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 Savannah River Site (SRS).

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 SRS. Continuing surveillance and data examination may suggest emerging trends that change the preliminary interpretation of the data.

Plans for future annual reports include a discussion of important

Savannah River Site at a Glance: 1994

The Savannah River Site was one of the sites at which epidemiologic surveillance was pilot tested in the early 1990s. The experience gained through the pilot test laid the groundwork for the current program, administered from the Office of Epidemiologic Studies at DOE Headquarters. Epidemiologic surveillance continues to develop and adapt to the changing mission and organization of the DOE complex. This report marks the first annual Epidemiologic Surveillance Program report for Savannah River Site.

◇ In 1994, Savannah River workers showed patterns of illness and injury similar to those observed at other sites in epidemiologic surveillance. About 14% of the Savannah River work force experienced at least one absence of 5 or more days due to illness or injury. This percentage ranges from about 5 to 15% among sites participating in epidemiologic surveillance. To some extent the difference may reflect real variations in the occurrence of illness and injury, but the percentage is also affected by how compliant workers are in getting medical clearances before returning to work after an illness leave of absence. Epidemiologic surveillance relies on the worker's self-reported reasons for absence when clearing back to work through the occupational medical clinic, so noncompliance has a direct effect on the accuracy of the rates presented in this and similar reports.

◇ The highest diagnosis rate among men was for respiratory illnesses (54.5 per 1,000) followed by diseases and conditions affecting the muscles and skeleton (25.7 per 1,000). Among women the highest diagnosis rate involved respiratory diseases (134.9 per 1,000); various symptoms and poorly defined conditions (69.6 per 1,000) ranked second and pregnancy and childbirth was third (48.7 per 1,000). These patterns are similar to those observed at other epidemiologic surveillance sites. Overall, respiratory complaints comprised over 27% of all the diagnoses recorded for 1994 at Savannah River Site.

◇ At Savannah River, hourly and salaried women workers had similar diagnostic rates but among men, the hourly workers' diagnosis rate was about twice that of salaried workers. Overall, women had diagnosis rates about 2.5 times those of men. This type of variation is found at other sites and frequently reflects a greater tendency of hourly workers and women to get medical clearances.

◇ The rate of all cancers combined among Savannah River workers was estimated at 2.8 per 1,000, somewhat lower than the 3.557 cancers per 1,000 population observed by the Savannah River Region Health Information System during 1991-1993. Specific cancer categories showed rates among workers that were approximately equal to or somewhat lower than those of the Savannah River Region's population as a whole.

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 investigation 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.

Introduction

Epidemiologic surveillance at U.S. Department of Energy (DOE) facilities consists of regular and systematic collection, analysis, and interpretation of data on absences due to 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 Savannah River Site (SRS) are summarized. These analyses focus on absences of 5 or more consecutive workdays occurring among workers aged 16-75 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 for specific types of disease or injury by occupational category. 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 "N/A" 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.

Facility Overview

The SRS is a key DOE facility, focusing on national security work; economic development and technology transfer initiatives; and environmental and waste management activities. Owned by DOE and operated under contract by the Westinghouse Savannah River Company, the complex covers 310 square miles, bordering the Savannah River between western South Carolina and Georgia for 27 miles.

SRS was constructed during the early 1950s to produce the basic materials used in the fabrication of nuclear weapons, primarily tritium and plutonium-239. Five reactors were built on the site. The reactors produced nuclear materials by irradiating target materials with neutrons. Also built were support facilities including two chemical separation plants, a heavy water extraction plant, a nuclear fuel and target fabrication facility, and waste management facilities.

Irradiated materials were moved from the reactors to the two chemical separation facilities—the next step in the production process. In these facilities, known as "canyons," the irradiated fuel and target assemblies were chemically processed to separate useful products from waste. After refinement, some nuclear materials were shipped to other DOE sites for final use.

SRS has adjusted through the years to meet changing defense requirements. All five of the original SRS production reactors are permanently shut down, a reflection of improved U.S. relations with the former Soviet Union. While production of new tritium will not be necessary for many years, recycling and reloading of tritium to keep the nation's supply of nuclear weapons ready is a continuing site mission. SRS is the nation's only source for recycling tritium from nuclear weapons reservoirs returned from service. All tritium unloading, mixing, and loading are performed in a new facility that went into operation in 1994. This facility replaces a majority of SRS facilities that processed the nation's tritium for the last 35 years.

Through the evolution of the site's original defense mission, the future of SRS lies in three areas: reducing the nuclear danger; transferring applied environmental technology to government and non-government entities; and forming economic and industrial alliances. To this end, one of the "canyons" is being used to produce plutonium-238 for deep space probes.

Labor Force by Occupational Category and Salary Status, 1994

During 1994, there were 15,754 employees (aged 16-75) identified as participants in epidemiologic surveillance. Seventy-one percent (11,122 workers) were men and 29% (4,632 workers) were women. Seventy-eight percent (12,254 workers) were Caucasian and 19% (2,963 workers) were African Americans. The remaining 3% (537 workers) included Asians, Hispanics, and Native Americans as well as 25 employees for whom no racial/ethnic information was reported.

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.

Seventy-nine percent of the workers were salaried, whereas 21% were hourly. The occupational categories with the largest number of employees were office management and administration (44%) and engineering, scientific and health care (25%).

	Occupational Category	Number of Workers in 1994	Number of Workers in 1993	% Change from Last Year
Salaried	Office Management and Administration	7,002	N/A	N/A
	Engineering, Scientific and Health Care	4,014	N/A	N/A
	Technical Support	1,369	N/A	N/A
	Subtotal	**12,385**	**N/A**	**N/A**
Hourly	Clerical	219	N/A	N/A
	Crafts and Manual Labor	1,672	N/A	N/A
	Nuclear Specialties	1,288	N/A	N/A
	Power Operator	190	N/A	N/A
	Subtotal	**3,369**	**N/A**	**N/A**
	TOTAL	**15,754**	**N/A**	**N/A**

Table 1. Labor Force by Occupational Category and Salary Status

Absences Among Work Force, 1994

Absences per Person. In 1994, 2,267 SRS employees reported an absence of 5 or more consecutive workdays because of illness or injury. Four hundred forty-five (20%) of these workers had two or more absences. A total of 2,868 absences were reported by the employees (Table 2A).

Diagnoses per Absence. A total of 4,458 diagnoses were associated with the 2,868 absences of 5 or more consecutive workdays. Multiple diagnoses were reported for 1,033 (36%) absences (Table 2B).

Diagnosis Rates for Absences. In 1994, diagnoses noted for absences of 5 or more consecutive workdays yielded an age-adjusted rate of 278.4 diagnoses per 1,000 persons. The diagnosis rate for women (526.7 per 1,000) was more than 2.8 times the rate for men (187.2 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	11,122	9,922	1,023	147	23	5	2	1,200	1,418
Women	4,632	3,565	799	190	50	20	8	1,067	1,450
TOTAL	15,754	13,487	1,822	337	73	25	10	2,267	2,868

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	6	7+		
Men	952	327	89	35	9	3	3	1,418	2,097
Women	883	368	126	36	18	10	9	1,450	2,361
TOTAL	1,835	695	215	71	27	13	12	2,868	4,458

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	11,122	2,097	188.5	187.2	177.9	196.9
Women	4,632	2,361	509.7	526.7	493.5	562.1
TOTAL	15,754	4,458	283.0	278.4	268.7	288.4

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 in Table 3. Tables 4 and 5 show diagnosis rates by gender to further describe the work force. Diagnoses associated with pregnancy, labor, and delivery are described in Table 6.

For all workers, the three diagnostic categories with the highest rates were diseases of the respiratory system (74.8 per 1,000); symptoms, signs, and ill-defined conditions (30.8 per 1,000); and diseases of the musculoskeletal system (28.8 per 1,000). Together, these three categories accounted for 50% of all diagnoses.

Men. The diagnostic category with the highest rate was diseases of the respiratory system (54.5 per 1,000) with 625 diagnoses reported among 473 men. This accounted for 30% of all diagnoses among men. Two hundred sixty-two diagnoses were related to upper respiratory diseases, 244 to pneumonia/bronchitis, 89 to chronic respiratory conditions, and 30 to other respiratory diseases. One hundred sixteen men had multiple diagnoses.

The second highest rate, making up 14% of the total diagnoses, was diseases of the musculoskeletal system (25.7 per 1,000), with 299 diagnoses reported for 202 men. Two hundred three diagnoses were related to dorsopathies (spinal disorders), 53 to arthropathies (joint disease), 34 to rheumatism (excluding the back), and 9 to disorders of bone and cartilage. Sixty-three men had multiple diagnoses.

Symptoms, signs, and ill-defined conditions (19.7 per 1,000) ranked third with 233 diagnoses among 149 men. There were 105 diagnoses for general symptoms. Of the remainder, 31 were for symptoms of the chest and respiratory system, 28 of the head and neck, 26 of the digestive system, 17 of the abdomen and pelvis, 9 of the skin and membrane tissue, 2 of the genitourinary system, and 1 of the cardiovascular system. Fourteen were nonspecific abnormal clinical or laboratory findings. Fifty-six men had multiple diagnoses.

Fifteen cancer diagnoses were reported among 13 men in 1994. Two men each had a diagnosis for prostate cancer. Two men each had a diagnosis for rectal cancer, one of which had an additional diagnosis for secondary cancer of the liver. One man had a total of two diagnoses for skin cancer of the face. One man each had a diagnosis for cancer of the gums, floor of the mouth, esophagus, larynx, lung, colon, testis, and kidney.

Women. The diagnostic category with the highest rate among women was diseases of the respiratory system (134.9 per 1,000), with 599 diagnoses reported among 394 women. This accounted for 25% of all diagnoses among women.

Two hundred sixty-four diagnoses were related to upper respiratory diseases, 188 to pneumonia/bronchitis, 118 to chronic respiratory conditions, and 29 to other respiratory diseases. One hundred forty-eight women had multiple diagnoses.

The second highest rate, making up 12% of the total diagnoses, was for symptoms, signs, and ill-defined conditions (69.6 per 1,000), with 280 diagnoses among 163 women. One hundred six of these diagnoses were for general symptoms. Of the remainder, 40 were for symptoms of the chest and respiratory system, 40 of the digestive system, 30 of the head and neck, 26 of the abdomen and pelvis, 12 of the skin and membrane tissue, 5 of the cardiovascular system, and 3 of the genitourinary system. Eighteen were non-specific abnormal clinical or laboratory findings. Sixty-four women had multiple diagnoses.

Diagnoses related to pregnancy and childbirth (48.7 per 1,000) were the third most frequently reported. Diseases of the genitourinary system (47.2 per 1,000) ranked fourth, with 250 diagnoses reported for 179 women. There were 56 diagnoses related to the urinary system. The 194 diagnoses related to the genital tract included 42 diagnoses for pain and bleeding, 33 for ovarian cysts, 32 for endometriosis, 30 for pelvic inflammatory disease, 15 for disorders of the breast, and 42 for other disorders. Fifty-three women had multiple diagnoses.

Fourteen cancer diagnoses were reported among 12 women in 1994. Four women had a total of five diagnoses for breast cancer. Two women had a total of three diagnoses for Hodgkin's disease. Two women had one diagnosis each of carcinoma in situ of cervix uteri. Four women each had a diagnosis for cancer of the colon, rectum, cervix, and melanoma of the skin.

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	219	14.7	12.5	17.3
Malignant neoplasms	140-208, 230-234	29	2.8	1.8	4.6
• Digestive organs	150-159	6	0.8	0.3	2.2
• Respiratory system	160-165	2	0.2	0.0	0.8
• Breast	174-175	5	0.2	0.1	0.6
• Genitourinary	179-189	5	0.3	0.1	0.8
• Nervous system	191-192	0			
• Leukemia, lymphoma	200-208	3	0.2	0.0	0.6
Benign neoplasms and other	210-229, 235-239	72	4.0	3.0	5.3
Endocrine and metabolic diseases	240-279	68	4.1	3.2	5.4
Blood and blood-forming organs	280-289	24	1.5	1.0	2.3
Mental disorders	290-319	75	3.9	3.0	5.0
• Alcoholism	303	1	0.0	0.0	0.2
• Drug abuse	304-305	0			
Nervous system and sense organs	320-389	185	12.2	10.2	14.5
Circulatory system	390-459	169	13.4	11.1	16.1
• Hypertension	401	25	1.8	1.2	2.8
• Acute myocardial infarction	410	10	1.2	0.6	2.4
• Ischemic disease, not M.I.	411-414, 429.2	44	4.4	3.1	6.3
• Cerebrovascular disease	430-438	13	1.2	0.6	2.4
Respiratory system	460-519	1,224	74.8	69.9	79.9
• Upper respiratory	460-465, 470-478	526	31.8	28.8	35.1
• Pneumonia/bronchitis	466, 480-487	432	26.0	23.3	29.1
• Chronic respiratory conditions	490-496	207	13.0	11.0	15.3
Digestive system	520-579	342	22.7	19.9	25.8
• Hernias	550-553	63	4.3	3.1	5.8
• Gall bladder disease	574-575	37	2.6	1.7	4.0
Genitourinary system	580-629	333	19.7	17.2	22.4
• Benign prostatic hypertrophy	600	3	0.4	0.1	1.1
• Endometriosis	617	32	1.5	1.0	2.2
• Ovarian cysts	620.0-620.2	33	1.6	1.1	2.3
• Female genital pain/bleeding	625-626	42	2.2	1.5	3.3
Pregnancy and childbirth[1]	630-676	268	17.4	15.3	19.9
Skin and subcutaneous tissue	680-709	39	2.2	1.6	3.2
Musculoskeletal system	710-739	471	28.8	25.8	32.2
• Dorsopathies	720-724	283	15.9	13.8	18.3
Congenital anomalies	740-759	5	0.3	0.1	0.8
Certain perinatal conditions	760-779	0			
Symptoms, signs, and ill-defined conditions	780-799	513	30.8	27.7	34.2
Injury and poisoning	800-999	351	21.2	18.7	24.0
• Fractures, all sites	800-829	63	4.0	3.0	5.2
• Dislocations	830-839	36	2.1	1.4	3.2
• Sprains and strains	840-848	108	6.6	5.3	8.2
• Intracranial injuries	850-854	6	0.3	0.1	0.8
• Internal injuries	860-869	0			
• Open wounds	870-897	12	0.7	0.3	1.6
• Other injuries	900-999	126	7.5	6.1	9.3
Health status/health service contract	V01-V82	71	3.9	3.0	5.1
• Family history of health problems	V10-V19	17	1.2	0.7	2.1
• Circumstances related to reproduction/development	V20-V28	31	1.5	1.0	2.2
• Specific procedure/aftercare	V50-V59	14	0.8	0.4	1.4
Total minus pregnancies		**4,190**	**260.9**	**251.6**	**270.7**
TOTAL		**4,458**	**278.4**	**268.7**	**288.4**

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

† Includes all diagnoses reported with an absence of 5 or more days.
* Standardized to age distribution of 1970 U.S. population
[1] 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	117	11.1	9.0	13.8
Malignant neoplasms	140-208, 230-234	15	2.4	1.3	4.4
• Digestive organs	150-159	4	0.8	0.3	2.4
• Respiratory system	160-165	2	0.2	0.0	0.9
• Breast	174-175	0			
• Genitourinary	179-189	4	0.3	0.1	1.0
• Nervous system	191-192	0			
• Leukemia, lymphoma	200-208	0			
Benign neoplasms and other	210-229, 235-239	16	1.6	0.9	2.8
Endocrine and metabolic diseases	240-279	38	3.4	2.4	4.8
Blood and blood-forming organs	280-289	2	0.2	0.0	0.9
Mental disorders	290-319	24	1.6	1.1	2.6
• Alcoholism	303	1	0.1	0.0	0.4
• Drug abuse	304-305	0			
Nervous system and sense organs	320-389	77	7.1	5.5	9 2
Circulatory system	390-459	124	13.5	11.0	16.5
• Hypertension	401	14	1.4	0.8	2.5
• Acute myocardial infarction	410	9	1.3	0.6	2.7
• Ischemic disease, not M.I.	411-414, 429.2	42	5.3	3.7	7.5
• Cerebrovascular disease	430-438	11	1.3	0.7	2.6
Respiratory system	460-519	625	54.5	49.8	59.8
• Upper respiratory	460-465, 470-478	262	23.5	20.5	27.0
• Pneumonia/bronchitis	466, 480-487	244	20.9	18.0	24.2
• Chronic respiratory conditions	490-496	89	7.4	5.8	9.5
Digestive system	520-579	201	18.4	15.6	21.6
• Hernias	550-553	52	4.7	3.3	6.5
• Gall bladder disease	574-575	16	1.5	0.8	2.7
Genitourinary system	580-629	83	8.3	6.4	10.7
• Benign prostatic hypertrophy	600	3	0.5	0.1	1.4
• Endometriosis	617	N/A			
• Ovarian cysts	620.0-620.2	N/A			
• Female genital pain/bleeding	625-626	N/A			
Pregnancy and childbirth	630-676	N/A			
Skin and subcutaneous tissue	680-709	21	1.5	0.9	2.4
Musculoskeletal system	710-739	299	25.7	22.4	29.4
• Dorsopathies	720-724	203	16.0	13.6	18.8
Congenital anomalies	740-759	1	0.1	0.0	0.4
Certain perinatal conditions	760-779	0			
Symptoms, signs, and ill-defined conditions	780-799	233	19.7	16.9	22.9
Injury and poisoning	800-999	199	16.8	14.2	19.7
• Fractures, all sites	800-829	38	3.1	2.2	4.5
• Dislocations	830-839	28	2.3	1.5	3.6
• Sprains and strains	840-848	65	6.2	4.7	8.2
• Intracranial injuries	850-854	4	0.2	0.1	0.5
• Internal injuries	860-869	0			
• Open wounds	870-897	7	0.6	0.2	1.7
• Other injuries	900-999	57	4.2	3.1	5.7
Health status/health service contract	V01-V82	22	1.5	1.0	2.4
• Family history of health problems	V10-V19	8	0.6	0.3	1.4
• Circumstances related to reproduction/development	V20-V28	2	0.1	0.0	0.5
• Specific procedure/aftercare	V50-V59	6	0.4	0.2	0.8
TOTAL		2,097	187.2	177.9	196.9

† Includes all diagnoses reported with an absence of 5 or more days.
* Standardized to age distribution of 1970 U S population

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	102	24.7	17.8	34.2
Malignant neoplasms	140-208, 230-234	14	2.4	1.4	4.2
• Digestive organs	150-159	2	0.4	0.1	1.8
• Respiratory system	160-165	0			
• Breast	174-175	5	0.9	0.4	2.2
• Genitourinary	179-189	1	0.1	0.0	0.8
• Nervous system	191-192	0			
• Leukemia, lymphoma	200-208	3	0.5	0.1	1.6
Benign neoplasms and other	210-229, 235-239	56	10.2	7.4	14.0
Endocrine and metabolic diseases	240-279	30	5.8	3.8	8.9
Blood and blood-forming organs	280-289	22	4.0	2.6	6.2
Mental disorders	290-319	51	9.8	7.1	13.7
• Alcoholism	303	0			
• Drug abuse	304-305	0			
Nervous system and sense organs	320-389	108	32.7	22.5	47.6
Circulatory system	390-459	45	11.5	8.0	16.5
• Hypertension	401	11	3.3	1.6	6.6
• Acute myocardial infarction	410	1	0.6	0.1	4.2
• Ischemic disease, not M.I.	411-414, 429.2	2	0.4	0.1	1.5
• Cerebrovascular disease	430-438	2	0.8	0.2	3 8
Respiratory system	460-519	599	134.9	118.7	153.4
• Upper respiratory	460-465, 470-478	264	53.7	45.0	64.3
• Pneumonia/bronchitis	466, 480-487	188	38.6	32.6	45.8
• Chronic respiratory conditions	490-496	118	32.3	23.2	44.9
Digestive system	520-579	141	36.6	27.2	49.2
• Hernias	550-553	11	2.4	1.2	4.7
• Gall bladder disease	574-575	21	7.4	3.0	18.4
Genitourinary system	580-629	250	47.2	39.0	57.2
• Benign prostatic hypertrophy	600	N/A			
• Endometriosis	617	32	4.5	3.1	6.6
• Ovarian cysts	620.0-620.2	33	5.1	3.4	7.6
• Female genital pain/bleeding	625-626	42	10.3	5.3	20.0
Pregnancy and childbirth[1]	630-676	268	48.7	42.8	55.4
Skin and subcutaneous tissue	680-709	18	4.8	2.8	8.4
Musculoskeletal system	710-739	172	35.9	30.0	43.0
• Dorsopathies	720-724	80	14.9	11.5	19.3
Congenital anomalies	740-759	4	1.1	0.3	3.6
Certain perinatal conditions	760-779	0			
Symptoms, signs, and ill-defined conditions	780-799	280	69.6	56.9	85.1
Injury and poisoning	800-999	152	37.1	27.8	49.5
• Fractures, all sites	800-829	25	6.5	4.1	10.3
• Dislocations	830-839	8	1.4	0.7	2.9
• Sprains and strains	840-848	43	7.3	5.2	10.2
• Intracranial injuries	850-854	2	0.7	0.1	3.8
• Internal injuries	860-869	0			
• Open wounds	870-897	5	0.9	0.4	2.2
• Other injuries	900-999	69	20.3	12.5	32.9
Health status/health service contract	V01-V82	49	9.6	6.8	13.4
• Family history of health problems	V10-V19	9	2.7	1.3	5.7
• Circumstances related to reproduction/development	V20-V28	29	4.3	2.9	6.3
• Specific procedure/aftercare	V50-V59	8	2.2	1.0	5.1
Total minus pregnancies		**2,093**	**478.0**	**445.5**	**512.9**
TOTAL		**2,361**	**526.7**	**493.5**	**562.1**

Table 5. Diseases and Injuries by Diagnostic Category - Women

† Includes all diagnoses reported with an absence of 5 or more days.
* Standardized to age distribution of 1970 U S. population
[1] 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, 268 pregnancy- related diagnoses were reported among women (Table 6). There were 131 diagnoses for complications related to pregnancy; 22 for ectopic and molar pregnancy/abortive outcomes; 16 for other indications for care in pregnancy, labor, and delivery; and 13 for complications occurring in the course of labor and delivery. Eighty-six women had normal deliveries. Forty-two women had multiple diagnoses.

Diagnoses by Occupational Category, 1994

During 1994, the age-adjusted diagnosis rate for all employees (Table 7) was higher among hourly workers than salaried workers (346.4 versus 262.4 per 1,000 persons). Nuclear specialty workers, who comprised 8% of the work force, had the highest diagnosis rate (497.0 per 1,000), with 499 diagnoses reported for 236 workers. Technical support workers had the second highest diagnosis rate (435.3 per 1,000), with 586 diagnoses reported among 272 persons. Crafts and manual labor workers ranked third, with 564 diagnoses reported for 275 workers (330.6 per 1,000). Engineering, scientific and health care workers had the lowest rate (194.4 per 1,000 workers), with 757 diagnoses for 445 workers.

Men. The diagnosis rate among men was higher for hourly workers (297.4 per 1,000) than for salaried workers (153.9 per 1,000) (Table 8). Nuclear specialty workers had the highest rate (415.9 per 1,000), with 280 diagnoses reported for 141 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
Ectopic and Molar Pregnancy/Abortive Outcome	630-639	22	4.6	3.0	7.1
Complications Related to Pregnancy	640-648	131	24.3	20.2	29.2
Normal Delivery	650	86	15.7	12.5	19.7
Other Indications for Care in Pregnancy, Labor, and Delivery‡	651-659	16	3.1	1.8	5.2
Complications of Labor, Delivery, and Puerperium	660-676	13	1.9	1.0	3.4
TOTAL		268	49.5	43.6	56.3

† 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.
‡ Includes delivery by cesarian section and multiple births.

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

The second highest rate was among the crafts and manual labor workers (303.8 per 1,000), with 461 diagnoses reported among 231 men. Technical support workers ranked third, with 203 diagnoses reported among 110 men (271.1 per 1,000). Men in the office management and administration category had the lowest rate (138.1 per 1,000 workers), with 621 diagnoses for 396 men.

Women. The diagnosis rate among women was slightly higher for hourly workers (563.2 per 1,000) than for salaried workers (512.9 per 1,000) (Table 9). Technical support workers had the highest rate (694.5 per 1,000), with 383 diagnoses reported for 162 women. The second highest rate was among the nuclear specialty workers (616.6 per 1,000), with 219 diagnoses reported among 95 women. Crafts and manual labor workers ranked third, with 103 diagnoses reported among 44 women (577.8 per 1,000). Women in the engineering, scientific and health care category had the lowest rate (434.6 per 1,000), with 290 diagnoses for 160 women. The women had higher diagnosis rates than the men; this suggests a greater tendency among women to report injury or illness.

	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	Office Management and Administration	7,002	1,922	277.0	262.7	292.0
	Engineering, Scientific, and Health Care	4,014	757	194.4	179.4	210.7
	Technical Support	1,369	586	435.3	388.8	487.5
	Subtotal	**12,385**	**3,265**	**262.4**	**252.1**	**273.1**
Hourly	Service	219	80	315.9	248.2	401.9
	Crafts and Manual Labor	1,672	564	330.6	295.1	370.4
	Nuclear Specialties	1,288	499	497.0	358.1	689.9
	Power Operator	190	50	220.6	157.7	308.8
	Subtotal	**3,369**	**1,193**	**346.4**	**313.1**	**383.3**
	TOTAL	**15,754**	**4,458**	**278.4**	**268.7**	**288.4**

† 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.

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	Office Management and Administration	4,299	621	138.1	125.5	151.9
	Engineering, Scientific, and Health Care	3,263	467	147.5	133.3	163.2
	Technical Support	780	203	271.1	228.0	322.4
	Subtotal	**8,342**	**1,291**	**153.9**	**144.5**	**163.9**
Hourly	Service	141	34	232.8	156.0	347.3
	Crafts and Manual Labor	1,532	461	303.8	268.4	343.9
	Nuclear Specialties	947	280	415.9	281.1	615.6
	Power Operator	160	31	162.6	105.4	250.9
	Subtotal	**2,780**	**806**	**297.4**	**263.8**	**335.3**
	TOTAL	11,122	2,097	187.2	177.9	196.9

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	Office Management and Administration	2,703	1,301	497.1	459.1	538.4
	Engineering, Scientific, and Health Care	751	290	434.6	373.4	505.9
	Technical Support	589	383	694.5	585.7	823.5
	Subtotal	**4,043**	**1,974**	**512.9**	**478.9**	**549.2**
Hourly	Service	78	46	453.2	337.8	608.0
	Crafts and Manual Labor	140	103	577.8	464.5	718.6
	Nuclear Specialties	341	219	616.6	516.7	735.9
	Power Operator	30	19	488.9	288.2	829.5
	Subtotal	**589**	**387**	**563.2**	**495.9**	**639.6**
	TOTAL	4,632	2,361	526.7	493.5	562.1

Table 9. Diagnoses by Occupational Category - Women

† 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

Deaths Among Active Workers, 1994

There were 15 deaths reported among active workers during 1994. Five were due to heart disease, five to cancer, two to unknown causes, and one each to infectious disease, stroke, and external causes.

Relative Risk for All Diseases and Injuries by Occupation

In Table10 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 SRS 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 1 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.

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 considered 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.

Technical support workers (RR=1.3), crafts and manual labor workers (RR=1.5), and nuclear specialty workers (RR=1.4) were at a statistically significant increased risk of being absent 5 or more consecutive workdays in 1994 due to disease or injury. Office management and administration workers (RR=0.8) and engineering, scientific and health care workers (RR=0.8) were at a significantly decreased risk of being absent 5 or more workdays.

Relative Risk for Selected Disease and Injury Categories by Occupation

Table10 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 technical support workers were significantly more likely to be absent at least once during 1994 for diseases of the genitourinary system (RR=1.8); diseases of the musculoskeletal system (RR=1.6); and symptoms, signs, and ill-defined conditions (RR=1.7). Service workers were significantly more likely to be absent at least once during 1994 for diseases of the musculoskeletal system (RR=2.8). Crafts and manual labor workers were found to have a statistically significant increased risk associated with mental disorders (RR=2.5). There were 11 diagnoses of mental disorders among 9 crafts and manual labor workers. Seven diagnoses were due to depressive disorders, three to anxiety states, and one to psychosis.

Crafts and manual labor workers were also at an increased risk for diseases of the circulatory system (RR=2.4); diseases of the respiratory system (RR=1.9); diseases of the skin and subcutaneous tissue (RR=2.6); diseases of the musculoskeletal system (RR=1.6); and symptoms, signs, and ill-defined conditions (RR=2.3). Nuclear specialty workers were significantly more likely to be absent at least once during 1994 for diseases of the digestive system (RR=1.7); diseases of the skin and subcutaneous tissue (RR=3.0); diseases of the musculoskeletal system (RR=1.7); symptoms, signs, and ill-defined conditions (RR=1.6); and sprains and strains (RR=2.0), a subcategory of injury and poisoning. Power operators were at a statistically significant increased risk for absence associated with diseases of the blood and blood forming organs (RR=8.2). This rate may appear high; however, it is important to note the wide confidence interval (1.1-61.7), indicating that this higher rate is probably the result of a small data set and may not be indicative of an actual increased risk among these workers.

Office management and administration workers were significantly less likely to be absent at least once during 1994 for diseases of the nervous system and sense organs (RR=0.7); diseases of the respiratory system (RR=0.7); diseases of the musculoskeletal system (RR=0.7); and symptoms, signs, and ill-defined conditions (RR=0.6). Engineering, scientific and health care workers had a statistically significant decreased risk of diseases of the circulatory system (RR=0.5); diseases of the respiratory system (RR=0.8); diseases of the digestive system (RR=0.7); diseases of the genitourinary system (RR=0.6); diseases of the musculoskeletal system (RR=0.7); symptoms, signs, and ill-defined conditions (RR=0.7); and injury and poisoning, as a whole (RR=0.7).

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.

ervice erson-Years				Crafts and Manual Labor 1,672 Person-Years				Nuclear Specialties 1,288 Person-Years				Power Operator 190 Person-Years				Total Number of Persons with at Least One Event*
Persons with at Least One Event*	Relative Risk**	Confidence Limit		Persons with at Least One Event*	Relative Risk**	Confidence Limit		Persons with at Least One Event*	Relative Risk**	Confidence Limit		Persons with at Least One Event*	Relative Risk**	Confidence Limit		
		Lower 95%	Upper 95%			Lower 95%	Upper 95%			Lower 95%	Upper 95%			Lower 95%	Upper 95%	
32	1.0	0.7	1.4	275	1.5	1.4	1.8	236	1.4	1.2	1.6	30	1.2	0.9	1.8	2,267
3	1.0	0.3	3.1	17	0.9	0.6	1.6	23	1.5	1.0	2.3	2	0.9	0.2	3.6	207
0				0				1	0.6	0.1	4.5	1	4.5	0.6	33.2	25
0				3	0.8	0.3	2.7	4	0.7	0.3	2.0	0				68
1	1.4	0.2	10.3	7	1.8	0.8	4.2	8	2.1	1.0	4.4	2	3.3	0.8	13.5	56
1	3.5	0.5	26.1	1	1.5	0.1	16.1	1	0.8	0.1	5.8	1	8.2	1.1	61.7	18
1	1.1	0.2	8.3	9	2.5	1.1	5.5	7	1.4	0.7	3.1	0				60
5	2.2	0.9	5.4	18	1.6	1.0	2.7	15	1.2	0.7	2.0	4	2.5	0.9	6.9	162
3	2.0	0.6	6.4	25	2.4	1.5	3.8	14	1.5	0.8	2.5	0				144
13	1.0	0.6	1.8	130	1.9	1.6	2.3	89	1.3	1.0	1.6	15	1.6	1.0	2.7	867
3	0.8	0.2	2.4	29	1.1	0.7	1.6	38	1.7	1.2	2.4	5	1.5	0.6	3.6	303
4	1.1	0.4	3.0	18	1.3	0.8	2.2	28	1.6	1.0	2.3	1	0.5	0.1	3.3	248
0				7	2.6	1.1	6.1	8	3.0	1.4	6.4	0				37
11	2.8	1.5	5.1	45	1.6	1.2	2.3	41	1.7	1.2	2.4	2	0.5	0.1	2.1	319
5	1.1	0.5	2.7	50	2.3	1.7	3.2	39	1.6	1.2	2.3	2	0.6	0.2	2.4	312
3	0.8	0.3	2.6	28	1.2	0.8	1.8	28	1.4	0.9	2.0	3	1.0	0.3	3.3	255
0				6	1.6	0.6	3.9	6	1.7	0.7	4.1	0				46
0				5	1.3	0.5	3.3	2	0.7	0.2	2.9	0				34
2	1.4	0.3	5.7	10	1.0	0.5	2.0	15	2.0	1.1	3.5	2	1.9	0.5	7.6	94
0				2	2.2	0.4	11.2	2	2.7	0.6	12.9	0				10
2	1.4	0.3	5.7	11	1.4	0.7	2.6	6	0.7	0.3	1.6	2	1.9	0.5	7.7	103

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

Disease	Office Management and Administration 7,002 Person-Years				Engineering, Scientific, and Health Care 4,014 Person-Years				Technical Support 1,369 Person-Years				S 219 P			
	Persons with at Least One Event*	Relative Risk**	Confidence Limit Lower 95%	Confidence Limit Upper 95%	Persons with at Least One Event*	Relative Risk**	Confidence Limit Lower 95%	Confidence Limit Upper 95%	Persons with at Least One Event*	Relative Risk**	Confidence Limit Lower 95%	Confidence Limit Upper 95%	Persons Least One Eve			
All Diseases and Injuries	977	0.8	0.7	0.9	445	0.8	0.7	0.9	272	1.3	1.1	1.5				
Infections and Parasitic Diseases	100	1.0	0.8	1.3	37	0.7	0.5	1.0	25	1.3	0.9	2.0				
Malignant Neoplasms	15	1.4	0.6	3.0	6	1.0	0.4	2.4	2	0.9	0.2	3.7				
Benign Neoplasms	40	1.2	0.7	1.9	10	0.8	0.4	1.6	11	1.5	0.8	2.8				
Endocrine and Metabolic Diseases	22	0.6	0.4	1.1	11	0.8	0.4	1.6	5	0.9	0.4	2.5				
Blood and Blood Forming Organs	6	0.4	0.1	1.0	6	2.4	0.8	6.8	2	0.9	0.2	4.1				
Mental Disorders	25	0.6	0.4	1.1	9	0.7	0.4	1.5	9	1.5	0.7	2.9				
Nervous System and Sense Organs	67	0.7	0.5	0.9	31	0.9	0.6	1.3	22	1.4	0.9	2.2				
Circulatory System	73	1.1	0.8	1.6	23	0.5	0.3	0.8	6	0.5	0.2	1.2				
Respiratory System	352	0.7	0.6	0.8	164	0.8	0.7	0.9	104	1.3	1.0	1.6				
Digestive System	139	0.9	0.7	1.1	54	0.7	0.5	0.9	35	1.3	0.9	1.9				
Genitourinary System	117	0.8	0.6	1.0	34	0.6	0.4	0.9	46	1.8	1.3	2.5				
Skin and Subcutaneous Tissue	15	0.7	0.3	1.3	4	0.4	0.2	1.3	3	0.8	0.3	2.8				
Musculoskeletal System	122	0.7	0.5	0.8	56	0.7	0.5	0.9	42	1.6	1.1	2.1				
Symptoms, Signs and Ill-Defined Conditions	117	0.6	0.5	0.7	50	0.7	0.5	0.9	49	1.7	1.3	2.3				
Injury and Poisoning	118	1.0	0.7	1.2	43	0.7	0.5	0.9	32	1.4	1.0	2.0				
Injury and Poisoning: Fractures	20	0.8	0.4	1.5	9	0.8	0.4	1.7	5	1.2	0.5	3.1				
Injury and Poisoning: Dislocations	19	1.7	0.8	3.4	4	0.4	0.1	1.1	4	1.5	0.5	4.2				
Injury and Poisoning: Sprains and Strains	33	0.6	0.4	1.0	20	0.9	0.5	1.4	12	1.4	0.8	2.5				
Injury and Poisoning: Other Wounds	3	0.4	0.1	1.9	1	0.3	0.03	3.5	2	2.6	0.6	11.9				
Injury and Poisoning: Other Injuries	57	1.2	0.8	1.8	14	0.6	0.3	1.0	11	1.1	0.6	2.0				

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

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