

1998 Fernald
National Laboratory
Annual Epidemiologic
Surveillance Report

FERNALD

1998 Epidemiologic Surveillance Report

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FERNALD 1998

At a Glance

There were 462 absences of 5 or more workdays among Fernald employees in 1998 compared with 476 in 1997. In addition there was a 14 percent decrease in the number of lost workdays due to illness and injury from 1997 to 1998.

Male employees lost 10,380 workdays due to illness and injury in 1998. The leading causes of absence were due to injuries (24 percent), muscles and skeleton conditions (19 percent), and respiratory conditions (10 percent).

Female employees lost 6,677 workdays due to illness and injury in 1998. The leading causes for these absences were injuries (20 percent), muscles and skeleton conditions (14 percent), and respiratory conditions (12 percent).

Male workers classified in the job category of Nuclear Specialties continued to have the highest rates for all injuries and illnesses combined. The age-adjusted illness and injury rates for this group of workers have steadily increased from 1993 to 1998.

Workers in the Service/Security/Craft and Repair category had the highest rates of OSHA-recordable events (illnesses and injuries that are associated with the work environment).

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Introduction

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



Program monitors illnesses and 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 Fernald Environmental Management Project (FEMP) from January 1, 1998 through December 31, 1998. The data were collected by a coordinator at FEMP 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 has been ongoing at Fernald since 1993.

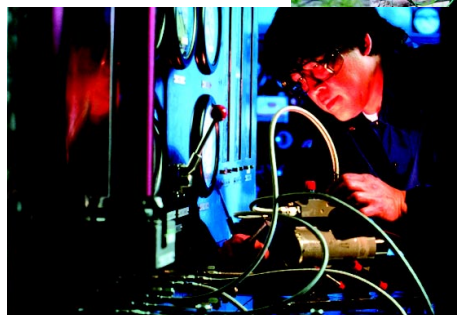
The information presented in this report provides highlights of the data analyses conducted. Earlier surveillance reports and additional supporting tables are posted on the Office of Health Programs Web Site (<http://www.eh.doe.gov/epi/surv>), or are available by request. The main sections of the report include: work force characteristics; absences due to injury or illness 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. This report also includes information on time trends that provides comparative information on the health of the work force from 1993 to 1998.



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

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



Site Overview

The Fernald Environmental Management Project (FEMP), located approximately 20 miles northwest of downtown Cincinnati, Ohio, once produced pure uranium metal products used in various U.S. defense programs. Construction began in 1951 in the midst of the Cold War era. Production operations started in 1953 and were suspended in July 1989. FEMP was originally called the Feed Materials Production Center (FMPC) because it produced “feed” in the form of purified uranium metal for use by other DOE



sites that made nuclear weapons. The site was designed as a large-scale, integrated facility capable of converting uranium ore and recycled material into uranium metal through a series of chemical and metallurgical conversions. These activities resulted in contamination with radioactive wastes that include uranium tailings emitting radon gas, thorium, and radium, as well as other hazardous materials such as heavy metals, barium, and asbestos. In November 1989, the site was added to the Superfund National Priority List, which requires site cleanup and remediation activities. Production activities officially ended in June 1991. Fernald, managed by Fluor Daniel Fernald since December 1992, is now

engaged in an environmental cleanup program to address concerns associated with the former production mission.



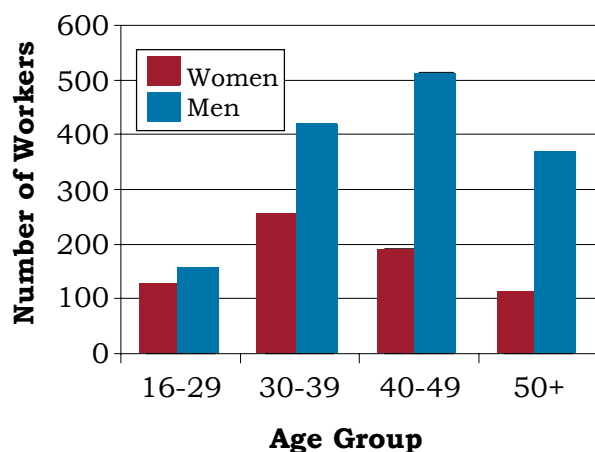
The Fernald Work Force - 1998

A total of 2,126 Fernald employees were included in epidemiologic surveillance in 1998, an increase of 20 workers from 1997. The gender and age distribution of the 1998 work force is shown in Figure 1. There were 676 (32%) women and 1,450 (68%) men in the work force. The average age of male Fernald workers was 42 years and 39 years for females.



The majority (88 percent) of the workers was White, 10 percent were African Americans, and the remaining 2 percent were Asians, Hispanics, and Native Americans.

Figure 1. The Work Force by Gender and Age



The distribution of workers by job category and gender is shown in Figure 2. As reported by Fernald, individual job titles were grouped together into job

categories. This is because there were either too few workers or health events within a particular job title, thereby limiting the type of analyses that could be conducted. Men and women were not distributed equally among the various job categories. Fifty-nine percent of the men were classified as white-collar workers compared with 43 percent of the female work force. Approximately one-third (34 percent) of females were clerical workers. The largest percentages of male workers were Professional employees (16 percent) or classified as Engineering, Scientific, and Health Care workers (22 percent).

Figure 2. The Work Force by Job Category and Gender

Job Category	Women	Men
Management	4 1%	51 3%
Administration	19 3%	114 8%
Professional	103 15%	238 16%
Engineering, Scientific, & Health Care	112 17%	319 22%
Technical Support	50 7%	140 10%
Clerical	232 34%	27 2%
Service	105 15%	177 12%
Security	5 1%	29 2%
Craft & Repair	7 1%	201 14%
Nuclear Specialties	39 6%	154 11%

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. Nonoccupational illnesses and injuries that involve absences less than 5 days do not routinely require a medical clearance for return to work and are therefore excluded from these analyses.

Specific health events resulting in an absence of 5 or more consecutive workdays were excluded. These include 18 women with 19 reported absences due to maternity leave, and 1 man and 2 women with reported absences due to elective surgical procedures not related to the treatment of an illness or injury.

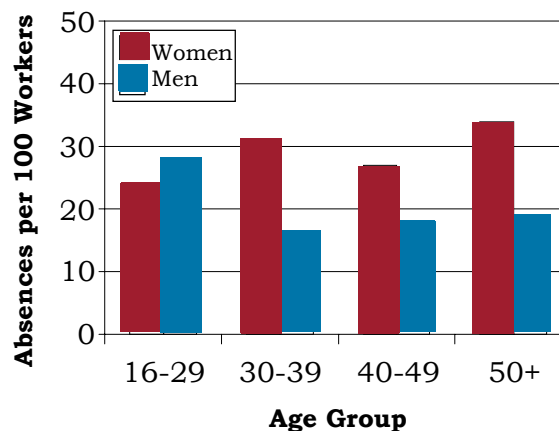
Throughout this report, analyses take gender, age, and job category into

account because the risk of illness and injury varies by these factors.

The rate of 5-day absences due to injury or illness varied by gender and age as shown in Figure 3. There were 195 5-day absences among 676 women, resulting in an absence rate of 29 per 100 workers (195/676). Among the 1,450 men, there were 267 absences, resulting in an absence rate of 18 per 100 workers (267/1,450). The rate of 5-day absences did not vary with age.

The average length of absence by gender and age is shown in Figure 4. A total of 17,057 calendar days of work (10,380 days for men and 6,677 days for women) were lost at Fernald in 1998 due to reported illness or injury. The average length of absence was 39 days for men and 34 days for women. The average length of absence was not related to age.

Figure 3. Absence Rate by Gender and Age



The rate of 5-day absences due to illness or injury varied by job category for men and women as shown in Figure 5. In general, women had higher rates of absence across similar job categories compared with men. Nuclear Specialties had the highest 5-day absence rate among male workers (50 per 100 workers) and among female workers (67 per 100 workers). This same job category

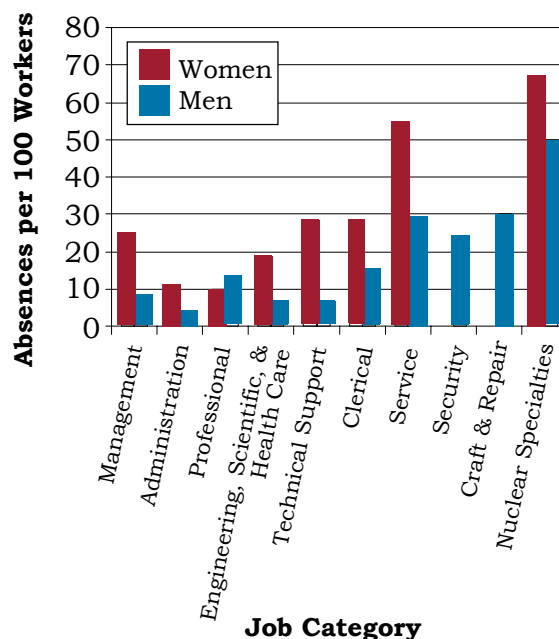
Figure 4. Number of Days Absent by Gender and Age

Gender	Age	Number of Absences	Number of Days Absent	Average Number of Days Absent
Women	16 - 29	30	1,202	40
	30 - 39	77	2,247	29
	40 - 49	51	1,753	34
	50 +	37	1,475	40
	Total	195	6,677	34
Men	16 - 29	43	1,465	34
	30 - 39	66	3,026	46
	40 - 49	90	2,590	29
	50 +	68	3,299	49
	Total	267	10,380	39

also had the highest rate of absence in 1997. There were no 5-day absences among females in Security or Craft and Repair during 1998.

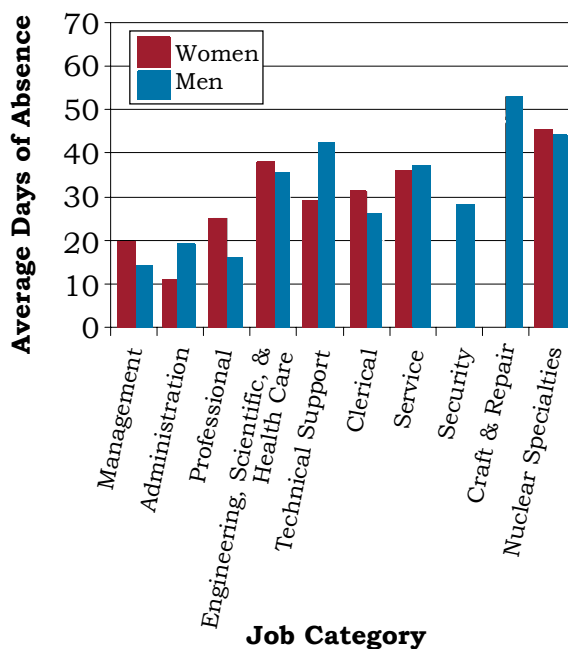
The average duration of absence by job category and gender is shown in Figure 6. Within a job category, there was no trend in length of absences by gender. Among women, the Nuclear

Figure 5. Absence Rate by Job Category and Gender



Specialties group had the highest rate of absence and the longest average length of absence, 45 days. Among men, Craft and Repair workers had the longest absence duration, 53 days, and the second highest 5-day absentee rates.

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



Diagnostic Categories

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

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

The number of reported diagnoses categorized according to the ICD-9-CM and number of lost calendar days (may include weekends and holidays) are presented in Figure 7. There were 367 diagnoses reported by female and 478 diagnoses reported by male Fernald employees in 1998. Female employees lost 6,677 workdays due to injury and illness. Among women, injuries (20 percent), muscles and skeleton conditions (14 percent), and respiratory conditions (12 percent) accounted for 46 percent of all reported diagnoses. Sixty-one percent of the injuries were reported as sprains and strains. Among the 72 diagnoses for injuries, 4 were allergic reactions and

1 was related to complications of medical care. Back pain and disk injuries made up 42 percent of muscles and skeleton conditions, followed by rheumatism (21 percent). The respiratory conditions were due to upper respiratory infections (42 percent), flu and pneumonia (31 percent), and bronchitis and asthma (22 percent).

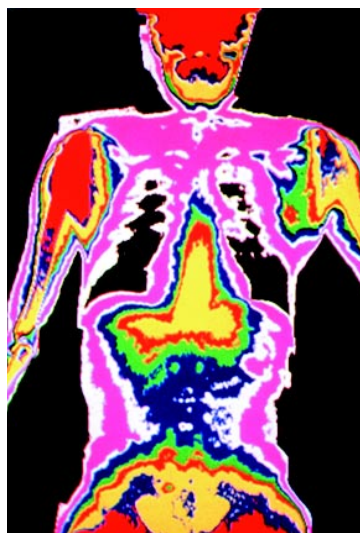
Figure 7. Number of Diagnoses and Lost Calendar Days by Diagnostic Category (Categorized by ICD-9-CM) and Gender

Diagnostic Category	Women		Men	
	Number of Diagnoses	Number of Lost Calendar Days	Number of Diagnoses	Number of Lost Calendar Days
Benign Growths	4	126	3	97
Blood	3	84	1	12
Cancer	4	501	4	229
Digestive	27	632	39	965
Endocrine / Metabolic	6	152	12	522
Existing Birth Condition	1	20	3	66
Genitourinary	38	778	18	460
Heart / Circulatory	12	459	44	1,219
Infections / Parasites	8	528	9	140
Injury	72	1,600	114	3,465
Miscarriage	2	26	NA	NA
Muscles & Skeleton	53	1,837	90	4,271
Nervous System	21	451	21	385
Psychological	36	1,201	36	953
Respiratory	45	547	46	835
Skin	2	27	4	206
Unspecified Symptoms	33	665	34	682

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

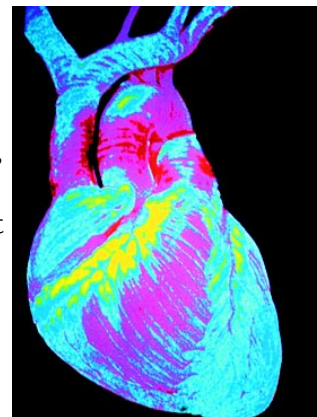
Men lost 10,380 workdays due to injury and illness. The most frequently reported diagnoses varied little by gender. Among male workers, 53 percent of all reported diagnoses were due to injuries (24 percent), muscles and skeleton conditions (19 percent), and respiratory conditions (10 percent). Frequently reported injuries were sprains and strains (42 percent), dislocations (15 percent), fractures (11 percent), and bruises (9 percent). Three allergic reactions and 2 complications of medical care were reported among the 114 diagnoses categorized as injuries. A closer look at diagnoses affecting the muscles and skeleton showed that about 58 percent were back problems, 19 percent were rheumatism, and 16 percent were arthritis. Upper respiratory infections accounted for 41 percent of the respiratory conditions, followed by pneumonia and flu (28 percent) and chronic obstructive pulmonary disease (26 percent).

Among men, the above diagnoses did not vary much by age. Psychological conditions were a frequently reported



diagnosis for workers under 30 and between 40-49 years. Thirteen workers reported 22 diagnoses. Among the five men under age 30, 6 of the 7 diagnoses were for anxiety and depression. Among the eight men aged 40-49, 13 diagnoses were for anxiety, depression, and stress, and 2 diagnoses were for substance abuse. Workers 40 years of age and older reported more heart/circulatory diseases than younger

workers. Twenty-three men reported 34 diagnoses: 12 diagnoses for hypertension, 10 for ischemic heart disease (restricted blood flow to an artery), and the remainder to other heart diseases and diseases of the veins. Digestive conditions were frequently reported among workers at least 50 years old; two-thirds of these diagnoses were for hernias.



Among women, the most frequently reported diagnoses were consistent among the various age groups. Psychological conditions were among the frequently reported diagnoses for workers less than 30 and between 40-49 years; 14 women reported 22 diagnoses, with all but 1 for anxiety, depression, and stress. For all age groups except the 40-49 year old group, genitourinary diagnoses were frequently reported. About three-quarters of these were related to disorders of the reproductive organs.

Figure 8 shows the frequency of reported diagnoses by job category for men and women. The types of diagnoses were similar among the job categories. Among men, muscles and skeleton conditions, injuries, psychological conditions, respiratory disorders, and heart/circulatory conditions appeared most often in the job categories. Among women, injuries, conditions affecting the muscles and skeleton, respiratory diagnoses, genitourinary conditions, and psychological disorders were common among the job categories. One woman in the Technical Support group reported two cancer diagnoses, both related to the breast.

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

Job Category	Men	Women
Management	Digestive (1) Endocrine / Metabolic (1) Respiratory (1) Unspecified Symptoms (1)	Respiratory (1)
Administration	Digestive (2) Injury (1) Respiratory (1) Muscles & Skeleton (1)	Genitourinary (1) Miscarriage (1) Unspecified Symptoms (1)
Professional	Injury (13) Muscles & Skeleton (11) Respiratory (6) Digestive (4) Heart / Circulatory (4)	Muscles & Skeleton (4) Respiratory (3) Unspecified Symptoms (3) Injury (2) Five Diagnoses (1)
Engineering, Scientific, & Health Care	Muscles & Skeleton (8) Endocrine / Metabolic (4) Heart / Circulatory (4) Respiratory (4) Unspecified Symptoms (3)	Muscles & Skeleton (6) Genitourinary (5) Injury (5) Respiratory (5) Digestive (4)
Technical Support	Respiratory (6) Psychological (6) Unspecified Symptoms (4) Genitourinary (3) Heart / Circulatory (3) Injury (3)	Respiratory (5) Muscles & Skeleton (4) Heart / Circulatory (3) Injury (3) Nervous System (3) Blood (2) Cancer (2) Unspecified Symptoms (2)
Clerical	Unspecified Symptoms (3) Injury (2) Endocrine / Metabolic (1) Respiratory (1) Muscles & Skeleton (1) Nervous System (1)	Injury (30) Respiratory (19) Genitourinary (16) Digestive (13)
Service	Injury (37) Muscles & Skeleton (15) Psychological (11) Heart / Circulatory (7)	Injury (22) Psychological (20) Muscles & Skeleton (19) Genitourinary (14) Unspecified Symptoms (14)
Security	Unspecified Symptoms (5) Injury (3) Heart / Circulatory (2) Respiratory (2) Muscles & Skeleton (2)	None
Craft & Repair	Muscles & Skeleton (24) Injury (18) Respiratory (13) Heart / Circulatory (11)	None
Nuclear Specialties	Injury (35) Muscles & Skeleton (27) Digestive (14) Heart / Circulatory (13) Psychological (12)	Muscles & Skeleton (11) Injury (10) Psychological (7) Respiratory (5)

Note: Numbers in parentheses are 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 114 diagnoses and women reported 72 diagnoses involving injuries during 1998. Men, therefore, reported 58 percent more injuries than women. As there are more than twice as many men as women at Fernald, it seems reasonable to expect more injuries among men than women. Does this mean that men were at greater risk of injuries compared with women in 1998? To correctly answer the question, the total number of men and women in the work force must be considered. To compare risk among men and women it is necessary to calculate the injury rate for each gender. Rates are calculated by dividing the number of injury diagnoses in a given gender by the total number of employees of that gender. Multiply this number by 1,000 to get the diagnosis rate per 1,000 workers.

For example:

114 injury diagnoses
÷ 1,450 men = .079 x 1,000 =
79 injury diagnoses per 1,000 men

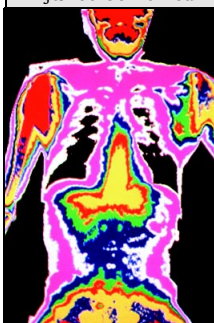
72 injury diagnoses
÷ 676 women = .107 x 1,000 =
107 injury diagnoses per 1,000 women

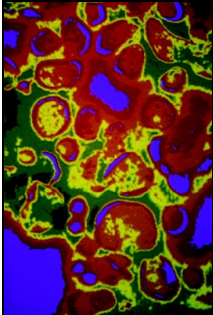
Comparing these rates now correctly suggests that the rate of reported absences due to injuries among women is higher than the rate for men. They are called **crude rates** because they do not account for possible differences between men and women such as age and other factors that might affect the individual's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

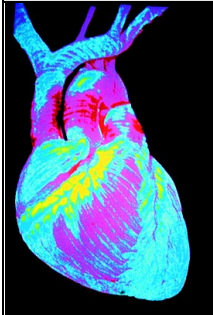
The diagnosis rate, also called the illness and injury rate, is the number of occurrences of a given disease or health condition observed over the course of a year per 1,000 workers at risk of getting that condition (see shaded box). One health condition, arthritis for example, may result in several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

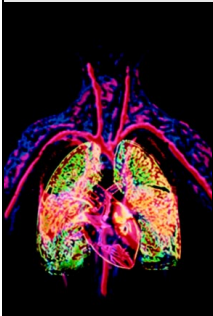
In the following set of analyses, the four age groups were collapsed into two groups, workers less than 50 years of age and those 50 or older. In addition, the 10 occupational categories were combined into 5 larger groups. These groups were collapsed to ensure that the number of diagnoses in each group was large enough to analyze. 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.

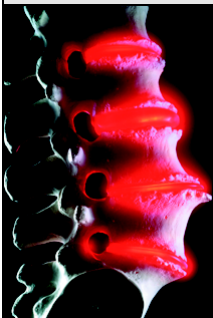
Figure 9. Illness and Injury Rates by Job Category, Gender, and Age

Diagnostic Category	Rate per 1,000			
	Job Category	Age	Men	Women
	Management / Administration / Professional	<50	152	180
		50+	133	67
	Engineering, Scientific & Health Care/Technical Support	<50	99	315
		50+	284	1,188
	Clerical	<50	391	565
		50+	0	354
	Service/Security/Craft & Repair	<50	528	1,000
		50+	426	800
	Nuclear Specialties	<50	1,074	1,400
		50+	587	556

Diagnostic Category	Rate per 1,000			
	Job Category	Age	Men	Women
	Management / Administration / Professional	<50	0	9
		50+	0	0
	Engineering, Scientific & Health Care/Technical Support	<50	0	0
		50+	11	125
	Clerical	<50	0	5
		50+	0	0
	Service/Security/Craft & Repair	<50	3	0
		50+	19	0
	Nuclear Specialties	<50	0	0
		50+	0	0

Diagnostic Category	Rate per 1,000			
	Job Category	Age	Men	Women
	Management / Administration / Professional	<50	3	0
		50+	27	0
	Engineering, Scientific & Health Care/Technical Support	<50	8	7
		50+	42	125
	Clerical	<50	0	33
		50+	0	0
	Service/Security/Craft & Repair	<50	47	0
		50+	56	50
	Nuclear Specialties	<50	65	67
		50+	130	0

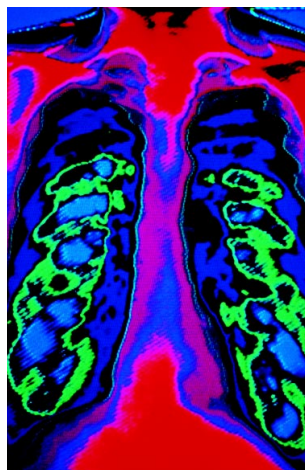
Diagnostic Category	Rate per 1,000			
	Job Category	Age	Men	Women
	Management / Administration / Professional	<50	17	36
		50+	27	0
	Engineering, Scientific & Health Care/Technical Support	<50	11	27
		50+	63	375
	Clerical	<50	43	98
		50+	0	21
	Service/Security/Craft & Repair	<50	43	41
		50+	37	150
	Nuclear Specialties	<50	83	167
		50+	22	0

Diagnostic Category	Rate per 1,000			
	Job Category	Age	Men	Women
	Management / Administration / Professional	<50	45	9
		50+	9	67
	Engineering, Scientific & Health Care/Technical Support	<50	11	34
		50+	11	188
	Clerical	<50	87	152
		50+	0	42
	Service/Security/Craft & Repair	<50	167	186
		50+	74	200
	Nuclear Specialties	<50	278	300
		50+	109	111

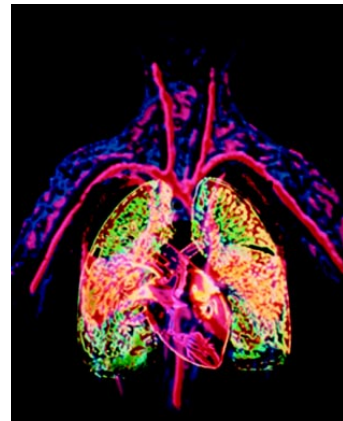
There was a slight tendency for rates of all illnesses and injuries combined to be greater for male and female Fernald workers less than 50 years old compared with those greater than 50. Rates for female employees were higher than those for males in the same job category, with two exceptions. Men 50+ years in the Management/Administration/Professional and Nuclear Specialties groups had higher rates than women in the same age group. The highest illness and injury rates for all employees were among individuals classified as Nuclear Specialties.

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

Seven absences related to cancer were noted with four diagnoses reported by three women and four diagnoses reported by three men. One worker reporting cancer in 1998 also reported a different type of cancer during the previous 5 years. The likelihood that an individual in the U.S. develops cancer increases with age, however our data do not reflect this observation.



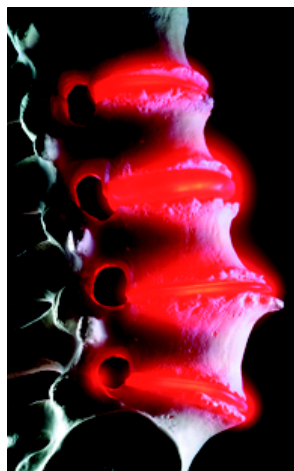
Older male workers had the greatest rates of heart/circulatory problems. Nineteen of the 44 diagnoses reported were among men aged 50 and older; 8 involved ischemic heart disease (restricted blood flow through an artery) and 3 diagnoses were for hypertension. Men categorized as Nuclear Specialties had the highest rates of heart/circulatory disorders. All 13 diagnoses in this group were for hypertension and ischemic heart disease. There was no apparent trend between age and heart/circulatory disorders among women. Women reported 12 heart/circulatory diagnoses; 9 of these were among women younger than 50. Five of the 9 diagnoses involved hypertension; no ischemic heart disease was reported. Women in Engineering, Scientific, and Health Care/Technical Support had the highest rates of heart/circulatory conditions compared with those in other job categories. Although the disease rate for older women in Engineering, Scientific, and Health Care/Technical Support appears high, 125 per 1,000, it reflects only 2 diagnoses.



Women generally had higher rates of respiratory disease than men, and workers under age 50 tended to have higher rates compared with older workers. Nuclear Specialties workers were twice as likely to report a respiratory diagnosis than other job categories.

Men younger than 50 years had higher rates of injuries than older men.

There was no pattern between injuries and age among women. The highest injury rates were among men and women in the Nuclear Specialties and among women in the Service/Security/Craft and Repair groups. Service and Nuclear Specialties workers were 2 to 4 times more likely to report an injury than other groups. Nuclear Specialties workers were also 4 times more likely to report a sprain or strain. Service workers were over 3 times more likely to



report a back sprain and over 6 times more likely to report a dislocation; 8 of the 19 reported dislocations were among these workers, who made up 13 percent of the work force.

In another set of analyses, the risk of illness and injury among workers classified in one job category was compared with workers in the other nine job categories. Service, Craft and Repair, and Nuclear Specialties workers were at least twice as likely to report an illness or injury compared to all other groups. These same occupational groups were also at increased risk for specific illnesses and injuries compared to other workers. The risk of infections and psychological disorders were over 3 times greater among Service workers. The risk of respiratory conditions and muscles and skeleton disorders were over twice as great among Craft and Repair workers. Psychological disorders, conditions of the nervous, respiratory, circulatory, digestive, and genitourinary systems, as well as disorders of the muscles and skeleton, were elevated two- to four-fold among workers in the Nuclear Specialties group compared with other workers.

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 groups of different ages. Age-adjusted rates are calculated using the age distribution of the 1970 U.S. population as a reference.

In 1995, Fernald began to report job categories that were not available in 1993 and 1994. In order to examine time trends from 1993 to 1998, some job categories used in 1995 through 1998 were combined to reflect the broader categories used in earlier years. The accompanying table shows how the categories were combined:

1993 & 1994 Job Categories Equal	1995 - 1998 Job Category
Office Management and Administration	Management
Office Management and Administration	Administration
Other Management and Administration	Professional
Engineering, Scientific, and Health Care	Engineering, Scientific, and Health Care
Technical Support	Technical Support
Office Management and Administration	Clerical
Service	Service
Service	Security
Craft and Repair	Craft and Repair
Nuclear Specialties	Nuclear Specialties

There are 6 years of epidemiologic surveillance data for Fernald workers. 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 Report* due to the exclusion of absences resulting from maternity leave.



Age-adjusted rates for selected diagnoses from 1993-1998 are presented in Figure 10. The age-adjusted rates for all diagnoses combined, heart/circulatory conditions, and injuries have steadily increased among men over the past 6 years. Among women, steady increases have occurred for all diagnoses combined and injuries.

The age-adjusted rates for illness and injury by job category are shown in Figure 11. The rates of diagnoses among men have remained fairly constant for most job categories, although there has been a steady increase in the rates among Nuclear Specialties, and a slight increase among Service workers. Among women, there has been a steady increase in the Administration group, primarily

due to an increase in sprains and strains and bruises. The large jump in the 1998 rate among the Technical Support group was the result of a small number of events.



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

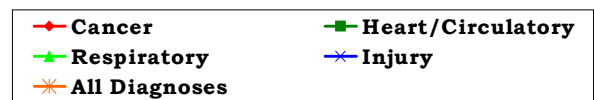
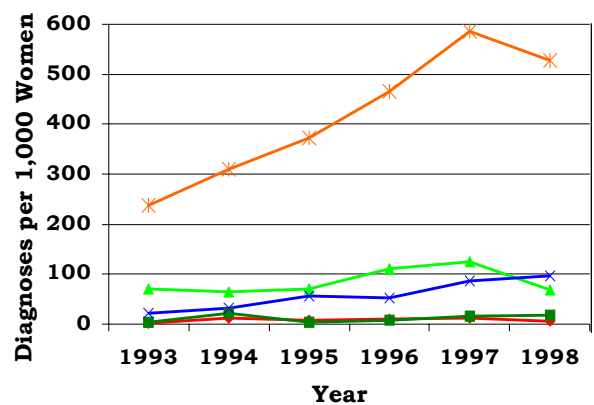
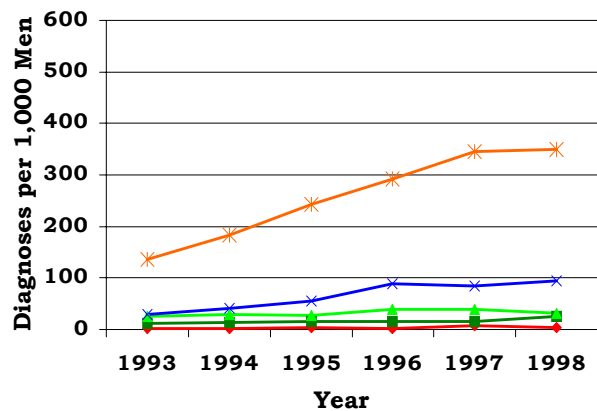
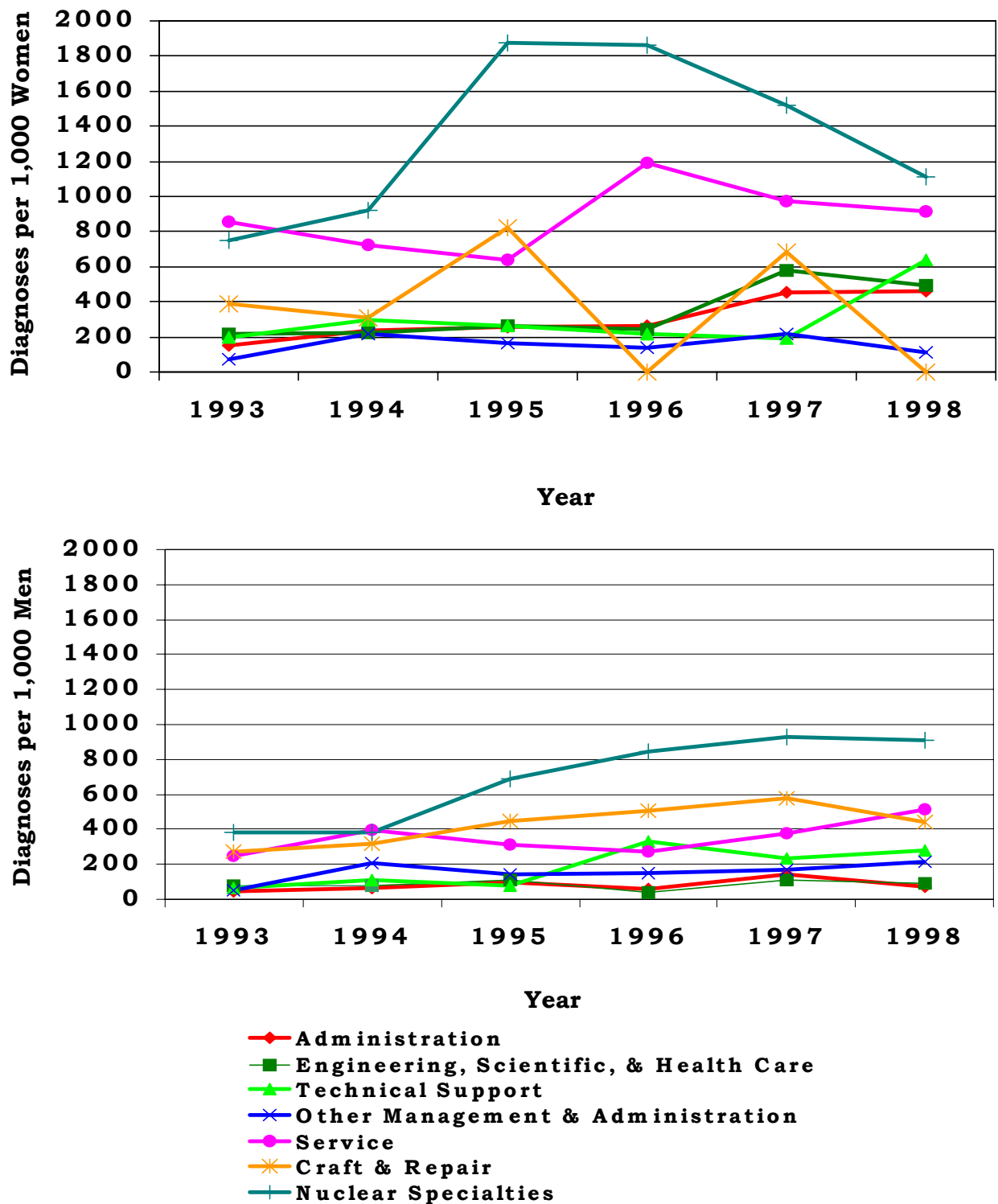


Figure 11. Age-Adjusted Rates for All Diagnoses Combined Among Women and Men by Job Category from 1993 to 1998



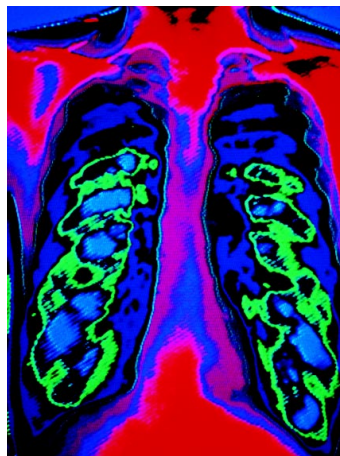
In 1993 there was a job category for “other” workers which did not appear for 1994 through 1998. There were 36 workers in this “other” group. These workers were excluded from the figure presented here.

Sentinel Health Events for Occupations

A sentinel health event for occupations (SHEO) is a disease, disability, or death, which 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 illness or injury 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.

Two definite sentinel health events and 7 possible sentinel health events were identified among the 845 reported diagnoses (Figure 12). Five of the sentinel health events were due to carpal tunnel syndrome and accounted for 156 days absent.

Figure 12. Characteristics of SHEOs by Gender

	Total Number of SHEO Diagnoses		Total Number of Days Absent	
	Men	Women	Men	Women
Definite	2	0	10	0
Possible	1	6	46	158
Total	3	6	56	158

Disabilities Among Active Workers

One man was on long-term disability in 1998 for cancer.



Deaths Among Active Workers

Six deaths occurred among male FEMP workers in 1998. Three deaths were due to cancer (leukemia, lung, and genitourinary) and three were due to heart conditions.

OSHA-Recordable Events

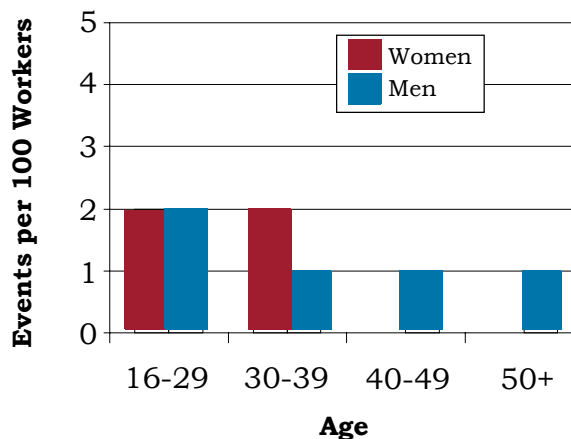
The Occupational Safety and Health Administration (OSHA) requires employers to maintain a record of occupational



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

The distribution of OSHA events by age and gender is shown in Figure 13.

Figure 13. OSHA-Recordable Events by Gender and Age



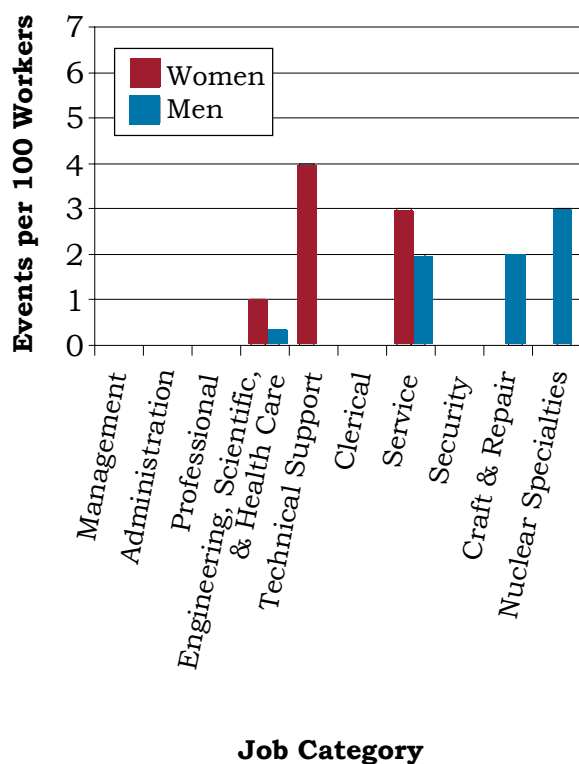
There were 6 women and 13 men with at least one OSHA-recordable event. The rate of OSHA-recordable events was the same for men and women (1 per 100), and was highest among men aged 16-29 and women aged 16-39 (2 per 100).

The rates of OSHA-recordable events by job category and gender are shown in Figure 14. For men and women combined, the Service, Craft and Repair, and Nuclear Specialties groups had the highest OSHA rates among workers with at least one OSHA event, 2 per 100. Women had higher rates of OSHA events compared with men among Technical Support, Service, and Engineering, Scientific, and Health Care categories. Among female Fernald workers, the Technical Support group had the highest rate of OSHA events, 4 per 100. Among males, the highest rate for an OSHA event was 2 per 100 among Craft and Repair and Nuclear Specialties.

A total of 70 days were lost or restricted due to OSHA events in 1998. On average, there were 5 workdays lost or with restricted activity for men.

Women reported a total of six OSHA-recordable events in 1998, but only one event resulted in any lost or restricted workdays. One female Service worker lost 7 days due to tendonitis. The highest average lost or restricted workdays for men occurred among workers aged 16-29 years; three OSHA events resulted in 39 lost or restricted workdays. By job category, male Nuclear Specialties workers averaged 10 lost or restricted workdays, a higher average than any other group.

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



Diagnostic and Accident Categories for OSHA-Recordable Events

There were 19 OSHA events recorded on the OSHA 200 Logs, 7 diagnoses among women and 15 diagnoses among men, as shown in Figure 15.

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

Diagnostic Category	Gender	
	Women	Men
Muscles & Skeleton	1	0
Skin	1	1
Injury	5	14
Fractures-Upper Limb	2	1
Dislocations	0	1
Back Sprains and Strains	0	1
Open Wounds-Head, Neck, Trunk	0	2
Open Wounds-Upper Limb	2	5
Open Wounds-Lower Limb	0	1
Superficial Injuries	1	0
Foreign Bodies Entering Orifice	0	2
Burns	0	1

Injuries accounted for 71 percent of the diagnoses reported by women. The most frequently recorded OSHA injuries were two fractures and two open wounds to the upper limb. Among men, injuries accounted for 93 percent of the diagnoses reported, primarily due to open wounds (57 percent).

Eighty-four percent of the 19 OSHA events were described as “an accident” in the OSHA logs. The distribution of accidents by category is shown in Figure 16. Seventy-five percent of the events were described as “other accidents” among women (3/4) and men (9/12). Being “struck by an object” made up the majority of that category (7/12).

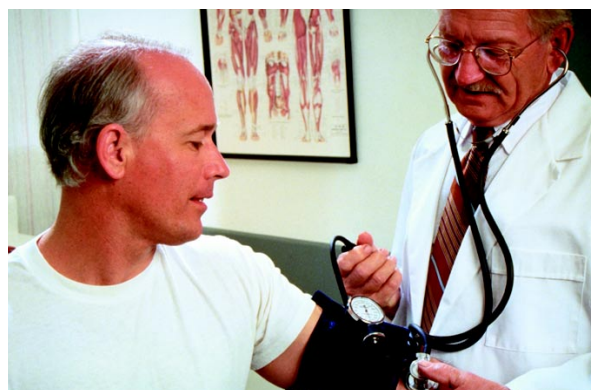
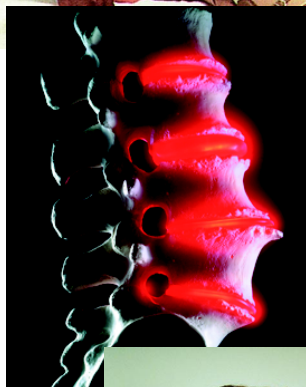
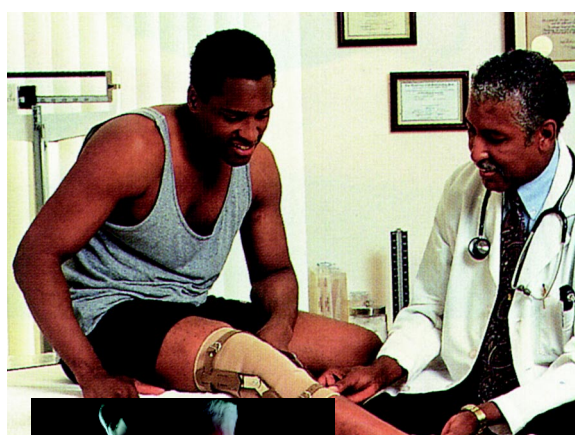


Figure 16. OSHA-Recordable Accidents by Type and Gender



Accident Category	Gender	
	Women	Men
	Number of Accidents	Number of Accidents
Motor Vehicle Traffic	0	1
Natural/Environmental Factors	1	0
Submersion / Suffocation / Foreign Bodies	0	2
Other Accidents	3	9
Caught Between Objects	0	3
Cutting/Piercing Instrument/Object	1	0
Hot, Corrosive, or Caustic Material/Steam	0	1
Struck by an Object	2	5

Rates of OSHA-Recordable Events

The rates of all OSHA-recordable events by job category, age category, and gender are shown in Figures 17 and 18. The OSHA-recordable rates for both men and women were highest among Service/Security/Craft and Repair workers. Most of the OSHA health conditions involved injuries.



When the rate for OSHA-recordable injuries was considered separately, the same job categories had the highest rates for male workers; however, women in the Engineering, Scientific, and Health Care/Technical Support category showed the highest injury rates. Among women, all six OSHA events were in the under 50 age groups. Service/Security/Craft and Repair workers made up 25 percent of the work force, but accounted for 58 percent of the OSHA-recordable events. Craft and Repair workers were at a 5 times greater risk of injury than other workers.

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

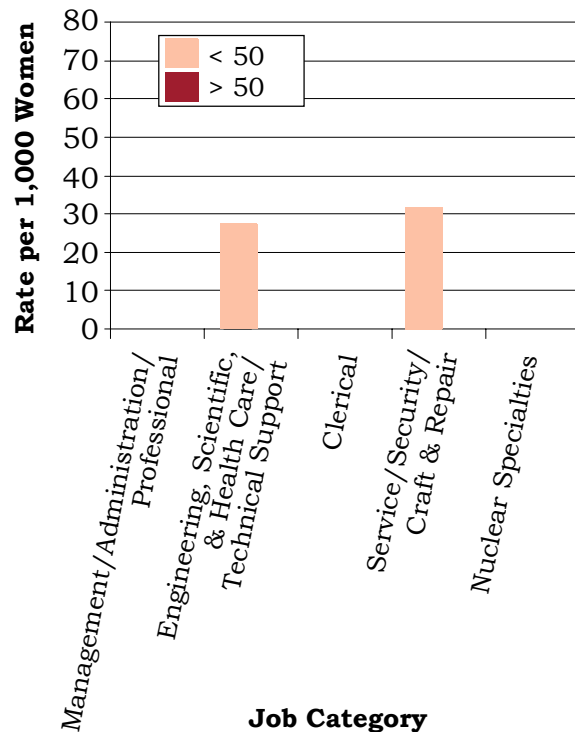
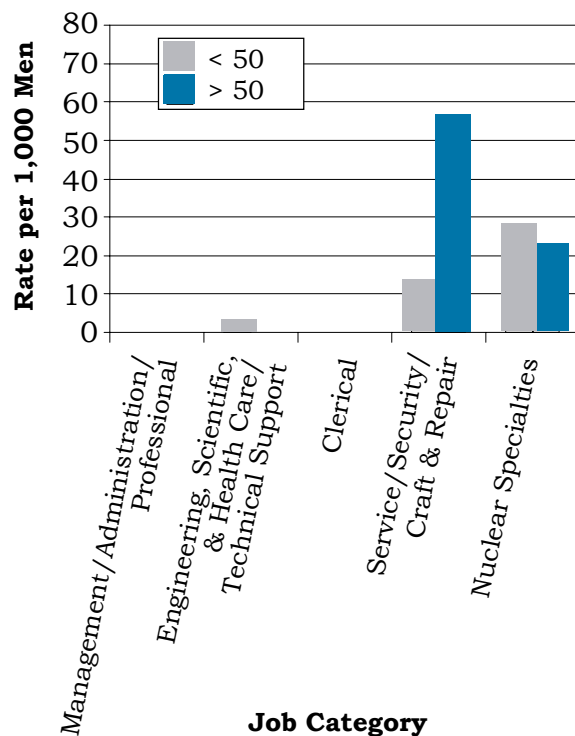


Figure 18. OSHA-Recordable Rates by Age and Job Category Among Men, All Diagnoses Combined



Time Trends for OSHA-Recordable Events

The age-adjusted rates for OSHA-recordable events by job category and gender from 1993 to 1998 are shown in Figures 19 and 20. During the 6-year period, the overall rates for OSHA-recordable events did not change greatly for most of the job categories among men and women. There were no significant changes noted in the injury rates among OSHA-recordable events from 1993 to 1998.



Figure 19. Age-Adjusted Rates for All OSHA-Recordable Diagnoses Combined Among Women by Job Category from 1993 to 1998*

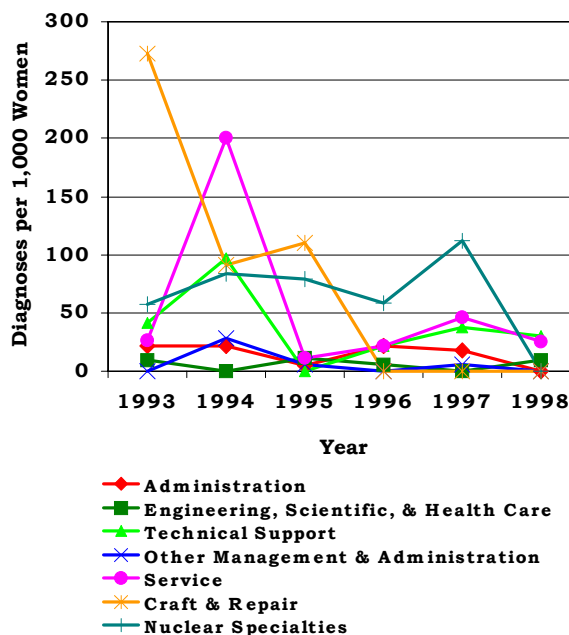
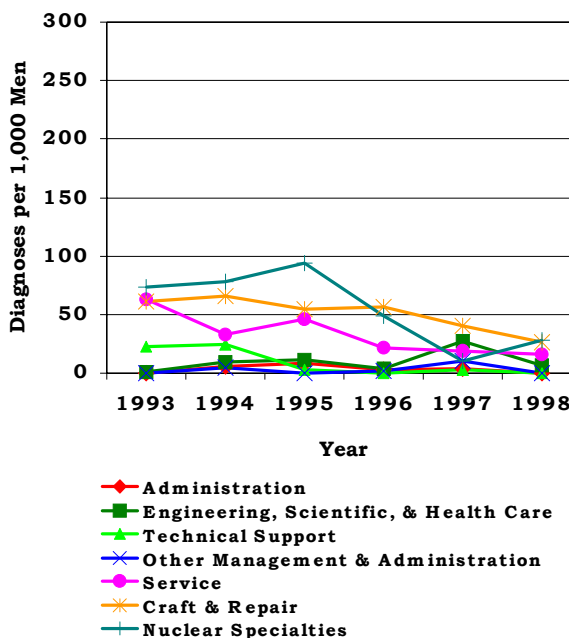


Figure 20. Age-Adjusted Rates for All OSHA-Recordable Diagnoses Combined Among Men by Job Category from 1993 to 1998*



* In 1993 there was an occupational group for "other" workers which did not appear for 1994 through 1998. There were 36 workers in this "other" group. These workers were excluded from the figures presented here.

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 Condition	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 nonarthropod 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, 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 - Nonpsychotic 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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