DDOE/EH 0253

# 2000

# Hanford Site Annual Epidemiologic Surveillance Report

# Hanford 2000
# Epidemiologic Surveillance Report

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

Dr. Cliff Strader at **cliff.strader@eh.doe.gov**
or Dr. Bonnie Richter at **bonnie.richter@eh.doe.gov**
United States Department of Energy
Office of Health Programs
Mail Stop: 270CC / EH-6
19901 Germantown Road
Germantown, MD 20874-1290

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

ACKNOWLEDGEMENT

# Hanford Site 2000

## At A Glance

Male employees at Hanford lost 21,492 workdays in 2000 due to illness and injury. The most frequently reported adverse health conditions among men were injuries, muscles and skeleton conditions, and digestive disorders.

Female employees at Hanford lost 17,466 workdays due to illness and injury in 2000. Women most frequently reported muscles and skeleton conditions, injuries, genitourinary disorders, and digestive conditions.

There was no evidence of excess cancer of any type among men or women by job category.

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

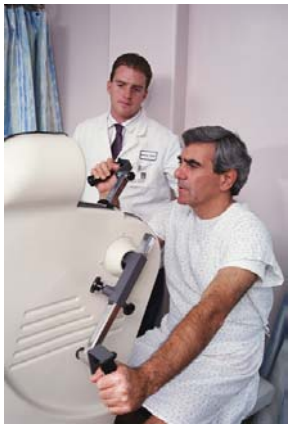
Occupational injuries (OSHA-recordables) resulted in a total of 2,826 lost or restricted workdays at Hanford in 2000. Forty-five percent of the OSHA events were due to injuries, primarily sprains and strains. Overall, Crafts and Manual Labor workers had the highest rate of OSHA events.

## 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, 2000 through December 31, 2000. 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 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 2000 data collected from Hanford. Surveillance reports and additional Supporting Tables are posted on the Office of Health Programs' Web site **(http://tis.eh.doe.gov/health/epi/surv/index.html)**, or are available by request. The main sections of the report include: work force characteristics; absences due to injury or illness 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 2000 report includes sections on time trends that provide comparative information on the health of the work force from 1993 through 2000.



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

DOE sites vary by mission, function, job classification, and worker exposures. Comparisons of 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 shut down 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 cleanup 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.

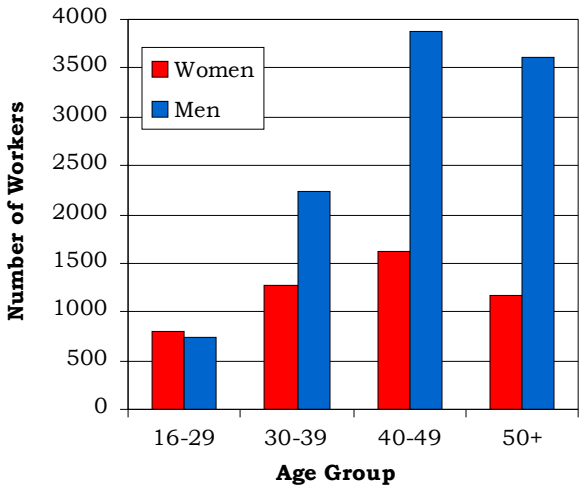
Congress created the Office of River Protection in 1998 to manage Hanford's tank waste retrieval, treatment, and disposal, DOE's largest, most complex environmental cleanup project. Sixty percent (by volume) of the nation's high-level radioactive waste has been stored at Hanford in aging and deteriorating tanks. Included in the site's 1999 and 2000 accomplishments are removal of waste from high-heat, self-boiling tanks and resolution of associated flammability issues. Also, the retrievable liquid waste from 125 of the 149 Single Shell Tanks has been pumped and removed to safer Double Shell Tanks.

A team of contractors manage the Hanford site. The team of prime contractors for the Richland Operations Office is made up of Battelle Memorial Institute, Bechtel Hanford, Inc., Fluor Hanford, Inc., and Hanford Environmental Health Foundation. The team of prime contractors for the Office of River Protection is composed of CH2M Hill Hanford Group, Inc. and Bechtel National, Inc.

## The Hanford Work Force - 2000

A total of 15,308 Hanford employees were included in epidemiologic surveillance in 2000, 407 more workers than were present in 1999. The gender and age distribution of the 2000 work force is shown in Figure 1. There were 4,859 (32 percent) women and 10,449 (68 percent) men in the work force. The average age of male workers at Hanford was 45 years and 41 years for women. There was no information on the distribution of workers by race.

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




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

Individual job titles, as reported by Hanford, were grouped together into job categories, 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. Hanford reported Service and Security as two separate job categories starting in 1995. The distribution of workers by job category and gender is shown in Figure 2. Men and women were not distributed equally among the various job categories. More than one-third (36 percent) of women were Administration workers; an additional 29 percent of the female work force was in the Other/Unknown job category. The largest percentage of men (24 percent) was Professional employees. The next largest group of men (21 percent) was in the Other/Unknown category.

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

| Job Category | Women | Men |
|---|---|---|
| Administration | 1,746<br>36% | 1,587<br>15% |
| Professional | 502<br>10% | 2,548<br>24% |
| Technical | 350<br>7% | 753<br>7% |
| Other/Unknown Salaried | 591<br>12% | 1,624<br>16% |
| Service | 95<br>2% | 244<br>2% |
| Security | 8<br><1% | 178<br>2% |
| Crafts & Manual Labor | 32<br>1% | 776<br>8% |
| Nuclear | 127<br>2% | 562<br>5% |
| Other/Unknown | 1,408<br>29% | 2,177<br>21% |

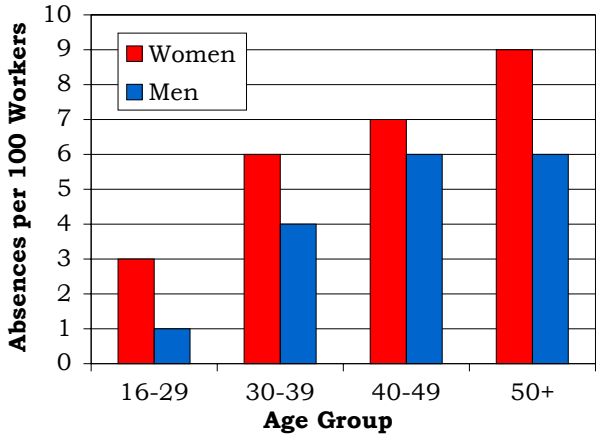
## Number and Length of Absences

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 that lasted 5 or more consecutive workdays but did not result from injury or illness. These include 50 absences among 50 women due to maternity leave and 4 absences among 4 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 job category 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 328 5-day absences among women, resulting in an absence rate of 7 per 100 workers (328/4,859). The 5-day absence rate among men was about 5 per 100 workers (545/10,449). 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 in all age groups. The rates of absence increased with age among men and women. The trend of the rates in 2000 is the same as in 1999.

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




The average length of absence by gender and age is shown in Figure 4. The average length of absence was 53 days for women and 39 days for men. Absences among women averaged 8 to 26 days longer than absences among men in the same age group. The length of absence increased with age until reaching 50 years of 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 | 27 | 1,092 | 40 |
| | 30-39 | 78 | 3,675 | 47 |
| | 40-49 | 112 | 6,852 | 61 |
| | 50+ | 111 | 5,847 | 53 |
| | Total | 328 | 17,466 | 53 |
| Men | 16-29 | 8 | 109 | 14 |
| | 30-39 | 98 | 3,867 | 39 |
| | 40-49 | 214 | 9,098 | 43 |
| | 50+ | 225 | 8,418 | 37 |
| | Total | 545 | 21,492 | 39 |

Figure 5 presents the 5-day absence rate by job category for men and women. Women had higher rates of absence for every job category compared with men. In the Other/Unknown job category, the absence rate among women was at least twice the rate among men. The 5-day absence rates among women were highest for Service (18/100), Nuclear (17/100), and Crafts and Manual Labor (16/100) workers. Among men, the absence rates were highest for Crafts and Manual Labor (12/100), Nuclear (12/100), and Service (10/100) workers. With the exception of women in the Crafts and Manual Labor group, men and women in these job categories also had the highest absence rates in 1999.

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

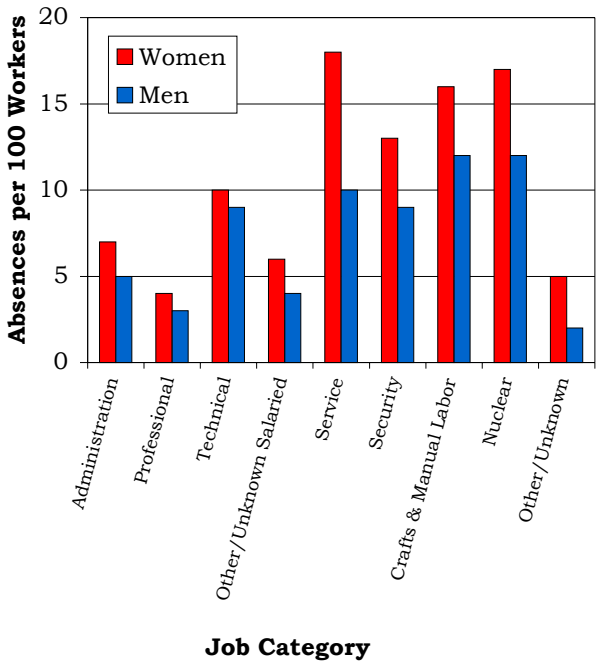
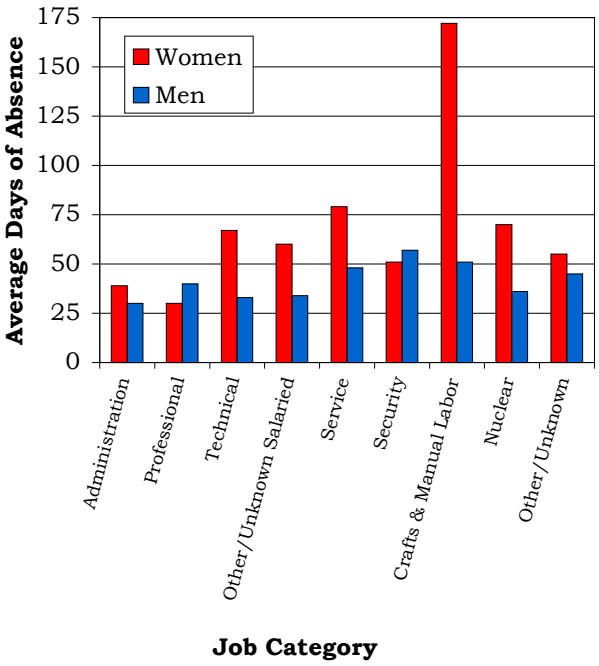



**Figure 6. Average Duration of Absence by Job Category and Gender**




The average length of absence also varied by job category as shown in Figure 6. Among women, workers in the Crafts and Manual Labor group (172 days) averaged the longest number of days absent. Workers classified as

Security (57 days) and Crafts and Manual Labor (51 days) had the longest average absences among men. Several women who reported very long absences influenced the long average absence duration among women in the Crafts and Manual Labor group. Among the five absences reported by workers in this group, only one lasted less than 6 weeks.

## 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 the 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 479 diagnoses reported by female workers and 746 diagnoses reported by male Hanford employees in 2000.

Female employees accrued 17,466 lost calendar days due to injury and illness. Four diagnostic categories accounted for 57 percent of all reported conditions: muscles and skeleton (18 percent), injuries (14 percent), genitourinary (13 percent), and digestive (12 percent). Dorsopathies (disk, neck, or back problems) accounted for 33 percent of all muscles and skeleton conditions, followed by rheumatism (31 percent) and joint problems (29 percent). Sprains and strains (39 percent) and fractures (12 percent) were the most common injuries. Allergic reactions and complications of medical care accounted for 10 injury diagnoses. Eighty-nine percent of genitourinary conditions were for female reproductive disorders. Digestive conditions were primarily due to diseases of the gallbladder and pancreas (48 percent). Conditions of the muscles and skeleton and psychological conditions resulted in the most frequent number of lost calendar days among women.

**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 | 17 | 770 | 9 | 137 |
| Blood | 1 | 28 | 0 | 0 |
| Cancer | 10 | 1,116 | 30 | 1,925 |
| Digestive | 58 | 1,453 | 90 | 2,005 |
| Endocrine/ Metabolic | 11 | 870 | 18 | 554 |
| Existing Birth Condition | 1 | 147 | 1 | 97 |
| Genitourinary | 61 | 2,208 | 12 | 298 |
| Heart/ Circulatory | 7 | 521 | 57 | 2,460 |
| Infections/ Parasites | 14 | 500 | 14 | 539 |
| Injury | 67 | 2,803 | 164 | 5,536 |
| Miscarriage | 1 | 9 | NA | NA |
| Muscles & Skeleton | 85 | 4,851 | 151 | 6,457 |
| Nervous System | 37 | 2,178 | 40 | 1,928 |
| Psychological | 36 | 3,193 | 31 | 948 |
| Respiratory | 48 | 1,009 | 62 | 930 |
| Skin | 0 | 0 | 8 | 183 |
| Unspecified Symptoms | 25 | 1,468 | 59 | 1,807 |

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 accrued 21,492 lost calendar days due to injury and illness. The most frequently reported conditions were injuries (22 percent), muscles and skeleton conditions (20 percent), and digestive conditions (12 percent). Sprains and stains accounted for 37 percent of the injuries. Fractures and dislocations made up another 32 percent. Among the injury diagnoses, 3 were allergic reactions and 8 were complications of medical care. Fifty-two

percent of the muscles and skeleton problems were dorsopathies (back, disk, or neck problems), 28 percent were joint disorders, and 17 percent were rheumatism. At Hanford, hernias accounted for 36 percent of the digestive conditions reported by men. Gallbladder disease and intestinal disorders accounted for 41 percent. The most frequent number of lost calendar days among men was due to muscles and skeleton conditions and injuries.

The more frequently reported health conditions varied little with age among men and women. Few diagnoses were reported among men 16-29 years old. Muscles and skeleton conditions showed up in all age categories for men and women. Men reported digestive disorders and injuries frequently in three of the four age groups. Injuries and genitourinary disorders were frequently reported by women in three of the four age groups.

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 all job categories among men. Digestive conditions also appeared frequently. Among women, muscles and skeleton conditions, injuries, and genitourinary disorders were commonly reported in most job categories. Women in several job categories frequently reported nervous system disorders and psychological conditions. Conditions of the nervous system accounted for 37 diagnoses reported by women. Seventy-six percent of these diagnoses were for carpal tunnel syndrome, migraines, and ear infections. Women reported 36 diagnoses for psychological conditions. Depression, stress, and anxiety accounted for 72 percent of these diagnoses.

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

| Job Category | Men | Women |
|---|---|---|
| Administration | Injury (22)<br>Muscles & Skeleton (19)<br>Heart/Circulatory (14)<br>Unspecified Symptoms (12) | Digestive (32)<br>Genitourinary (28)<br>Muscles & Skeleton (25)<br>Respiratory (25) |
| Professional | Injury (24)<br>Muscles & Skeleton (18)<br>Digestive (16)<br>Respiratory (11) | Injury (5)<br>Muscles & Skeleton (4)<br>Genitourinary (3)<br>Nervous System (3) |
| Technical | Muscles & Skeleton (24)<br>Injury (17)<br>Digestive (11) | Genitourinary (8)<br>Muscles & Skeleton (8)<br>Injury (7)<br>Nervous System (6) |
| Other/Unknown Salaried | Injury (19)<br>Muscles & Skeleton (16)<br>Digestive (12)<br>Heart/Circulatory (11) | Digestive (10)<br>Psychological (8)<br>Benign Growths (7)<br>Injury (6) |
| Service | Injury (9)<br>Muscles & Skeleton (6)<br>Digestive (5)<br>Heart/Circulatory (5) | Muscles & Skeleton (6)<br>Injury (4)<br>Nervous System (4)<br>Respiratory (4) |
| Security | Muscles & Skeleton (9)<br>Benign Growths (4)<br>Injury (4) | Genitourinary (1) |
| Crafts & Manual Labor | Injury (27)<br>Muscles & Skeleton (24)<br>Digestive (13)<br>Respiratory (13) | Muscles & Skeleton (4)<br>Injury (2)<br>Psychological (1)<br>Respiratory (1) |
| Nuclear | Injury (29)<br>Muscles & Skeleton (17)<br>Digestive (12)<br>Unspecified Symptoms (12) | Psychological (7)<br>Injury (6)<br>Muscles & Skeleton (5)<br>Digestive (4) |
| Other/Unknown | Muscles & Skeleton (18)<br>Digestive (13)<br>Injury (13)<br>Respiratory (6) | Muscles & Skeleton (30)<br>Injury (20)<br>Genitourinary (14)<br>Nervous System (14) |

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

## Rates of Disease Occurrence

**A Word about Rates:** The previous section considered the number of absences and health conditions among various worker groups. For example, Figure 7 shows that men reported 164 diagnoses of injuries and women reported 67 diagnoses involving injuries during 2000. Men, therefore, reported more than twice as many injuries as women. As there were more than twice as many men as 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 2000? 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 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:

164 injury diagnoses ÷ 10,449 men =
.016 x 1,000 =
16 injury diagnoses per 1,000 men

67 injury diagnoses ÷ 4,859 women =
.014 x 1,000 =
14 injury diagnoses per 1,000 women

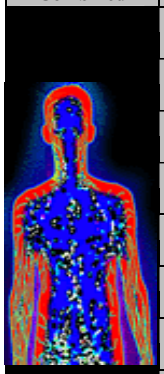
Comparing these rates now correctly suggests that the rate of reported diagnoses are similar for men and women. They are called ***crude rates*** because they do not account for possible differences between men and women such as age and other factors that might affect the individual's risk of having 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.

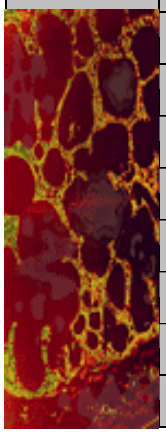
In the following set of analyses, the four age groups were collapsed into two groups: workers younger than 50 years of age and those 50 or older. These groups were collapsed to ensure that the number of diagnoses in each group was large enough to analyze. The "Other/Unknown Salaried" and "Other/Unknown" groups were combined into one job category. 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. Additional information about 15 other disease groups is also analyzed and can be found in the Supporting Tables.

Women generally had higher rates for all diagnoses combined than men for all job categories regardless of age. Among women and men, rates tended to be higher among the older workers. Among both men and women, workers in the Service, Crafts and Manual Labor, and Nuclear groups were at highest risk of illness or injury. These job categories also had high rates in 1998 and 1999.

## 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 | 49 | 91 |
| | | 50+ | 81 | 126 |
| | Professional | <50 | 46 | 39 |
| | | 50+ | 36 | 53 |
| | Technical | <50 | 119 | 132 |
| | | 50+ | 158 | 127 |
| | Service | <50 | 94 | 286 |
| | | 50+ | 274 | 256 |
| | Security | <50 | 125 | 0 |
| | | 50+ | 118 | 333 |
| | Crafts & Manual Labor | <50 | 105 | 87 |
| | | 50+ | 237 | 667 |
| | Nuclear | <50 | 151 | 206 |
| | | 50+ | 297 | 320 |
| | Other/Unknown | <50 | 39 | 66 |
| | | 50+ | 48 | 173 |

| Diagnostic Category | Rate per 1,000 | | | |
|---|---|---|---|---|
| Respiratory | Job Category | Age | Men | Women |
|  | Administration | <50 | 12 | 9 |
| | | 50+ | 0 | 24 |
| | Professional | <50 | 4 | 0 |
| | | 50+ | 4 | 21 |
| | Technical | <50 | 14 | 10 |
| | | 50+ | 6 | 0 |
| | Service | <50 | 6 | 54 |
| | | 50+ | 27 | 26 |
| | Security | <50 | 7 | 0 |
| | | 50+ | 0 | 0 |
| | Crafts & Manual Labor | <50 | 11 | 0 |
| | | 50+ | 24 | 111 |
| | Nuclear | <50 | 13 | 0 |
| | | 50+ | 11 | 40 |
| | Other/Unknown | <50 | 2 | 4 |
| | | 50+ | 2 | 14 |

| Diagnostic Category | Rate per 1,000 | | | |
|---|---|---|---|---|
| Cancer | Job Category | Age | Men | Women |
|  | Administration | <50 | 2 | 2 |
| | | 50+ | 5 | 3 |
| | Professional | <50 | 1 | 0 |
| | | 50+ | 2 | 0 |
| | Technical | <50 | 0 | 3 |
| | | 50+ | 6 | 0 |
| | Service | <50 | 6 | 0 |
| | | 50+ | 27 | 0 |
| | Security | <50 | 7 | 0 |
| | | 50+ | 0 | 0 |
| | Crafts & Manual Labor | <50 | 0 | 0 |
| | | 50+ | 21 | 0 |
| | Nuclear | <50 | 0 | 0 |
| | | 50+ | 0 | 0 |
| | Other/Unknown | <50 | 2 | 3 |
| | | 50+ | 3 | 0 |

| Diagnostic Category | Rate per 1,000 | | | |
|---|---|---|---|---|
| Injury | Job Category | Age | Men | Women |
|  | Administration | <50 | 12 | 9 |
| | | 50+ | 16 | 12 |
| | Professional | <50 | 11 | 10 |
| | | 50+ | 7 | 11 |
| | Technical | <50 | 27 | 24 |
| | | 50+ | 6 | 0 |
| | Service | <50 | 35 | 36 |
| | | 50+ | 41 | 51 |
| | Security | <50 | 28 | 0 |
| | | 50+ | 0 | 0 |
| | Crafts & Manual Labor | <50 | 34 | 43 |
| | | 50+ | 36 | 111 |
| | Nuclear | <50 | 51 | 20 |
| | | 50+ | 55 | 160 |
| | Other/Unknown | <50 | 8 | 11 |
| | | 50+ | 10 | 23 |

| Diagnostic Category | Rate per 1,000 | | | |
|---|---|---|---|---|
| Heart/ Circulatory | Job Category | Age | Men | Women |
|  | Administration | <50 | 5 | 1 |
| | | 50+ | 13 | 3 |
| | Professional | <50 | 3 | 0 |
| | | 50+ | 3 | 0 |
| | Technical | <50 | 3 | 0 |
| | | 50+ | 6 | 0 |
| | Service | <50 | 0 | 0 |
| | | 50+ | 68 | 0 |
| | Security | <50 | 0 | 0 |
| | | 50+ | 0 | 0 |
| | Crafts & Manual Labor | <50 | 7 | 0 |
| | | 50+ | 24 | 0 |
| | Nuclear | <50 | 0 | 0 |
| | | 50+ | 0 | 0 |
| | Other/Unknown | <50 | 2 | 1 |
| | | 50+ | 10 | 6 |

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 association was not seen among women. Thirty-nine 5-day absences were reported involving 10 diagnoses among 10 women and 30 diagnoses among 29 men. Prostate cancer was the most frequently reported cancer diagnosis among men.

Thirteen men who were all at least 50 years old reported 13 prostate cancer diagnoses. In 1998 and 1999, 4 and 12 men reported prostate cancer, respectively. The 17 remaining cancer diagnoses reported by men in 2000 were for 12 different sites. Two men who reported cancer in 2000 had reported the same cancer in the period 1994-1999. One man reported prostate cancer in 1999 and the other reported lymphoma in 1994 and 1996. In 2000, one woman reported one diagnosis for breast cancer. Of the remaining nine cancer diagnoses, seven different sites were reported. One woman who reported ovarian cancer in 2000 reported the same cancer in 1999. Workers in the Service and Crafts and Manual Labor groups were 3 to 4 times more likely to report a cancer diagnosis in 2000 compared to workers in other job categories. There was no evidence of an excess of any one particular type of cancer for either men or women by job category.

Women reported 7 heart/circulatory diagnoses, 3 were among women under 50 years old. Two of the 7 diagnoses involved hypertension; both women were over 50 years old. No diagnoses for ischemic heart disease (restricted blood flow through an artery) were reported. Among men, workers aged 50 or older generally had the highest rates of heart/circulatory problems. Thirty-five of the 49 absences among men occurred in workers aged 50 or older; 69 percent (27/39) of the diagnoses among these older workers were for hypertension or ischemic heart disease. Crafts and Manual Labor workers were almost 3 times more likely to report heart/circulatory diagnoses compared to workers in other job categories.

Respiratory disease rates tended to be higher for younger workers compared to older workers among men, but among women, the rates tended to be higher among older workers. Among women, 22 of the 48 diagnoses for respiratory disease were upper respiratory infections, 12 diagnoses were for influenza and pneumonia, and 12 were for bronchitis and asthma. As in 1998 and 1999, women in the Service group had the highest rates of respiratory disease in 2000. Among men, 28 of the 62 respiratory diagnoses were for upper respiratory infections, 15 were for influenza and pneumonia, and 13 were for bronchitis and asthma.

Respiratory disease rates among men of all ages were highest among workers in the Crafts and Manual Labor group. Respiratory disease was almost 3 times more common among Service workers and over 3 times more common among Crafts and Manual Labor workers compared to workers in other job categories. Service workers were also at higher risk of reporting a respiratory condition in 1998 and 1999 compared to workers in other job categories.

Injury rates were greater for older workers among women, except for Technical workers. The injury rate tended to be higher among older men compared to younger men. Among men, Nuclear workers were more likely to report a non-occupational injury than were workers in other job categories. Among women, workers in the Crafts and Manual Labor group had the highest reporting of non-occupational injury. 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 over 2 times more likely to report an injury than other workers, a trend that continues from 1998. The risk of specific injuries varied by job category. Technical workers were almost 3 times more likely to report a sprain or strain other than to the back compared to workers in other job categories. Service workers were at 3 to 4 times the risk of reporting a sprain or strain compared with other workers. Back sprains and strains were 15 times more common among Security workers compared with other workers. Crafts and Manual Labor workers had 3 times the risk of a dislocation and 4 times the risk of a late effect of an injury than other workers. The risk of a dislocation was over 5 times greater and of a sprain or strain other than to the back was almost 4 times 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 Security workers were at almost twice the risk, and Service, Crafts and Manual Labor, and Nuclear workers were at over 2 times the risk of all injuries and illnesses compared with workers in other groups. These increased risks were also observed in 1999. Technical workers were at almost twice the risk of conditions of the muscles and skeleton, and at over twice the risk of infections and psychological, genitourinary, and ill-defined conditions compared to other job categories. Other / Unknown Salaried workers were over 3 times more likely to report a benign growth. Among Service workers, the risk of cancer and disorders of the muscles and skeleton and endocrine / metabolic, nervous, and digestive systems was 2 to 5 times greater than other workers. The risk of cancer, nervous system, digestive, muscles and skeleton, and ill-defined conditions was over 2 times greater in the Crafts and Manual Labor group compared to other job categories. Nuclear workers were at 7 times greater risk of endocrine / metabolic disorders; almost 5 times the risk of psychological disorders; over 3 times the risk of nervous and digestive disorders and ill-defined conditions; and almost 3 times the risk of muscles and skeleton 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 differing ages. Age-adjusted rates are calculated using the age distribution of the 1970 U.S. population as a reference.

Age-adjusted rates for all illness and injury categories combined are presented in Figure 10. It is important to note that the age-adjusted rates for the years 1993 and 1994 presented in this report differ from the *1993 and 1994 Annual Epidemiologic Surveillance Reports* due to the elimination of health conditions resulting from maternity leave.

The age-adjusted rates for all illness and injury categories combined changed little from 1999 to 2000. Over the past 8 years, these rates have generally decreased among men and women. From 1993 through 2000, respiratory rates declined 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. Among men, the rate of psychological disorders has remained steady, the rate of digestive diseases has steadily declined, and the rate of muscles and skeleton disorders has tended to increase (Figure 11). Among men and women, the injury rates have tended to decrease, but the decrease is not due to any particular type of injury. Among women, the rates of psychological disorders have remained relatively constant, but digestive rates for recent years have returned to the 1993 rate. Muscles and skeleton conditions have not shown a consistent trend upward or downward over the 8-year period.

Age-adjusted rates for all diagnoses combined are shown for the various job categories in Figure 12. Hanford reported Service and Security job categories as two separate categories starting in 1995. For most job categories, the rates for all diagnostic categories combined remained fairly constant, especially over the last 5 years, among men. Among women, the trend in the rates has been less consistent across the job categories. The rates in the Administration, Other/Unknown Salaried, and Other/Unknown groups have changed little over the 8-year period. Rates have decreased among women in the Professional, Technical, and Nuclear groups. The decline in rates among Professional and Technical women was not due to a decline in any particular illness. The dramatic changes in the rates among women in the Crafts and Manual Labor group is partly due to the small number of women in the job category. Although these decreases reflect a decline in illnesses or injuries, other events should also be considered, such as changes in reporting requirements for absenteeism or policies related to the administration of sick leave. Women in the Security group reported an absence for the first time since 1997.

**Figure 10. Age-Adjusted Rates for All Diagnoses Combined Among Women and Men from 1993 to 2000**

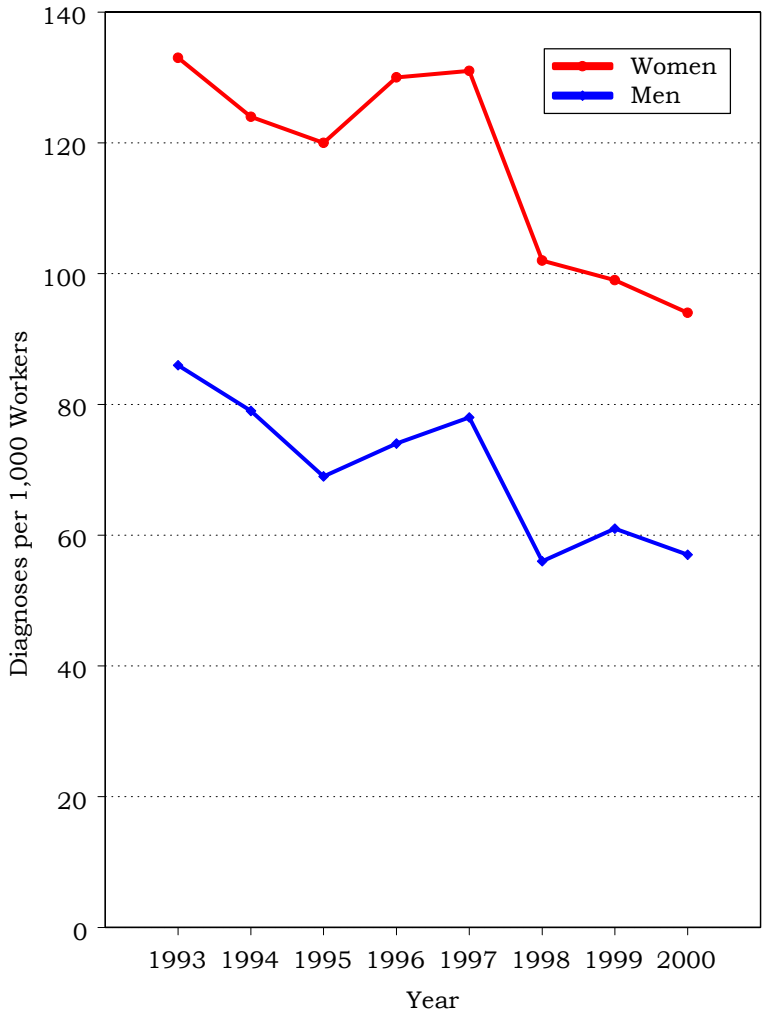
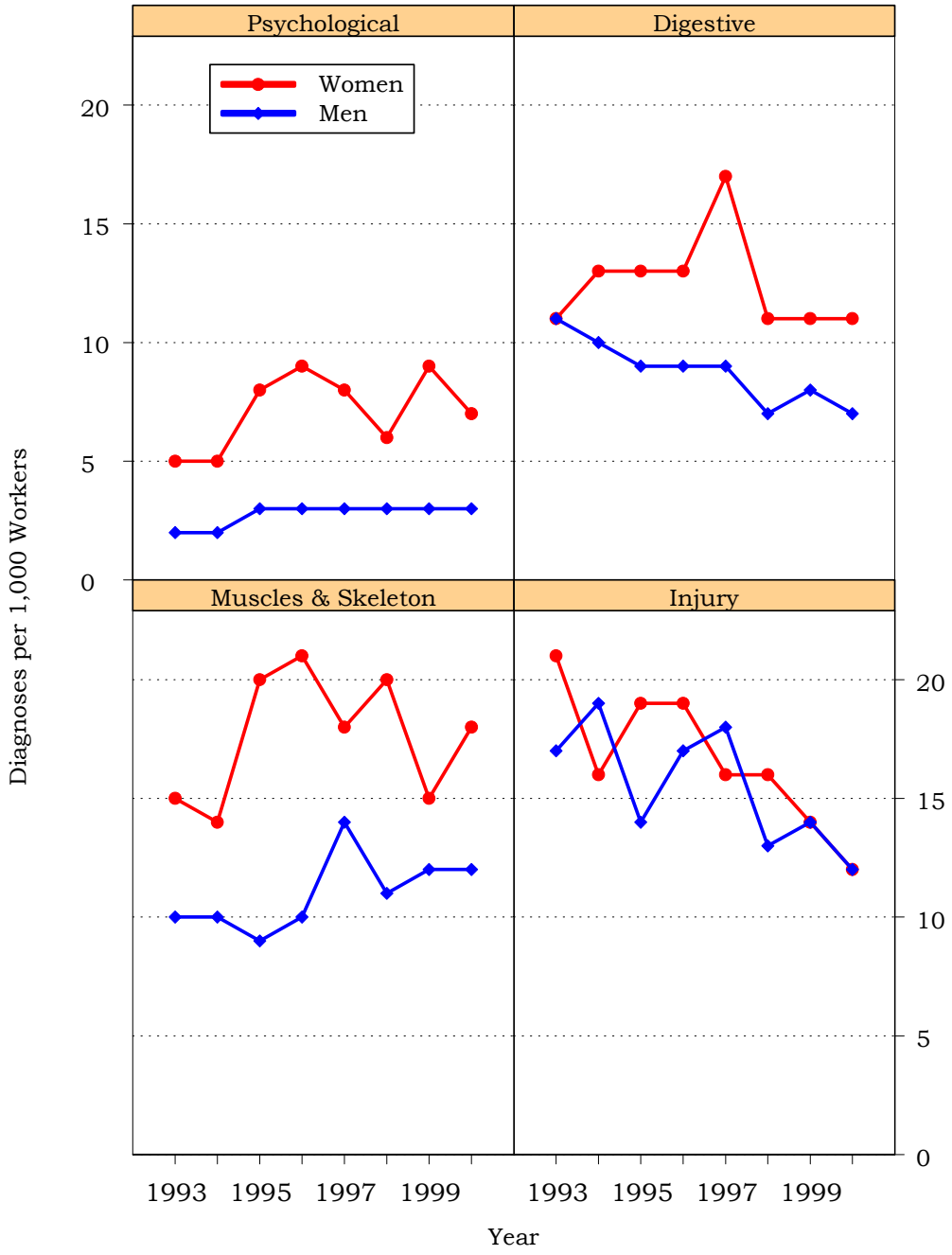
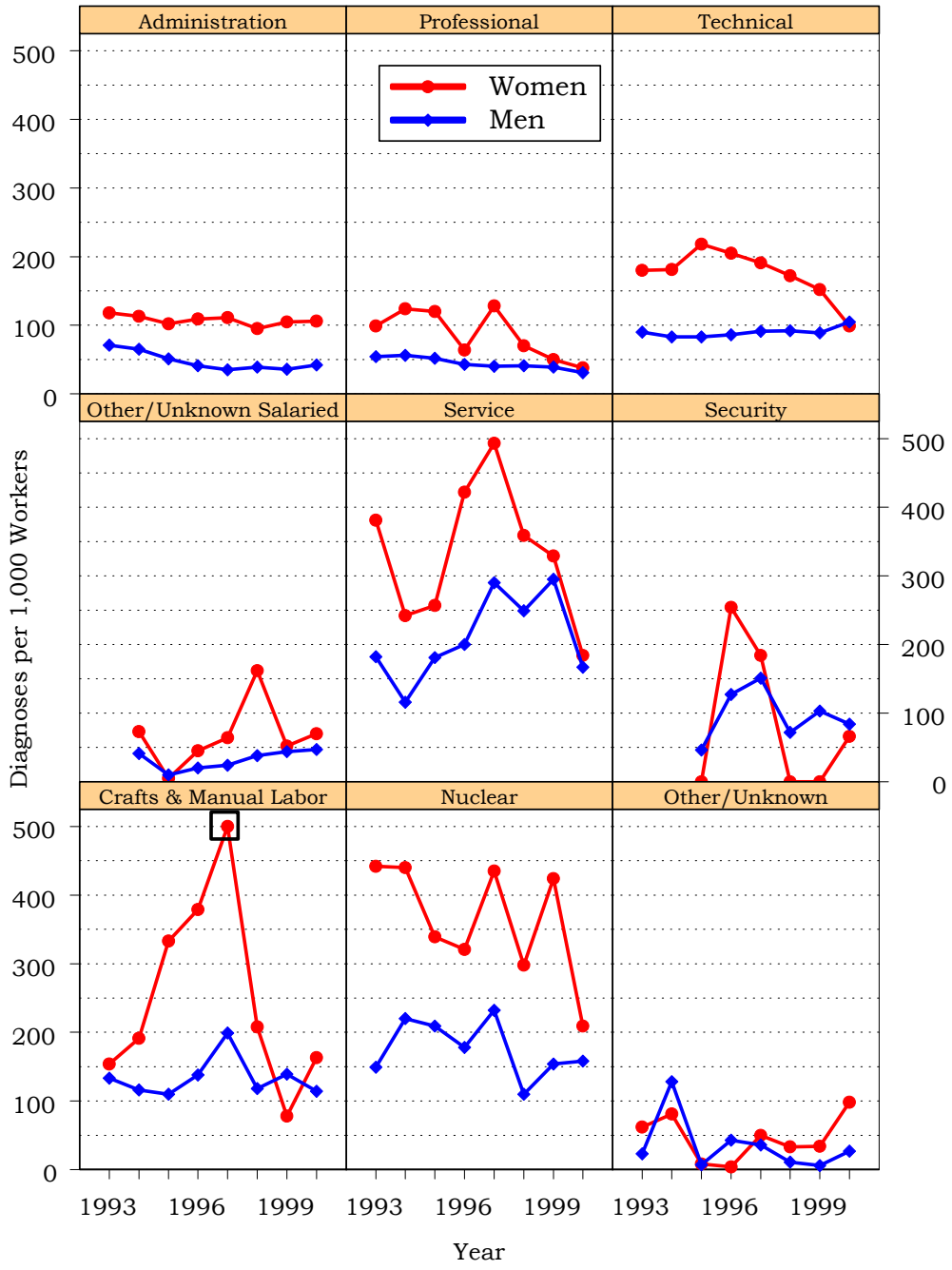


**Figure 11. Age-Adjusted Rates for Selected Diagnostic Categories Among Women and Men from 1993 to 2000**




Note: For 1993, the injury rate was based on external causes of injury data; for 1994 through 2000, the rate was based on injury and poisoning data.

**Figure 12. Age-Adjusted Rates for All Diagnoses Combined Among Women and Men by Job Category from 1993 to 2000**




Note: Other/Unknown Salaried job category workers were included in various job categories in 1993. Security workers were included in the Service job category in 1993 and 1994. The 1997 Crafts & Manual Labor rate for women was truncated to 500 ( ) for graphical presentation. The actual rate was 1,037.

## 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.

Three definite sentinel health event diagnoses affecting 3 male workers were identified in 2000 (Figure 13). These diagnoses included a case of berylliosis, a herniated disk, and a wrist sprain. Thirty-one of 1,225 (3 percent) diagnoses were identified as possible sentinel health events. Twenty-eight of the 31 diagnoses were carpal tunnel syndrome, reported by 24 workers and resulting in 2,012 lost calendar days. Fifteen of these diagnoses were reported by women.

**Figure 13. Characteristics of SHEOs by Gender**

| | Total Number of SHEO Diagnoses | | Total Number of Days Absent | |
|---|---|---|---|---|
| | Men | Women | Men | Women |
| Definite | 3 | 0 | 225 | 0 |
| Possible | 15 | 16 | 930 | 1,243 |
| Total | 18 | 16 | 1,155 | 1,243 |

## Disabilities Among Active Workers

There were no disability data reported in 2000.

## Deaths Among Active Workers

There were no death data reported in 2000.

## OSHA-Recordable Events

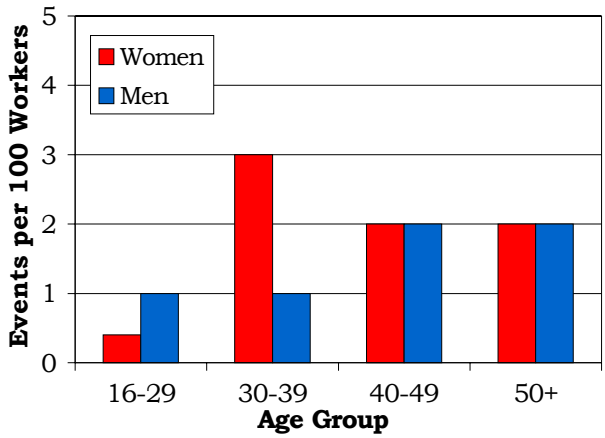
The Occupational Safety and Health Administration (OSHA) requires that employers maintain a record of occupational injuries and illnesses occurring among employees and to make that information available to OSHA on request. Employers maintain the information from these OSHA-recordable events in the OSHA 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 14. Occupational injuries resulted in a total of 2,826 lost or restricted workdays at Hanford in 2000. There were 82 women and 145 men who had one recordable OSHA event and 5 women and 6 men with two or more OSHA events. Men reported 67

percent more 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 among women; the number of events increased with age among men. The average number of workdays lost or with restricted activity was similar for women (12 days) and men (11 days) and did not appear related to age.

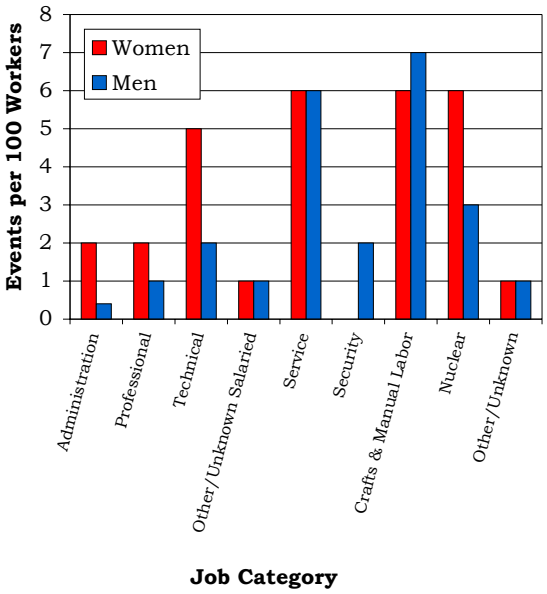
**Figure 14. OSHA-Recordable Events by Gender and Age**




There was a 21 percent increase in the number of OSHA-recordable events in 2000 (251) compared to the recordable events in 1999 (208). This 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 15. Overall, Crafts and Manual Labor workers had the highest rate of OSHA events (7 per 100 workers) and the second highest average number of lost or restricted workdays (18 days). Service workers reported the highest average number of lost or restricted workdays among all workers combined (23 days). Among female workers, those in the Service, Crafts and Manual Labor, and Nuclear categories had the highest rates of OSHA events, 6 per 100 workers. Service workers reported the highest average number of lost or restricted workdays among women (45 days). Among male workers, the highest rate of OSHA events was among Crafts and Manual Labor workers, 7 per 100. These workers also had the highest average number of workdays lost or with restricted activity for OSHA events among men (18 days). The Supporting Tables contain more detailed data about the number of OSHA events and the number of days of work lost or with restricted activity.

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




## Diagnostic and Accident Categories for OSHA-Recordable Events

There were a total of 251 OSHA events recorded on the OSHA 200 Logs. From these, there were 195 diagnoses among women and 258 diagnoses among men, as shown in Figure 16. Forty-five 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 superficial injuries for women. Sprains and strains accounted for 38 percent of all OSHA-recordable injuries in 2000 (41 percent in 1999). About 60 percent

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

| Diagnostic Category | Gender | |
|---|---|---|
| | Women | Men |
| Digestive | 1 | 0 |
| Endocrine/Metabolic | 0 | 1 |
| Heart/Circulatory | 1 | 0 |
| Muscles & Skeleton | 75 | 51 |
| Nervous System | 13 | 10 |
| Psychological | 5 | 13 |
| Respiratory | 6 | 7 |
| Skin | 0 | 2 |
| Unspecified Symptoms | 18 | 46 |
| Injury | 76 | 128 |
| Fractures – Neck, Trunk | 1 | 1 |
| Fractures – Upper Limb | 2 | 6 |
| Fractures – Lower Limb | 2 | 1 |
| Dislocations | 1 | 1 |
| Back Sprains & Strains | 19 | 21 |
| Other Sprains & Strains | 13 | 25 |
| Intracranial Injuries | 1 | 0 |
| Open Wounds – Head, Neck, Trunk | 1 | 2 |
| Open Wounds – Upper Limb | 6 | 25 |
| Open Wounds – Lower Limb | 2 | 4 |
| Superficial Injuries | 14 | 3 |
| Bruises | 6 | 12 |
| Crushing Injuries | 1 | 0 |
| Foreign Bodies Entering Orifice | 2 | 4 |
| Burns | 0 | 8 |
| Unspecified Injuries | 0 | 5 |
| Adverse Reactions to Non-Medical Substances | 3 | 3 |
| Adverse Reactions to External Causes | 2 | 5 |
| Complications of Surgical/Medical Care | 0 | 2 |

of the sprains and strains were associated with overexertion and strenuous movement, and an additional 29 percent were associated with falls. Conditions related to the muscles and skeleton also occurred frequently.

An accident is defined as an injury diagnosis that results from the OSHA event. Eighty-nine percent (224/251) of the OSHA events were reported as an accident (Figure 17). 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 or strenuous movements accounted for 45 percent of these accidents. Falls were the second most common type of accident.

**Figure 17. OSHA-Recordable Accidents by Type and Gender**

| Accident Category | Gender | |
|---|---|---|
| | Women | Men |
| | Number of Accidents | Number of Accidents |
| Motor Vehicle Traffic | 2 | 1 |
| Poisoning – Non-Medicinal | 3 | 4 |
| Surgical and Medical Procedures | 0 | 2 |
| Falls | 20 | 20 |
| Fire | 0 | 2 |
| Natural/Environmental Factors | 1 | 5 |
| Submersion/Suffocation/ Foreign Bodies | 2 | 3 |
| Drug Reaction | 1 | 0 |
| Other Accidents | 59 | 99 |
| Struck by an Object | 4 | 14 |
| Caught Between Objects | 3 | 7 |
| Machinery | 0 | 1 |
| Cutting/Piercing Instrument/Object | 7 | 16 |
| Hot, Corrosive, or Caustic Material/Steam | 0 | 5 |
| Overexertion/Strenuous Movements | 23 | 48 |
| Repetitive Trauma | 22 | 8 |
| Total | 88 | 136 |

Among the 27 events not attributed to a particular accident, 15 involved reactions to stress. There were 3 joint disorders, 2 cases of beryllium sensitization, 2 allergies, and 1 each for tenosynovitis, hearing loss, contact dermatitis, eye disorder, and disease of the nasal cavity and sinuses.

## 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 18 and 19. Women in the Service, Technical, and Nuclear groups and male Crafts and Manual Labor and Service workers tended to have higher rates than other job categories for all diagnoses combined. There was no consistent pattern between rates and age among men; among women, younger workers had higher rates in all job categories except Crafts and Manual Labor. 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.

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

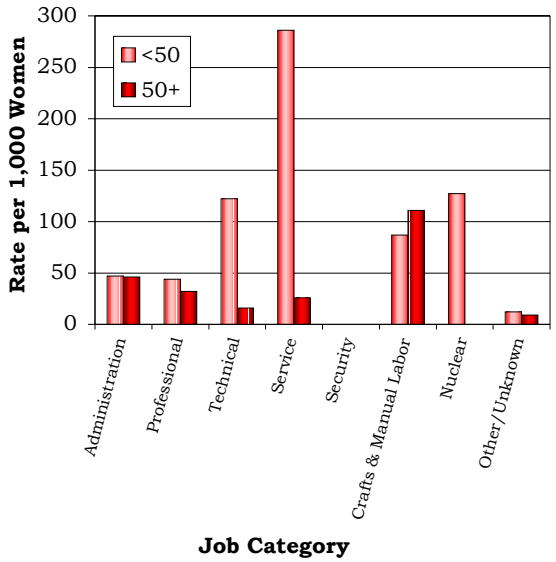
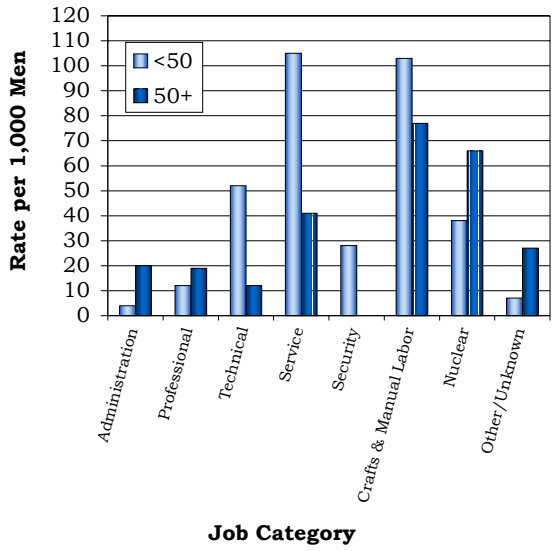



**Figure 19. OSHA-Recordable Rates by Age and Job Categories Among Men, All Diagnoses Combined**




Hanford workers missed 1,096 workdays and had 1,730 days restricted as a result of occupational injuries. Crafts and Manual Labor workers experienced over one-quarter (26 percent) of the restricted workdays. Technical and Nuclear workers together reported an additional 42 percent of the restricted workdays. These three job categories made up 17 percent of the Hanford work force in 2000. Eighty percent of the lost workdays were reported by Service and Crafts and Manual Labor workers. Two of the larger groups, Administration (22 percent of the work force) and Professional (20 percent of the work force), reported 12 percent of the lost and restricted workdays. Crafts and Manual Laborers comprised only 5 percent of the work force in 2000 and had the highest percentage of lost and restricted workdays (34 percent). In 1999, Nuclear workers and Crafts and Manual Laborers, who each made up 6 percent of the work force, had the highest percentages of lost and restricted workdays (36 percent and 18 percent, respectively). These two job categories were also responsible for the highest percentages of lost and restricted workdays in 1998.

Crafts and Manual Labor workers were 9 times more likely to experience an injury as other workers, followed by Technical, Nuclear, and Service workers, who were at least 2 times as likely to report an injury. Workers in three of the previously mentioned job categories (Crafts and Manual Labor, Nuclear, and Service) were at least 4 times more likely to suffer a sprain or strain as other workers. Crafts and Manual Laborers were at 20 times higher risk for open wounds of the upper limb. The risk of bruises was 13 times greater for Crafts and Manual Laborers and 7 times greater for Service workers than other categories. Technical, Service, Security,

and Crafts and Manual Labor workers were at least twice as likely as other workers to report muscles and skeleton disorders. Nervous system disorders were more likely among Nuclear workers (4 times). In addition, Technical and Service workers were more likely to report unspecified symptoms (3 times and 4 times, respectively).

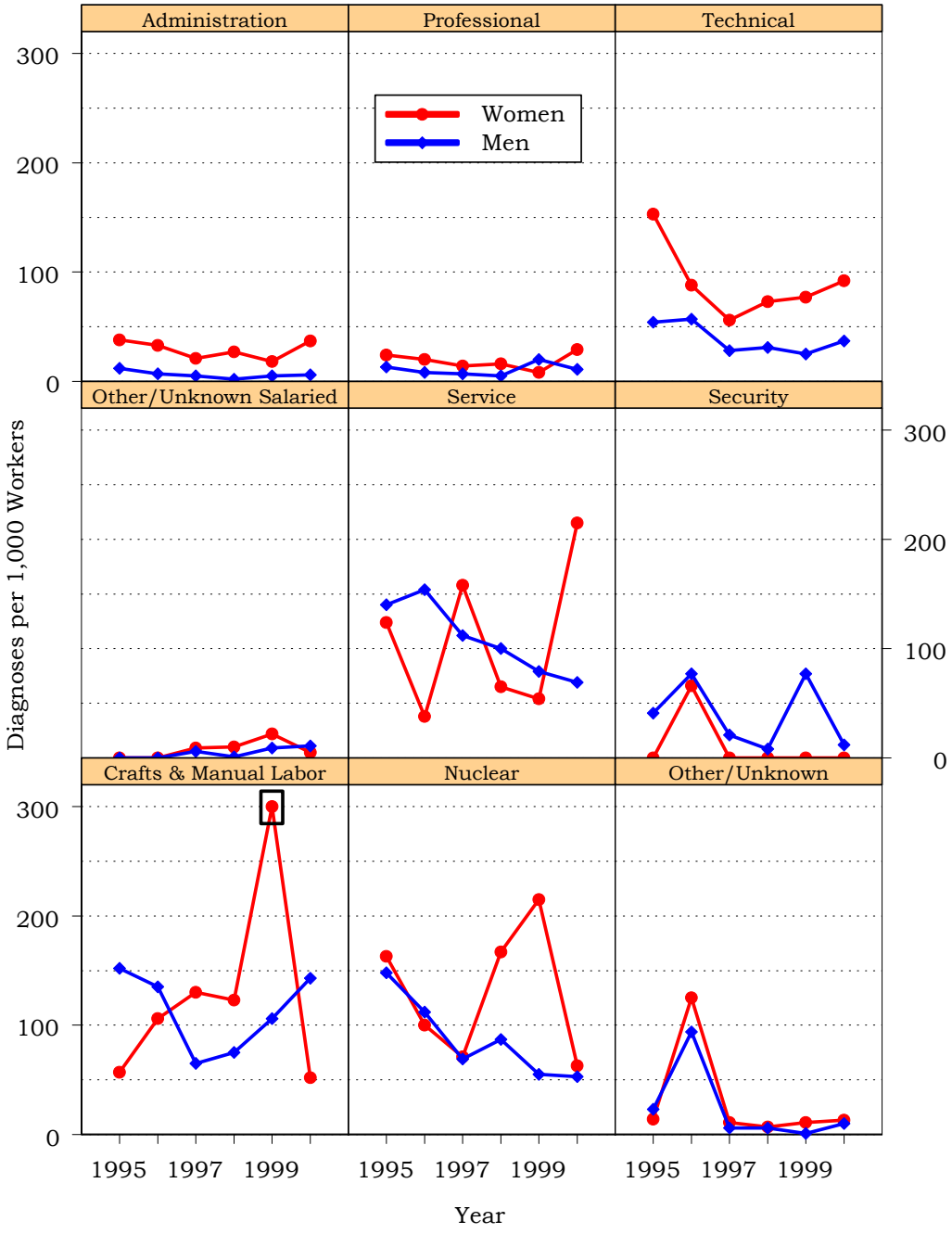
## Time Trends for OSHA-Recordable Events

The age-adjusted rates for all diagnostic categories combined from 1995 to 2000 by job category and gender are shown in Figure 20. During the 6-year period, the overall rates for OSHA-recordable events among men and women did not change greatly for the majority of the job categories. Significant changes in rates occurred from 1999 to 2000 for women in the Service, Crafts and Manual Labor, and Nuclear job categories. Women Service workers showed a rate increase and an increase in muscles and skeleton conditions (mainly joint and back disorders). Among women in the Crafts and Manual Labor and Nuclear categories, significant decreases in rates were noted, probably due to the small number of employees in these groups and the small number of diagnoses reported. For the fourth year in a row, women in the Security group reported no OSHA events.

Among men in the Security job category, a significant rate decrease from 1999 to 2000 was noted. The decrease resulted from a decrease in the number of injuries reported.

For all occupational categories combined, there were no significant changes in injury rates from 1999 to 2000 for both men and women.

**Figure 20. Age-Adjusted Rates for All OSHA-Recordable Diagnoses Combined Among Women and Men by Job Category from 1995 to 2000**




Note: The 1999 Crafts & Manual Labor rate for women was truncated to 300 ( ☐ ) for graphical presentation. The actual rate was 583.

## Glossary

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**Person-Year:** A unit of measurement combining the number of people being studied with the time that each was observed equivalent to 1 person followed for 1 year. For example, 5 people followed for 1 year contribute 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<br>235-239 |
| Blood | 280-289 |
| Cancer | 140-208<br>230-234 |
| Digestive | 520-579 |
| Endocrine / Metabolic | 240-279 |
| Existing Birth Conditions | 740-759 |
| Genitourinary | 580-629 |
| Heart / Circulatory | 390-459 |
| Infections / Parasites | 001-139 |
| Injury | 800-999 |
| Miscarriage | 630-676 |
| Muscles and Skeleton | 710-739 |
| Nervous System | 320-389 |
| Psychological | 290-319 |
| Respiratory | 460-519 |
| Skin | 680-709 |
| Unspecified Symptoms | 780-799 |

## ICD-9-CM Codes

| | | |
|---|---|---|
| **All conditions** | 001-V82 | All reported health events |
| **Infectious and parasitic diseases** | 001-139 | Diseases caused by bacteria, viruses, and parasites |
| • Intestinal infections | 001-009 | Infections of the bowel or gut |
| • Tuberculosis | 010-018 | TB in the lungs and other organs |
| • Zoonotic bacterial diseases | 020-027 | Bacterial diseases that animals transmit to humans |
| • Other bacterial diseases | 030-041 | Whooping cough, diphtheria, strep throat, and gangrene |
| • Human Immunodeficiency Virus (HIV) infection | 042 | AIDS |
| • Poliomyelitis and other non-arthropod diseases of the central nervous system | 045-049 | Viral meningitis (swelling of the layers covering the brain and spinal cord); viral encephalitis (swelling of the brain); and polio |
| • Viral diseases accompanied by exanthem | 050-057 | Diseases accompanied by rashes or blisters like chickenpox, measles, shingles, and herpes |
| • Arthropod-borne viral diseases | 060-066 | Encephalitis (swelling of the brain) caused by bites from virus-carrying ticks or mosquitoes |
| • Other diseases caused by viruses and chlamydiae | 070-079 | Viral hepatitis, mumps, rabies, and mononucleosis |
| • Rickettsioses and other arthropod-borne diseases | 080-088 | Rocky Mountain spotted fever, malaria, and lyme disease |
| • Other spirochetal diseases | 100-104 | Trench mouth and Weil's disease (jaundice caused by coil-shaped bacteria) |
| • Mycoses | 110-118 | Athlete's foot; fungal infections of fingernails and toenails; and thrush |
| • Helminthiases | 120-129 | Pinworms, tapeworms, roundworms, and whipworms |

| | | |
|---|---|---|
| • Other infectious and parasitic diseases | 130-136 | Lice, chiggers, scabies, and mites |
| • Late effects of infectious or parasitic diseases | 137-139 | Side effects of TB, chickenpox, or polio even though the disease is no longer active |
| **Malignant neoplasms** | 140-208, 230-234 | All cancers, regardless of the part of the body affected |
| • Lip, oral cavity, and pharynx | 140-149 | Lip, mouth, throat, and tongue |
| • Digestive organs and peritoneum | 150-159 | Stomach, esophagus (tube that transports food to the stomach), intestines, colon, rectum, anus, liver, pancreas, and gallbladder |
| • Respiratory system and intrathoracic organs | 160-165 | Sinuses, throat, voice box, lungs, and heart |
| • Bone, connective tissue, skin, and breast | 170-176 | Bone, muscle, ligament, tendon, blood vessels, fat, skin, and breast |
| • Genitourinary organs | 179-189 | Kidney, bladder, and cervix, ovary, uterus, and prostate |
| • Other and unspecified sites | 190-199 | Eye, brain, and thyroid |
| • Lymphatic and hematopoietic tissue | 200-208 | Leukemia, lymphoma, Hodgkin's disease, multiple myeloma, lymphosarcoma, and reticulum cell sarcoma |
| • Carcinoma in situ | 230-234 | A cancer that is confined to the site of origin (has not spread to neighboring tissue) |
| **Benign neoplasms and neoplasms of uncertain behavior and unspecified nature** | 210-229 235-239 | Tumors that are not cancerous or do not exhibit cancerous behavior, regardless of the part of the body affected |
| **Endocrine, nutritional, and metabolic diseases and disorders of the immune system** | 240-279 | Diseases affecting the hormone secreting glands and organs. Overactive thyroid; underactive thyroid; vitamin deficiency; diabetes; gout; and problems affecting the antibody producing system |

| | | |
|---|---|---|
| **Disorders of the blood and blood forming organs** | 280-289 | Anemia and hemophilia (excludes leukemia) |
| **Mental disorders** | 290-319 | Psychiatric diagnoses - Non-psychotic disorders: depression; anxiety, fear, and stress disorders; alcoholism; drug dependence; and eating disorders, such as anorexia; Psychotic disorders: dementia, schizophrenia, and manic depression |
| **Diseases of the nervous system and sense organs** | 320-389 | Huntington's chorea; Alzheimer's and Parkinson's disease; epilepsy; multiple sclerosis; migraine; diseases of the eye, such as cataract and glaucoma |
| • Inflammatory diseases of the central nervous system | 320-326 | Bacterial meningitis (swelling of the layers covering the brain and spine); bacterial encephalitis (swelling of the brain); and brain and spinal abscesses |
| • Hereditary and degenerative diseases of the central nervous system | 330-337 | Alzheimer's and Parkinson's disease, tremors, and Huntington's chorea |
| • Other disorders of the central nervous system | 340-349 | Multiple sclerosis (MS), cerebral palsy, epilepsy, and migraine |
| • Disorders of the peripheral nervous system | 350-359 | Nerve disorders of the face, carpal tunnel syndrome, muscular dystrophy |
| • Disorders of the eye | 360-379 | Inflammation and ulcers of the eye and eyelid; detached retina; pink eye; problems with tear ducts; glaucoma; and cataracts |
| • Diseases of the ear and mastoid process | 380-389 | Infections of the outer, middle, or inner ear; ringing of the ears; hearing loss |

| | | |
|---|---|---|
| **Diseases of the circulatory system** | 390-459 | Rheumatic fever, heart murmurs, heart attacks, angina, hardening of the arteries, varicose veins, hemorrhoids, and phlebitis |
| • Acute rheumatic fever | 390-392 | High fever and joint pain with possible heart damage |
| • Chronic rheumatic heart disease | 393-398 | Long lasting swelling and damage to the heart which results from rheumatic fever |
| • Hypertensive disease | 401-405 | High blood pressure |
| • Ischemic heart disease (Restricted blood flow to the heart) | 410-414 | Heart attack and angina |
| • Diseases of pulmonary circulation | 415-417 | Blood clots in the lung and pulmonary aneurysm (bulge that develops in the wall of the pulmonary artery, which is the artery that carries blood to the lungs) |
| • Other forms of heart disease | 420-429 | Swelling of the inner lining, middle lining, or sac enclosing the heart; heart failure; and irregular heartbeat |
| • Cerebrovascular disease | 430-438 | Stroke, bleeding in the brain, and blockage or low blood flow in blood vessels of the brain |
| • Diseases of the arteries and capillaries | 440-448 | Hardening of the arteries; aneurysm (bulge that develops in the walls of arteries); and blood clots |
| • Diseases of the veins, lymphatics, and other circulatory system diseases | 451-459 | Phlebitis (swelling of a vein), thrombophlebitis (swelling of a vein which has a blood clot), varicose veins, and hemorrhoids |

| | | |
|---|---|---|
| **Diseases of the respiratory system** | 460-519 | Colds, sinusitis, laryngitis, pneumonia, influenza, chronic bronchitis, asthma, and emphysema |
| • Acute respiratory infections | 460-466 | Colds, sore throat, sinus infections, swollen tonsils, and bronchitis |
| • Other diseases of the upper respiratory tract | 470-478 | Allergies, hay fever, sinus infections, bronchitis, and sore throat that continue for a long time |
| • Pneumonia and influenza | 480-487 | "The flu" and pneumonia caused by a bacteria or virus |
| • Chronic obstructive pulmonary diseases and allied conditions | 490-496 | Emphysema and asthma |
| • Pneumoconiosis and other lung diseases caused by external agents | 500-508 | Black lung; miners' asthma; asbestosis; silicosis; berylliosis; and conditions caused by chemical fumes and vapors |
| • Other diseases of the respiratory system | 510-519 | Pleurisy (swelling of the lining of the lungs), collapsed lung, and respiratory failure |
| **Diseases of the digestive system** | 520-579 | Diseases affecting the teeth and mouth, salivary glands, digestive tract, and the abdominal cavity. Examples include dental abscess, ulcers, appendicitis, hepatitis (excluding viral hepatitis), cirrhosis of the liver, gallstones, pancreatitis, abdominal hernia, and intestinal polyps |
| • Diseases of the oral cavity, salivary glands, and jaw | 520-529 | Tooth problems (too many, too few, abnormal shape or size, cavities, bleeding gums, toothaches), and infections and swelling of the mouth, jaw, and tongue |
| • Diseases of the esophagus, stomach, and duodenum | 530-537 | Ulcers of the esophagus (tube that transports food to the stomach), stomach, and small intestine; indigestion; and uncontrollable vomiting |

| | | |
|---|---|---|
| • Appendicitis | 540-543 | Swelling of the appendix (rupture, surgery, or both may result) |
| • Hernia of the abdominal cavity | 550-553 | Ruptures of the groin and diaphragm (muscle which separates the chest area from the lower part of the trunk) |
| • Non-infectious enteritis and colitis | 555-558 | Crohn's disease and swelling of the intestine and colon |
| • Other diseases of the intestines and peritoneum | 560-569 | Irritable bowel syndrome, blockage of the intestine, constipation, and diarrhea |
| • Other diseases of the digestive system | 570-579 | Diseases of the liver, gallbladder, and pancreas; hepatitis; blood in stool; and bleeding in the stomach and intestine |
| **Diseases of the genitourinary system** | 580-629 | Diseases affecting the kidneys, the prostate, and testes; benign breast diseases; infertility (male and female); diseases of the ovary; pelvic inflammatory disease; and menstrual disorders |
| • Nephritis, nephrotic syndrome, and nephrosis | 580-589 | Swelling of the kidney; swelling of the small blood vessels in the kidney; and kidney failure |
| • Other diseases of the urinary system | 590-599 | Swelling and infection of the kidney and bladder; kidney stones; and difficulty urinating |
| • Diseases of the male genital organs | 600-608 | Enlarged prostate; swelling of the scrotum and prostate; and abscess of the prostate |
| • Disorders of the breast | 610-611 | Benign tumors, cysts, and infections of the breast |
| • Inflammatory disease of the female pelvic organs | 614-616 | Swelling of the uterus, ovary, fallopian tubes, or cervix |
| • Other diseases of the female genital tract | 617-629 | Conditions associated with menopause and postmenopause; PMS; infertility; and cramps |

| | | |
|---|---|---|
| **Complications of pregnancy, childbirth, and the puerperium** | 630-676 | Miscarriage; complications of pregnancy, such as hemorrhage; pregnancy-related high blood pressure; preeclampsia; and premature labor or other complications of labor |
| • Ectopic and molar pregnancy | 630-633 | Development of fetus outside the uterus and growth of cysts |
| • Other pregnancy with abortive outcome | 634-639 | Miscarriage and complications associated with miscarriage |
| • Complications mainly related to pregnancy | 640-648 | Abnormal bleeding and possible miscarriage; infections; high blood pressure caused by pregnancy; and premature labor |
| • Normal delivery, and other indications for care in pregnancy, labor, and delivery | 650-659 | Delivery requiring little or no assistance; multiple births; breech birth; and problems of the fetus or placenta which affect care of mother |
| • Complications occurring mainly in the course of labor and delivery | 660-669 | Long labor; unusually fast delivery; and abnormal bleeding after delivery |
| • Complications of the puerperium | 670-676 | Infections of the breast; blood clot in lung; and varicose veins |
| **Diseases of the skin and subcutaneous tissue** | 680-709 | Acne, cellulitis, sunburn, psoriasis, and seborrhea |
| • Infections of the skin and subcutaneous tissue | 680-686 | Abscesses, boils, hair-containing cysts, and pus-filled blisters |
| • Other inflammatory conditions of skin and subcutaneous tissue | 690-698 | Skin rashes caused by detergents, oils, greases, solvents, sun, food, drugs, or medicine |
| • Other diseases of the skin and subcutaneous tissue | 700-709 | Corns, calluses, heat rash, swollen hair follicles, acne, and ingrown fingernails and toenails |

| | | |
|---|---|---|
| **Diseases of the musculoskeletal system and connective tissue** | 710-739 | Arthritis, systemic lupus erythematosus, ankylosing spondylitis, herniated intervertebral disk ("slipped disk"), lumbago, sciatica, rheumatism, tendonitis, and osteoporosis |
| • Arthropathies and related disorders | 710-719 | Arthritis; joint pain and stiffness; and other diseases of the connective tissue which supports and connects internal organs, forms bones and blood vessel walls, and attaches to bones |
| • Dorsopathies | 720-724 | Swelling of the spine; herniated, slipped, and ruptured disk; rheumatoid arthritis of the spine; lumbago; and sciatica |
| • Rheumatism, excluding the back | 725-729 | Swelling and degeneration of joints, muscles, tendons; tennis elbow; and bursitis |
| • Osteopathies, chondropathies, and acquired musculoskeletal deformities | 730-739 | Fracture caused by bone disease; osteoporosis; curvature of the spine; flat foot; hammer toe; and development of deformities of the nose, toes, feet, legs, arms, and hands |
| **Congenital anomalies** | 740-759 | Spina bifida; cleft palate; harelip; and various chromosomal anomalies, such as Klinefelter's syndrome |
| **Certain conditions originating in the perinatal period** | 760-779 | Maternal high blood pressure; maternal malnutrition; ectopic pregnancy; breech birth; fetal malnutrition or slow growth; injuries related to birth trauma; and perinatal jaundice |
| **Symptoms, signs, and ill-defined conditions** | 780-799 | Blackout, chills, dizziness, fatigue, pallor, abnormal weight loss, undiagnosed chest pain, and heartburn |

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

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

# NOTES