

1999

Oak Ridge Y-12 Plant Annual Epidemiologic Surveillance Report



Y-12 Plant 1999 Epidemiologic Surveillance Report

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<http://tis.eh.doe.gov/health/epi/surv/index.html>

Y-12 Plant 1999

At A Glance

A more accurate count of workers led to an apparent large increase in the size of the work force in 1999 compared to the estimate reported in 1998, the startup year for epidemiologic surveillance at Y-12 Plant.

We saw no indication that any particular diagnoses occurred disproportionately in a specific job category.

Nuclear Workers had the highest absence rate among both men and women.

The Security group had the highest rate of OSHA events (11 per 100 workers) among women. Nuclear Workers had the highest rate of OSHA events among men (15 per 100 workers).

Nuclear Workers comprised 4 percent of the work force and reported 14 percent of the OSHA events.

Compared with other workers, Crafts workers were at increased risk for a variety of occupational injuries, including open wounds to the arms, burns, muscles and skeleton conditions, and disorders affecting the nervous system and sense organs.

Introduction	1	Sentinel Health Events for Occupations	12
Site Overview	2	Characteristics of SHEOs by Gender	13
The Y-12 Work Force – 1999	3	Disabilities Among Active Workers	13
The Work Force by Gender and Age.....	3	Deaths Among Active Workers	13
The Work Force by Job Category and Gender.....	3	OSHA-Recordable Events	13
Number and Length of Absences	4	OSHA-Recordable Events by Gender and Age.....	13
Absence Rate by Gender and Age.....	4	OSHA-Recordable Events by Job Category and Gender	14
Number of Days Absent by Gender and Age.....	5	Diagnostic and Accident Categories for OSHA-Recordable Events	14
Absence Rate by Job Category and Gender	5	OSHA-Recordable Diagnoses by Diagnostic Category and Gender.....	15
Average Duration of Absence by Job Category and Gender	6	OSHA-Recordable Accidents by Type and Gender	15
Diagnostic Categories	6	Rates of OSHA-Recordable Events	15
Number of Diagnoses and Lost Calendar Days by Diagnostic Category (Categorized by ICD-9-CM) and Gender.....	7	OSHA-Recordable Rates by Age and Job Categories Among Women, All Diagnoses Combined	16
Most Frequently Reported Diagnoses by Job Category and Gender	8	OSHA-Recordable Rates by Age and Job Categories Among Men, All Diagnoses Combined	16
Rates of Disease Occurrence	9		
Illness and Injury Rates by Job Category, Gender, and Age.....	10		

Glossary 17

**Explanation of Diagnostic
Categories** 18

ICD-9-CM Codes 19

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.

This report provides a summary of epidemiologic surveillance data collected from the Y-12 Plant from January 1, 1999 through December 31, 1999. The data were collected by a coordinator at Y-12 and submitted to DOE's Epidemiologic Surveillance Data



Center, located at Oak Ridge Institute for Science and Education, where quality control procedures and data analyses were carried out. Epidemiologic

surveillance began at Y-12 in 1998. The information presented in this report provides highlights of the data analyses conducted. 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 of 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.

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

DOE sites vary by mission, function, job classification, and worker exposures. Therefore, comparisons of Y-12 with other DOE sites should be made with caution. In addition, many factors can affect the completeness and accuracy of health information reported by the sites, thereby affecting the observed patterns of illness and injury.



Site Overview

The Y-12 Plant is a DOE facility located in Oak Ridge, Tennessee on 811 acres within the Oak Ridge Reservation. Its 250 buildings contain about 7 million square feet of floor space of



laboratory, research and development, machining, dismantlement, and storage areas. The site was established in 1943 as part of the Manhattan Project to produce highly enriched uranium. After World War II, the plant's focus changed to manufacturing components for nuclear weapons. Construction of the plant started in February 1943; enriched uranium production started in November of the same year. Plant construction, however, was not entirely finished until 1945. At its peak during World War II, the plant employed approximately 22,000 workers.

For more than 50 years, the Y-12 Plant has been one of the DOE weapons complex's manufacturing facilities. Every weapon in the stockpile has some components manufactured at the Y-12 Plant.

Today, the mission of the Y-12 Plant is to meet the needs of DOE, other agencies, and private industry through:

- Production of complex components and assemblies,
- Safe and secure storage of nuclear materials,
- Dismantlement, disposition, evaluation, and assessment of weapon components,
- Transitioning the plant size to meet DOE needs,
- Transfer of technology to private industry,
- Maintenance of DOE capabilities, and
- Support of other national priorities.

The nation's first DOE Defense Programs deployment / user facility was located at the Y-12 Plant, and the plant continues to be the home of eight user centers. Such designation allows easier access to the centers, where manufacturers can conduct their own research using unique machinery available at Y-12.

Y-12 was placed on the National Priorities List under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) in 1989. The CERCLA activities are covered under a 1992 tri-party agreement among the Environmental Protection Agency, DOE, and the Tennessee Department of Environment and Conservation. This tri-party, umbrella agreement established a procedural framework and schedule to investigate and remediate contaminant releases and potential releases at the Oak Ridge Reservation in accordance with CERCLA requirements.

Lockheed Martin Energy Systems, Inc. is the primary managing and operating contractor for the Y-12 Plant.

The Y-12 Work Force - 1999

A total of 5,802 Y-12 employees were included in epidemiologic surveillance in 1999, an increase of 1,373 workers from 1998. The increase can be explained by undercounting in



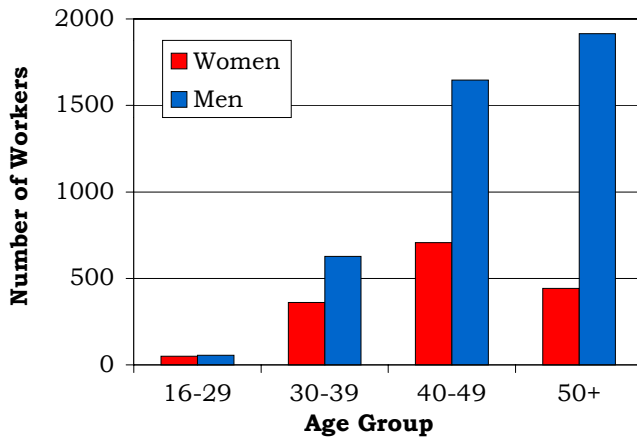
1998, the startup year for epidemiologic surveillance at the site.

Demographic data needed for construction of rosters are retained in a complex

information systems network at the site, increasing the difficulty of assuring that all workers eligible for inclusion are counted.

The gender and age distribution of the 1999 work force is shown in Figure 1. There were 1,558 (27 percent) women and 4,244 (73 percent) men in the work force. The average age of male Y-12 workers was 48 years and 45 years for females.

Figure 1. The Work Force by Gender and Age



The distribution of workers by job category and gender is shown in Figure 2. Individual job titles reported by Y-12 were grouped together into 11 job categories because there

were either too few workers or too few health events within a particular job title, thereby limiting the type of analyses that could be conducted. Men and women were not distributed equally among the various job categories. Almost 30 percent of female employees were Administrative workers, while only 1 percent of men were in this category. The largest percentage of men (24 percent) were Engineering, Scientific, and Health Care workers.



Figure 2. The Work Force by Job Category and Gender

Job Category	Women	Men
Management	121 8%	635 15%
Engineering, Scientific, & Health Care	265 17%	1,035 24%
Professional	264 17%	451 10%
Administrative	462 29%	40 1%
Technical	205 13%	335 8%
Crafts	21 1%	837 20%
Security	38 2%	331 8%
Operators	12 1%	131 3%
Nuclear Workers	63 4%	195 4%
Laborers & General Workers	106 7%	253 6%
Unknown	1 <1%	1 <1%

Number and Length of Absences

Epidemiologic surveillance examines absences of 5 or more consecutive workdays (also referred to as “5-day absences”). This absence threshold is based on DOE Order 440.1, which requires contractor management to notify Occupational Medicine when a



worker has been absent for 5 or more consecutive workdays. 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 also must

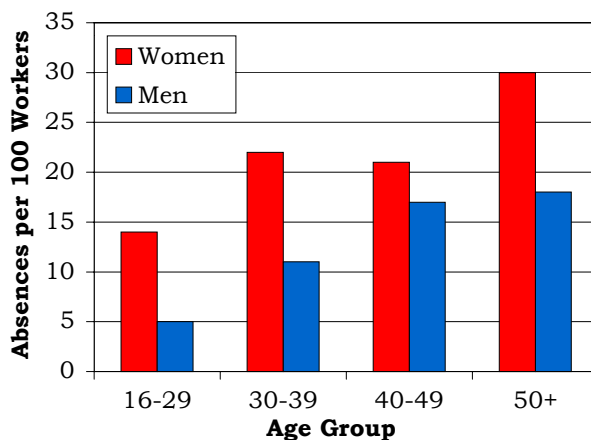
be reported. Non-occupational illnesses and injuries that involve absences of fewer than 5 days do not routinely require a medical clearance for return to work and are therefore excluded from these analyses.

Specific absences of 5 or more consecutive workdays that were not the result of an injury or illness were excluded. These include 17 women with 18 reported absences due to maternity leave and 1 female worker and 2 male workers with reported absences due to elective surgical procedures not related to the treatment of an illness or injury.

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

The Y-12 work force increased substantially in 1999, and the site experienced a large increase in the number of reported absences as well. Women reported 62 percent and men reported 49 percent more absences in 1999 than in 1998. Overall, the 53 percent increase in absences exceeded the 31 percent increase in the number of men and women included in epidemiologic surveillance from 1998 to 1999. Although the number of absences reported in 1999 was substantially higher than in 1998, the overall absence rates for both women and men were only slightly higher in 1999 than in 1998. The 5-day absence rate among women was 24 per 100 workers compared with 22 per 100 women in 1998. Among men, the absence rate was 17 per 100 workers compared with 14 absences per 100 men in 1998. The rate of 5-day absences due to injury or illness varied by gender and age (Figure 3). The rate of 5-day absences among both men and women increased with age.

Figure 3. Absence Rate by Gender and Age



The average length of absence was 39 days for men and 34 days for women (Figure 4). The average duration of absence increased with age among both men and women.

Figure 4. Number of Days Absent by Gender and Age

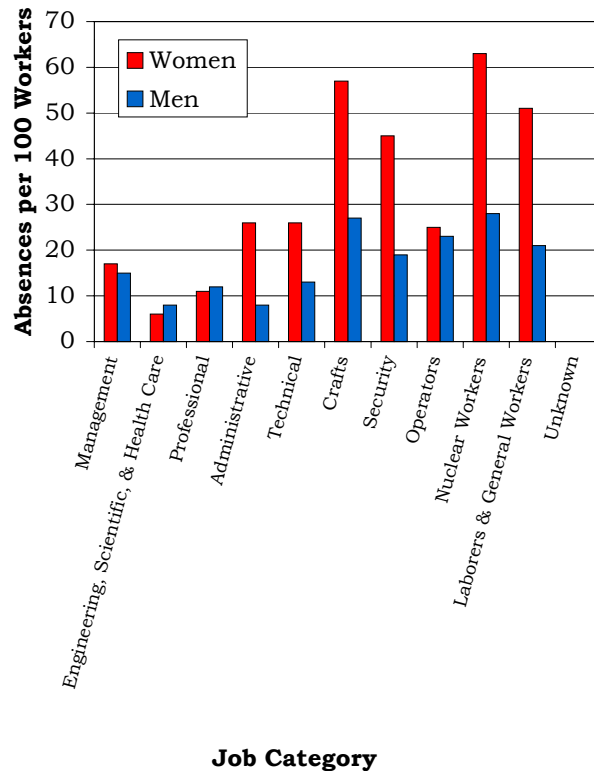
Gender	Age	Number of Absences	Number of Days Absent	Average Number of Days Absent
Women	16-29	7	108	15
	30-39	79	2,108	27
	40-49	150	5,537	37
	50+	132	4,758	36
	Total	368	12,511	34
Men	16-29	3	74	25
	30-39	72	2,212	31
	40-49	282	8,772	31
	50+	348	16,571	48
	Total	705	27,629	39

The rate of 5-day absences due to illness or injury varied by job category for both men and women (Figure 5). Women had a higher rate of absence than did men within the same job category except for those in the Engineering, Scientific, and Health Care and Professional categories. Nuclear Workers had the highest absence rate among male workers; those in the Engineering, Scientific, and Health Care and Administrative groups had the lowest absence rates. Among women, Nuclear Workers also had the highest absence rate; workers in the Engineering, Scientific, and Health Care group had the lowest rate. The low rates among workers in the Engineering, Scientific, and Health Care category were also observed in 1998.



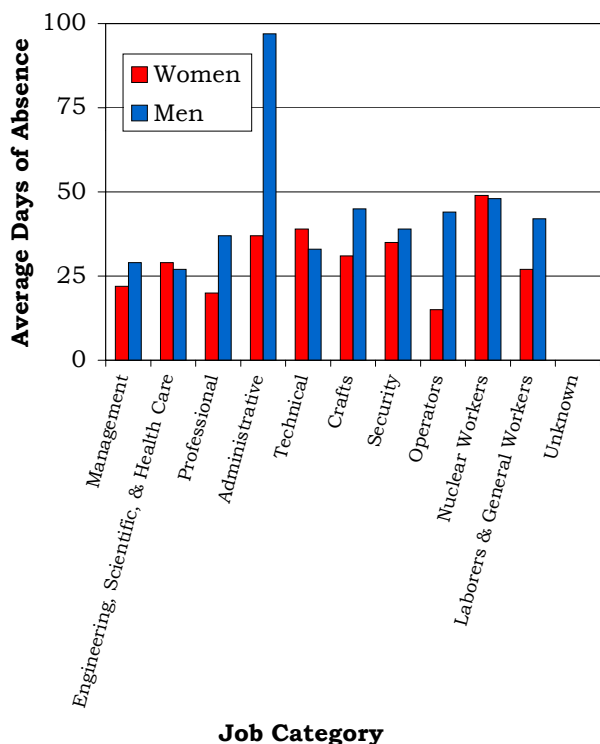
Care and Professional categories. Nuclear Workers had the highest absence rate among male workers; those in the Engineering, Scientific, and Health Care and Administrative groups had the lowest absence rates. Among women, Nuclear Workers also had the highest absence rate; workers in the Engineering, Scientific, and Health Care group had the lowest rate. The low rates among workers in the Engineering, Scientific, and Health Care category were also observed in 1998.

Figure 5. Absence Rate by Job Category and Gender



Men tended to have longer absences than did women within a job category (Figure 6). The two job categories with the lowest absence rates among men were at the extremes in terms of the average duration of absence. Administrative workers had the longest average number of days absent, 97 days. One of the three absences reported by male Administrative workers lasted over 6 months. Workers in the Engineering, Scientific, and Health Care group had the shortest absence duration, 27 days. Nuclear workers, who had the highest absence rate among women, also had longest average duration of absences, 49 days. Female Operators averaged the shortest absences, 15 days.

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



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 section of this report.

The number of reported diagnoses categorized according to the ICD-9-CM and the number of lost calendar days are presented in Figure 7. Women reported 386 diagnoses and men reported 743 diagnoses in 1999. This represented a 60 percent increase for women and a 52 percent increase for men in reported diagnoses in 1999 compared with 1998. The most frequently reported diagnoses varied little by gender. Among both women and men, the most common diagnoses were respiratory conditions. Reported respiratory conditions increased almost 2.5 times from the 131 diagnoses reported in 1998.

Diagnostic Categories

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

This report organizes illness and injury categories based on a standard reference, the *International*



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	6	370	8	215
Blood	4	227	3	210
Cancer	2	198	16	1,402
Digestive	22	558	67	2,115
Endocrine/ Metabolic	5	87	17	687
Existing Birth Condition	0	0	0	0
Genitourinary	62	2,130	32	909
Heart/ Circulatory	13	335	62	2,761
Infections/ Parasites	8	335	9	359
Injury	23	970	115	5,325
Miscarriage	1	7	NA	NA
Muscles & Skeleton	58	4,380	149	9,632
Nervous System	25	678	30	1,093
Psychological	7	619	11	407
Respiratory	128	1,881	193	3,068
Skin	3	39	10	267
Unspecified Symptoms	19	384	21	1,226

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

Women lost 12,511 calendar days due to injury and illness. Respiratory diseases (33 percent), genitourinary disorders (16 percent), and muscles and skeleton conditions (15 percent) accounted for 64 percent of all reported diagnoses among women. The majority of the respiratory conditions were upper respiratory type infections (74 percent), followed by flu and pneumonia (16 percent). Ninety-four percent of the genitourinary conditions were related to female reproductive disorders. Joint

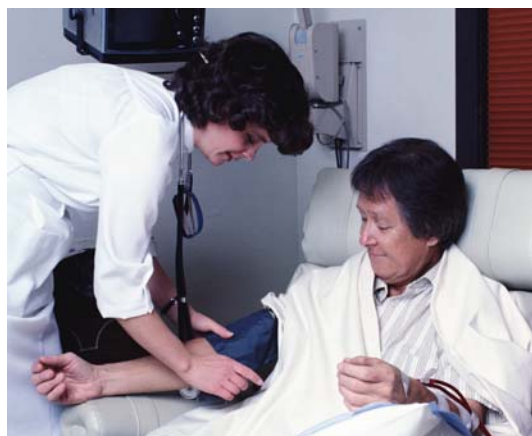
disorders made up 41 percent of the muscles and skeleton conditions, followed by disc and back problems (28 percent) and rheumatism (22 percent).

Men lost 27,629 calendar days due to injury and illness. Sixty-one percent of all reported diagnoses among men were due to respiratory conditions (26 percent), muscles and skeleton conditions (20 percent), and injuries (15 percent). Upper respiratory infections accounted for 68 percent of the respiratory conditions, followed by pneumonia and flu (24 percent). A closer look at diagnoses affecting the muscles and skeleton showed that about 42 percent were back problems and disc disorders, 27 percent were conditions affecting the joints (primarily knee derangement and other joint disorders), and 22 percent were rheumatism. Frequently reported injuries included sprains and strains (51 percent) and fractures (26 percent).



The previously mentioned diagnoses did not vary by age. Conditions affecting the respiratory system, diagnoses of the muscles and skeleton, and injuries were the three most frequently reported categories for all men at least 30 years old. Only three diagnoses were reported among men under 30 years old.

Among women, the most frequently reported diagnoses were also consistent among the various age groups. Respiratory diseases, muscles and



skeleton disorders, and genitourinary conditions were frequently reported diagnoses by women regardless of age. As with men, women less than 30 years old reported few diagnoses.

Figure 8 shows the frequency of reported diagnoses by job category for men and women. The types of diagnoses did not vary significantly by job category. Among men, muscles and skeleton conditions, injuries, and respiratory conditions appeared in all job categories except Administrative and Unknown. Among women, genitourinary disorders, muscles and skeleton conditions, and respiratory diagnoses were common across most job categories. We saw no indication that any particular diagnoses occurred disproportionately in a specific job category.



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

Job Category	Men	Women
Management	Respiratory (23) Muscles & Skeleton (22) Digestive (13) Injury (13) Heart/Circulatory (7)	Digestive (4) Genitourinary (4) Muscles & Skeleton (4) Respiratory (4) Nervous System (2)
Engineering, Scientific, & Health Care	Digestive (17) Injury (16) Respiratory (16) Muscles & Skeleton (13)	Respiratory (7) Genitourinary (2) Muscles & Skeleton (2) Unspecified Symptoms (2)
Professional	Respiratory (17) Injury (9) Muscles & Skeleton (8) Heart/Circulatory (7)	Respiratory (13) Genitourinary (4) Digestive (3) Injury (3)
Administrative	Genitourinary (1) Muscles & Skeleton (1) Respiratory (1)	Genitourinary (32) Respiratory (32) Muscles & Skeleton (17) Injury (8)
Technical	Respiratory (17) Muscles & Skeleton (8) Heart/Circulatory (7) Injury (4)	Respiratory (14) Genitourinary (10) Nervous System (9) Muscles & Skeleton (6)
Crafts	Respiratory (58) Muscles & Skeleton (55) Injury (34) Heart/Circulatory (24)	Muscles & Skeleton (3) Respiratory (3) Genitourinary (2)
Security	Respiratory (23) Injury (15) Muscles & Skeleton (10) Digestive (5)	Respiratory (9) Digestive (1) Genitourinary (1) Heart/Circulatory (1) Infections/Parasites (1) Injury (1) Muscles & Skeleton (1) Nervous System (1) Skin (1)
Operators	Muscles & Skeleton (9) Injury (8) Respiratory (7)	Respiratory (2) Genitourinary (1)
Nuclear Workers	Muscles & Skeleton (14) Respiratory (12) Injury (11)	Respiratory (15) Muscles & Skeleton (10) Injury (5)
Laborers & General Workers	Respiratory (19) Muscles & Skeleton (9) Digestive (5) Heart/Circulatory (5) Injury (5)	Respiratory (29) Muscles & Skeleton (13) Unspecified Symptoms (5)
Unknown	None	None

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 149 and women reported 58 diagnoses involving the muscles and skeleton during 1999. Men, therefore, reported more than twice as many conditions of the muscles and skeleton as did women. As there were more than twice as many men than women at Y-12, it seems reasonable to expect more muscles and skeleton conditions among men than women. Does this mean that men were at greater risk of muscles and skeleton conditions than were women in 1999? To correctly answer that question, the total number of men and women in the work force must be considered. To compare risk among men and women, it is necessary to calculate the rate of muscles and skeleton conditions for each gender. Rates are calculated by dividing the number of 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:

149 muscles and skeleton diagnoses ÷
4,244 men =
.035 x 1,000 = 35 muscles and skeleton
diagnoses per 1,000 men

58 muscles and skeleton diagnoses ÷
1,558 women =
.037 x 1,000 = 37 muscles and skeleton
diagnoses per 1,000 women

Comparing these rates now correctly suggests that the rate of reported muscle and skeleton conditions among women is about the same as the rate for men. They are called **crude rates** because they do not account for possible differences between men and women such as age and other factors that might affect the individual's risk of having a muscle and skeleton condition. 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.



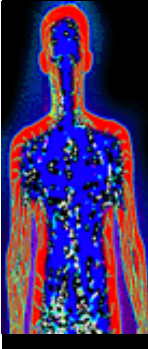
In the following set of analyses, the four age groups previously used were collapsed into two groups: workers younger than 50 years of age and those 50 or older. In addition, the 11 job categories were combined into five

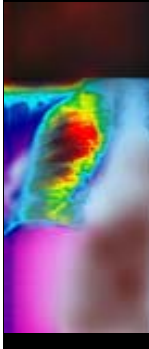


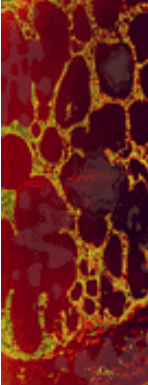
larger groups. Five groups of diagnoses of particular interest to workers are presented in Figure 9: all illnesses and injuries combined, cancer, heart / circulatory system, respiratory system, and


injury. Additional information about 13 other disease groups is also analyzed and can be found in the Supplemental Tables.

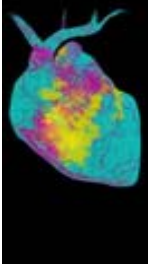
Figure 9. Illness and Injury Rates by Job Category, Gender, and Age

Diagnostic Category	Rate per 1,000			
All Illnesses & Injuries Combined	Job Category	Age	Men	Women
	Management/ Professional/ Administrative	<50	145	203
		50+	136	224
	Engineering, Scientific, & Health Care/ Technical	<50	75	141
		50+	123	194
	Crafts/Security/ Operators/ Laborers & General Workers	<50	249	548
		50+	264	548
	Nuclear Workers	<50	252	625
		50+	381	677
	Unknown	<50	0	0
		50+	0	0

Diagnostic Category	Rate per 1,000			
Respiratory	Job Category	Age	Men	Women
	Management/ Professional/ Administrative	<50	44	53
		50+	29	69
	Engineering, Scientific, & Health Care/ Technical	<50	23	40
		50+	25	65
	Crafts/Security/ Operators/ Laborers & General Workers	<50	75	260
		50+	63	219
	Nuclear Workers	<50	63	313
		50+	60	161
	Unknown	<50	0	0
		50+	0	0

Diagnostic Category	Rate per 1,000			
Cancer	Job Category	Age	Men	Women
	Management/ Professional/ Administrative	<50	3	2
		50+	7	0
	Engineering, Scientific, & Health Care/ Technical	<50	0	0
		50+	4	11
	Crafts/Security/ Operators/ Laborers & General Workers	<50	1	0
		50+	8	0
	Nuclear Workers	<50	0	0
		50+	12	0
	Unknown	<50	0	0
		50+	0	0

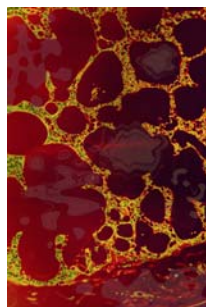
Diagnostic Category	Rate per 1,000			
Injury	Job Category	Age	Men	Women
	Management/ Professional/ Administrative	<50	26	12
		50+	13	20
	Engineering, Scientific, & Health Care/ Technical	<50	8	11
		50+	25	0
	Crafts/Security/ Operators/ Laborers & General Workers	<50	43	10
		50+	37	14
	Nuclear Workers	<50	54	0
		50+	60	161
	Unknown	<50	0	0
		50+	0	0

Diagnostic Category	Rate per 1,000			
Heart/ Circulatory	Job Category	Age	Men	Women
	Management/ Professional/ Administrative	<50	10	5
		50+	14	16
	Engineering, Scientific, & Health Care/ Technical	<50	7	0
		50+	10	0
	Crafts/Security/ Operators/ Laborers & General Workers	<50	13	19
		50+	29	41
	Nuclear Workers	<50	18	0
		50+	36	32
	Unknown	<50	0	0
		50+	0	0

Age was not strongly related to the rates for all illness and injuries combined across the various job categories. Both men and women classified as Nuclear Workers had the highest rates, followed by workers in the combined Crafts / Security / Operators / Laborers and General Workers category. By contrast, workers in the combined Management / Professional / Administrative and Engineering, Scientific, and Health Care / Technical groups tended to have substantially lower rates. This

difference may in part reflect more complete reporting of absences by workers in bargaining unit occupations than is typical among white collar occupations. The same contrast has been noted at other sites participating in epidemiologic surveillance.

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



The likelihood that an individual in the U.S. develops cancer increases with age. Our data reflect this observation for men. In all job categories in which cancer was reported, cancer rates were higher among older workers. Fourteen men reported 16 5-day absences due to cancer. The diagnoses were four prostate cancers, two colon cancers, two lung cancers, two skin cancers, and one cancer each of the nasopharynx, esophagus, stomach, testis, kidney, and brain. The man who reported kidney cancer in 1999 reported cancer at the same site in 1998. Only two women reported cancer in 1999, one liver and one ovarian cancer. Neither woman reported cancer previously. Of the 16 workers who reported cancer, 12 were 50 years of

age or older. We found no relationship between the type of cancer and job category.

Older workers had the highest rates due to heart / circulatory problems among men and women. The highest rates were among older men in the Nuclear Workers group and older women in the Crafts / Security / Operators / Laborers and General Workers group, but in each case the rate was based on only five reported diagnoses. Thirty-eight of the 62 absences among men occurred in workers aged 50 or older. Forty-one of 62 diagnoses involved hypertension (high blood pressure) or ischemic heart disease (restricted blood flow through an artery). Ten of 13 diagnoses for heart / circulatory problems reported among women were for hypertension or ischemic heart disease. Compared with other workers, Crafts workers were at over twice the risk of reporting heart / circulatory conditions.

Women had higher rates of respiratory disease than did men in all job categories. Younger men generally had higher rates than did men age 50 or older. Among women, age was not related to the rate of respiratory disease. Crafts / Security / Operators / Laborers and General Workers had the highest rates of respiratory disease for female workers. Men in this job category also had higher rates than did male workers in other job categories. Workers in this job category also had the highest rates in 1998. Workers in the Crafts, Security, Nuclear Workers, and Laborers and General Workers categories were twice as likely to report these conditions as were other workers.

Except for the Engineering, Scientific, and Health Care / Technical category, older women had higher rates of injury than did younger women.

Among men, the injury rate was not related to age. Men tended to have higher rates than did women in a given job category. The highest rates of injury were among men and women in the Nuclear Workers group, the same as in 1998. Crafts and Nuclear Workers were at least twice as likely to report an injury as were other workers. Compared with other workers, Nuclear Workers and Security workers were also at over 3 times higher risk of reporting a back sprain or strain. Operators were 5 times more likely to report a fracture of the leg.

In other analyses, we compared the risk of illness and injury among workers classified in one job category with the risk to workers in the remaining 10 job categories. Workers in the Crafts, Security, Nuclear Workers, and Laborers and General Workers categories were at about twice the risk compared with all other groups. Administrative workers were 6 times as likely to report a psychological condition and more than twice as likely to report a genitourinary disorder compared with other workers. Crafts workers were at more than twice the risk for reporting conditions of the nervous system, genitourinary disorders, muscles and skeleton disorders, and unspecified symptoms. Operators had 7 times the risk of other workers for reporting a psychological condition, and Nuclear Workers had 4 times the risk of unspecified symptoms. Laborers and General Workers had a 5 times increased risk of a skin condition and almost twice the risk of a muscles or skeleton disorder compared with other workers.

Sentinel Health Events for Occupations

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

Definite Sentinel Health Events: Conditions 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.

One definite sentinel health event was identified in 1999. One female Administrative worker, aged 40-49, was diagnosed with a malignant neoplasm of the liver. This event resulted in 17 lost calendar days. Fourteen of 1,129 diagnoses (1 percent) were identified as possible sentinel health events (Figure 10). Ten of the 14 possible sentinel health events were identified as carpal tunnel syndrome, reported by 10 workers (6 women and 4 men), and resulted in 336 lost calendar days. Women in the Technical job category reported three of the carpal tunnel diagnoses, and workers in the Administrative category reported two other carpal tunnel diagnoses. Nine diagnoses occurred among workers aged 40 or older; one worker was in the 30-39 age group.

Figure 10. Characteristics of SHEOs by Gender

	Total Number of SHEO Diagnoses		Total Number of Days Absent	
	Men	Women	Men	Women
Definite	0	1	0	17
Possible	8	6	649	243
Total	8	7	649	260

Disabilities Among Active Workers

Disability data for the 1999 Y-12 work force were not available.

Deaths Among Active Workers

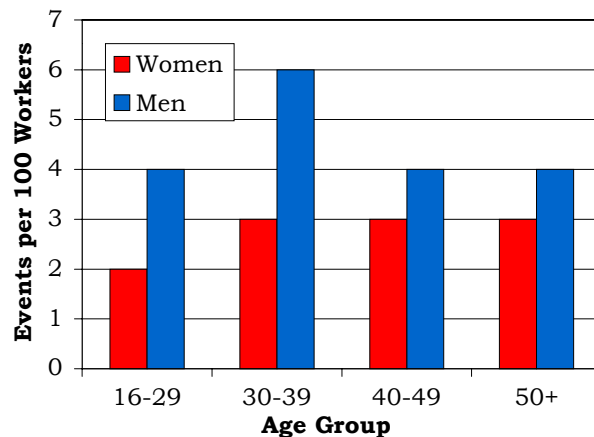
During 1999, eight deaths occurred among Y-12 workers (all men). The causes of death were three cardiovascular disease, two cancer, one meningitis, one motorcycle accident, and one unknown.

OSHA-Recordable Events

The Occupational Safety and Health Administration (OSHA) requires employers to maintain a record of occupational injuries and illnesses that have occurred among employees and to make that information available to OSHA on request. Employers maintain the information from these OSHA-recordable events in the OSHA 200 Log. OSHA-recordable events differ from health events captured through return-to-work clearances in at least two important respects: 1) they do not necessarily result in days lost from work, and 2) they are usually accompanied by a specific determination that they are work-related.

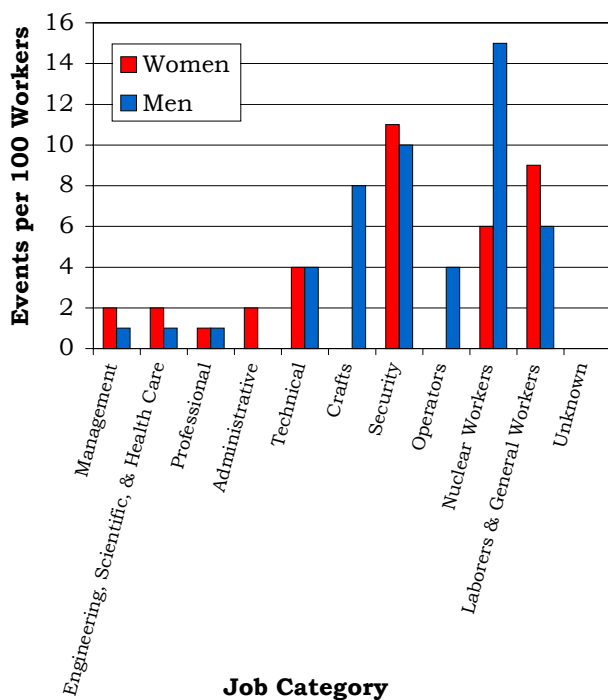
Figure 11 shows the distribution of OSHA events by gender and age. There were 46 OSHA-recordable events among women and 185 OSHA-recordable events among men. The rate of OSHA-recordable events was the similar for men (4 per 100 workers) and women (3 per 100 workers). The average number of lost or restricted workdays increased with age for women.

Figure 11. OSHA-Recordable Events by Gender and Age



The distribution of OSHA-recordable events by job category and gender is shown in Figure 12. The Security group had the highest rate of OSHA events (11 per 100 workers) among women. Nuclear Workers had the highest rate of OSHA events among men (15 per 100 workers). Women had higher rates of OSHA-recordable events than did men in five job categories: Management; Engineering, Scientific, and Health Care; Administrative; Security; and Laborers and General Workers. Men and women in the Unknown job category, women in the Operators and Crafts categories, and male Administrative workers did not report any OSHA events.

Figure 12. OSHA-Recordable Events by Job Category and Gender



The average number of workdays lost or with restricted activity due to an OSHA event was over 30 percent higher for men (8 days) than for women (6 days). Women in the Laborers and General Workers category averaged the

highest number of lost or restricted workdays (18 days). Operators had the highest average number of lost or restricted workdays (24 days) among men. This average was based on five events, two of which involved unspecified injuries to the shoulder and to multiple sites, resulting in 43 and 76 lost / restricted workdays, respectively.

An accident occurred at Y-12 on December 8, 1999, resulting in eight OSHA events reported. The accident involved a sodium-potassium (NaK) reaction in building 9201-5 during a cleanup operation.

Diagnostic and Accident Categories for OSHA-Recordable Events

There were 231 OSHA events recorded on the OSHA 200 Logs, containing 49 diagnoses among women and 198 diagnoses among men (Figure 13). Among women, injuries accounted for 63 percent of the diagnoses reported. The most common (45 percent) type of OSHA-recordable injury was sprains and strains. Twenty-three percent of the reported injuries among women were unspecified and 10 percent were internal injuries. Among men, injuries accounted for 78 percent of the diagnoses reported, again primarily due to sprains and strains (34 percent). Open wounds (22 percent) and unspecified injuries (18 percent) were also frequently reported among men. After injuries, the most common type of OSHA-recordable diagnoses among both men and women were conditions involving the muscles and skeleton. Twelve of the OSHA diagnoses involved the nervous system; 9 (75 percent) of these were carpal tunnel syndrome.

Figure 13. OSHA-Recordable Diagnoses by Diagnostic Category and Gender

Diagnostic Category	Gender	
	Women	Men
Digestive	0	1
Muscles & Skeleton	10	24
Nervous System	5	7
Psychological	0	1
Respiratory	0	2
Skin	2	6
Unspecified Symptoms	1	3
Injury	31	154
Fractures – Skull	0	1
Fractures – Upper Limb	1	1
Fractures – Lower Limb	0	2
Back Sprains and Strains	2	19
Other Sprains and Strains	12	33
Internal Injuries – Thorax, Abdomen, Pelvis	3	10
Open Wounds – Head, Neck, Trunk	1	8
Open Wounds – Upper Limb	0	26
Superficial Injuries	0	3
Bruises	2	7
Burns	2	9
Unspecified Injuries	7	28
Adverse Reactions to Non-Medical Substances	0	5
Adverse Reactions to External Causes	0	2
Complications of Surgical/ Medical Care	1	0

Two of the 231 OSHA events were described as “an accident” in the OSHA logs (Figure 14). These events were described as “other accidents,” both occurring among women (one Engineering, Scientific, and Health Care worker and one Professional employee). Hot, corrosive, or caustic material / steam caused these accidents, which resulted in no lost or restricted workdays.

Figure 14. OSHA-Recordable Accidents by Type and Gender

Accident Category	Gender	
	Women	Men
	Number of Accidents	Number of Accidents
Other Accidents	2	0
Hot, Corrosive, or Caustic Material/Steam	2	0
Total	2	0

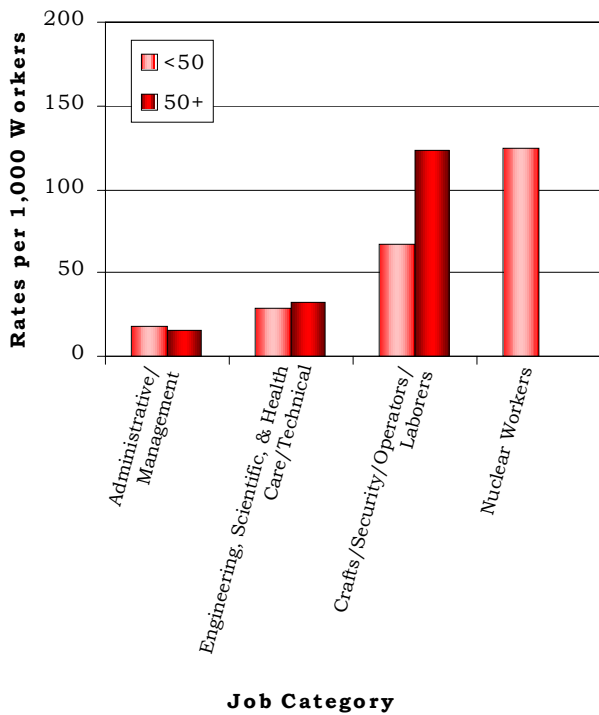
Rates of OSHA-Recordable Events

The rates of all OSHA-recordable events by age and job categories and gender are shown in Figures 15 and 16. Women tended to have higher rates than did men for most job categories.



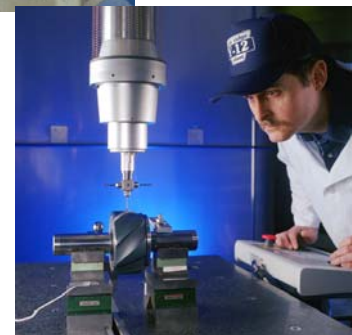
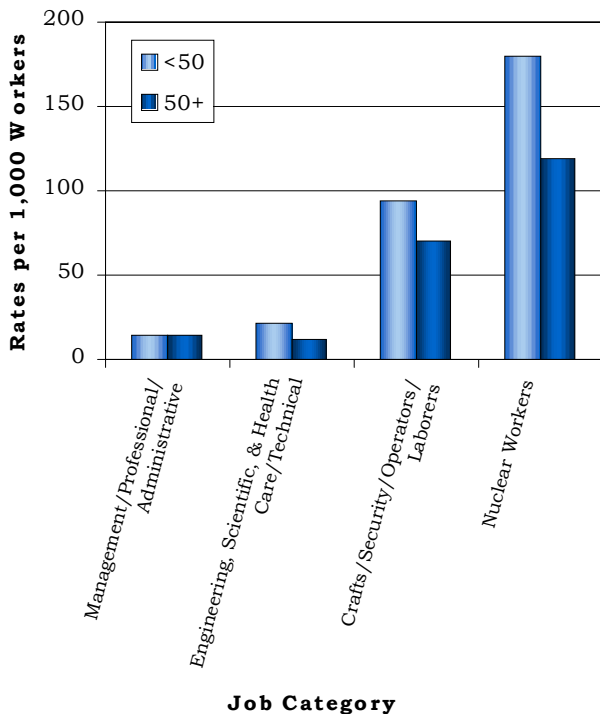
The OSHA-recordable rates among men were highest among Nuclear Workers; the highest rates for women were among Crafts / Security / Operators / Laborers and General Workers. Most of the OSHA health conditions involved injuries. When the rate for OSHA-recordable injuries was considered separately from other OSHA-recordable health conditions, the same job categories had the highest rates for men and women. Crafts / Security / Operators / Laborers and General Workers accounted for 30 percent of the work force and 58 percent of the OSHA-recordable events. Nuclear Workers comprised 4 percent of the work force and reported 14 percent of the OSHA events.

Figure 15. OSHA-Recordable Rates by Age and Job Categories Among Women, All Diagnoses Combined



Laborers and General Workers were at 6 times greater risk of a back sprain or strain than were other groups of workers. Security workers were also at increased risk for sprains and strains (4 times for the back and 8 times for areas other than the back). Crafts workers were 7 times more likely to report an open wound of the upper limb and 5 times more likely to report a burn as other workers. Disorders of the muscles and skeleton were more likely among Crafts workers (4 times) and Nuclear Workers (4 times) than in other job categories. Crafts workers were at increased risk (10 times) for disorders of the nervous system and sense organs, and Nuclear Workers were 9 times more likely to experience a burn. Complications and unspecified injuries were more likely to be reported by Security workers (3 times) and Operators (6 times).

Figure 16. OSHA-Recordable Rates by Age and Job Categories Among Men, All Diagnoses Combined



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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