

## Foreword

The U.S. Department of Energy (DOE) is committed to assuring the health and safety of its workers through the development of epidemiologic surveillance activities. An epidemiologic surveillance program has been implemented at selected DOE sites during the past several years. This approach has been expanded to include surveillance of all medical conditions that result in an absence of 5 or more consecutive workdays, occupational injuries and illnesses, and deaths among active employees. This annual epidemiologic surveillance report provides the final summary of the 12-month period January 1, 1994, through December 31, 1994, for the Rocky Flats plant.

Caution is required when comparing this information with other DOE facilities. Interpretation of these data must take into account the occupational medicine program, health and safety practices, the composition of the work force, and potential occupational exposures unique to this facility; therefore, the data presented are pertinent only to the Rocky Flats plant. Continuing surveillance and data examination may suggest emerging trends that change the preliminary interpretation of the data.

Caution is also required when comparing information in this report to earlier reports. The methods used to collect and analyze the data in this report are different from those used in previous years.

Plans for future annual reports include a discussion of important new findings and changes occurring since previous reports and the incorporation of information from the National Center for Health Statistics and the National Cancer Institute's Surveillance, Epidemiology, and End Results Program. This information will allow early recognition and investi-

gation of possible work-related problems, as well as an analysis of trends over time. In addition, the results of epidemiologic surveillance will be combined with those of medical and exposure surveillance to form an integrated approach to worker health protection.

## Rocky Flats at a Glance: 1994

- ◆ Between 1993 and 1994, the work force increased 5.2%. Reversing a large proportional decrease in the number of service workers observed in 1993, the proportion of service workers increased 76.6%. The proportion of workers classified as craftsmen and manual laborers and those in nuclear trades decreased by about half in 1994.
- ◆ About 15% of the Rocky Flats work force reported at least one absence of 5 or more days because of illness or injury during 1994.
- ◆ As in 1993, diagnosis rates were highest for respiratory diseases, which accounted for about 29% of all diagnoses reported during 1994.
- ◆ The rate of mental disorders reported in 1994 was 8.0 per 1,000 workers, an increase from 3.4 per 1,000 workers in 1993, that may reflect anxieties associated with uncertainties about the changing mission of the site.
- ◆ This marked the first year for which Occupational Safety and Health Administration (OSHA) recordable data were analyzed by the epidemiologic surveillance program. Rates of recordable injuries were highest among service workers and those in the nuclear trades, with the rate of sprains and strains substantially higher than rates of other types of injuries.

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## Introduction

Epidemiologic surveillance at U.S. Department of Energy (DOE) facilities consists of regular and systematic collection, analysis, and interpretation of data on absences resulting from illness and injury in the work force. Its purpose is to provide an early warning system for health problems occurring among employees at participating sites. Data are collected by coordinators at each site and submitted to the Epidemiologic Surveillance Data Center, located at the Oak Ridge Institute for Science and Education, where quality control procedures and analyses are carried out. Rates of absences and rates of diagnoses associated with absences are analyzed by occupation and other relevant variables. They may be compared with the disease experience of different groups within the DOE work force and with populations that do not work for DOE to identify disease patterns or clusters that may be associated with work activities.

In this annual report, the 1994 morbidity data for the Rocky Flats plant are summarized. These analyses focus on absences of 5 or more consecutive workdays occurring among workers aged 19-81 years. They are arranged in five sets of tables that present: 1) the distribution of the labor force by occupational category and salary status; 2) the absences per person, diagnoses per absence, and diagnosis rates for the whole work force; 3) diagnosis rates by type of disease or injury; 4) diagnosis rates

by occupational category; and 5) relative risks (RR) for specific types of disease or injury by occupational category. In addition to this information, the report contains health events that are considered recordable by the Occupational Safety and Health Administration (OSHA). The analyses of the OSHA data are arranged like the analyses of absences of 5 or more consecutive workdays. The OSHA-recordable events are those that occur on the job or involve fatalities (regardless of the time between the injury and death); lost workday cases other than fatalities; and nonfatal cases without lost workdays resulting in transfer to another job, termination of employment, medical treatment other than first aid, loss of consciousness, or restriction of work or motion. Also recordable are any diagnosed occupational health events reported to the employer that are neither fatal nor result in lost workdays. Deaths occurring among active workers are listed separately; they are not included in any tables. All rates presented in this report are age-adjusted (see glossary) and represent the number of diagnoses reported per 1,000 persons in 1 year.

Throughout this report, the symbol "NA" means "not available" or "not applicable". An empty cell in a table indicates that the value of the cell is zero or the value cannot be computed.

The tables show the results of analyses of diagnoses resulting from *absences*. An absence is defined as a period of 5 or more consecutive workdays away from work due to some health problem such as an illness or injury. In tables presenting analyses of *diagnoses*, each diagnosis is counted because a diagnosis is for a specific illness or injury. A worker can have more than one diagnosis related to one absence from work. For example, a worker's single absence might involve both a back injury and pneumonia. Unlike analyses of absences, analyses of diagnoses focus on the rates of occurrence of specific types of disease and injury. Thus the worker with one absence in which he had a back injury and pneumonia would be counted twice in the analysis of diagnoses, because two separate diagnoses are recorded for this one absence.

The data included in this report are supplemental to, but do not replace, those reported in other safety, industrial hygiene, and health physics reports prepared by DOE. There has been no attempt to validate diagnoses with medical records, pathology, or other laboratory reports. Also, there has been no attempt to validate occupational information reported by the site. For reporting purposes, occupational titles have been grouped into broad categories within which a great deal of diversity in tasks and exposures is likely to exist. Additional material outlining the methods used and explaining the diagnostic categories and frequently used terms can be found on the inside back cover.

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## **Facility Overview**

The Rocky Flats plant is located in northern Jefferson County, Colorado, approximately 16 air miles from Denver. In 1952, the Atomic Energy Commission selected the Rocky Flats site as one of seven production plants in its Weapons Complex.

Rocky Flats manufactured components for nuclear weapons from materials such as plutonium, beryllium, uranium, and various alloys of stainless steel, using varied metal fabrication technologies.

This activity remained the primary mission of Rocky Flats until January 1992, when the mission was redirected to environmental cleanup. Rocky Flats is also involved in technology development to resolve critical waste management and environmental restoration issues.

## Labor Force by Occupational Category and Salary Status, 1994

During 1994, there were 6,733 employees (aged 19-81) identified by Rocky Flats as participants in epidemiologic surveillance. Seventy-three percent (4,912 workers) were men and 27% (1,821 workers) were women. Eighty-five percent (5,724 workers) were Caucasian, and 9.6% (643 workers) were Hispanic. One worker was of unknown race. The remaining 5.4% (365 workers) included African Americans, Asians, and Native Americans.

The composition of the labor force by occupational category and salary status is given in Table 1. The occupational categories used in the table are based on the occupation and industry codes created by the Bureau of the Census in 1980. Because workers can change occupational category over the course of a year, workers were counted in the occupational category where they spent most of their time.

Twenty-three workers (0.3%) were placed in the unknown category because there were no occupational codes reported for these workers. In previous reports, "other" hourly employees included summer co-op students and a few workers with unknown occupational codes. However, this year there were no co-op students reported. The pay status of workers in the unknown category included both salaried (n=7) and

hourly (n=16) codes. Therefore, a new "unknown" category was created for these workers.

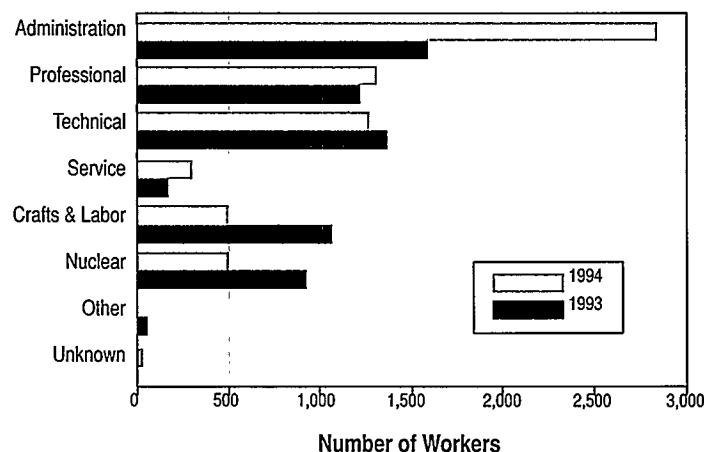
Eighty percent of the workers were salaried, whereas 19% were hourly. The occupational categories with the largest number of employees were administration (42%) and professional (19%).

The labor force increased by 335 employees, a 5.2% increase, in 1994 compared with 1993. The biggest increase in the number of workers was in the administration category with a 78% increase. The occupational category with the largest decrease in numbers was crafts and manual labor with a 53% decrease over 1993.

**Table 1A.**  
*Labor Force by Occupational Category and Salary Status*

	Occupational Category	Number of Workers in 1994	Number of Workers in 1993	% Change from Last Year
Salaried	Administration	2,831	1,593	+77.7
	Professional	1,310	1,219	+7.5
	Technical	1,269	1,363	-6.9
	Subtotal	5,410	4,175	+29.6
Hourly	Service	302	171	+76.6
	Crafts and Manual Labor	499	1,066	-53.2
	Nuclear	499	936	-46.7
	Other	0	50	-100.0
	Subtotal	1,300	2,223	-41.5
	Unknown	23	0	+100.0
	<b>TOTAL</b>	<b>6,733</b>	<b>6,398</b>	<b>+5.2</b>

**Table 1B.**  
*Change in Labor Force by Year*



## Absences Among Work Force, 1994

**Absences per Person.** In 1994, 1,026 Rocky Flats employees reported an absence of 5 or more consecutive workdays because of illness or injury. Two hundred-fifty (24%) of these workers had two or more absences. A total of 1,361 absences were reported by the employees (Table 2A).

**Diagnoses per Absence.** A total of 1,885 diagnoses were associated with the absences of 5 or more consecutive workdays. Multiple diagnoses were reported for 424 (31%) absences (Table 2B).

**Diagnosis Rates for Absences.** In 1994, 1,885 diagnoses noted for 1,361 absences of 5 or more consecutive workdays yielded an age-adjusted rate of 271.2 diagnoses per 1,000 persons. The diagnosis rate for women (498.5 per 1,000) was more than 2.5 times the rate for men (181.3 per 1,000) (Table 2C).

Employee Category	Number of Workers in 1994	Number of Absences						Total Persons Absent at Least Once	Total Number of Absences
		0	1	2	3	4	5+		
Men	4,912	4,334	469	87	19	2	1	578	713
Women	1,821	1,373	307	106	20	9	6	448	648
<b>TOTAL</b>	<b>6,733</b>	<b>5,707</b>	<b>776</b>	<b>193</b>	<b>39</b>	<b>11</b>	<b>7</b>	<b>1,026</b>	<b>1,361</b>

**Table 2A.**  
*Absences per Person*

Employee Category	Number of Diagnoses per Absence					Total Number of Absences	Total Number of Diagnoses†
	1	2	3	4	5		
Men	522	152	31	8	0	713	951
Women	415	187	40	5	1	648	934
<b>TOTAL</b>	<b>937</b>	<b>339</b>	<b>71</b>	<b>13</b>	<b>1</b>	<b>1,361</b>	<b>1,885</b>

**Table 2B.**  
*Diagnoses per Absence*

Employee Category	Number of Workers in 1994	Total Number of Diagnoses†	Crude Rate per 1,000	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Men	4,912	951	193.6	181.3	167.1	196.7
Women	1,821	934	512.9	498.5	461.0	539.0
<b>TOTAL</b>	<b>6,733</b>	<b>1,885</b>	<b>280.0</b>	<b>271.2</b>	<b>256.2</b>	<b>287.1</b>

**Table 2C.**  
*Diagnosis Rates for Absences*

† Includes all diagnoses reported with an absence of 5 or more days, including absences for pregnancy and delivery.

\* Standardized to age distribution of 1970 U.S. population

## Diseases and Injuries by Diagnostic Category, 1994

The age-adjusted diagnosis rate for each diagnostic category is given for all workers and separately for each gender (Tables 3-5). Diagnoses associated with pregnancy, labor, and delivery are described in Table 6. As Table 3 shows, the three diagnostic categories with the highest rates were diseases of the respiratory system (81.7 per 1,000), injury and poisoning (36.2 per 1,000), and diseases of the musculoskeletal system (28.7 per 1,000). Together, these three categories accounted for 55% of all diagnoses. Tables 4 and 5 show the diagnosis rates by gender to further describe the disease and injury patterns in the work force.

**Men.** Among men (Table 4), the diagnostic category with the highest rate was diseases of the respiratory system (46.9 per 1,000) with 241 diagnoses reported among 168 men. This accounted for 25% of all diagnoses among men. Ninety-nine diagnoses were related to upper respiratory diseases, 84 to pneumonia/bronchitis, 42 to chronic respiratory conditions, and 16 to other respiratory diseases. Fifty-one men had multiple diagnoses.

The second highest rate, making up 19% of the total diagnoses, was injury and poisoning (34.8 per 1,000), with 179 diagnoses reported for 140 men. Within this category, two sub-categories had relatively high numbers of diagnoses. Sprains and strains accounted for 37% of these diagnoses with 67 diagnoses among 61 men. Thirty-two diagnoses were sprains and strains of the back, 23 of the lower extremities, 11 of the upper extremities, and 1 of the jaw. Six men had multiple diagnoses. "Other" injuries accounted for 28% of the injury and poisoning diagnoses, with 51

diagnoses among 42 men. These diagnoses included 27 unspecified injuries — 9 to the trunk, 8 to the shoulder and upper extremities, 8 to the lower extremities, and 2 to the face and neck; 6 complications of surgical and medical care; 5 contusions — 2 to the face, neck, and scalp, and 1 each to the eye, chest wall, and thigh; 3 abrasion/friction burns; 2 late effects due to external causes; 2 second degree burns — 1 to the face and head, and 1 to the back; 2 adverse effects of a drug, medicinal, or biological substance; and 1 each for a foreign body on the eye, superficial injury to the eye, spinal cord injury, and toxic effect of a spider bite. Eight men had multiple diagnoses.

Diseases of the musculoskeletal system (23.7 per 1,000) ranked third, with 122 diagnoses reported for 99 men. Fifty diagnoses were related to dorsopathies (spinal disorders), 42 to arthropathies (joint disease), 24 to rheumatism (excluding the back), 4 to disorders of bone and cartilage, and 2 acquired deformities of the toe. Eighteen men had multiple diagnoses.

Seventeen cancer diagnoses were reported among 14 men in 1994. Four men had a total of five diagnoses of prostate cancer. Two men each had a diagnosis for lymphoma, and two men each had a diagnosis for cancer of the kidney. One man had a total of two diagnoses of cancer of the coccyx (tailbone); and one man had a total of two diagnoses for malignant melanoma of the skin of the armpit. One man each had a diagnosis for cancer of the skin, anus, liver, and bladder.

**Women.** The diagnostic category with the highest rate among women (Table 5) was diseases of the respiratory system (177.8 per 1,000), with 309 diagnoses reported among 190 women.

This accounted for 33% of all diagnoses among women. One hundred-forty diagnoses were related to upper respiratory diseases, 82 to pneumonia/bronchitis, 82 to chronic respiratory conditions, and 5 to other respiratory diseases. Seventy-six women had multiple diagnoses.

The second highest rate, making up 8% of the total diagnoses, was for diseases of the digestive system (42.3 per 1,000), with 79 diagnoses among 68 women. Nineteen diagnoses were for diseases of the oral cavity, salivary glands, and jaws; 15 for diseases of the intestines and peritoneum; 13 for diseases of the esophagus, stomach, and duodenum; 9 for noninfectious enteritis and colitis (inflammation of the intestines and colon); 9 for gall bladder disease; 6 for appendicitis; 5 for hernias; and 3 for disorders of the liver, including 1 non-infectious hepatitis. Ten women had multiple diagnoses. Diseases of the musculoskeletal system (41.3 per 1,000) ranked third, with 92 diagnoses reported for 57 women. Thirty-one diagnoses were related to dorsopathies (spinal disorders); 29 to arthropathies (joint disease); 27 to rheumatism (excluding the back); 3 to disorders of bone and cartilage; 1 to a deformity of the toe; and 1 to an acquired deformity to the clavicle (collar bone). Twenty-two women had multiple diagnoses.

Seven cancer diagnoses were reported among six women in 1994. Two women had one diagnosis each for breast cancer. One of these women also had one diagnosis for secondary cancer in an unspecified site. One woman each had a diagnosis for cancer of the nasal cavity, skin, bladder, and thyroid.

**Table 3.**  
**Diseases and**  
**Injuries by**  
**Diagnostic**  
**Category - Men**  
**and Women**

Category of Diagnoses	ICD9-CM Code	Number of Diagnoses†	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Infections and parasitic diseases	001-139	126	17.5	14.0	21.9
Malignant neoplasms	140-208, 230-234	24	3.6	2.2	5.7
• Digestive organs	150-159	2	0.3	0.1	1.1
• Respiratory system	160-165	1	0.1	0.0	0.7
• Breast	174-175	2	0.3	0.1	1.1
• Genitourinary	179-189	9	1.9	0.9	4.0
• Nervous system	191-192	0			
• Leukemia, lymphoma	200-208	2	0.2	0.0	0.8
Benign neoplasms and other	210-229, 235-239	21	2.3	1.5	3.6
Endocrine and metabolic diseases	240-279	22	3.3	1.9	5.5
Blood and blood-forming organs	280-289	4	0.8	0.2	2.8
Mental disorders	290-319	56	8.0	5.8	11.2
• Alcoholism	303	6	0.6	0.3	1.2
• Drug abuse	304-305	0			
Nervous system and sense organs	320-389	122	16.8	13.4	21.0
Circulatory system	390-459	51	7.1	5.2	9.6
• Hypertension	401	6	0.8	0.3	1.7
• Acute myocardial infarction	410	4	0.6	0.2	1.7
• Ischemic disease, not M.I.	411-414, 429.2	11	1.8	0.9	3.5
• Cerebrovascular disease	430-438	2	0.6	0.1	2.7
Respiratory system	460-519	550	81.7	73.5	90.8
• Upper respiratory	460-465, 470-478	239	37.2	31.6	43.7
• Pneumonia/bronchitis	466, 480-487	166	24.6	20.3	29.9
• Chronic respiratory conditions	490-496	124	17.3	14.0	21.5
Digestive system	520-579	159	22.6	18.5	27.4
• Hernias	550-553	30	4.0	2.6	6.2
• Gall bladder disease	574-575	12	1.3	0.7	2.4
Genitourinary system	580-629	90	13.8	10.6	18.1
• Benign prostatic hypertrophy	600	3	1.0	0.3	3.4
• Endometriosis	617	6	0.9	0.3	2.7
• Ovarian cysts	620.0-620.2	7	1.8	0.8	4.5
• Female genital pain/bleeding	625-626	0			
Pregnancy and childbirth†	630-676	33	8.3	5.4	12.7
Skin and subcutaneous tissue	680-709	27	3.7	2.3	5.8
Musculoskeletal system	710-739	214	28.7	24.4	33.8
• Dorsopathies	720-724	81	10.1	7.8	13.2
Congenital anomalies	740-759	1	0.2	0.0	1.1
Certain perinatal conditions	760-779	0			
Symptoms, signs, and ill-defined conditions	780-799	90	13.1	10.1	17.0
Injury and poisoning	800-999	272	36.2	31.3	41.9
• Fractures, all sites	800-829	42	6.4	4.4	9.5
• Dislocations	830-839	19	2.0	1.2	3.1
• Sprains and strains	840-848	105	12.8	10.2	16.1
• Intracranial injuries	850-854	3	0.3	0.1	0.9
• Internal injuries	860-869	4	0.4	0.2	1.2
• Open wounds	870-897	16	2.0	1.1	3.5
• Other injuries	900-999	83	12.3	9.4	16.1
Health status/health service contract	V01-V82	23	3.7	2.2	6.4
• Family history of health problems	V10-V19	2	0.2	0.0	0.7
• Circumstances related to reproduction/development	V20-V28	13	2.7	1.3	5.5
• Specific procedure/aftercare	V50-V59	6	0.6	0.3	1.4
Total minus pregnancies		1,852	262.9	248.3	278.4
<b>TOTAL</b>		1,885	271.2	256.2	287.1

† Includes all diagnoses reported with an absence of 5 or more days.

\* Standardized to age distribution of 1970 U.S. population.

† Only women aged 18-45 were included in the calculation of the rates for these diagnostic categories.

**Table 4.**  
**Diseases**  
**and Injuries**  
**by Diagnostic**  
**Category - Men**

Category of Diagnoses	ICD9-CM Code	Number of Diagnoses†	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Infections and parasitic diseases	001-139	73	13.0	9.6	17.6
Malignant neoplasms	140-208, 230-234	17	3.5	2.0	6.1
• Digestive organs	150-159	2	0.3	0.1	1.3
• Respiratory system	160-165	0			
• Breast	174-175	0			
• Genitourinary	179-189	8	2.2	1.0	4.8
• Nervous system	191-192	0			
• Leukemia, lymphoma	200-208	2	0.3	0.1	1.0
Benign neoplasms and other	210-229, 235-239	12	1.6	0.9	2.9
Endocrine and metabolic diseases	240-279	14	3.2	1.7	6.1
Blood and blood-forming organs	280-289	0			
Mental disorders	290-319	23	4.5	2.7	7.4
• Alcoholism	303	6	0.8	0.4	1.7
• Drug abuse	304-305	0			
Nervous system and sense organs	320-389	56	9.1	6.5	12.6
Circulatory system	390-459	39	6.7	4.8	9.4
• Hypertension	401	3	0.5	0.2	1.7
• Acute myocardial infarction	410	4	0.8	0.3	2.1
• Ischemic disease, not M.I.	411-414, 429.2	8	1.7	0.8	3.8
• Cerebrovascular disease	430-438	1	0.2	0.0	1.4
Respiratory system	460-519	241	46.9	39.8	55.4
• Upper respiratory	460-465, 470-478	99	20.2	15.5	26.3
• Pneumonia/bronchitis	466, 480-487	84	16.1	12.1	21.4
• Chronic respiratory conditions	490-496	42	8.3	5.7	12.1
Digestive system	520-579	80	14.7	11.1	19.5
• Hernias	550-553	25	4.2	2.6	6.9
• Gall bladder disease	574-575	4	0.6	0.2	1.6
Genitourinary system	580-629	28	7.4	4.5	12.1
• Benign prostatic hypertrophy	600	3	1.3	0.4	4.2
• Endometriosis	617	0			
• Ovarian cysts	620.0-620.2	0			
• Female genital pain/bleeding	625-626	0			
Pregnancy and childbirth	630-676	0			
Skin and subcutaneous tissue	680-709	18	3.2	1.7	5.8
Musculoskeletal system	710-739	122	23.7	18.9	29.6
• Dorsopathies	720-724	50	9.5	6.6	13.5
Congenital anomalies	740-759	0			
Certain perinatal conditions	760-779	0			
Symptoms, signs, and ill-defined conditions	780-799	38	7.5	5.1	11.1
Injury and poisoning	800-999	179	34.8	28.8	42.1
• Fractures, all sites	800-829	31	6.8	4.3	10.8
• Dislocations	830-839	13	1.9	1.1	3.3
• Sprains and strains	840-848	67	12.6	9.2	17.2
• Intracranial injuries	850-854	1	0.1	0.0	0.9
• Internal injuries	860-869	0			
• Open wounds	870-897	16	2.6	1.5	4.6
• Other injuries	900-999	51	10.8	7.6	15.4
Health status/health service contract	V01-V82	11	1.4	0.8	2.6
• Family history of health problems	V10-V19	1	0.1	0.0	0.9
• Circumstances related to reproduction/development	V20-V28	6	0.8	0.4	1.7
• Specific procedure/aftercare	V50-V59	4	0.5	0.2	1.4
<b>TOTAL</b>		<b>951</b>	<b>181.3</b>	<b>167.1</b>	<b>196.7</b>

† Includes all diagnoses reported with an absence of 5 or more days.

\* Standardized to age distribution of 1970 U.S. population.

**Table 5.**  
**Diseases**  
**and Injuries**  
**by Diagnostic**  
**Category - Women**

Category of Diagnoses	ICD9-CM Code	Number of Diagnoses <sup>†</sup>	Age-Adjusted Rate per 1,000 <sup>*</sup>	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Infections and parasitic diseases	001-139	53	27.6	19.8	38.4
Malignant neoplasms	140-208, 230-234	7	3.7	1.6	8.2
• Digestive organs	150-159	0			
• Respiratory system	160-165	1	0.4	0.1	2.6
• Breast	174-175	2	1.1	0.2	4.9
• Genitourinary	179-189	1	0.8	0.1	5.5
• Nervous system	191-192	0			
• Leukemia, lymphoma	200-208	0			
Benign neoplasms and other	210-229, 235-239	9	4.7	2.3	9.7
Endocrine and metabolic diseases	240-279	8	2.6	1.3	5.3
Blood and blood-forming organs	280-289	4	2.6	0.8	7.9
Mental disorders	290-319	33	17.3	11.0	27.3
• Alcoholism	303	0			
• Drug abuse	304-305	0			
Nervous system and sense organs	320-389	66	39.3	28.6	53.9
Circulatory system	390-459	12	8.6	4.4	16.9
• Hypertension	401	3	1.5	0.4	5.0
• Acute myocardial infarction	410	0			
• Ischemic disease, not M.I.	411-414, 429.2	3	1.9	0.6	6.3
• Cerebrovascular disease	430-438	1	2.1	0.3	15.2
Respiratory system	460-519	309	177.8	154.9	204.1
• Upper respiratory	460-465, 470-478	140	83.3	67.7	102.6
• Pneumonia/bronchitis	466, 480-487	82	48.1	36.9	62.7
• Chronic respiratory conditions	490-496	82	42.5	33.0	54.7
Digestive system	520-579	79	42.3	32.6	54.9
• Hernias	550-553	5	3.4	1.3	8.9
• Gall bladder disease	574-575	8	3.7	1.7	7.7
Genitourinary system	580-629	62	29.0	21.7	38.7
• Benign prostatic hypertrophy	600	0			
• Endometriosis	617	6	2.9	1.1	7.4
• Ovarian cysts	620.0-620.2	7	5.3	2.3	12.2
• Female genital pain/bleeding	625-626	0			
Pregnancy and childbirth <sup>†</sup>	630-676	33	22.4	15.0	33.4
Skin and subcutaneous tissue	680-709	9	5.2	2.5	10.8
Musculoskeletal system	710-739	92	41.3	32.9	52.0
• Dorsopathies	720-724	31	12.8	8.8	18.7
Congenital anomalies	740-759	1	0.8	0.1	5.5
Certain perinatal conditions	760-779	0			
Symptoms, signs, and ill-defined conditions	780-799	52	24.8	18.1	34.1
Injury and poisoning	800-999	93	40.6	32.4	51.0
• Fractures, all sites	800-829	11	5.4	2.8	10.6
• Dislocations	830-839	6	2.1	0.9	4.7
• Sprains and strains	840-848	38	15.2	10.8	21.4
• Intracranial injuries	850-854	2	0.7	0.2	2.7
• Internal injuries	860-869	4	1.8	0.6	5.2
• Open wounds	870-897	0			
• Other injuries	900-999	32	15.5	10.4	23.0
Health status/health service contract	V01-V82	12	7.8	4.0	15.0
• Family history of health problems	V10-V19	1	0.3	0.0	2.2
• Circumstances related to reproduction/development	V20-V28	7	5.6	2.4	13.0
• Specific procedure/aftercare	V50-V59	2	1.1	0.2	4.9
Total minus pregnancies		901	476.1	439.6	515.5
<b>TOTAL</b>		934	498.5	461.0	539.0

<sup>†</sup>Includes all diagnoses reported with an absence of 5 or more days.

\* Standardized to age distribution of 1970 U.S. population.

<sup>†</sup> Only women aged 18-45 were included in the calculation of the rates for these diagnostic categories.

## Diagnoses Associated with Pregnancy, Labor, and Delivery

During 1994, 33 pregnancy related diagnoses were reported among 30 women (Table 6). There were eight diagnoses for complications related to pregnancy and three for ectopic and molar pregnancy/abortive outcomes. Twenty-two women had normal deliveries. Three women had multiple diagnoses.

## Diagnoses by Occupational Category, 1994

During 1994, the age-adjusted diagnosis rate for all employees (Table 7) was higher among salaried workers than hourly workers (281.7 versus 229.3 per 1,000 persons). Administration workers, who comprised 42% of the work force, had the highest diagnosis rate (331.6 per 1,000), with 946 diagnoses reported for 498 workers. Nuclear workers had the second highest diagnosis rate (281.6 per 1,000), with 147 diagnoses

reported among 77 persons. Technical workers ranked third, with 360 diagnoses reported for 197 workers (265.3 per 1,000). "Other/unknown" workers had the lowest rate (106.1 per 1,000 workers), with four diagnoses for one worker.

**Men.** Among men (Table 8), the diagnosis rate was slightly higher for salaried workers (183.9 per 1,000) than for hourly workers (177.4 per 1,000). Nuclear workers had the highest rate (201.5 per 1,000), with 78 diagnoses reported for 49 men. The second highest rate was among the administration workers (198.6 per 1,000), with 357 diagnoses reported among 205 men. Technical workers ranked third, with 195 diagnoses reported among 119 men (191.6 per 1,000). Men in the "other/unknown" occupational category had no diagnoses reported.

**Women.** The diagnosis rate among women (Table 9) was higher for hourly workers (631.4 per 1,000) than for salaried workers (486.1 per 1,000). "Other/unknown" workers had the highest rate (849.1 per 1,000), with four diagnoses reported for one woman. The second highest rate was among the nuclear workers (785.6 per 1,000), with 69 diagnoses reported among 28 women. Administration workers ranked third, with 589 diagnoses reported among 293 women (499.7 per 1,000). Workers in the crafts and manual labor category had the lowest rate (45.4 per 1,000), with one diagnosis for one woman. The women had higher diagnosis rates than the men; this suggests a greater tendency among women to report injury or illness.

Category of Diagnoses	ICD9-CM Code	Number of Diagnoses <sup>†</sup>	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Ectopic and Molar Pregnancy/Abortive Outcome	630-639	3	2.1	0.6	7.4
Complications Related to Pregnancy	640-648	8	4.2	1.8	9.8
Normal Delivery	650	22	16.3	10.1	26.4
Other Indications for Care in Pregnancy, Labor, and Delivery <sup>‡</sup>	651-659	0			
Complications of Labor, Delivery, and Puerperium	660-676	0			
<b>TOTAL</b>		<b>33</b>	<b>22.6</b>	<b>15.2</b>	<b>33.7</b>

**Table 6.**  
**Diagnoses**  
**Associated with**  
**Pregnancy, Labor,**  
**and Delivery**

<sup>†</sup> Includes all diagnoses reported with an absence of 5 or more days.

\* Only women aged 18-45 were included in the calculation of the rates for these diagnostic categories.

<sup>‡</sup> Includes delivery by cesarian section and multiple births.

**Table 7.**  
*Diagnoses by  
Occupational  
Category - Men  
and Women*

	Occupational Category	Number of Workers in 1994	Number of Diagnoses†	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Salaried	Administrative	2,831	946	331.6	306.0	359.5
	Professional	1,310	251	191.6	164.8	222.7
	Technical	1,269	360	265.3	230.9	304.8
	Subtotal	5,410	1,557	281.7	264.6	299.8
Hourly	Service	302	82	254.9	198.6	327.1
	Crafts and Manual Labor	499	95	141.1	114.5	173.8
	Nuclear	499	147	281.6	229.4	345.7
	Subtotal	1,300	324	229.3	200.2	262.7
	Other/Unknown	23	4	106.1	39.8	282.8
<b>TOTAL</b>		<b>6,733</b>	<b>1,885</b>	<b>271.2</b>	<b>256.2</b>	<b>287.1</b>

**Table 8.**  
*Diagnoses by  
Occupational  
Category - Men*

	Occupational Category	Number of Workers in 1994	Number of Diagnoses†	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Salaried	Administrative	1,664	357	198.6	172.8	228.3
	Professional	1,102	175	154.6	129.6	184.4
	Technical	978	195	191.6	158.5	231.6
	Subtotal	3,744	727	183.9	167.5	201.8
Hourly	Service	236	52	188.7	139.7	255.0
	Crafts and Manual Labor	491	94	142.1	115.3	175.3
	Nuclear	420	78	201.5	149.5	271.6
	Subtotal	1,147	224	177.4	149.9	210.0
	Other/Unknown	21	0			
<b>TOTAL</b>		<b>4,912</b>	<b>951</b>	<b>181.3</b>	<b>167.1</b>	<b>196.7</b>

**Table 9.**  
*Diagnoses by  
Occupational  
Category -  
Women*

	Occupational Category	Number of Workers in 1994	Number of Diagnoses†	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Salaried	Administrative	1,167	589	499.7	453.2	550.9
	Professional	208	76	327.6	245.0	438.1
	Technical	291	165	494.1	406.6	600.4
	Subtotal	1,666	830	486.1	446.9	528.8
Hourly	Service	66	30	459.9	306.6	689.7
	Crafts and Manual Labor	8	1	45.4	6.4	322.2
	Nuclear	79	69	785.6	609.7	1,012.3
	Subtotal	153	100	631.4	507.7	785.4
	Other/Unknown	2	4	849.1	318.7	2,262.3
<b>TOTAL</b>		<b>1,821</b>	<b>934</b>	<b>498.5</b>	<b>461.0</b>	<b>539.0</b>

† Includes all diagnoses reported with an absence of 5 or more days, including absences for pregnancy and childbirth.

\* Standardized to age distribution of 1970 U.S. population.

## Deaths Among Active Workers, 1994

There were no deaths reported among active workers during 1994.

## Relative Risk for All Diseases and Injuries by Occupation

In Table 10, the risk of one or more absences associated with selected diagnostic categories for specific occupational categories is compared with all other occupational categories in the Rocky Flats work force. This comparison takes into account the possible confounding effects of age and gender. In contrast to the previous series of tables, these analyses

examine the risk of a worker having *one or more* absences for 5 or more consecutive workdays during 1994. This was done to minimize the problem associated with one person having multiple absences for the same condition.

Throughout this report, various tables and discussions refer to rates of illness or injury. Rates in this report reflect the number of events (e.g., absences, diagnoses) per 1,000 "person-years." A "person-year" is a unit of measurement combining persons and time; it is equivalent to one person followed up for 1 year. When

an individual worker remains in the work force for the entire year, she or he contributes one person-year to the calculation of rates of disease and injury presented in the report. Rates of disease and injury are often presented as the number of diagnoses or absences from work per thousand workers per year, or per 1,000 person-years.

The statistical methods used to compare the incidence of absences are the relative risk and the 95% confidence interval.

Disease	Administrative 2,631 Person-Years				Professional 1,310 Person-Years				Technical 1,269 Person-Years				Service 302 Person-Years							
	Persons with at Least One Event*	Relative Risk**	Confidence Limit	Lower 95%	Upper 95%	Persons with at Least One Event*	Relative Risk**	Confidence Limit	Lower 95%	Upper 95%	Persons with at Least One Event*	Relative Risk**	Confidence Limit	Lower 95%	Upper 95%	Persons with at Least One Event*	Relative Risk**	Confidence Limit	Lower 95%	Upper 95%
All Diseases and Injuries	498	1.1		0.9	1.2	152	0.8		0.7	1.0	197	1.1		0.9	1.2	46	1.1		1.1	0.1
Infections and Parasitic Diseases	62	1.5		1.0	2.2	16	0.8		0.4	1.3	21	1.1		0.7	1.7	2	0.4		0.4	0.
Malignant Neoplasms	9	1.1		0.4	2.7	5	1.6		0.5	4.5	4	1.1		0.4	3.4	0				
Benign Neoplasms	11	1.3		0.5	3.3	1	0.2		0.03	1.8	6	1.8		0.7	4.9	1	1.2		1.2	0.
Endocrine and Metabolic Diseases	12	1.9		0.8	4.5	1	0.2		0.03	1.5	3	0.7		0.2	2.4	0				
Mental Disorders	29	3.3		1.4	7.6	2	0.3		0.1	1.2	4	0.5		0.2	1.5	2	1.3		1.3	0.
Nervous System and Sense Organs	55	1.2		0.8	1.7	16	0.9		0.5	1.6	23	1.3		0.8	2.1	5	1.2		1.2	0.
Circulatory System	27	2.0		1.1	3.6	6	0.7		0.3	1.7	7	0.8		0.4	1.8	1	0.5		0.5	0.
Respiratory System	190	1.1		0.9	1.4	54	0.9		0.7	1.2	68	1.1		0.8	1.4	10	0.7		0.7	0.
Digestive System	72	1.1		0.8	1.5	28	1.2		0.8	1.8	21	0.8		0.5	1.3	2	0.3		0.3	0.
Genitourinary System	45	1.2		0.7	1.8	9	0.7		0.3	1.4	12	0.8		0.5	1.6	3	0.9		0.9	0.
Skin and Subcutaneous Tissue	9	0.7		0.3	1.7	1	0.2		0.02	1.5	8	2.2		0.9	5.1	1	0.9		0.9	0.
Musculoskeletal System	63	0.8		0.6	1.2	21	0.7		0.4	1.1	37	1.3		0.9	1.9	12	1.9		1.9	1.0
Symptoms, Signs and Ill-Defined Conditions	34	0.9		0.6	1.4	11	0.9		0.5	1.8	14	1.1		0.6	2.0	2	0.7		0.7	0.
Injury and Poisoning	85	0.8		0.6	1.1	28	0.6		0.4	0.9	42	1.0		0.7	1.4	18	2.0		2.0	1.1
Injury and Poisoning: Fractures	16	0.9		0.5	1.7	8	1.0		0.4	2.1	7	0.9		0.4	2.0	3	1.7		1.7	0.5
Injury and Poisoning: Sprains and Strains	31	0.6		0.4	0.9	10	0.5		0.3	1.0	19	1.1		0.7	1.8	10	2.6		2.6	1.4
Injury and Poisoning: Open Wounds	5	0.9		0.3	2.8	2	0.5		0.1	2.5	1	0.3		0.04	2.2	2	3.5		3.5	0.
Injury and Poisoning: "Other" Injuries	32	1.0		0.6	1.6	8	0.5		0.3	1.2	13	1.0		0.5	1.8	6	2.0		2.0	0.

\* Persons with multiple absences during the time period were counted only once.

\*\* Adjusted for age and gender — compared with all other occupational categories.

The relative risk is the rate of absence in one group divided by the rate in a reference (comparison) group. The reference group is all workers other than the occupational category of primary interest. A relative risk of 1.0 indicates that both groups have the same risk of absence. A relative risk *greater than 1.0* indicates that workers in a selected occupational category have a higher risk of absence than workers in all other occupational categories combined. A relative risk *less than 1.0* implies that the selected occupational group has a lower risk of absence compared to all other occupational categories combined.

The confidence interval is a statistical measure of the precision of the risk estimate. A 95% confidence interval indicates the range in which one would expect the relative risk to fall 95% of the time. If the confidence interval includes the value 1.0, then the rate of absence is likely to have occurred by chance; in other words, the relative risk is not statistically significant at the 95% confidence level. For example, a relative risk of 2.0 with a confidence interval of .9 to 2.1 would not be considered statistically significant, whereas a relative risk of 1.4 with a confidence interval of 1.2 to 1.7 would be con-

sidered statistically significant. The width of the confidence interval indicates the amount of uncertainty in the risk estimate and is affected by sample size and the number of events in the diagnostic category.

None of the occupational categories were at a statistically significant increased or decreased risk of being absent 5 or more consecutive workdays in 1994 due to all diseases and injuries combined.

**Table 10.**  
**Relative Risk for Selected Disease and Injury Categories by Occupation**

Occupation	Crafts and Manual Labor Person-Years				Nuclear 499 Person-Years				Unknown 23 Person-Years				Total Number of persons with at least One Event*
	Persons with at least One Event*	Relative Risk**	Confidence Limit Lower 95%	Upper 95%	Persons with at least One Event*	Relative Risk**	Confidence Limit Lower 95%	Upper 95%	Persons with at least One Event*	Relative Risk**	Confidence Limit Lower 95%	Upper 95%	
Administrative and Clerical	55	0.9	0.7	1.2	77	1.1	0.9	1.4	1	0.3	0.05	2.4	1,026
Armed Forces	3	0.4	0.1	1.4	6	0.8	0.4	1.9	0				110
Arts, Crafts, and Recreation	1	0.6	0.1	4.4	1	0.7	0.1	4.6	0				20
Business and Finance	1	0.8	0.1	7.0	1	0.7	0.1	5.4	0				21
Chemical Process	0				5	4.7	1.6	13.5	0				21
Chemical Sales	1	0.6	0.1	4.2	1	0.4	0.1	3.1	0				39
Chemical Storage	2	0.4	0.1	1.5	2	0.3	0.1	1.2	0				103
Chemical Transportation	3	0.7	0.2	2.4	2	0.5	0.1	2.2	0				46
Chemical Use	13	0.7	0.4	1.2	23	1.0	0.7	1.6	0				358
Cooking	7	0.9	0.4	1.9	12	1.3	0.7	2.4	1	2.7	0.4	19.0	143
Construction	4	1.6	0.5	4.6	5	1.2	0.5	2.9	1	5.8	0.8	41.4	79
Customer Service	3	2.2	0.6	7.9	2	1.2	0.3	5.2	0				24
Delivery	7	0.6	0.3	1.4	16	1.5	0.9	2.5	0				156
Engineering	2	0.5	0.1	2.3	9	2.2	1.1	4.3	0				72
Food Preparation	22	1.7	1.1	2.7	22	1.5	1.0	2.3	0				217
Food Service	3	1.0	0.3	3.5	4	1.4	0.5	3.9	0				41
Health Care	11	1.9	1.0	3.7	14	2.3	1.3	4.1	0				95
Manufacturing	4	3.2	1.0	10.3	1	0.8	0.1	6.0	0				15
Marketing	8	2.2	1.0	4.7	4	0.8	0.3	2.2	0				71

## **Relative Risk for Selected Disease and Injury Categories by Occupation**

Table 10 also presents the relative risks of absences of 5 or more consecutive workdays for selected disease categories among workers by each occupational category. These show that administration workers were significantly more likely to be absent at least once during 1994 for mental disorders (RR=3.3). There were 40 diagnoses of mental disorders among 29 administration workers. Fifteen diagnoses were due to acute reactions to stress, nine to depressive disorders, seven to neurotic disorders, three to other mental disorders, and two to psychoses.

Administration workers were also at an increased risk due to diseases of the circulatory system (RR=2.0). Service workers were significantly more likely to be absent at least once during 1994 for injury and poisoning as a whole (RR=2.0), with sprains and strains (RR=2.6) as a subcategory of injury and poisoning. Crafts and manual labor workers were found to have a statistically significant increased risk associated with injury and poisoning (RR=1.7). Nuclear workers were significantly more likely to be absent at least once during 1994 for endocrine and metabolic diseases (RR=4.7); symptoms, signs, and ill-defined conditions (RR=2.2); and sprains and strains (RR=2.3), a subcategory of injury and poisoning.

Administration workers were significantly less likely to be absent at least once during 1994 for sprains and strains (RR=0.6), as a subcategory of injury and poisoning. Professional workers had a statistically significant decreased risk of injury and poisoning, as a whole (RR=0.6).

The reasons for the large differences in overall diagnosis rates and relative risks for particular diagnostic categories among different occupational categories may be due to small numbers.

## OSHA-Recordable Events Among Rocky Flats Employees, 1994

**OSHA-Recordable Events per Person.** In 1994, 277 Rocky Flats employees had at least one OSHA-recordable event. Eight (3%) of these workers had two or more events. There was a total of 287 OSHA-recordable events among all employees (Table 11A).

**Diagnoses per OSHA-Recordable Event.** A total of 324 diagnoses were associated with the OSHA events reported during 1994. Multiple diagnoses were reported for 31 (11%) of the events (Table 11B).

**Diagnosis Rates for OSHA-Recordable Events.** In 1994, the 324 diagnoses noted for the 287 OSHA

events yielded an age-adjusted rate of 47.5 per 1,000 persons. The age-adjusted diagnosis rate for women (52.8 per 1,000) was higher than the rate for men (46.9 per 1,000) (Table 11C).

Employee Category	Number of Workers in 1994	Number of OSHA-Recordable Events				Total Persons with at Least One Event	Total Number of Events
		0	1	2	3		
Men	4,912	4,712	195	4	1	200	206
Women	1,821	1,744	74	2	1	77	81
<b>TOTAL</b>	<b>6,733</b>	<b>6,456</b>	<b>269</b>	<b>6</b>	<b>2</b>	<b>277</b>	<b>287</b>

**Table 11A.**  
**OSHA-Recordable Events per Person**

Employee Category	Number of Diagnoses per OSHA Event			Total Number of Events	Total Number of Diagnoses†
	1	2	3		
Men	184	18	4	206	232
Women	72	7	2	81	92
<b>TOTAL</b>	<b>256</b>	<b>25</b>	<b>6</b>	<b>287</b>	<b>324</b>

**Table 11B.**  
**Diagnoses per OSHA-Recordable Event**

Employee Category	Number of Workers in 1994	Total Number of Diagnoses†	Crude Rate per 1,000	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Men	4,912	232	47.2	46.9	39.7	55.5
Women	1,821	92	50.5	52.8	40.7	68.5
<b>TOTAL</b>	<b>6,733</b>	<b>324</b>	<b>48.1</b>	<b>47.5</b>	<b>41.5</b>	<b>54.5</b>

**Table 11C.**  
**Diagnosis Rates for OSHA-Recordable Events**

\* Standardized to age distribution of 1970 U.S. population.  
† Includes all diagnoses associated with an OSHA-recordable event.

## **OSHA-Recordable Diseases and Injuries by Diagnostic Category, 1994**

The age-adjusted diagnosis rate for each diagnostic category is presented for all workers combined and by gender (Tables 12-14). As Table 12 shows, the diagnostic category with the highest rate was injury and poisoning (35.2 per 1,000), with 230 diagnoses reported for 202 people, which accounted for 71% of all the diagnoses. Within this category were two subcategories with relatively high rates. Sprains and strains (18.6 per 1,000), with 115 diagnoses among 105 workers; and "other" injuries (10.6 per 1,000), with 68 diagnoses among 61 workers. Tables 13 and 14 show the diagnosis rates by gender to further describe the disease and injury patterns in the work force.

**Men.** The leading diagnostic category among men (Table 13), accounting for 70% of all diagnoses, was injury and poisoning (34.1 per 1,000), with 162 diagnoses reported among 145 men. Within this category were two subcategories with relatively high rates.

Sprains and strains (16.9 per 1,000) accounted for 48% of these diagnoses, with 77 diagnoses among 73 men. Thirty-eight diagnoses were sprains and strains of the back, 23 of the lower extremities, 15 of the upper extremities, and 1 of the ribs. Four men had multiple diagnoses. "Other" injuries (10.4 per 1,000) accounted for 30% of the injury and poisoning diagnoses, with 49 diagnoses among 45 men. These included ten diagnoses for second degree burns — nine to the upper extremities and one to a lower extremity. Eight effects of heat were recorded, as were eight abrasion/friction burns — four to the lower extremities, two to the upper extremities, and two to the face. Eight contusions were recorded — three to the upper extremities, four to the lower extremities, and one to the chest. There were three allergies due to unspecified agents, three hearing losses, and three unspecified injuries — one to the shoulder, one to a lower extremity, and one unspecified. Two foreign bodies in the eye were recorded, two insect bites, one splinter, and one effect of a toxic agent. Four men had multiple diagnoses.

**Women.** As Table 14 shows, the diagnostic category with the highest rate was the same among women as for men. Injury and poisoning (42.0 per 1,000) accounted for 74% of all diagnoses, with 68 diagnoses among 57 women. Within this category were two subcategories with relatively high rates. Sprains and strains (26.1 per 1,000) accounted for 56% of these diagnoses, with 38 diagnoses for 32 women. Twenty of these were sprains and strains of the back, 11 of the upper extremities, 6 of the lower extremities, and 1 of the ribs. Four women had multiple diagnoses. "Other" injuries (11.7 per 1,000) accounted for 28%, with 19 diagnoses for 16 women. These included ten diagnoses for contusions — six to the upper extremities, two to the lower extremities, one to the back, and one to the spine; three unspecified injuries to the upper extremities; two allergies; one second degree burn to the wrist; one abrasion/friction burn; one effect of heat; and one toxic effect due to an unspecified fume. Three women had multiple diagnoses.

**Table 12.**  
**OSHA-**  
**Recordable**  
**Diseases and**  
**Injuries by**  
**Diagnostic**  
**Category - Men**  
**and Women**

Category of Diagnoses	ICD9-CM Code	Number of Diagnoses†	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Infections and parasitic diseases	001-139	0			
Malignant neoplasms	140-208, 230-234	0			
• Digestive organs	150-159	0			
• Respiratory system	160-165	0			
• Breast	174-175	0			
• Genitourinary	179-189	0			
• Nervous system	191-192	0			
• Leukemia, lymphoma	200-208	0			
Benign neoplasms and other	210-229, 235-239	0			
Endocrine and metabolic diseases	240-279	0			
Blood and blood-forming organs	280-289	0			
Mental disorders	290-319	0			
• Alcoholism	303	0			
• Drug abuse	304-305	0			
Nervous system and sense organs	320-389	14	2.3	1.2	4.4
Circulatory system	390-459	0			
• Hypertension	401	0			
• Acute myocardial infarction	410	0			
• Ischemic disease, not M.I.	411-414, 429.2	0			
• Cerebrovascular disease	430-438	0			
Respiratory system	460-519	2	0.2	0.0	0.7
• Upper respiratory	460-465, 470-478	0			
• Pneumonia/bronchitis	466, 480-487	0			
• Chronic respiratory conditions	490-496	0			
Digestive system	520-579	1	0.1	0.0	0.7
• Hernias	550-553	1	0.1	0.0	0.7
• Gall bladder disease	574-575	0			
Genitourinary system	580-629	0			
• Benign prostatic hypertrophy	600	0			
• Endometriosis	617	0			
• Ovarian cysts	620.0-620.2	0			
• Female genital pain/bleeding	625-626	0			
Pregnancy and childbirth	630-676	0			
Skin and subcutaneous tissue	680-709	23	2.7	1.7	4.4
Musculoskeletal system	710-739	44	5.2	3.8	7.2
• Dorsopathies	720-724	4	0.4	0.1	1.0
Congenital anomalies	740-759	0			
Certain perinatal conditions	760-779	0			
Symptoms, signs, and ill-defined conditions	780-799	10	1.8	0.8	3.9
Injury and poisoning	800-999	230	35.2	29.9	41.4
• Fractures, all sites	800-829	19	2.2	1.4	3.5
• Dislocations	830-839	1	0.1	0.0	0.7
• Sprains and strains	840-848	115	18.6	14.7	23.6
• Intracranial injuries	850-854	2	0.6	0.1	3.0
• Internal injuries	860-869	1	0.1	0.0	0.7
• Open wounds	870-897	24	3.1	1.9	4.9
• Other injuries	900-999	68	10.6	7.9	14.2
Health status/health service contract	V01-V82	0			
• Family history of health problems	V10-V19	0			
• Circumstances related to reproduction/development	V20-V28	0			
• Specific procedure/aftercare	V50-V59	0			
Total minus pregnancies		324	47.5	41.5	54.5
<b>TOTAL</b>		324	47.5	41.5	54.5

† Includes all diagnoses resulting from an OSHA-recordable event.

\* Standardized to age distribution of 1970 U.S. population.

**Table 13.**  
**OSHA-**  
**Recordable**  
**Diseases and**  
**Injuries by**  
**Diagnostic**  
**Category - Men**

Category of Diagnoses	ICD9-CM Code	Number of Diagnoses†	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Infections and parasitic diseases	001-139	0			
Malignant neoplasms	140-208, 230-234	0			
• Digestive organs	150-159	0			
• Respiratory system	160-165	0			
• Breast	174-175	0			
• Genitourinary	179-189	0			
• Nervous system	191-192	0			
• Leukemia, lymphoma	200-208	0			
Benign neoplasms and other	210-229, 235-239	0			
Endocrine and metabolic diseases	240-279	0			
Blood and blood-forming organs	280-289	0			
Mental disorders	290-319	0			
• Alcoholism	303	0			
• Drug abuse	304-305	0			
Nervous system and sense organs	320-389	11	2.2	1.1	4.3
Circulatory system	390-459	0			
• Hypertension	401	0			
• Acute myocardial infarction	410	0			
• Ischemic disease, not M.I.	411-414, 429.2	0			
• Cerebrovascular disease	430-438	0			
Respiratory system	460-519	2	0.3	0.1	1.0
• Upper respiratory	460-465, 470-478	0			
• Pneumonia/bronchitis	466, 480-487	0			
• Chronic respiratory conditions	490-496	0			
Digestive system	520-579	1	0.1	0.0	0.9
• Hernias	550-553	1	0.1	0.0	0.9
• Gall bladder disease	574-575	0			
Genitourinary system	580-629	0			
• Benign prostatic hypertrophy	600	0			
• Endometriosis	617	0			
• Ovarian cysts	620.0-620.2	0			
• Female genital pain/bleeding	625-626	0			
Pregnancy and childbirth	630-676	0			
Skin and subcutaneous tissue	680-709	18	3.1	1.7	5.7
Musculoskeletal system	710-739	32	5.2	3.6	7.7
• Dorsopathies	720-724	3	0.4	0.1	1.2
Congenital anomalies	740-759	0			
Certain perinatal conditions	760-779	0			
Symptoms, signs, and ill-defined conditions	780-799	6	1.9	0.7	5.3
Injury and poisoning	800-999	162	34.1	27.8	41.8
• Fractures, all sites	800-829	13	2.0	1.2	3.5
• Dislocations	830-839	1	0.1	0.0	0.9
• Sprains and strains	840-848	77	16.9	12.5	22.8
• Intracranial injuries	850-854	1	0.8	0.1	5.5
• Internal injuries	860-869	1	0.1	0.0	0.9
• Open wounds	870-897	20	3.7	2.1	6.4
• Other injuries	900-999	49	10.4	7.2	15.0
Health status/health service contract	V01-V82	0			
• Family history of health problems	V10-V19	0			
• Circumstances related to reproduction/development	V20-V28	0			
• Specific procedure/aftercare	V50-V59	0			
<b>TOTAL</b>		<b>232</b>	<b>46.9</b>	<b>39.7</b>	<b>55.5</b>

† Includes all diagnoses resulting from an OSHA-recordable event.

\* Standardized to age distribution of 1970 U.S. population.

**Table 14.**  
**OSHA-**  
**Recordable**  
**Diseases and**  
**Injuries by**  
**Diagnostic**  
**Category -**  
**Women**

Category of Diagnoses	ICD9-CM Code	Number of Diagnoses <sup>†</sup>	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Infections and parasitic diseases	001-139	0			
Malignant neoplasms	140-208, 230-234	0			
• Digestive organs	150-159	0			
• Respiratory system	160-165	0			
• Breast	174-175	0			
• Genitourinary	179-189	0			
• Nervous system	191-192	0			
• Leukemia, lymphoma	200-208	0			
Benign neoplasms and other	210-229, 235-239	0			
Endocrine and metabolic diseases	240-279	0			
Blood and blood-forming organs	280-289	0			
Mental disorders	290-319	0			
• Alcoholism	303	0			
• Drug abuse	304-305	0			
Nervous system and sense organs	320-389	3	1.8	0.5	7.0
Circulatory system	390-459	0			
• Hypertension	401	0			
• Acute myocardial infarction	410	0			
• Ischemic disease, not M.I.	411-414, 429.2	0			
• Cerebrovascular disease	430-438	0			
Respiratory system	460-519	0			
• Upper respiratory	460-465, 470-478	0			
• Pneumonia/bronchitis	466, 480-487	0			
• Chronic respiratory conditions	490-496	0			
Digestive system	520-579	0			
• Hernias	550-553	0			
• Gall bladder disease	574-575	0			
Genitourinary system	580-629	0			
• Benign prostatic hypertrophy	600	0			
• Endometriosis	617	0			
• Ovarian cysts	620.0-620.2	0			
• Female genital pain/bleeding	625-626	0			
Pregnancy and childbirth	630-676	0			
Skin and subcutaneous tissue	680-709	5	2.2	0.9	5.6
Musculoskeletal system	710-739	12	5.0	2.7	9.2
• Dorsopathies	720-724	1	0.4	0.1	2.6
Congenital anomalies	740-759	0			
Certain perinatal conditions	760-779	0			
Symptoms, signs, and ill-defined conditions	780-799	4	1.8	0.6	5.3
Injury and poisoning	800-999	68	42.0	30.9	57.0
• Fractures, all sites	800-829	6	2.5	1.0	5.8
• Dislocations	830-839	0			
• Sprains and strains	840-848	38	26.1	17.3	39.5
• Intracranial injuries	850-854	1	0.3	0.0	2.2
• Internal injuries	860-869	0			
• Open wounds	870-897	4	1.4	0.5	3.7
• Other injuries	900-999	19	11.7	6.7	20.4
Health status/health service contract	V01-V82	0			
• Family history of health problems	V10-V19	0			
• Circumstances related to reproduction/development	V20-V28	0			
• Specific procedure/aftercare	V50-V59	0			
<b>Total minus pregnancies</b>		<b>92</b>	<b>52.8</b>	<b>40.7</b>	<b>68.5</b>
<b>TOTAL</b>		<b>92</b>	<b>52.8</b>	<b>40.7</b>	<b>68.5</b>

† Includes all diagnoses resulting from an OSHA-recordable event.

\* Standardized to age distribution of 1970 U.S. population.

## OSHA-Recordable Diagnoses by Occupational Category, 1994

During 1994, the age-adjusted diagnosis rate for all employees (Table 15) was more than 3 times higher among hourly workers than salaried workers (105.6 versus 33.9 per 1,000 persons). Service workers, who comprised 4.5% of the work force, had the highest diagnosis rate (115.0 per 1,000), with 35 diagnoses reported for 30 persons. The second highest diagnosis rate was among nuclear workers (110.3 per 1,000), with 55 diagnoses reported for 48 persons. Crafts and manual labor workers (73.3 per 1,000) ranked third, with 47 diagnoses reported among 43 workers. The diagnosis rate for workers in the administration category was lower than all other occupational categories (23.2 per 1,000 workers), with 55 diagnoses for 47 workers.

**Men.** The diagnosis rate among men (Table 16) was more than 3.5 times higher for hourly workers (108.6 per 1,000) than for salaried workers (28.3 per 1,000). Service workers had the highest rate (120.0 per 1,000), with 29 diagnoses reported for 25 men. Nuclear workers ranked

second (116.7 per 1,000), with 46 diagnoses reported among 39 men. Crafts and manual labor workers followed, with 47 diagnoses reported for 43 men (74.2 per 1,000). As seen with the combined groups, administration workers had the lowest rate (12.9 per 1,000) with 17 diagnoses reported for 16 men.

**Women.** The diagnosis rate among women (Table 17) was almost 2 times as high for the hourly workers (95.8 per 1,000) as for the salaried workers (49.8 per 1,000). The diagnosis rate for workers in the service category (118.2 per 1,000) was the highest with six diagnoses reported among five women. Technical workers (92.1 per 1,000) ranked second with 32 diagnoses reported for 27 women. The third highest rate occurred among nuclear workers (87.1 per 1,000), with nine diagnoses reported among nine women. The diagnosis rate was the lowest among the professional workers (24.6 per 1,000) with seven diagnoses reported for five women.

## OSHA-Recordable Relative Risk for All Diseases and Injuries by Occupation

In Table 18 and Tables 19A through 19I, the risk of one or more OSHA events associated with selected diagnostic categories for each occupational category is compared with all other occupational categories in the Rocky Flats work force. This comparison takes into account the possible confounding effects of age and gender.

In contrast to the previous series of tables, these analyses examine the risk of a worker having *one or more* OSHA-recordable events during 1994. This was done to minimize the problem associated with one person having multiple events for the same condition.

Technical workers (RR=1.8), service workers (RR=2.6), crafts and manual labor workers (RR=2.4), and nuclear workers (RR=2.6) had statistically significant increased risks of an OSHA-recordable event in 1994 (Table 18). Administration workers (RR=0.2), and professional workers (RR=0.4) had a statistically significant decreased risk of an event.

**Table 15.**  
**OSHA-Recordable Diagnoses by Occupational Category - Men and Women**

	Occupational Category	Number of Workers in 1994	Number of Diagnoses†	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Salaried	Administrative	2,831	55	23.2	16.5	32.5
	Professional	1,310	31	25.1	16.3	38.7
	Technical	1,269	101	67.1	52.3	86.1
	Subtotal	5,410	187	33.9	28.3	40.6
Hourly	Service	302	35	115.0	79.3	166.8
	Crafts and Manual Labor	499	47	73.3	53.7	100.0
	Nuclear	499	55	110.3	78.6	154.9
	Subtotal	1,300	137	105.6	84.9	131.4
	Other/Unknown	23	0			
	<b>TOTAL</b>	<b>6,733</b>	<b>324</b>	<b>47.5</b>	<b>41.5</b>	<b>54.5</b>

† Includes all diagnoses resulting from an OSHA-recordable event.

\* Standardized to age distribution of 1970 U.S. population

Occupational Category		Number of Workers in 1994	Number of Diagnoses†	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Salaried	Administrative	1,664	17	12.9	6.6	25.2
	Professional	1,102	24	23.9	14.8	38.7
	Technical	978	69	57.5	43.0	76.9
	Subtotal	3,744	110	28.3	22.3	36.0
Hourly	Service	236	29	120.0	79.6	180.9
	Crafts and Manual Labor	491	47	74.2	54.4	101.2
	Nuclear	420	46	116.7	78.4	173.8
	Subtotal	1,147	122	108.6	85.3	138.4
	Other/Unknown	21	0			
TOTAL		4,912	232	46.9	39.7	55.5

**Table 16.**  
*OSHA-Recordable Diagnoses by Occupational Category - Men*

Occupational Category		Number of Workers in 1994	Number of Diagnoses†	Age-Adjusted Rate per 1,000*	Lower 95% Confidence Limit per 1,000	Upper 95% Confidence Limit per 1,000
Salaried	Administrative	1,167	38	41.6	27.6	62.7
	Professional	208	7	24.6	9.4	64.5
	Technical	291	32	92.1	59.1	143.5
	Subtotal	1,666	77	49.8	37.0	67.0
Hourly	Service	66	6	118.2	50.2	278.0
	Crafts and Manual Labor	8	0			
	Nuclear	79	9	87.1	43.3	175.3
	Subtotal	153	15	95.8	54.7	167.9
	Other/Unknown	2	0			
TOTAL		1,821	92	52.8	40.7	68.5

**Table 17.**  
*OSHA Diagnoses by Occupational Category - Women*

Occupational Category	Person-Years	Persons with at Least One Event ††	Relative Risk**	Lower 95% Confidence Limit	Upper 95% Confidence Limit
Administration	2,831	47	0.2	0.2	0.3
Professional	1,310	26	0.4	0.3	0.6
Technical	1,269	83	1.8	1.4	2.4
Service	302	30	2.6	1.8	3.8
Crafts and Manual Labor	499	43	2.4	1.7	3.4
Nuclear	499	48	2.6	1.9	3.6
Unknown	23	0			
<b>TOTAL</b>	<b>6,733</b>	<b>277</b>			

**Table 18.**  
*All OSHA-Recordable Diseases and Injuries by Occupational Categories*

†† Persons with multiple absences during the time period were counted only once.

\*\* Adjusted for age and gender — compared with all other occupational categories.

## OSHA-Recordable Relative Risk for Selected Disease and Injury Categories by Occupation

Tables 19A through 19I present the relative risk of an OSHA-recordable event for selected disease categories among workers by each occupational category.

Examination of the tables shows that technical workers were significantly more likely to have at least one OSHA event during 1994 for injury and poisoning (RR=2.1), as a whole; and sprains and strains (RR=2.2), open wounds (RR=3.5), and other injuries (RR=2.3), as subcategories of injury and poisoning. Service workers were also significantly more likely to have at least one OSHA event during 1994 for diseases of the skin and subcutaneous tissue (RR=4.6); and injury and poisoning (RR=3.0), as a whole; with sprains

and strains (RR=4.2), and other injuries (RR=2.6), as subcategories of injury and poisoning. Crafts and manual labor workers were significantly more likely to have at least one OSHA event during 1994 for diseases of the musculoskeletal system (RR=3.2); and injury and poisoning (RR=2.2), as a whole; with sprains and strains (RR=2.2), and open wounds (RR=3.4), as subcategories of injury and poisoning. Nuclear workers were significantly more likely to have an OSHA event due to diseases of the nervous system and sense organs (RR=10.1). There were six diagnoses for diseases of the nervous system and sense organs among six nuclear workers. Four were for hearing loss, one for conjunctivitis, and one for an unspecified disorder of the eye. Nuclear workers were also at an increased risk of an OSHA event due to injury

and poisoning (RR=2.8), as a whole; with open wounds (RR=3.4), and other injuries (RR=3.9), as subcategories of injury and poisoning.

Administration workers were statistically significantly less likely to have an OSHA event due to diseases of the musculoskeletal system (RR=0.4); and injury and poisoning (RR=0.2), as a whole; with decreases in sprains and strains (RR=0.2), open wounds (RR=0.04), and other injuries (RR=0.2), as subcategories of injury and poisoning. Professional workers were also at a significantly decreased risk for injury and poisoning (RR=0.4), as a whole; with sprains and strains (RR=0.4) and other injuries (RR=0.3), as subcategories of injury and poisoning.

Occupational Category	Person-Years	Persons with at Least One Event*	Relative Risk**	Lower 95% Confidence Limit	Upper 95% Confidence Limit
Administration	2,831	2	0.2	0.02	1.2
Professional	1,310	2	0.7	0.1	3.3
Technical	1,269	3	1.2	0.3	4.3
Service	302	0			
Crafts and Manual Labor	499	1	0.7	0.1	5.8
Nuclear	499	6	10.1	3.2	31.6
Unknown	23	0			
<b>TOTAL</b>	<b>6,733</b>	<b>14</b>			

*Table 19A.  
Diseases of the  
Nervous System  
& Sense Organs*

Occupational Category	Person-Years	Persons with at Least One Event*	Relative Risk**	Lower 95% Confidence Limit	Upper 95% Confidence Limit
Administration	2,831	6	0.5	0.2	1.3
Professional	1,310	1	0.2	0.02	1.3
Technical	1,269	4	0.9	0.3	2.5
Service	302	4	4.6	1.5	13.8
Crafts and Manual Labor	499	4	2.8	0.9	8.7
Nuclear	499	4	2.6	0.9	7.7
Unknown	23	0			
<b>TOTAL</b>	<b>6,733</b>	<b>23</b>			

*Table 19B.  
Diseases of  
the Skin &  
Subcutaneous  
Tissue*

\* Persons with multiple absences during the time period were counted only once.  
\*\* Adjusted for age and gender — compared with all other occupational categories.

Occupational Category	Person-Years	Persons with at Least One Event*	Relative Risk**	Lower 95% Confidence Limit	Upper 95% Confidence Limit
Administration	2,831	9	0.4	0.2	0.9
Professional	1,310	5	0.7	0.3	1.8
Technical	1,269	11	1.9	0.9	3.9
Service	302	2	1.3	0.3	5.3
Crafts and Manual Labor	499	7	3.2	1.3	7.9
Nuclear	499	2	0.7	0.2	3.1
Unknown	23	0			
<b>TOTAL</b>	<b>6,733</b>	<b>36</b>			

**Table 19C.**  
*Diseases of the  
Musculoskeletal  
System*

Occupational Category	Person-Years	Persons with at Least One Event*	Relative Risk**	Lower 95% Confidence Limit	Upper 95% Confidence Limit
Administration	2,831	2	0.3	0.1	1.3
Professional	1,310	3	1.8	0.5	6.9
Technical	1,269	2	1.1	0.2	4.9
Service	302	0			
Crafts and Manual Labor	499	2	4.3	0.9	21.2
Nuclear	499	1	1.6	0.2	13.6
Unknown	23	0			
<b>TOTAL</b>	<b>6,733</b>	<b>10</b>			

**Table 19D.**  
*Syptoms, Signs,  
& Ill-Defined  
Conditions*

Occupational Category	Person-Years	Persons with at Least One Event*	Relative Risk**	Lower 95% Confidence Limit	Upper 95% Confidence Limit
Administration	2,831	27	0.2	0.1	0.3
Professional	1,310	17	0.4	0.2	0.6
Technical	1,269	67	2.1	1.6	2.9
Service	302	25	3.0	2.0	4.6
Crafts and Manual Labor	499	29	2.2	1.5	3.4
Nuclear	499	37	2.8	2.0	4.0
Unknown	23	0			
<b>TOTAL</b>	<b>6,733</b>	<b>202</b>			

**Table 19E.**  
*Injury and  
Poisoning*

Occupational Category	Person-Years	Persons with at Least One Event*	Relative Risk**	Lower 95% Confidence Limit	Upper 95% Confidence Limit
Administration	2,831	4	0.3	0.1	1.2
Professional	1,310	1	0.3	0.04	2.2
Technical	1,269	5	1.8	0.6	5.1
Service	302	2	3.0	0.7	13.6
Crafts and Manual Labor	499	2	1.7	0.4	7.2
Nuclear	499	3	2.8	0.8	9.8
Unknown	23	0			
<b>TOTAL</b>	<b>6,733</b>	<b>17</b>			

**Table 19F.**  
*Injury and  
Poisoning:  
Fractures*

\* Persons with multiple absences during the time period were counted only once.  
\*\* Adjusted for age and gender — compared with all other occupational categories.

Occupational Category	Person-Years	Persons with at Least One Event*	Relative Risk**	Lower 95% Confidence Limit	Upper 95% Confidence Limit
Administration	2,831	16	0.2	0.1	0.4
Professional	1,310	10	0.4	0.2	0.8
Technical	1,269	35	2.2	1.4	3.3
Service	302	17	4.2	2.5	7.1
Crafts and Manual Labor	499	14	2.2	1.2	4.0
Nuclear	499	13	1.8	1.0	3.3
Unknown	23	0			
<b>TOTAL</b>	<b>6,733</b>	<b>105</b>			

**Table 19G.**  
*Injury and  
Poisoning:  
Sprains &  
Strains*

Occupational Category	Person-Years	Persons with at Least One Event*	Relative Risk**	Lower 95% Confidence Limit	Upper 95% Confidence Limit
Administration	2,831	1	0.04	0.003	0.6
Professional	1,310	1	0.2	0.03	1.4
Technical	1,269	10	3.5	1.5	8.3
Service	302	0			
Crafts and Manual Labor	499	5	3.4	1.2	10.0
Nuclear	499	5	3.4	1.3	9.2
Unknown	23	0			
<b>TOTAL</b>	<b>6,733</b>	<b>22</b>			

**Table 19H.**  
*Injury and  
Poisoning:  
Open Wounds*

Occupational Category	Person-Years	Persons with at Least One Event*	Relative Risk**	Lower 95% Confidence Limit	Upper 95% Confidence Limit
Administration	2,831	7	0.2	0.1	0.4
Professional	1,310	4	0.3	0.1	0.8
Technical	1,269	21	2.3	1.3	3.9
Service	302	7	2.6	1.2	5.7
Crafts and Manual Labor	499	7	1.6	0.7	3.6
Nuclear	499	15	3.9	2.2	7.0
Unknown	23	0			
<b>TOTAL</b>	<b>6,733</b>	<b>61</b>			

**Table 19I.**  
*Injury and  
Poisoning:  
“Other” Injuries*

\* Persons with multiple absences during the time period were counted only once.  
\*\* Adjusted for age and gender — compared with all other occupational categories

## DIAGNOSTIC CATEGORIES

Category of Diagnoses	ICD-9-CM Code	Types of Illness in Category
All conditions	001-V82	All reported health events.
Infectious and parasitic diseases	001-139	Diseases caused by bacteria, viruses, and parasites.
Malignant neoplasms	140-208, 230-234	All cancers, regardless of the part of the body affected.
Benign neoplasms and neoplasms of uncertain behavior and unspecified nature	210-229, 235-239	Tumors that are not cancerous or that do not exhibit clearly malignant behavior, regardless of the part of the body affected.
Endocrine, nutritional and metabolic diseases, and disorders of the immune system	240-279	Diseases and conditions affecting the hormone secreting glands and organs; nutritional disorders, such as vitamin deficiency; metabolic diseases, such as diabetes and gout; and problems affecting the antibody producing system.
Diseases of the blood and blood-forming organs	280-289	Includes anemia and hemophilia, but excludes leukemia.
Mental disorders	290-319	Psychiatric diagnoses, such as dementia, schizophrenia, depression, and anxiety disorders; alcoholism; drug dependence; and eating disorders, such as bulimia.
Diseases of the nervous system and sense organs	320-389	Diseases affecting the brain, spinal cord, and peripheral nerves. Examples include meningitis; encephalitis; hereditary diseases, such as Huntington's chorea; Alzheimer's and Parkinson's disease; epilepsy; multiple sclerosis; migraine; diseases of the eye, such as cataract and glaucoma; and diseases of the ear, such as conductive hearing loss and otitis.
Diseases of the circulatory system	390-459	Diseases involving the heart, arteries, veins, and lymphatic system. Examples include rheumatic fever, heart murmurs, heart attacks, angina, hardening of the arteries, varicose veins, hemorrhoids, and phlebitis.
Diseases of the respiratory system	460-519	Includes colds, sinusitis, laryngitis, pneumonia and influenza, chronic bronchitis, asthma, and emphysema.
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 genitourinary system	580-629	Diseases affecting the kidneys, the prostate, and testes; benign breast diseases; infertility (male and female); pelvic inflammatory disease; diseases of the ovary; and menstrual disorders.
Complications of pregnancy, childbirth, and puerperium	630-676	Includes miscarriage; complications of pregnancy, such as hemorrhage; pregnancy-related high blood pressure; pre-eclampsia; premature labor or other complications of labor.
Diseases of the skin and subcutaneous tissue	680-709	Includes acne, cellulitis, sunburn, psoriasis, and seborrhea.
Diseases of the musculoskeletal system and connective tissue	710-739	Includes arthritis, systemic lupus erythematosus, ankylosing spondylitis, herniated intervertebral disc ("slipped disc"), lumbago, sciatica, rheumatism, tendinitis, and osteoporosis.
Congenital anomalies	740-759	Abnormal anatomical development present at birth. Includes spina bifida, cleft palate, harelip, and various chromosomal anomalies, such as Klinefelter's syndrome.
Certain conditions originating in the perinatal period	760-779	Conditions or diseases of the mother that can produce perinatal illness or death of the fetus or newborn. Examples include maternal high blood pressure, maternal malnutrition, ectopic pregnancy, and breech birth. Also includes other conditions originating in the perinatal period, such as fetal malnutrition or slow growth, injuries related to birth trauma, and perinatal jaundice.
Symptoms, signs, and ill-defined conditions	780-799	Symptoms, signs, abnormal results of laboratory or other tests, and conditions for which no specific diagnosis has been made. Examples include blackout, chills, dizziness, fatigue, pallor, abnormal weight loss, undiagnosed chest pain, and heartburn.
Injury and poisoning	800-999	Dislocation of joints; sprains and strains of joints and associated muscles; concussions; bruises; cuts; internal injuries due to crushing, puncture, tearing, or blunt impact; burns; blisters; poisoning; frostbite; heat stroke; 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 include injuries to muscle from overexertion or from stretching the muscle beyond its normal limit. Sprains include injuries involving tearing or overextending the ligaments of a joint.
Intracranial injuries excluding those with skull fractures	850-854	Includes concussions, internal bruises, and hemorrhages within the skull without a fracture of the bones of the skull.
Internal injuries of the chest, abdomen, and pelvis	860-869	Includes internal injuries to the chest, abdomen, and pelvis and the organs within these areas of the body that do not involve an open wound.
Open wounds	870-897	Includes animal bites, cuts, lacerations, punctures, and amputations, excluding the arteries and veins.
Other injuries and 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, heat stroke, electrocution, and altitude sickness.
Motor vehicle traffic accidents	E810-E819	Includes accidents involving motor vehicles alone or with other motor vehicles, pedestrians, or vehicles operated by pedals.
Other accidents	E916-E928	Includes accidents involving falling objects or machinery; accidents related to explosions; and those related to electrical current, radiation, hot or corrosive substances, noise, and overexertion.
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	Includes 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	Includes 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.

## GLOSSARY

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

**Epidemiologic Surveillance** - The regular and systematic collection of data and interpretation of the distribution of illness, injury, and death in the DOE labor force over time.

**ICD-9-CM** - The ICD-9-CM (International Classification of Diseases-9th Revision-Clinical Modification) is based on the ICD-9 originally published by the World Health Organization and widely accepted as a standard for the coding of cause of death. The ICD-9-CM is required for the reporting of morbidity to all U.S. Public Health Service programs.

**Diagnoses Rate** - The number of new, reported health events observed among DOE workers per thousand DOE workers at risk during a given period of time.

**Person-year** - A unit of measurement combining persons and time equivalent to one person followed up for one year. In Epidemiologic Surveillance reports, rates are often expressed as the number of events (e.g., illness absences, injuries) per 1,000 person-years.

## STATISTICAL NOTE

The age-adjusted rate was calculated using the 1970 U.S. population. The age-adjusted rate represents the hypothetical rate that would have been observed if the 1993 group had the same age distribution as the 1970 U.S. population. The age-adjusted rate is used to compare populations that differ in age. The 1970 U.S. population was selected because it is the standard most used for published morbidity data.

The illness and injury absence rate is defined as an absence due to illness or injury of 5 or more consecutive work days, divided by the total number of workers. OSHA-recordable events may or may not involve an absence from work.

The 95% confidence interval is based on the normal approximation to the binomial distribution where the calculated illness and injury absence rate falls within the interval. The true rate lies within this interval 95% of the time.