent of the work force) and Professional (26 percent of the work force), reported 15 percent of the lost workdays and only 4 percent of the days restricted. Service workers had the highest percentage of lost and restricted workdays of any occupational group in 1996 and 1997. This group also had one of the highest percentage of lost and restricted workdays in 1995. In 1998, Nuclear workers, who made up 5 percent of the work force, had the highest percentage of lost and restricted workdays (38 percent) followed by Crafts and Manual Laborers (6 percent of the workforce; 26 percent of lost and restricted workdays).

Crafts and Manual Labor workers were at the greatest risk of injury (6 times) when compared to other job categories, followed by Service workers (5 times), Nuclear workers (5 times), and the Technical job category (2 times). Workers in these four job categories were at least 3 times more likely to suffer a sprain or strain as other workers. Crafts and Manual Laborers were at higher risk for open wounds (head, neck, and trunk – 21 times; upper limb – 15 times). Nuclear workers were also 4 times more likely to report an open wound to the upper limb. The risk of bruises was 12 times greater for Service workers and 4 times greater for Crafts and Manual Laborers than other categories. These two groups of workers were also at increased risk for burns (9 times for Service; 7 times for Crafts and Manual Labor), along with Nuclear workers (6 times). Service, Crafts and Manual Labor, and Nuclear workers were 5 times as likely as other workers to report a muscles and skeleton disorder.

Time Trends for OSHA-Recordable Events

The age-adjusted rates for all diagnostic categories combined from 1995 to 1998 by job category and gender are shown in Figure 19. During the 4-year period, the overall rates for OSHA-recordable events among men and women did not change greatly for the majority of the job categories. The decline in rates which began in 1997 for men in the Security group and women Other/Unknown workers continued into 1998. There were no significant changes in injury rates from 1997 to 1998 for both men and women.

Figure 19. Age-Adjusted Rates for All OSHA-Recordable Diagnoses Combined Among Men and Women by Job Category from 1995 to 1998



Glossary

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Explanation of Diagnostic Categories

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

Abbreviated Categories Used in the Annual Report	ICD-9-CM Codes
Benign Growths	210-229 235-239
Blood	280-289
Cancer	140-208 230-234
Digestive	520-579
Endocrine/Metabolic	240-279
Existing Birth 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 disc ("slipped disc"), lumbago, sciatica, rheumatism, tendonitis, and osteoporosis
• Arthropathies and related disorders	710-719	Arthritis; joint pain and stiffness; and other diseases of the connective tissue which supports and connects internal organs, forms bones and blood vessel walls, and attaches to bones
• Dorsopathies	720-724	Swelling of the spine; herniated, slipped, and ruptured disc; rheumatoid arthritis of the spine; lumbago; and sciatica
• Rheumatism, excluding the back	725-729	Swelling and degeneration of joints, muscles, tendons; tennis elbow; and bursitis
• Osteopathies, chondropathies, and acquired musculoskeletal deformities	730-739	Fracture caused by bone disease; osteoporosis; curvature of the spine; flat foot; hammer toe; and development of deformities of the nose, toes, feet, legs, arms, and hands
Congenital anomalies	740-759	Spina bifida; cleft palate; harelip; and various chromosomal anomalies, such as Klinefelter's syndrome
Certain conditions originating in the perinatal period	760-779	Maternal high blood pressure; maternal malnutrition; ectopic pregnancy; breech birth; fetal malnutrition or slow growth; injuries related to birth trauma; and perinatal jaundice

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

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

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