

# 2000

## Oak Ridge East Tennessee Technology Park Annual Epidemiologic Surveillance Report



## **East Tennessee Technology Park 2000 Epidemiologic Surveillance Report**

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

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

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## **East Tennessee Technology Park 2000**

### **At A Glance**

A total of 1,341 ETPP employees were included in epidemiologic surveillance in 2000, a 34 percent decline from the past year. The decline occurred despite the addition of 188 JA Jones employees who were not included in the 1999 roster.

We saw no significant variation by job category in diagnoses reported by workers returning to work.

No diagnoses were reported among the 24 workers under 30 years old.

We noted a 47% reduction in the number of reported OSHA events from 1999, ETPP's first year of participation in the Epidemiologic Surveillance Program.

Workers in the JA Jones group reported 7 of the 17 OSHA events, followed by the Operators and Laborers groups, each of which reported 3 OSHA events. These 3 occupational categories accounted for 27 percent of the work force but 76 percent of the OSHA events.

The Management, Scientists, and Technicians groups, comprising 22 percent of the work force, did not report any OSHA events in 2000.

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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 absences, occupational injuries and illnesses, and disabilities and deaths among current workers.



This report summarizes epidemiologic surveillance data collected from East Tennessee Technology Park (ETTP) from January 1, 2000 through December 31, 2000. The data were collected by a coordinator at ETTP 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. The analyses were interpreted and the final report prepared by the DOE Office of Health Studies. Epidemiologic Surveillance has been conducted at ETTP since 1999.



The information presented in this report provides highlights of the data analyses conducted on the 2000 data collected from ETTP. Surveillance reports and additional supporting tables are posted on the Office of Health Studies' 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; workplace illnesses, injuries, 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. Comparisons of ETTP with other DOE sites should be made with caution. In addition, many factors can affect the completeness and accuracy of health information reported at the sites, thereby affecting the observed patterns of illness and injury.



## Site Overview

The East Tennessee Technology Park (ETTP), formerly known as the Oak Ridge Gaseous Diffusion Plant and as the K-25 Site, is located on a 1,500-acre tract of land adjacent to the Clinch River and approximately 10 miles west of downtown Oak Ridge, Tennessee. The plant was built between 1943 and 1946 as part of the World War II Manhattan Project. The site's original mission was to produce uranium enriched in the  $^{235}\text{U}$  isotope for use in atomic weapons. The plant produced enriched uranium for the commercial nuclear power industry from 1945 to 1985 and was permanently shut down in 1987.



The mission of ETTP is environmental cleanup and reindustrialization/reuse of the assets (i.e., facilities, equipment, materials, utilities, and trained work force) of the site. The mission is being accomplished by cleaning up the site through the Environmental Management Program's management and integration contract and by forming partnerships with commercial interests who conduct environmental restoration, decontamination and decommissioning, waste treatment and disposal, and diffusion technology development in exchange for reduced rents.



ETTP serves as the base of operations for environmental management at the Department of Energy, Oak Ridge Operations facilities. These activities include management of the Toxic Substances Control Act Incinerator, which is the only U.S. facility capable of incinerating certain radioactive and/or hazardous wastes within permitted air emission requirements. Other activities at the site include treatment, storage, and disposal of hazardous and radioactive waste and support of risk-based environmental cleanup programs for contaminated facilities and natural resources at DOE facilities in Oak Ridge and in Paducah, Kentucky and Portsmouth, Ohio.

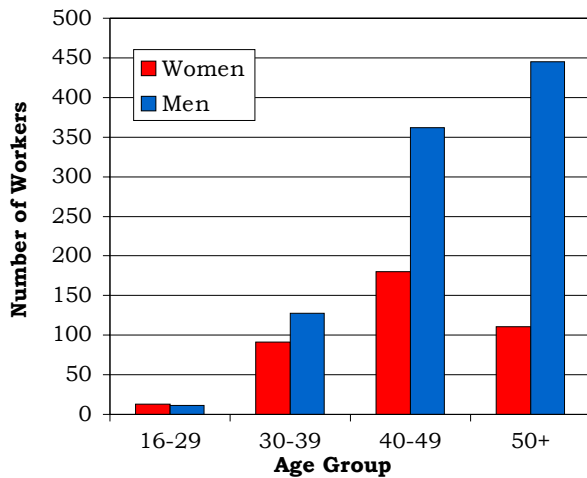
Bechtel Jacobs Company LLC, owned by Bechtel National, Inc. and Jacobs Engineering Group, Inc., is the primary management and integrating contractor responsible for environmental management oversight and the enrichment facilities programs for operations at the site for the period December 18, 1997 to September 30, 2003.



## The East Tennessee Technology Park Work Force - 2000

A total of 1,341 ETPP employees were included in epidemiologic surveillance in 2000, a 34 percent decline from the past year. The decline occurred despite the addition of 188 JA Jones employees who were not included in the 1999 roster. The gender and age distribution of the 2000 work force is shown in Figure 1. There were 395 (29 percent) women and 946 (71 percent) men in the work force. The average age of ETPP workers was 48 years for men and 45 years for women.

**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 ETPP were grouped together into 10 job categories, 1 more than in 1999. The JA Jones group is a new job category added in 2000. Jobs were categorized 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. As in 1999, men and women were not distributed equally among the various job categories. Over one-third of female workers (36 percent) were in the Administrative category; the

next largest percentage of women (23 percent) was Professional workers. The Engineering and Management groups each contained 21 percent of the male workers.

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

Job Category	Women	Men
Administrative	144 36%	3 <1%
Management	30 8%	198 21%
Professional	92 23%	115 12%
Engineering	52 13%	197 21%
Scientists	4 1%	19 2%
Technicians	16 4%	28 3%
Crafts	2 1%	77 8%
Laborers	12 3%	444 4%
Operators	17 4%	103 11%
JA Jones	26 7%	162 17%

## Number and Length of Absences

Epidemiologic surveillance examines all absences due to illness or injury. Under DOE Order 440.1, contractor management is required 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. ETPP, however, has chosen to report all absences, regardless of length.

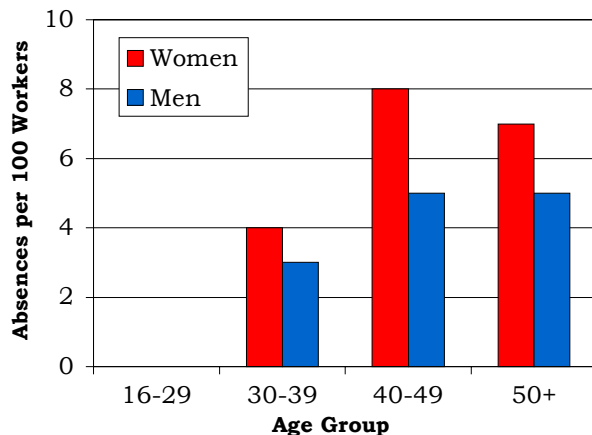
Specific absences that were not the result of an injury or illness were excluded. These included the absences of two women due to maternity leave.

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



The rate of absences due to injury or illness tended to increase with age for both men and women (Figure 3). The 27 absences among 26 women resulted in an absence rate of 7 per 100 workers (27/395). Among the 946 men, 45 absences resulted in an absence rate of 5 per 100 workers (45/946). The rate of absence decreased about 60 percent from 1999 to 2000 for both men and women. Over this same period, the work force only declined about 35 percent.

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



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

Gender	Age	Number of Absences	Number of Days Absent	Average Number of Days Absent
Women	16-29	0	0	0
	30-39	4	78	20
	40-49	15	270	18
	50+	8	350	44
	Total	27	698	26
Men	16-29	0	0	0
	30-39	4	72	18
	40-49	18	129	7
	50+	23	928	40
	Total	45	1,129	25

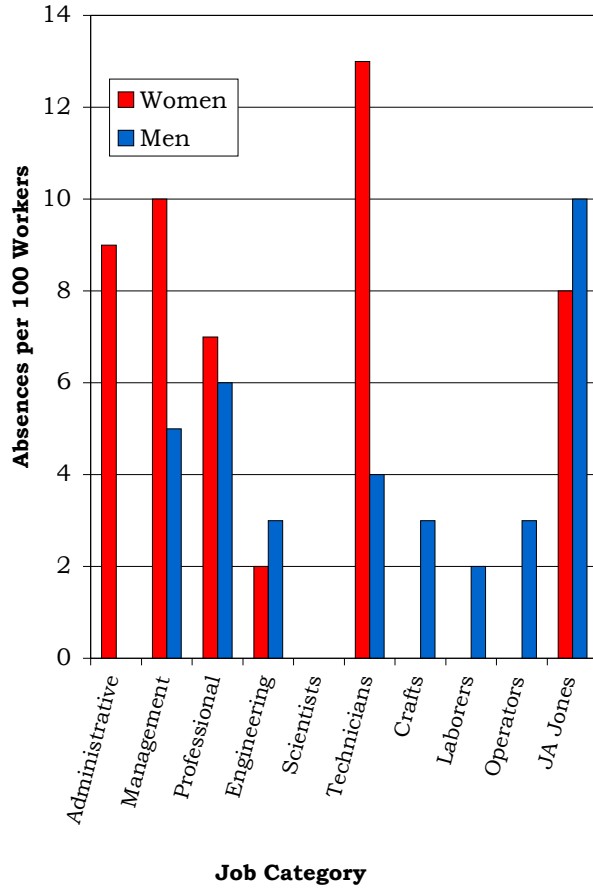
The average length of absence by gender and age is shown in Figure 4. The average length of absence was 25 days for men and 26 days for women. The average duration of absence tended to increase with age among women, but not among men. Workers under 30 years of age did not report any absences during 2000.



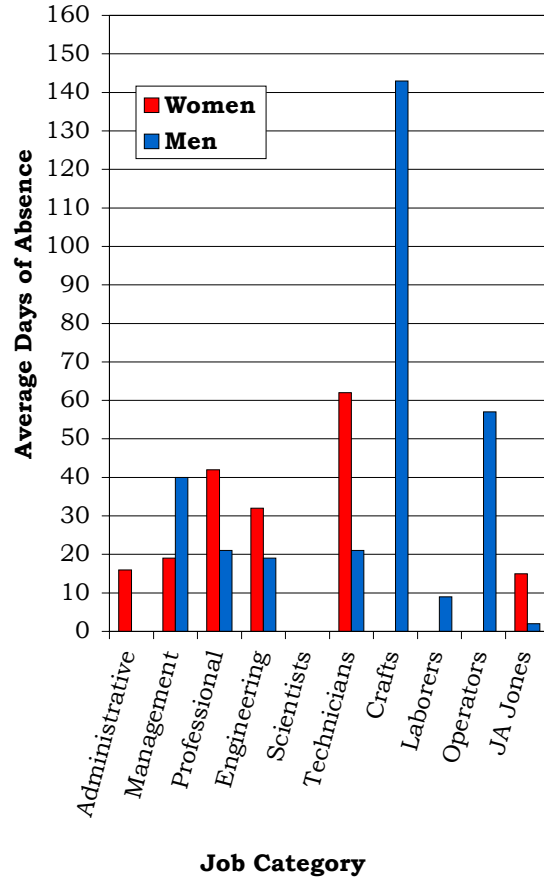
The rate of absences due to illness or injury varied by job category for both men and women (Figure 5). We saw no relationship between absence rate and gender and job category. JA Jones workers had the highest absence rate among men; men in the Administrative and Scientists groups reported no absences in 2000. Among women, Technicians had the highest absence rate. Women in the Scientists, Crafts, Laborers, and Operators job categories reported no absences during 2000.



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



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



We saw no consistent pattern for average absence duration among men and women within a job category (Figure 6). Male Crafts workers had the longest average number of days absent, 143 days, based on two absences. Both of these absences lasted 3 months or more. Among women, Technicians had the longest average absence, 62 days. One of the two absences reported by these workers lasted over 3 months. Although JA Jones workers had the highest absence rate among men, the average duration of their absences was shortest compared with that of other job categories. JA Jones workers averaged 2 days for men and 15 days for women.

**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 Classification of Diseases, 9th Revision, Clinical Modification* (ICD-9-CM). This reference is used to classify health events for statistical purposes. You can find specific health conditions in the Explanation of Diagnostic Categories.

The number of reported diagnoses categorized according to the ICD-9-CM and the number of lost calendar days are presented in Figure 7. Women reported 40 diagnoses, and men reported 71 diagnoses in 2000.

**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	2	79	0	0
Blood	1	37	0	0
Cancer	0	0	1	13
Digestive	5	63	7	70
Endocrine/Metabolic	0	0	0	0
Existing Birth Condition	1	92	1	21
Genitourinary	5	69	0	0
Heart/Circulatory	3	69	9	145
Infections/Parasites	0	0	4	16
Injury	6	167	15	474
Miscarriage	0	0	NA	NA
Muscles & Skeleton	8	163	8	381
Nervous System	2	59	2	15
Psychological	1	7	5	211
Respiratory	5	30	12	39
Skin	0	0	1	10
Unspecified Symptoms	1	39	6	21

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 698 calendar days due to injury and illness. Muscles and skeleton conditions (20 percent), injuries (15 percent), digestive disorders (13 percent), genitourinary conditions (13 percent), and respiratory diseases (13 percent) accounted for 74 percent of all reported



diagnoses among women. Disk and back problems made up 50 percent of the muscles and skeleton conditions. Forty percent of digestive disorders were gallbladder problems. Upper respiratory-type infections accounted for 80 percent of respiratory conditions.

Men lost 1,129 calendar days due to injury and illness. Sixty-two percent of all reported diagnoses among men were due to injuries (21 percent), respiratory diseases (17 percent), heart/circulatory conditions (13 percent), and muscles and skeleton disorders (11 percent). Frequently reported injuries included sprains and strains (67 percent) and fractures (20 percent). Upper respiratory-type infections accounted for 50 percent of the respiratory conditions, followed by pneumonia and flu (25 percent) and bronchitis and asthma (25 percent). Thirty-three percent of heart/circulatory diagnoses were ischemic heart disease (restricted blood flow to an artery), with the remainder evenly divided between pulmonary embolism, irregular heartbeat, and diseases of the veins. A closer look at diagnoses affecting the muscles and skeleton showed that about 63 percent were joint disorders.

The previously mentioned diagnoses did not vary much by age among men or women. No diagnoses were reported among the 24 workers under 30 years old.



The types of diagnoses did not vary significantly by job category (Figure 8). Among men, muscles and skeleton conditions, respiratory diseases, psychological disorders, and injuries appeared among numerous job categories. Men in the Professional, Crafts, and Laborers occupational groups reported psychological disorders. Digestive disorders were common diagnoses among the male Professional and Engineering groups. Among women, muscles and skeleton conditions were common across job categories. No diagnoses were reported among women in the Scientists, Crafts, Laborers, or Operators groups. Male workers in the Administrative and Scientists categories reported no diagnoses in 2000.



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

Job Category	Men	Women
Administrative	None	Respiratory (5) Digestive (4) Muscles & Skeleton (4) Genitourinary (2)
Management	Heart/Circulatory (6) Injury (6) Muscles & Skeleton (2)	Injury (1) Muscles & Skeleton (1) Psychological (1) Unspecified Symptoms (1)
Professional	Digestive (3) Heart/Circulatory (3) Psychological (2) Respiratory (2)	Injury (4) Genitourinary (3) Benign Growths (1) Heart/Circulatory (1) Muscles & Skeleton (1) Nervous System (1)
Engineering	Digestive (3) Respiratory (2) Muscles & Skeleton (1) Skin (1)	Heart/Circulatory (1)
Scientists	None	None
Technicians	Existing Birth Condition (1) Muscles & Skeleton (1)	Existing Birth Condition (1) Nervous System (1)
Crafts	Muscles & Skeleton (1) Psychological (1)	None
Laborers	Psychological (1)	None
Operators	Injury (1) Muscles & Skeleton (1) Nervous System (1)	None
JA Jones	Respiratory (8) Injury (7) Unspecified Symptoms (5)	Muscles & Skeleton (2) Digestive (1)

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

## Rates of Disease Occurrence

**A Word about Rates:** The previous section considered the number of absences and health conditions among various worker groups. For example, Figure 7 shows that men reported 15 diagnoses and women reported 6 diagnoses involving injuries during 2000. As there were more than 2 times as many men than women at ETPP, it seems reasonable to expect more injuries among men than women. Does this mean that men were at greater risk of injuries compared with women in 2000? To correctly answer that question, the total number of men and women in the work force must be considered. 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:

$$15 \text{ injury diagnoses} \div 946 \text{ men} = .016 \times 1,000 = 16 \text{ injury diagnoses per 1,000 men}$$

$$6 \text{ injury diagnoses} \div 395 \text{ women} = .015 \times 1,000 = 15 \text{ injury diagnoses per 1,000 women}$$

Comparing these rates now correctly suggests that the rate of reported injuries 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 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 absences over a year. Conversely, one 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 and older. In addition, the 10 job categories were combined into 6 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 two other disease groups is also analyzed and can be found in the Supplemental Tables.





The rates for all illnesses and injuries combined tended to be greater for ETP workers 50 years of age and older than for younger workers. Men in the JA Jones group and women classified as Administrative/Management workers had the highest illness and injury rates.



Cancer rates presented in this report are based on reported absences during the year. A worker may experience several periods of absence from one cancer diagnosis due to medical complications or treatment regimens. Each absence results in the report of a cancer diagnosis; however, it



does not imply that this is a new cancer. The cancer rates in this report are not comparable to the *incidence rates* frequently published in many articles on cancer with which you may be familiar.

Incidence cancer rates are based on the number of new cancer cases diagnosed within a given time, usually a year.

Only one worker reported cancer during 2000, an absence due to lymphoma. He had not reported any cancer diagnoses in 1999.

Older workers had the highest rates of heart/circulatory problems, with one exception among women. The highest rate seen among men was Administrative/Management workers 50 years of age or older. Four of the five absences among men occurred in workers aged 50 or older; two of these older men had diagnoses of embolism/thrombosis (blood clot in arteries or veins), and two had ischemic heart disease (restricted blood flow to an artery).



Three women reported three diagnoses: ischemic heart disease, embolism/thrombosis in a vein, and hemorrhoids. One of the women was under 50 years old.

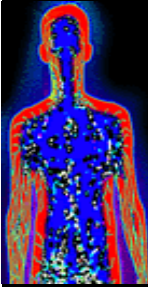
The only women who reported absences for respiratory conditions were Administrative/Management workers under age 50. The JA Jones group had the highest rate of respiratory disease for male workers. Age was not related to reported respiratory diagnoses among men.




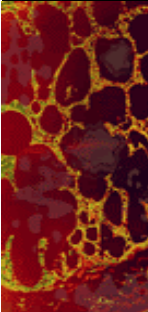
Except for men in the JA Jones category, older workers had higher rates of injury than did younger workers. Women had lower rates of injury than did men in all job categories except Professional. The highest rates of injury were among men in the JA Jones group and among women in the Professional group. Scientific/Engineering and Crafts/Laborers workers reported no injury diagnoses in 2000.





**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
		Administrative/Management	<50	32
50+			112	56
Professional		<50	71	71
		50+	200	273
Scientific/Engineering		<50	35	0
		50+	27	125
Technicians/Operators		<50	29	40
		50+	49	125
Crafts/Laborers		<50	15	0
		50+	37	0
JA Jones		<50	339	91
		50+	68	133

Diagnostic Category	Rate per 1,000			
Respiratory	Job Category	Age	Men	Women
		Administrative/Management	<50	0
50+			0	0
Professional		<50	0	0
		50+	44	0
Scientific/Engineering		<50	14	0
		50+	0	0
Technicians/Operators		<50	0	0
		50+	0	0
Crafts/Laborers		<50	0	0
		50+	0	0
JA Jones		<50	119	0
		50+	10	0

Diagnostic Category	Rate per 1,000			
Cancer	Job Category	Age	Men	Women
		Administrative/Management	<50	0
50+			0	0
Professional		<50	14	0
		50+	0	0
Scientific/Engineering		<50	0	0
		50+	0	0
Technicians/Operators		<50	0	0
		50+	0	0
Crafts/Laborers		<50	0	0
		50+	0	0
JA Jones		<50	0	0
		50+	0	0

Diagnostic Category	Rate per 1,000			
Injury	Job Category	Age	Men	Women
		Administrative/Management	<50	21
50+			37	19
Professional		<50	0	0
		50+	22	182
Scientific/Engineering		<50	0	0
		50+	0	0
Technicians/Operators		<50	0	0
		50+	16	0
Crafts/Laborers		<50	0	0
		50+	0	0
JA Jones		<50	51	0
		50+	39	0

Diagnostic Category	Rate per 1,000			
Heart/Circulatory	Job Category	Age	Men	Women
		Administrative/Management	<50	0
50+			56	19
Professional		<50	14	14
		50+	44	0
Scientific/Engineering		<50	0	0
		50+	0	125
Technicians/Operators		<50	0	0
		50+	0	0
Crafts/Laborers		<50	0	0
		50+	0	0
JA Jones		<50	0	0
		50+	0	0

### 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

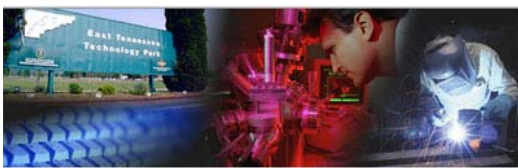
associated with workplace exposures from studies of many different industries have been identified as sentinel health events. Although sentinel health events may indicate an occupational exposure, many may also result from non-occupational exposures. Due to this uncertainty, sentinel health events are 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.



No definite sentinel health events were identified in 2000. Two of 111 diagnoses (2 percent) were identified as possible sentinel health events (Figure 10). One of the possible sentinel health events was identified as carpal tunnel syndrome. It was reported by a female Professional worker in the 50 or older age category. She was absent 28 calendar days.

**Figure 10. Characteristics of SHEOs by Gender**

	Total Number of SHEO Diagnoses		Total Number of Days Absent	
	Men	Women	Men	Women
Definite	0	0	0	0
Possible	1	1	13	28
Total	1	1	13	28

**Disabilities Among Active Workers**

Disability data for the 2000 ETPP work force were not available.

**Deaths Among Active Workers**

Three male ETPP employees died during 2000. Two workers died from cardiac arrest, and the third had a stroke. Each of the three workers was over 50 and in a different job category.

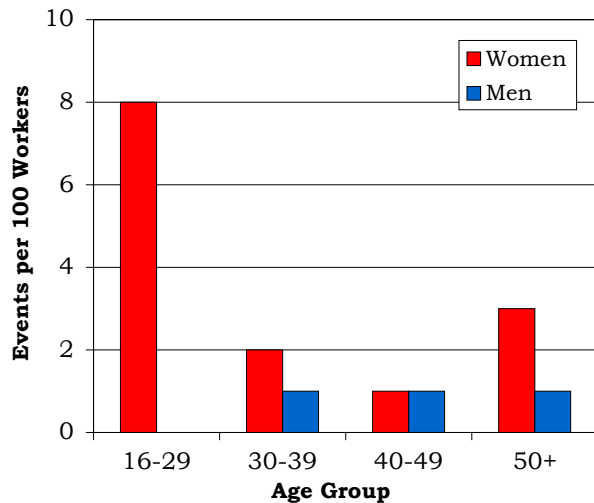
**OSHA-Recordable Events**

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.



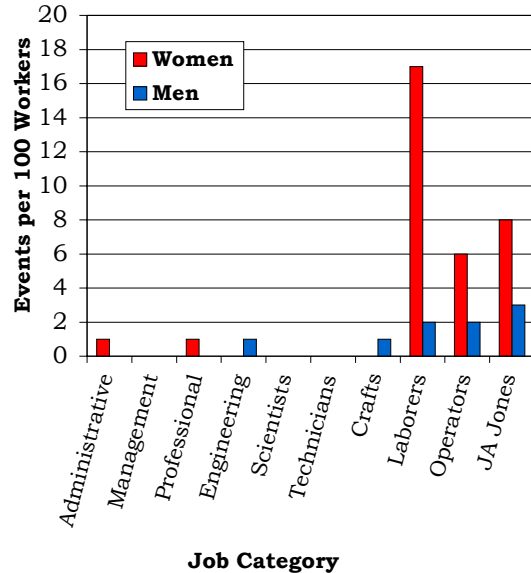
The distribution of OSHA events by age and gender is shown in Figure 11. We saw little evidence that the rate was associated with age. The rates of OSHA-recordable events by job category and gender are shown in Figure 12. Seven women and 10 men reported 17 OSHA-recordable events. Sixteen of the events resulted from accidents: 10 overexertion and strenuous movements, 4 falls, and 1 each for struck by an object and repetitive trauma. These 16 events resulted in 22 diagnoses: 8 sprains and strains, 3 open wounds to the head and neck, 7 unspecified injuries, and 1 diagnosis each for carpal tunnel syndrome, tendonitis of the wrist and hand, a bone growth, and tingling skin. The 1 event not recorded as an accident had a diagnosis of contact dermatitis of unspecified cause.

**Figure 11. OSHA-Recordable Events by Gender and Age**



A total of 208 workdays were lost and 326 workdays were restricted due to OSHA events in 2000. Eight OSHA events resulted in these lost and restricted days: 4 overexertion and strenuous movements, 3 falls, and 1 repetitive trauma.

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



There were no OSHA events reported by the 11 men under age 30. Workers in the JA Jones group reported 7 of the 17 OSHA events, followed by the Operators and Laborers groups, each of which reported 3 OSHA events. These 3 occupational categories accounted for 27 percent of the work force but 76 percent of the OSHA events. The Management, Scientists, and Technicians groups, which made up 22 percent of the work force, did not report any OSHA events in 2000.

The 17 OSHA events reported in 2000 were in contrast to 32 events reported in 1999. The reduction in the number of reported OSHA events is consistent with the reduction in the size of the ETPP work force experienced from 1999 to 2000. The small number of diagnoses reported in 2000 reflected the frequent occurrence of sprains and strains to the back (4) and other sprains and strains (4). Common accidents included overexertion and strenuous movements (10) and falls (4).

## Glossary

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

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

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

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

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

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

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

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

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

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

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

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

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

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

**Person-Year:** A unit of measurement combining the number of people being studied with the time that each was observed equivalent to 1 person followed for 1 year. For example, 5 people followed for 1 year contribute five person-years, as do 10 people each followed for half a year.

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

### Explanation of Diagnostic Categories

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

Abbreviated Categories Used in the Annual Report	ICD-9-CM Codes
Benign Growths	210-229 235-239
Blood	280-289
Cancer	140-208 230-234
Digestive	520-579
Endocrine / Metabolic	240-279
Existing Birth Conditions	740-759
Genitourinary	580-629
Heart / Circulatory	390-459
Infections / Parasites	001-139
Injury	800-999
Miscarriage	630-676
Muscles and Skeleton	710-739
Nervous System	320-389
Psychological	290-319
Respiratory	460-519
Skin	680-709
Unspecified Symptoms	780-799



**ICD-9-CM Codes**

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

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

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

<b>Diseases of the circulatory system</b>	390-459	Rheumatic fever, heart murmurs, heart attacks, angina, hardening of the arteries, varicose veins, hemorrhoids, and phlebitis
• Acute rheumatic fever	390-392	High fever and joint pain with possible heart damage
• Chronic rheumatic heart disease	393-398	Long lasting swelling and damage to the heart which results from rheumatic fever
• Hypertensive disease	401-405	High blood pressure
• 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

<b>Diseases of the respiratory system</b>	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
<b>Diseases of the digestive system</b>	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

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

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

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

<ul style="list-style-type: none"><li>• Other injuries and late effects of external causes</li></ul>	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
<b>Supplementary classifications related to personal or family history of disease</b>	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
<b>Supplementary classifications related to health care for reproduction and child development</b>	V20-V28	Problems related to pregnancy, postpartum care, contraception, outcome of delivery, and physical development of child
<b>Contact with health services for reasons other than illness or injury</b>	V50-V59	Care for workers who have been treated previously for an illness or injury that is no longer present but who receive care to complete treatment or prevent recurrence



## **NOTES**