1995 Annual Epidemiologic Surveillance Report for **Brookhaven National Laboratory**

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Introduction

The U.S. Department of Energy's (DOE) conduct of epidemiologic surveillance provides an early warning system for health problems among workers. This program monitors illnesses and health conditions that result in an absence of five or more consecutive workdays, occupational injuries and illnesses, and disabilities and deaths among current workers.

This report summarizes epidemiologic surveillance data collected from Brookhaven National Laboratory (BNL) from January 1, 1995 through December 31, 1995. The data were collected by a coordinator at BNL and submitted to the Epidemiologic Surveillance Data Center, located at Oak Ridge Institute for Science and Education, where quality control procedures and data analyses were carried out.

The annual report for 1995 has been redesigned from reports for previous years. Most of the information given in previous reports is also in this report, but some material now appears in the appendices instead of the main body of the report. The information presented in the main body of the report provides a descriptive analysis of the data collected from the site and the appendices provide more detail. This report provides information describing the work force by age and occupational groups. At the site's request, the occupational groups were redefined in 1994. Time trend analyses require a minimum of three years of data, so trends in specific occupational groups will begin with the 1996 report. The Glossary and Explanation of Diagnostic Categories have been expanded with more examples of health conditions to illustrate the content of each category.

The data presented in this report apply only to BNL. The DOE sites are varied, so comparisons of BNL with other DOE sites should be made with caution. It is important to keep in mind that many factors can affect the completeness and accuracy of health information collected at the sites as well as affect patterns of illness and injury observed.

Brookhaven National Laboratory AT A GLANCE, 1995:

- We observed no overall changes in illness or injury rates from previous years that indicate a significant emerging health issue among BNL workers.
- The percentage of men and women with at least one health event changed very little over the 1993-1995 period.
- A redefinition of occupational categories in 1994 requires that comparisons with various occupational groups in previous years' reports be made cautiously. The redefinition was done at the request of BNL to better align the occupational categories in Epidemiologic Surveillance reports with those used administratively on site.
- The lack of any reported absences among workers classified as managers in 1995 was noteworthy. There may actually have been no health events in this group that required an absence of 5 or more workdays, or these workers routinely did not report their illness absences. Less complete reporting of illness absences among salaried staff compared with hourly workers has been observed at most epidemiologic surveillance sites.
- The 1995 Epidemiologic Surveillance report has been redesigned from previous years. The new format places greater emphasis on separate analyses of men and women to reflect the different patterns of disease and injury they experience, and a more detailed assessment of occupational injuries is included. Readers who want additional detail will find extensive tables of rates and risk estimates included as appendices to the body of the report.

Site Overview

BNL is a DOE multidisciplinary research laboratory located 60 miles east of New York City in Suffolk County, Long Island, New York. Associated Universities, Inc. (AUI), a non-profit research management organization originally sponsored by nine northeastern universities, founded the laboratory in 1947 under contract to the Atomic Energy Agency. The laboratory was designed to provide non-defense basic and applied research in a multitude of disciplines, from physics, chemistry, and materials science to biology and medicine.

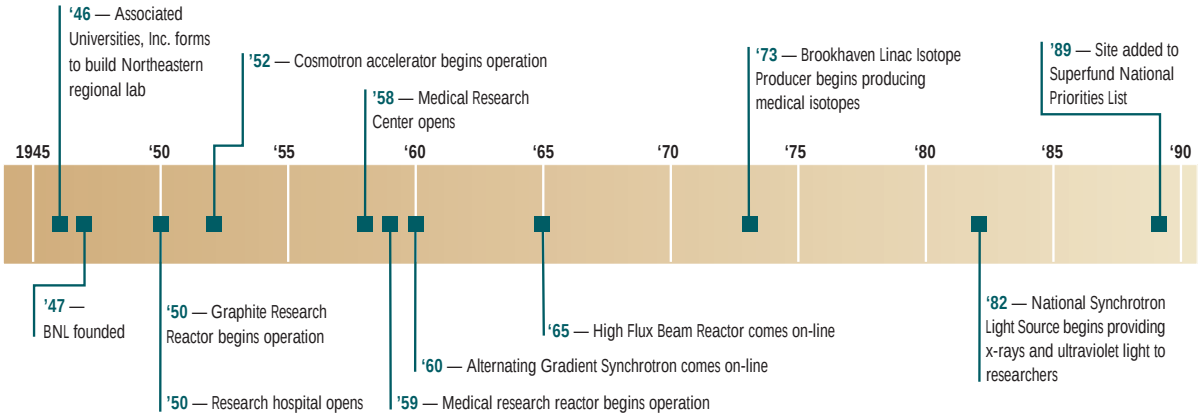
Over the years, BNL has built world-class scientific machines. In 1950, the Brookhaven Graphite Research Reactor — the world's first nuclear reactor built entirely for peacetime research purposes — began operation. Another scientific machine was added in 1952: the Cosmotron, the first particle physics accelerator to reach billion-electron-volt energies. In 1960, the Alternating Gradient Synchrotron, the workhorse of BNL's "big machines," was built to surpass the Cosmotron's capabilities and eventually yielded many new particles and phenomena.

BNL began conducting medical research in 1950 with the opening of the first hospital devoted to nuclear medicine. This research continued with the building of the Medical Research Center in 1958, the startup of the Brookhaven Medical Research Reactor (a three-megawatt reactor) in 1959, and the building of the Brookhaven Linac Isotope Producer in 1973.

In 1965, the High Flux Beam Reactor began providing neutrons to researchers of all disciplines. The beams of neutrons produced in the neutron's core are extremely useful for the biologists, solid-state physicists, materials scientists, and industrial scientists who come to BNL to conduct scientific exploration at the atomic level.

The newest of the "big machines" at BNL is the National Synchrotron Light Source (NSLS) which came on-line in 1982. The most-used scientific facility in the world, the NSLS produces x-rays and ultraviolet light capable of probing a vast array of materials.

BNL is dedicated to basic and applied investigation in a multitude of scientific disciplines. Experimental and theoretical physics, medicine, chemistry, biology, environmental research, engineering, and many other fields are represented by the nearly 1,000 BNL scientists and over 4,000 national and international visitors who come to BNL every year to use the facilities. With areas of the campus contaminated from past practices, the site was added to the Federal Superfund National Priorities List in 1989; remediation is proceeding.



Timeline of Major Activities at BNL

The BNL Work Force

A total of 3,717 employees were included in epidemiologic surveillance in 1995, 159 fewer workers than were present in 1994. There were almost three times as many men (2,766) as women (951) (figure 1). The BNL work force was relatively young compared to the general population. The average age of BNL workers was 45 among men and 41 among women (figure 1). The majority of the workers was White (82%). Asians comprised about 8% of the work force; African Americans 7%, and Hispanics and Native Americans made up the remainder (figures 2a and 2b).

Not all occupations pose equal risks for illness or injury, so we compared rates among several occupational categories to determine whether some occupational groups are at greater risk than others for these health events. The number of illnesses or injuries reported in any specific occupation may be very small in a given year or the number of workers in a given occupation may be small. These small numbers limit the certainty with which illness and injury rates can be calculated and compared, and in some cases were so few in number that we could not analyze specific occupations separately. The analyses in this report use broad occupational categories (figure 3) because there were not enough health events in many specific occupations to permit more detailed analyses. You can find which occupational category you are in by referring to figure 4 which lists many of the job titles that are grouped into each of the categories used for the analyses. Men and women were not distributed equally among the various occupational groups; we noted large gender differences in the scientific, administrative (both Exempt [E] and Nonexempt [NE]), supervisory technical support, and clerical groups (figure 3). Appendix A contains a more detailed distribution of the work force by gender, age, and occupational group.

Figure 1. The Work Force by Gender and Age

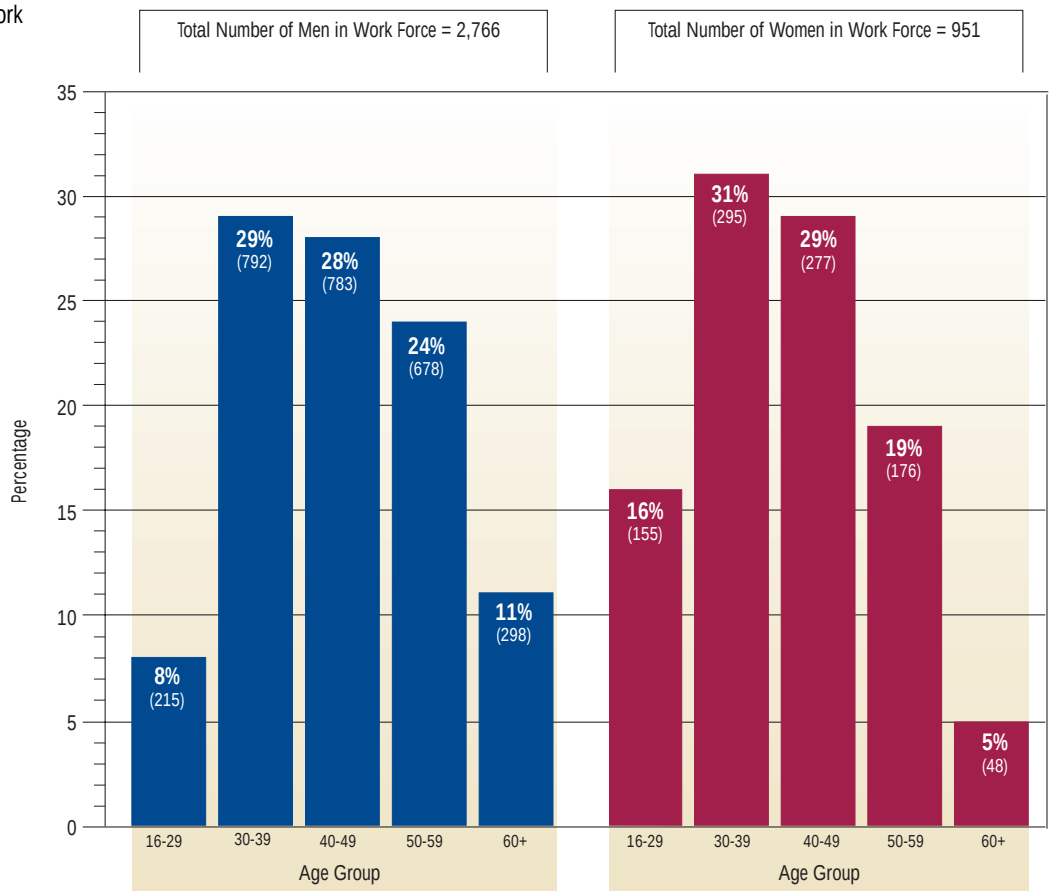


Figure 2a and 2b. Racial Composition of the Work Force by Gender

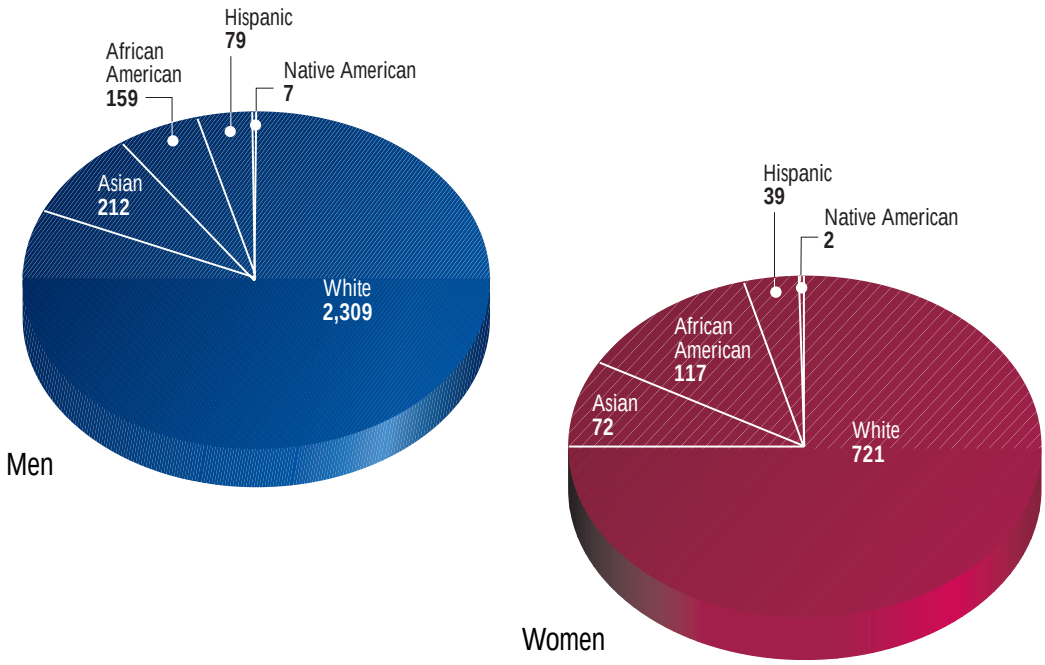


Figure 3. The Work Force by Gender and Occupation

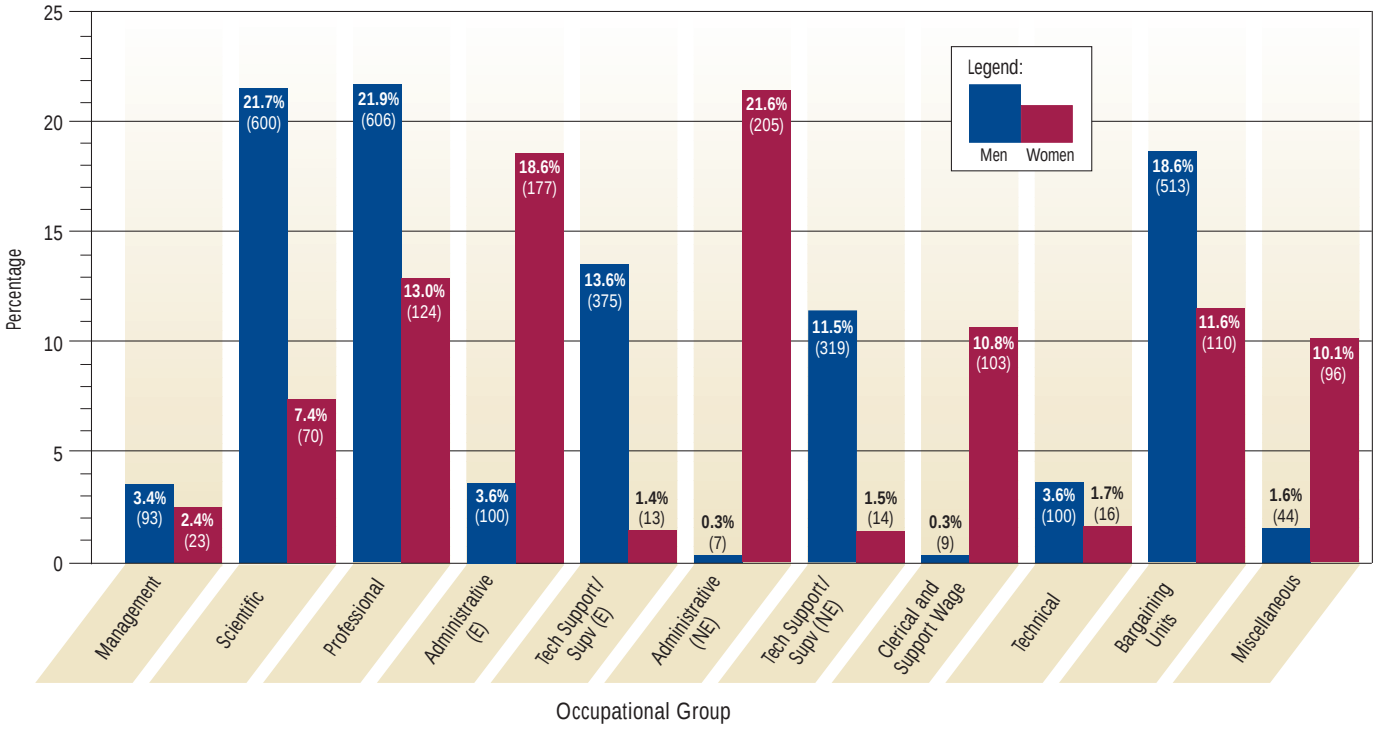


Figure 4. Most Common Job Titles in Each Occupational Group

MANAGEMENT
ADMINISTRATIVE MGR
ASSISTANT SECRETARY
ASSOC DEPT CHAIR
ASSOC DIRECTOR
ASSOC LAB DIRECTOR
ASSOC RHIC PROJ DIR
ASSOC RHIC PROJ HD
ASST DEPT CHAIR
ASST DIRECTOR
ASST LAB DIRECTOR
ASST MAGNET DIV HD
ASST MGR HUMAN RESOURCES
ASST RHIC PROJ DIR
ASST TO CHRMN ADM
ASST TO THE DIRECTOR
BUDGET OFFICER
BUSINESS MGR
CHIEF INTERNAL AUDITOR
COMPTG & COMM DIV HD
DEPT ADMIN MGR
DEPT CHAIR
DEPUTY BUDGET OFCR
DEPUTY DEPT CHAIR
DEPUTY DEPT CHRMN
DEPUTY DIR INTERNAL AUDIT
DEPUTY DIRECTOR
DEPUTY DIV HD
DEPUTY FISCAL OFCR
DEPUTY MGR ENVR RESTORATION
DIR HUMAN RESOURCES
DIRECTOR
DIV HEAD
DPTY MGR CNTR & PROC
DPTY MGR MGT INFO SYST
DPTY MGR OCCUP MED CLINIC
DPTY MGR OPER & MAINT
DPTY MGR PLANT ENGR
"DPTY TO ASO DIR REAC,SAF&SEC"
EMP ASSTNCE PROG MGR
FISCAL OFFICER
HD CTR ACCEL PHYS
HD OCCUP MED CLINIC
HFBR PLANT MGR
IND HYG DPTY DIV HD
LABORATORY COUNSEL
LICENSING SPEC
MASTER PLANNER
MGR ADP ACQUISITION
MGR BENEFITS
MGR CENTRAL SHOPS
MGR COMP AND HRIS
MGR CONTRACTS & PROC
MGR DIST COMPUTING SVCS
MGR EMPLOYMENT
MGR ENGRG & CONSTR SVCS
MGR ENVR RESTORATION
MGR INFO SVCS
MGR INFRASTRUCTURE MGMT
MGR LABOR RELATIONS
MGR MATERIEL
MGR OF MGT INFO SYST
MGR OFC OF EDUC PGMS
MGR OFC OF SCI PERS
MGR OPER & MAINT
MGR PHOTO & GR ARTS
MGR PLANT ENGRG
MGR POLICE GROUP
MGR PROJECT COORDNTN
MGR PUBLIC AFFAIRS
MGR QUALITY MANAGEMENT
MGR REACTOR DIV
MGR RHIC PROJ PLNG
MGR SEC PLNG & ADTNG
MGR SFGDS & SECURITY
MGR STAFF SVCS
MGR SYS SUPPORT SVCS
MGR TECH SYSTEMS
MGR TECHNOLOGY TRANSFER
PHYSICIAN
PRESIDENT
"PROJ HD, FIN MGT & ACCT SYST"
PROJ MGR ENVIRONMENT TECH
RHIC PROJ DIRECTOR
SPEC ASST TO ASSOC LAB DIR
SPEC ASST TO ASST LAB DIR
SR ENGR DIV HD
SR HLTH PHYS DIV HD
VICE PRESIDENT

SCIENTIFIC
ASSOC BIOCHEMIST
ASSOC CHEMIST
ASSOC ELECTRNCS ENGR
ASSOC MECH ENGR
ASSOC NUCL ENGR
ASSOC PHYSICIST
ASSOC SCIENTIST
ASST BIOCHEMIST
ASST BIOLOGIST
ASST CHEMIST
ASST ENGINEER
ASST PHYSICIST
ASST SCIENTIST
BIOCHEMIST
BIOLOGIST
BIOPHYSICIST
BOTANIST
CHEM ENGR
CHEMIST
CIVIL ENGR
COMP SCIENTIST
ECOLOGIST
ECONOMIST
ELEC ENGR
ENGINEER
GENETICIST
HLTH PHYSICIST
JR RES ASSOC
MATHEMATCN
MECH ENGR
METALLURGIST
METEOROLOGIST
MICROBIOLOGIST
NUCL ENGR
PHYSICIST
RES ASSOC
SCIENTIST
SR BIOCHEMIST
SR BIOLOGIST
SR BIOPHYSICIST
SR CHEM ENGR
SR CHEMIST
SR COMP SCIENTIST
SR CYTOLOGIST
SR ELEC ENGR
SR ELECTRONICS ENGR
SR GENETICIST
SR HLTH PHYSICIST
SR MATHEMATCN
SR MECH ENGR
SR METALLURGIST
SR NUCL ENGR
SR PHYSICIST
SR RES ASSOC
SR SCIENTIST
STATISTICIAN
VIS ASSOC PHYSICIST
VIS ASST PHYSICIST
VIS CHEMIST
VIS CIVIL ENGR
VIS NUCL ENGR
VIS PHYSICIST
VIS RES ASSOC
VIS SCIENTIST
VIS SR CIVIL ENGR
VIS SR ELECTRONICS ENGR
VIS SR PHYSICIST
VIS SR SCIENTIST

PROFESSIONAL
ADV COMP ANAL
ASSOC STAFF ENGR
BIOLOGY ASSOC I
BIOLOGY ASSOC II
BIOLOGY ASSOC III
BIOLOGY ASSOC IV
CHEMISTRY ASSOC I
CHEMISTRY ASSOC II
CHEMISTRY ASSOC III
CHEMISTRY ASSOC IV
COMM HLTH ASSOC I
COMP ANAL
COMP ANAL I
ENVRN SCI ASSOC I
ENVRN SCI ASSOC II
ENVRN SCI ASSOC III
ENVRN SCI ASSOC IV
GEOCHEM ASSOC I
MATER SCI ASSOC I
MATH ASSOC III
MEDICAL ASSOC I
MEDICAL ASSOC II
MEDICAL ASSOC III
MEDICAL ASSOC IV
METEOROLOGY ASSOC III
OCEANOGRAPHY ASSOC I
OCEANOGRAPHY ASSOC II
OCEANOGRAPHY ASSOC III
OCEANOGRAPHY ASSOC IV
PHYSICS ASSOC I
PHYSICS ASSOC II
PHYSICS ASSOC III
PHYSICS ASSOC IV
PROG/ANAL
PROGRAMMER
PROJECT ENGR I
PROJECT ENGR II
REACTOR OPRS ENGR
RESEARCH ENGR I
RESEARCH ENGR II
SCIENTIFIC ASSOC I
SCIENTIFIC ASSOC II
SCIENTIFIC ASSOC III
SCIENTIFIC ASSOC IV
SR CHEMISTRY ASSOC
SR COMP ANAL
SR HLTH PHYS ASSOC
SR MATER SCI ASSOC
SR PHYSICS ASSOC
SR PROJECT ENGR
SR RESEARCH ENGR
STAFF ENGR
STATISTICS ASSOC II

ADMINISTRATIVE (E)
ACCOUNTANT
ADMIN ASST
ADMIN SPECIALIST
ADV BIS PROGRAMMER
ADV BUS SYS ANAL
ADV INFO SUPPORT ANAL
ASST ACCOUNTANT
ASST BUDGET ANAL
ASST BUDGET SPEC
ASST CONTRACTS SPEC
ASST MGR CNTRL SHOPS
ASST MGR RHIC PROJECT PLNG
ASST STAFF SPEC
ASST SUPV CLIN SVCS
ASST SUPV NURSE
ASST SYSTEMS SPEC
ASST TRAINING SPEC
AUDITOR
BIS PROGRAMMER
BUDGET ADMIN
BUDGET ANALYST I
BUDGET SPECIALIST
BUYER
CONF SUPPORT SUPV
CONTRACTS ADMIN
CONTRACTS PAYABLE SPEC
CONTRACTS SPEC
COST & PRICE ANALYST
DIV ADMIN MGR
DPTY DEPT ADMIN MGR
DPTY MGR TECH INFO
EDUCATIONAL PROGRAMS ADMIN
EMPLOYEE RELS ADMIN
GEN SUPV STAFF SVCS
GRAPHIC ARTS SUPV
HUMAN RESOURCES REP
ISD ADMINISTRATOR
LABORATORY ASSOC
LIBRARIAN
MEDICAL RECORDS ADM
MGR ACCOUNTING
MGR HRIS
MGR INVENTORY
MGR PAYROLL
MGR PROPERTY
MGR TRAFFIC
PHOTO SUPV
PHYSICAL TRNG SPEC
PROG SEC COORDINATOR
PROJECT PLNG SPEC
PUBLIC AFFAIRS REP
RADIOLOGY TECH
RECREATION SUPV
RHIC ACCT & FNCL ADM
RHIC MGT SYS ADM
S&M ADMIN
SPONS RES CONTRS ADM
SR ACCOUNTANT
SR ADMIN ASST
SR AUDITOR
SR BIS PROG/ANAL
SR BUDGET ANALYST
SR BUDGET SPEC
SR BUS SYS ANAL
SR BUYER
SR CONTRACTS SPEC
SR DIVERSITY COORDINATOR
SR EDITOR
SR EDUCATNL PROG REP
SR FAC/PROP MGT SPEC
SR HUMAN RESOURCES REP
SR INFO SUPPORT ANAL
SR LIBRARIAN
SR PROJ PLNG SPEC
SR STAFF SPEC
SR SYSTEMS SPEC
SR TECH SYS ANAL
SR TRAINING SPEC
STAFF PSYCHOLOGIST
STAFF SPEC
SUPERVISORY AUDITOR
SUPV ACCTS PAYABLE
SUPV APPLICATIONS SUPPT
SUPV BIS OPERATIONS
SUPV CLINICAL SVCS
SUPV EMPLOYEE COMMUN
SUPV EXTERNAL COMMUN
SUPV HOUSING
SUPV INFO & PERS SEC

(continued)

Figure 4 (continued). Most Common Job Titles in Each Occupational Group

SUPV LIBRARIAN
SUPV MUSEUM PROGRAMS
SUPV OCPL HLTH NURSE
SUPV PAYROLL OPERS
SUPV PERSONNEL RECS
SUPV SALARY ADMIN
SUPV USER SERVICES
SYSTEMS SPEC
TRANSPORTATION SUPV
TRAVEL SUPV
VET SVCS SUPV

TECH SUPPORT / SUPV (E)
ASST GEN SUPV CONST SUPPORT
CABINET SHOP SUPV
CAM PROGRAMMER
CARPENTRY SUPV
CHIEF PLANNER / ESTIMATOR
CONSTRUCTION INSPCTR
CONSTRUCTION SPT SPV
CTRL STEAM PLNT SUPV
DEPUTY FIRE CHIEF
DESIGN ENGR
DESIGN ENGR I
ELECTRICAL SUPV
FABRICATION PLAN SUPV
FAC / PREVENTIVE MAINT SPEC
FACILITIES INSPECTOR
FIRE CAPTAIN
FIRE CHIEF
GEN SUPV BLDG MAINT
GEN SUPV CUSTDL SVCS
GEN SUPV ELECTRICAL
GEN SUPV MACH SHOPS
GEN SUPV MECHANICAL
GEN SUPV RDS & GRNDS
GLASSBLOWING SPEC II
GROUNDS & SANIT SUPV
HEATING SVC SUPV
HVY EQ MAINT SUPV
MACHINE SHOP SUPV
MOTOR VEH MAINT SUPV
NDT / QC INSPECTOR
PLANNER / ESTIMATOR
PLUMBING SUPV
POLICE CAPTAIN
POLICE INSPECTOR
POLICE LIEUTENANT
PREV MAINT COORD
REACTOR MAINT SUPV
REACTOR SUPPORT SPEC
REF & A / C SUPV
RIGGING SUPV
ROADS & MASONRY SUPV
S & M SUPV
SCI COMP OPR SUPV
SECURITY TRNG INSTR
SHEET METAL INSUL SUPV
SITE SUPV
SR DESIGN ENGR
SR DESIGNER
SR DRAFTING SPEC
SR REACTOR SUPPORT SPEC
SR TECH ASSOC
SR TECH SUPV
SR TECH SUPV P&GA
SUPV TECHNICAL INFO
TECH ASSOC I
TECH ASSOC II
TECH PROJECT SUPV
TECH RES ASSOC
TECH SUPV I
TECH SUPV II
TECH SUPV P&GA
TELEPHONE SVCS SUPV
TOWER LINE SUPV
WATER SYSTEM SUPV
WLDNG & SHT MTL SUPV

ADMINISTRATIVE (NE)
ADM SVCS ASST
ADMIN SECRETARY
ASST VET SVCS SUPV
COMP APPLCNS ASST
COMP APPLCNS SPEC
FISCAL ASST
HUMAN RESOURCES ASST
LAB SPEC
LIBRARY ASST
RECREATION ASST
RECREATION REP
REGISTERED NURSE
SECRETARIAL SPEC
SR ADM SVCS ASST
SR ADMIN SECY
SR BIS ASST
SR BUDGET ASST
SR COMP APPLCNS SPEC
SR CONTR & PROC ASST
SR FISCAL ASST
SR HUMAN RESOURCES ASST
SR LAB SPEC
SR LIBRARY ASST
SR PROGRM ASST
SR PUBLIC AFFRS ASST
SR STAFF SVCS ASST
SR TECH SECY
STAFF SVCS ASST
TECH SECRETARY

TECH SUPPORT / SUPV (NE)
CUSTODIAL SVC SUPV
DRAFTING SPEC
FABRICATION SPEC
OPERS ENGRG SPEC
RES SVCS SUPV
SR CONST SAFETY SPEC
SR DRAFTING SPEC
SR OPER ENGRG SPEC
SR STDS INSPECTOR
SR TECH SPEC
TECH SPEC

CLERICAL AND SUPPORT WAGE
DATA SVCS ASST
DATA SVCS CLERK
HOSP SVCS ASST
OFC SVCS ASST
OFC SVCS CLERK
RES SVCS ASST
SECRETARY
SR DATA SVCS ASST
SR LAB TECH
SR OFC SVCS ASST
SR RES SVCS ASST
SR SECRETARY
SR VET SVCS ASST
VET SVCS ASST

TECHNICAL
COMPUTER OPR
PRIN COMPUTER OPR
PRIN DRAFTER
PRIN TECHNICIAN
SR COMPUTER OPR
SR TECHNICIAN
TECHNICIAN

BARGAINING UNITS
AUTO TRCK MCH GRP LD
AUTO TRUCK MECHANIC
AUTOMOTIVE OFC CLERK
BLDG GRNDS UTIL WKR
CABINETMAKER A
CARPENTER
CARPENTER GRP LDR
CHAUFFEUR
CLERICAL TRAINEE
CNC / NC OPERATOR
CS OFC SPEC
CUSTODIAN
DRIVER
ELECTR A GRP LDR
ELECTRICIAN A
ELECTRICIAN APPRENTICE
EXPER WELDER
FACILITIES OFC ASST
FINISHER A
FIRE LIEUTENANT
FIREFIGHTER / EMT
GEN COMMUN CLERK
GRAPHIC ARTS ANALYST
GRAPHIC DESIGNER
GUARD
HAZARDOUS WASTE TECH
HEATING MAINT ENGR A
HELPER A
HS TRAINEE CLRK
HS TRAINEE TECH
HV EQ MCH OP GRP LDR
HVY EQUIP MECH OPER
ILLUSTRATOR
INSLTN WKR GRP LDR
INSULATION WORKER
LAB CUSTDN GRP LDR
LAB CUSTODIAN
LABORER
LAUNDRY OPER A
LAUNDRY OPERATOR B
LNDRY OPR A GRP LDR
LOCKSMITH
LOCKSMITH GRP LDR
MAC MNT MEC A GRP LD
MACH MAINT MECH A
MACH TOOL REBUILDER
MAIL CLERK
MASON
MASTER METAL WORKER
MASTER WELDER
MASTER WELDER GRP LD
METAL CUTTER A
METAL WKR MAINT A
MSTR MTL WKR GRP LDR
MTL CUTTER A GRP LDR
MTL WKR MT A GRP LDR
NUCL REAC OPR
OFC MACH REPAIR MECH
P&GA OFC SPEC
P&GA SPEC A
P&GA SPEC A GRP LDR
P&GA SPEC A-1
P&GA SPEC B
PAINTER A
PAINTER A GRP LDR
PATROL OFCR 1 CLASS
PATROL OFFICER
PHOTOMICROGRAPHER
PLUMBER A
PLUMBER A GRP LDR
RADIOACTIVE MAT TECH
REF & AC ENGR
REF A C ENGR GRP LDR
REFRIG & AC APPRENTICE
RESIDENCE CUSTODIAN
RIGGER
RIGGER GRP LDR
RIGGERS ASST
SERGEANT
SEW TR PL OP A GR LD
SEWAGE TREAT PL OP A
SIGN PAINTER
SPECIAL SVCS ATTDT
SR COMMUN CLERK
SR FACIL OFC ASST
SR GRAPHIC ARTS ANAL
SR P&GA SPEC
SR P&GA SPEC GRP LDR
SR SUPPLY MATL CLK
SR TECH PHOTOGRAPHER
SR TECH PHOTOGRAPHER GRP LDR
STATIONARY ENGR SR
STEAMFITTER A
STEAMFITTER A GRP LDR
STEAMFITTER APPRENTICE
STNRY ENG SR GRP LDR
STORES CLERK
STOREKEEPER
SUPPLY MATL CLERK
TELEPHONE OPER
TL & INS MKR GRP LDR
TOOL & INSTR MAKER
TOOL CRIB ATTENDANT
TOWER LINE PERSON
TWR LN PRSN GRP LDR
W&S OPR ENGR GRP LDR
WATER SWGE OPER ENGR

MISCELLANEOUS
ACCEL ENGR INTERN
CLERICAL ASST
CO-OP ENGR
GEM FELLOW
GRADUATE RESEARCH FELLOW
PARTICPTNG RES TEAM ASSOC
PARTICPTNG RES TEAM SPEC
PROF INTERN
RECREATION ATTDT
SCI EDUC INTERN
STUDENT ASST
TECH INTERN
TOUR WORKER
TRANSPORTATION COORD INTERN

Work Force Demographics

Over the three-year period from 1993 to 1995, the size of the BNL work force has fluctuated from a low of 3,480 in 1993 to a high of 3,876 in 1994 followed by a slight decline to 3,717 in 1995. The percentage of men and women has remained constant with women making up about 25% of the work force each year. The age distribution of workers has remained relatively unchanged over the time period (figures 5 and 6). Because of the change in the definition of the occupational categories in 1995, we are unable to evaluate how the predominant jobs may have changed over the three-year period. Beginning with the 1996 report, this evaluation will be included.

Figure 5. Percentage of Men in Different Age Groups, 1993 to 1995

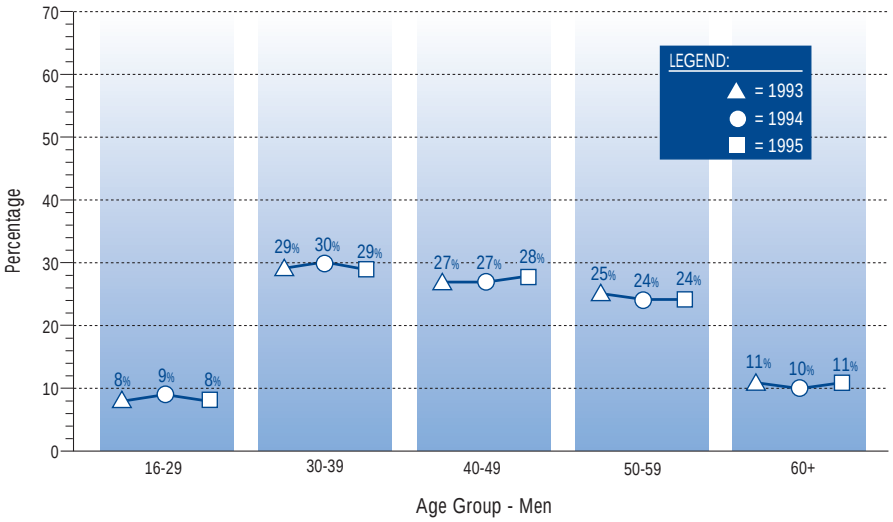
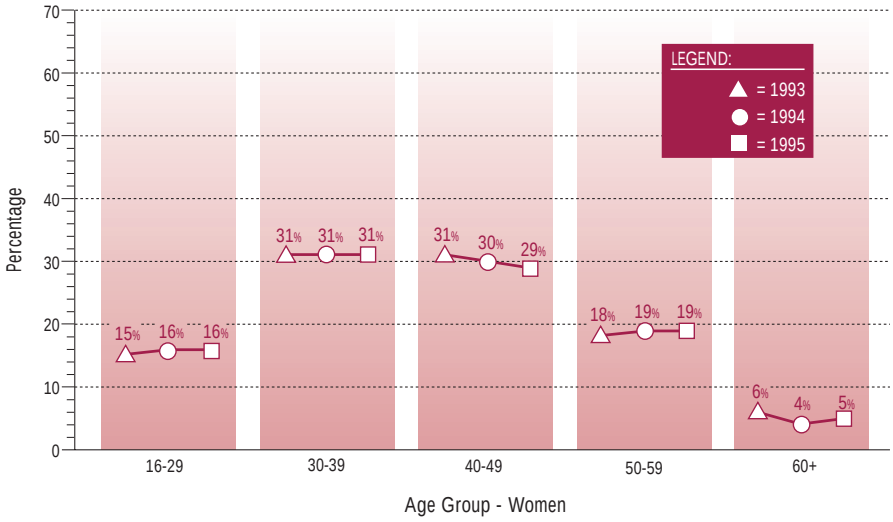


Figure 6. Percentage of Women in Different Age Groups, 1993 to 1995



Number and Length of Absences

As in other Epidemiologic Surveillance reports, this report includes absences that lasted at least five consecutive workdays. Epidemiologic surveillance refers to absences due to illness or injury as "health events" and uses the five-day length of absence because DOE Order 440.1 requires contractor management to notify Occupational Medicine when a worker has been absent for five or more consecutive workdays. Although occupational injuries and illnesses must be reported regardless of duration of absence, nonoccupational illnesses and injuries that involve absences shorter than five consecutive workdays do not routinely require a medical clearance for return to work. As a result, nonoccupational injuries and illnesses involving fewer than five workdays are not identified consistently. Throughout this report, the analyses take gender, age, and occupation into account because the risk of illness and injury varies by these factors. For analyses that examine duration of absence, the reported number of days absent includes weekends unless otherwise stated.

The percentage of men with at least one health event (7%) was only slightly greater than that of women (6%) in 1995. The total number of absences was about three times higher among men, reflecting the fact that the work force contained almost three times as many men as women (figure 1). A similar percentage of men and women had one or more absences in 1994 (7%) and 1993 (6.6%).

How Are Percentages Calculated?

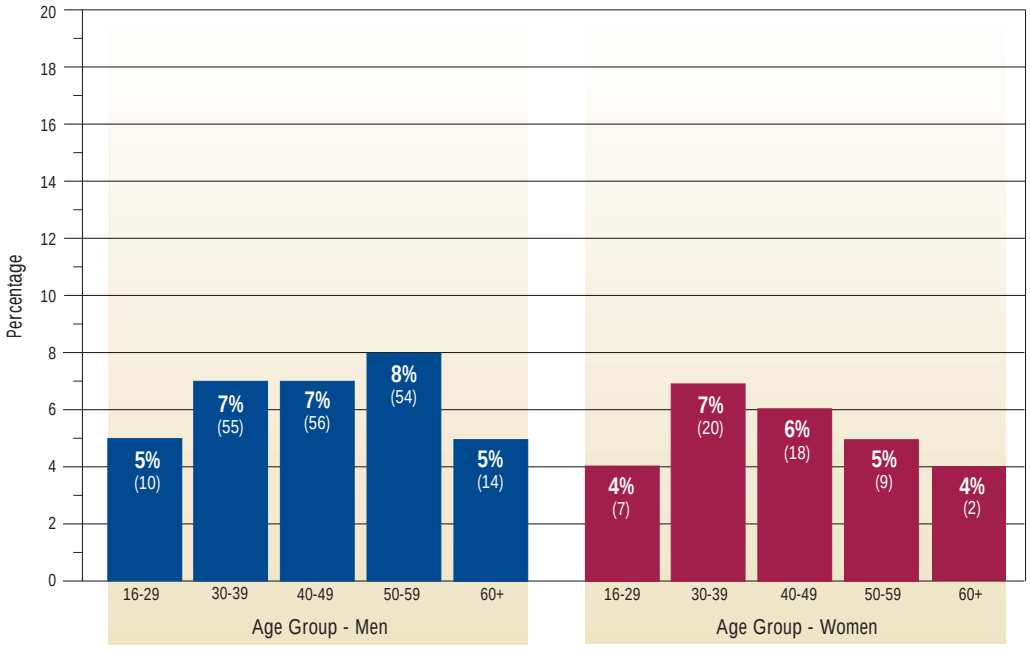
The percentages are calculated by dividing the number of workers with at least one health event in a given age and gender group by the number of employees in the same group. This number is multiplied by 100 to give a percent. The number of employees in each group is shown in figure 1. An example is given below:

10 (number of men aged 16-29 with at least one health event from figure 7)

÷ 215 (number of men in the work force aged 16-29 from figure 1)

= .047 x 100 = 5%

Figure 7. Workers with at Least One Health Event by Gender and Age*

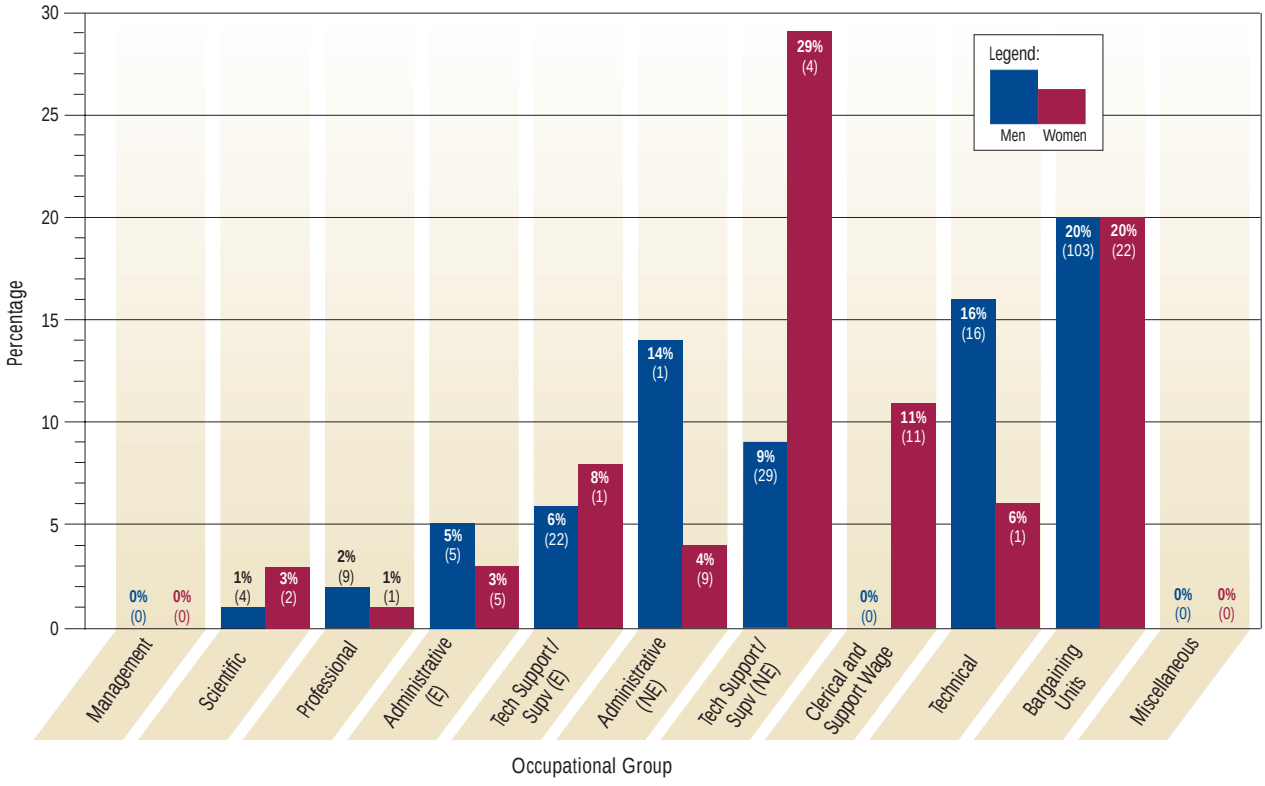


*Numbers in parentheses represent the number of workers with at least one event.

The percentage of men reporting at least one health event increased with age to a high of 8% in those aged 50 to 59 years and then declined. Among women, the percentage increased to a high of 7% among 30 to 39 year olds and then declined steadily as age increased (figure 7). The duration of absence was similar for men and women 50 or more years of age. In the 40-49 age group, women had substantially shorter absences than men (17.5 days for women versus 24.6 days for men). In workers age 16 to 39 the opposite occurred. Women averaged 27.3 days and men averaged 20.4 days for each absence (figure 9). The longer average duration of absences among women aged 16 to 39 may reflect maternity leave. Pregnancy/childbirth was the diagnostic category with the highest number of days absent for women in these age groups (appendix G).

In examining the percentage of various occupational groups that recorded at least one absence (figure 8), the single most striking observation was the lack of any recorded absences among managers in 1995. There may actually have been no health events in this group that required an absence of 5 or more workdays, or these workers routinely did not report their illness absences. Women in the supervisory and

Figure 8. Workers with at Least One Health Event by Gender and Occupation*



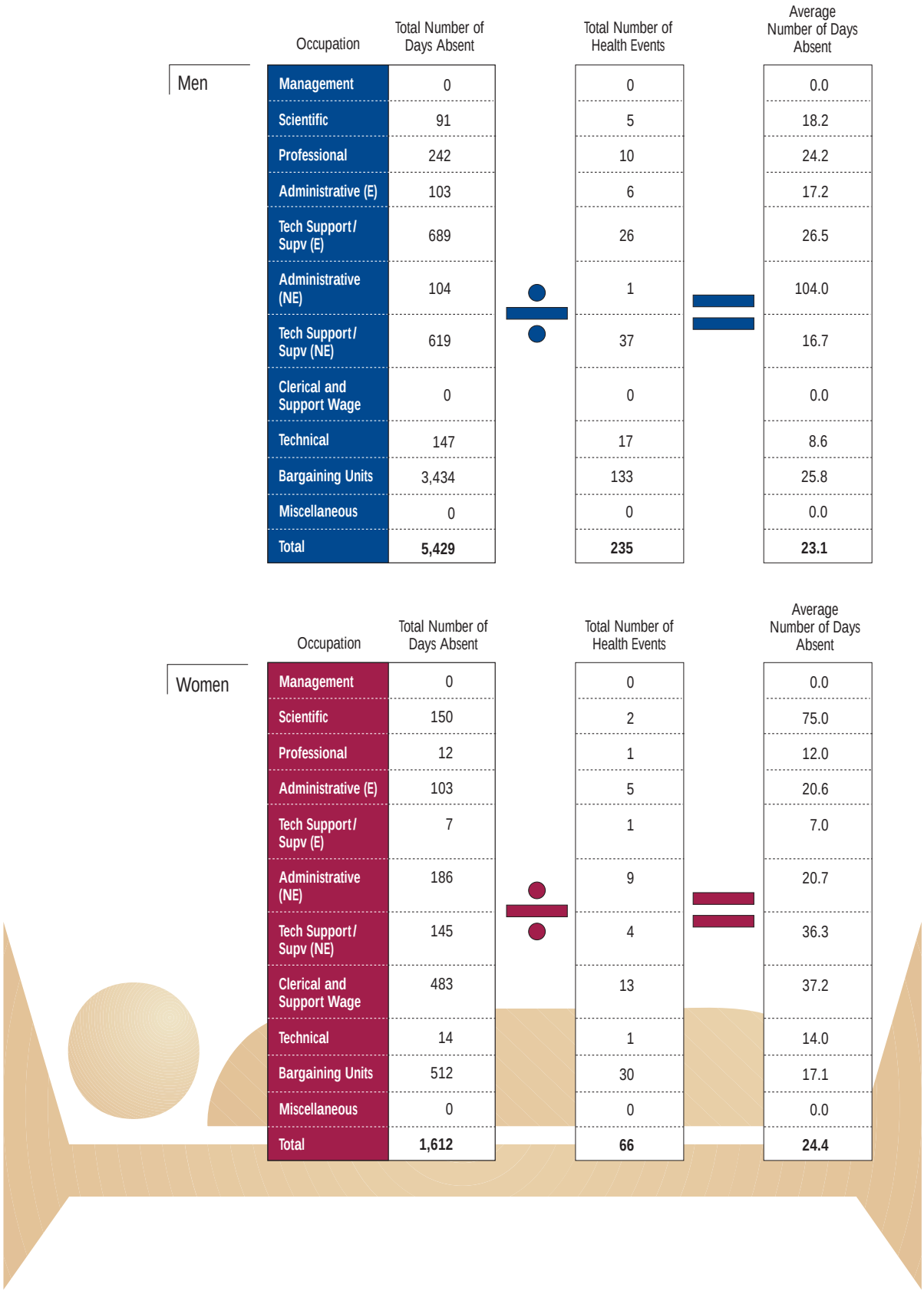
*Numbers in parentheses represent the number of workers with at least one event.

technical support group had the highest percentage of workers with one or more absences, but the percentage reflects only 4 absences among these 13 workers. Both men and women in the bargaining units group had the next highest percentage of workers (20%) with a health event (figure 8). In those occupational groups distinguishing between exempt and nonexempt personnel, the nonexempt categories generally reflected a higher percentage of workers reporting at least one absence.

Although the percentage of bargaining unit workers with at least one absence was higher than most other groups, the average length of their absences (24.2 days) was similar to the average for the entire work force (23.4 days). The clerical and support wage group had the highest average number of days absent (37.2 days) per health event followed by the scientific group (34.4 days). Additional information about the number and length of absences for men and women in different age and occupational groups is in figures 9 and 10 and appendices B-E. The Rates of Disease Occurrence section of this report examines the diagnoses underlying these absences.

Figure 9. Number of Days Absent by Gender and Age

Figure 10. Number of Days Absent by Gender and Occupation



Men

Occupation	Total Number of Days Absent	Total Number of Health Events	Average Number of Days Absent
Management	0	0	0.0
Scientific	91	5	18.2
Professional	242	10	24.2
Administrative (E)	103	6	17.2
Tech Support / Supv (E)	689	26	26.5
Administrative (NE)	104	1	104.0
Tech Support / Supv (NE)	619	37	16.7
Clerical and Support Wage	0	0	0.0
Technical	147	17	8.6
Bargaining Units	3,434	133	25.8
Miscellaneous	0	0	0.0
Total	**5,429**	**235**	**23.1**

Women

Occupation	Total Number of Days Absent	Total Number of Health Events	Average Number of Days Absent
Management	0	0	0.0
Scientific	150	2	75.0
Professional	12	1	12.0
Administrative (E)	103	5	20.6
Tech Support / Supv (E)	7	1	7.0
Administrative (NE)	186	9	20.7
Tech Support / Supv (NE)	145	4	36.3
Clerical and Support Wage	483	13	37.2
Technical	14	1	14.0
Bargaining Units	512	30	17.1
Miscellaneous	0	0	0.0
Total	**1,612**	**66**	**24.4**

Diagnostic Categories

Epidemiologic surveillance monitors both occupational and nonoccupational illnesses and injuries among active workers. For many health conditions it is not possible to say with certainty what caused the health problem, so epidemiologic surveillance assesses the health of the work force by including both occupational injuries and illnesses and health problems that are not necessarily attributed to workplace exposures. Most of the diagnoses are reported by the workers when they visit their site's occupational medicine clinic for a return-to-work clearance following an absence. In contrast, health events are recorded on the OSHA 200 Log because they are occupationally related. We conduct separate analyses of the occupational injuries and illnesses recorded in the OSHA 200 Log because they have been designated as occupational, whether or not they involve an absence.

This report organizes diagnoses into categories based on the type of disease or condition (e.g., cancer) or body system (e.g., lung/respiratory) affected. Categories can be broken down into specific health conditions. For example, rheumatism is one health condition under the diagnostic category of muscles and skeleton. Bronchitis is a condition in the lung/respiratory category. You can find specific health conditions in the Explanation of Diagnostic Categories on pages 39-43 of this report. A health event can involve more than one diagnosis, and epidemiologic surveillance includes all diagnoses reported. If a worker reported more than one health condition for a single absence and all of these health conditions fell into the same diagnostic category, all of them were counted.

As in 1994, injury and poisoning, lung/respiratory, and muscles and skeleton were the three categories occurring most frequently among men and women. The injury and poisoning and muscles and skeleton diagnostic categories were among those with the most calendar days of absence (figure 11). These injuries were primarily nonoccupational. Some of the more common diagnoses within the frequently occurring categories for 1995 are shown in figure 12.

The most frequently reported health conditions varied with age and gender (figure 13 and appendix F). Lung/respiratory conditions ranked among the top three categories for men in all age groups. Acute respiratory infections such as colds accounted for 55% of the lung/respiratory conditions. Sinusitis, flu, pneumonia, and bronchitis made up the remainder. Injury and poisoning was among the top three for all age groups except the 50-59 age group. Sprains and strains accounted for 45% of the injuries reported among men. Other frequently reported injuries included fractures (14%), dislocations (8%), and bruises (16%). Conditions affecting the muscles and skeleton ranked among the top three for men aged 30 to 59. Back problems accounted for 53% of these diagnoses, rheumatism for 23%, and arthritis for 17%. Diseases of the heart/circulatory system ranked high among men 50 years and older. Ischemic heart disease (restricted blood flow through an artery) accounted for 32% and high blood pressure and stroke each accounted for 21% of these diagnoses.

Lung/respiratory diagnoses were among the top two diagnostic categories for women under 60 years of age. The types of conditions were similar to those reported by men. Conditions related to the muscles and skeleton were common among women 30 to 49 and 60+ years of age, with back problems and rheumatism comprising the majority of the diagnoses. Injury and poisoning were also reported by women in the 16-29 and 40-49 age groups. Most of these events involved sprains and strains.

Diagnoses for injury and poisoning occurred relatively frequently in this work force. None of the 78 diagnoses was related to poisoning. Complications of medical care are also included in the injury and poisoning category; two such diagnoses were reported. One was a hemorrhage (severe bleeding) and the

other was a postoperative infection. Injury and poisoning was among the top three categories for men in 7 of the 11 occupational groups. For three of the remaining four occupational groups, no absences were reported in 1995 among men. These groups are management, clerical and support wage, and miscellaneous (figure 14). The predominant type of injury was sprains and strains, followed by contusions, fractures, and dislocations. Lung/respiratory and muscle and skeleton conditions were among the top three categories reported for men in 5 of the 11 occupational groups. Among men in the scientific group, the conditions reported most frequently were different from those reported by other occupational groups. However, men in this group reported only six diagnoses: two for heart/circulatory conditions, and one each in four other categories (figure 14 and appendix H). Among the technical support/supervisory (E) group, six heart/circulatory diagnoses were reported: three for ischemic heart disease and the other three each for a different condition. Digestive conditions were the most frequently seen category among men in the administrative (E) group. Four diagnoses were reported: two diverticulitis (inflammation of the large intestine) and one each for a condition of the mouth and a hernia. Although there were clear differences in the reported illnesses and conditions affecting men in various occupational groups, there we saw no indication of patterns suggesting the need for further assessment.

Among women, injury and poisoning, lung/respiratory, and muscles and skeleton diagnoses occurred often among the top three diagnostic categories reported in each occupational group. The management and miscellaneous groups did not report any absences among women in 1995. For some occupational groups, other diagnostic categories were more prominent, but these occurrences usually reflected very small numbers of events (appendix H). The only exceptions were genitourinary conditions in the administrative (NE) group and digestive diagnoses in the clerical and support wage group. Five genitourinary diagnoses were reported among two administrative (NE) women: one woman reported three breast disorders (two benign abnormalities of the breast tissue and one enlargement of the breast tissue) and one each of two different reproductive disorders (appendix H). The three digestive diagnoses reported for the clerical and support wage group were each for a different diagnosis. Overall, we observed no patterns suggesting the presence of health issues in need of further investigation.

Figure 11. Total Number of Health Conditions Reported and Total Number of Days Absent from Work by Gender and Diagnostic Category

Diagnostic Category	Men		Women	
	Total Number of Health Conditions Reported	Total Number of Days Absent	Total Number of Health Conditions Reported	Total Number of Days Absent
Benign Growths	4	93	2	94
Blood	3	153	1	54
Cancer	3	165	0	0
Digestive	24	563	7	165
Endocrine/Metabolic	3	96	2	49
Genitourinary	8	194	10	208
Heart/Circulatory	28	3 966	2	48
Infections/Parasites	7	109	3	21
Injury and Poisoning	2 64	1 2,463	2 14	2 365
Lung/Respiratory	1 98	896	1 23	189
Mental	1	6	3	55
Pregnancy/Childbirth	0	0	6	1 486
Muscles and Skeleton	3 49	2 1,844	3 13	3 308
Nervous System	10	156	4	137
Skin	6	110	0	0
Unspecified Symptoms	15	219	4	73

Figure 12. Health Conditions Reported Under Selected Diagnostic Categories by Gender

Men

Cancer
- Esophagus
- Eye
- Prostate

Injury and Poisoning
- Bruises
- Dislocations
- Fractures
- Late Effects of an Injury
- Open Wounds
- Sprains and Strains

Lung/Respiratory
- Bronchitis
- Flu
- Laryngitis
- Pneumonia
- Sinusitis
- Sore Throat
- Upper Respiratory Infection

Muscles and Skeleton
- Arthritis
- Disc Disorders
- Low Back Pain
- Rheumatism
- Soft Tissue Disorders in a Limb
- Tendonitis

Women

Cancer
- None Reported

Injury and Poisoning
- Fractures
- Sprains and Strains
- Superficial Injuries

Lung/Respiratory
- Bronchitis
- Laryngitis
- Sinusitis
- Sore Throat
- Upper Respiratory Infection

Muscles and Skeleton
- Disc Problems
- Low Back Pain
- Rheumatism

Figure 13. Three Diagnostic Categories Reported Most Often by Gender and Age

		16-29	30-39	40-49	50-59	60+
Men	Most Common Diagnostic Category	Lung/Respiratory	Injury and Poisoning	Lung/Respiratory	Lung/Respiratory	Lung/Respiratory
	Second Most Common Diagnostic Category	Injury and Poisoning	Lung/Respiratory	Injury and Poisoning	Muscles and Skeleton	Heart/Circulatory
	Third Most Common Diagnostic Category	Unspecified Symptoms	Muscles and Skeleton	Digestive; Muscles and Skeleton	Heart/Circulatory	Injury and Poisoning
Women	Most Common Diagnostic Category	Injury and Poisoning	Lung/Respiratory	Injury and Poisoning	Genitourinary	Muscles and Skeleton
	Second Most Common Diagnostic Category	Digestive; Lung/Respiratory	Muscles and Skeleton	Lung/Respiratory; Muscles and Skeleton	Lung/Respiratory	Nervous System
	Third Most Common Diagnostic Category	Unspecified Symptoms (1)	Pregnancy/Childbirth	Digestive	(2)	None

(1) This diagnostic category was reported the same number of times as the one above it.
(2) More than two diagnostic categories tied.

Figure 14. Three Diagnostic Categories Reported Most Often by Gender and Occupation

		Management	Scientific	Professional	Administrative (E)	Tech Support/ Supv (E)	Administrative (NE)
Men	Most Common Diagnostic Category	None	Heart/Circulatory	Injury and Poisoning	Digestive	Lung/Respiratory	Injury and Poisoning
	Second Most Common Diagnostic Category	None	Benign Growths; Digestive	Lung/Respiratory	Injury and Poisoning	Heart/Circulatory	None
	Third Most Common Diagnostic Category	None	Genitourinary (1); Injury and Poisoning (1)	(2)	Muscles and Skeleton (1)	Muscles and Skeleton; Nervous System	None
Women	Most Common Diagnostic Category	None	Mental	Lung/Respiratory	Muscles and Skeleton; Nervous System	Pregnancy/Childbirth	Genitourinary
	Second Most Common Diagnostic Category	None	Pregnancy/Childbirth	None	Injury and Poisoning; Lung/Respiratory	None	Lung/Respiratory (1)
	Third Most Common Diagnostic Category	None	None	None	Unspecified Symptoms (1)	None	Injury and Poisoning

		Tech Support/ Supv (NE)	Clerical and Support Wage	Technical	Bargaining Units	Miscellaneous
Men	Most Common Diagnostic Category	Lung/Respiratory	None	Lung/Respiratory	Lung/Respiratory	None
	Second Most Common Diagnostic Category	Injury and Poisoning	None	Injury and Poisoning	Injury and Poisoning	None
	Third Most Common Diagnostic Category	Muscles and Skeleton	None	Muscles and Skeleton	Muscles and Skeleton	None
Women	Most Common Diagnostic Category	Digestive; Endocrine/ Metabolic	Digestive	Digestive	Lung/Respiratory	None
	Second Most Common Diagnostic Category	Heart/Circulatory (1); Injury and Poisoning (1)	Lung/Respiratory	None	Muscles and Skeleton	None
	Third Most Common Diagnostic Category	Muscles and Skeleton (1)	Pregnancy/ Childbirth	None	Injury and Poisoning	None

(1) This diagnostic category was reported the same number of times as the one above it.
(2) More than two diagnostic categories tied.

Rates of Disease Occurrence

Some occupational groups had only a small number of workers who reported very few health events in 1995 (appendix H). Because events among a small number of workers can vary widely just by chance, the eleven occupational groups were combined into six larger groups for analysis. The five age groups were also combined into two age groups for the same reasons (figures 15 and 16). The age groups, less than 40 years and 40 years and older, were chosen because the rates of many illnesses begin to change more rapidly among persons over 40 years of age.

The likelihood of getting cancer increases with age, and the three cancer diagnoses were all among workers over age 40 (appendix F). Although this report discusses rates of cancer diagnoses, one cancer diagnosis can be associated with several absences over a year. The rates are not comparable to incidence rates, which reflect the number of new cancer diagnoses in a population over a specified period of time (usually one year). Incidence rates count a cancer diagnosis only once, but a worker who is absent for a week on four different occasions during the same year could have four "diagnoses" recorded for epidemiologic surveillance. Cancer rates presented in this report are really absence rates related to cancer, and because a worker may experience many absences related to the same cancer diagnosis, the cancer rates in this report can appear substantially higher than the actual incidence of cancer. All three cancer diagnoses reported during 1995 were reported by three men. In 1994, two men reported four cancer diagnoses and one woman reported one cancer diagnosis. None of the men who reported cancer in 1995 reported the same cancer in 1994. Among men, the sites of the three cancers were the esophagus, eye, and prostate. We found no evidence of an excess of any one type of cancer or any occupational group at significantly increased risk for this disease.

Rates of heart/circulatory system disease were consistently higher among workers over age 40 (figure 16). Of the 30 heart/circulatory diagnoses reported, only 1 diagnosis occurred in a worker under age 40. Eighteen of the 28 diagnoses for men involved hypertension (high blood pres-

A Word about Rates...

The previous section considered the **number** of health events among various groups, but comparing these numbers may be misleading. For example, figure 11 shows that during 1995 men reported 49 diagnoses involving muscles and skeleton; women reported 13. You can honestly say that men reported over three and a half times as many muscles and skeleton disorders as women. Does this mean that men were at greater risk of these disorders in 1995? Comparing the number of muscles and skeleton disorders among men versus women will not answer this question. To answer the question, the number of men and women in the work force must be considered (figure 1). Since there are almost three times as many men as women at BNL, it is reasonable to expect more muscles and skeleton disorders among men than women. A more accurate way to compare men and women is to calculate the rate of muscles and skeleton disorders for each group. The rates are calculated by dividing the number of muscles and skeleton diagnoses in a given group by the number of employees in the same group. This number is multiplied by 1,000 to give a rate per 1,000 workers. For example:

(49 muscles and skeleton disorders ÷ 2,766 men) = .018 x 1,000 = 18 muscles and skeleton disorders per 1,000 men

(13 muscles and skeleton disorders ÷ 951 women) = .014 x 1,000 = 14 muscles and skeleton disorders per 1,000 women

These rates account for differences in the number of men and women in the work force, and comparing them suggests that the rate per 1,000 of reported muscles and skeleton disorders among men is only slightly greater than that of women. They are called **crude rates** because they do not account for differences between men and women with regard to age, occupation, and other factors that might affect the individual's risk of having a muscle and skeleton disorder. Not all age groups are equally susceptible to various diseases and injuries, so epidemiologists often take age into account when calculating rates. For example, figure 16 shows that injury and poisoning rates vary not only by occupation but also by both age and gender. Because these differences can be dramatic, age-specific rates for workers under age 40 and those age 40 and older are presented in this section of the report. Definitions of **diagnostic rates** and **age-specific rates** appear in the Glossary of this report.

sure), ischemic heart disease (including restricted blood flow through an artery and heart attack), or irregular heart beat (appendix F). Two diagnoses for heart/circulatory disease among women both occurred in the 50-59 age group. One diagnosis was for ischemic heart disease and the other for congestive heart failure (appendix F). Workers in the technical and bargaining units groups showed the highest rates of heart/circulatory disease (figure 16, appendix H). Workers in the bargaining units group were 6 times more likely to report a heart/circulatory diagnosis than workers in other occupational groups (appendix J). The higher rates observed in technical and bargaining unit workers may reflect a combination of factors, perhaps including differences in lifestyle that may increase the risk of heart disease, but it is likely that at least part of the explanation lies in different completeness of reporting by various occupational groups. At all of the DOE sites participating in epidemiologic surveillance, hourly workers and those who are supervised more closely are more likely to report through the medical department than are workers who work more independently with less supervision. Another possible reason is that an illness involving the heart or circulatory system may preclude a worker returning to work quickly if his or her job is physically demanding, but a worker whose tasks are not physically demanding may be able to return to work much sooner, perhaps before five days of absence have accrued.

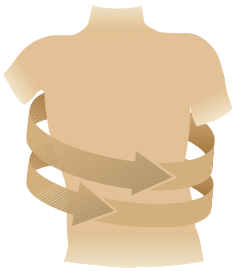
The lung/respiratory category contains very different kinds of diseases: acute infectious diseases such as colds, influenza, and pneumonia; allergies, sinusitis, and bronchitis; and chronic diseases like asthma and emphysema. Sixty-nine percent of the lung/respiratory diagnoses involved acute infections, influenza, or pneumonia (appendix H). Women generally had higher rates of lung/respiratory disease than men, a pattern that has been noted frequently at the DOE sites participating in epidemiologic surveillance. The bargaining units group showed the highest rates of lung/respiratory diagnoses for both men and women (figure 16). Respiratory disease risk among bargaining units workers was almost 8 times higher than other occupational groups. Workers in the technical group were almost 4 times more likely to report a respiratory condition than other occupational groups (appendix J). The increased risk reflected an increase in all types of respiratory diseases, not any one in particular (appendix H).

In the injury and poisoning category, none of the 78 diagnoses involved poisoning, so this category really focuses on injuries. Injury rates were generally higher among younger workers than older workers (figure 16). The types of injuries reported were similar for both men and women. Three types of injuries accounted for the majority of the diagnoses: sprains and strains (45%), bruises (14%), and fractures (14%). The higher injury rates among women in the bargaining units group were based on eight diagnoses, of which four were sprains and strains (appendix H). There were six sprains and strains among all women in 1995.

The bargaining unit workers as a whole were about 5 times more likely to report an injury and poisoning diagnosis than were other occupational groups. They were almost 6 times more likely to report back sprains and strains and 15 times more likely to report other sprains and strains (appendix J). Eight (57%) of the 14 back sprains and strains and 16 (76%) of the other sprains and strains reported were among the bargaining units workers, who made up 17% of the work force (figure 3, appendix H). Technical support/supervisory (NE) workers were about 4 times more likely to report back sprains and strains than were other occupational groups (appendix J). Four (29%) of the 14 back sprains and strains reported were among the technical support/supervisory (NE) workers, who made up 9% of the work force (figure 3, appendix H).

Figure 15. Rates per 1,000 for All Diagnostic Categories Combined by Gender, Age, and Occupation

All Diagnostic Categories

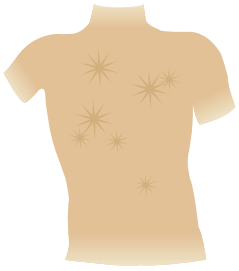


Occupational Group	Age	Rate per 1,000 Men	Rate per 1,000 Women
Management, Administrative, and Clerical	<40	26	99
	40+	41	66
Scientific	<40	0	49
	40+	14	0
Professional	<40	12	27
	40+	22	0
Technical	<40	114	136
	40+	176	190
Bargaining Units	<40	290	393
	40+	383	389
Miscellaneous	<40	0	0
	40+	0	0

Figure 16. Rates per 1,000 for Selected Diagnostic Categories by Gender, Age, and Occupation

Diagnostic Category

Cancer



Occupational Group	Age	Rate per 1,000 Men	Rate per 1,000 Women
Management, Administrative, and Clerical	<40	0	0
	40+	0	0
Scientific	<40	0	0
	40+	0	0
Professional	<40	0	0
	40+	3	0
Technical	<40	0	0
	40+	4	0
Bargaining Units	<40	0	0
	40+	0	0
Miscellaneous	<40	0	0
	40+	0	0

(continued)

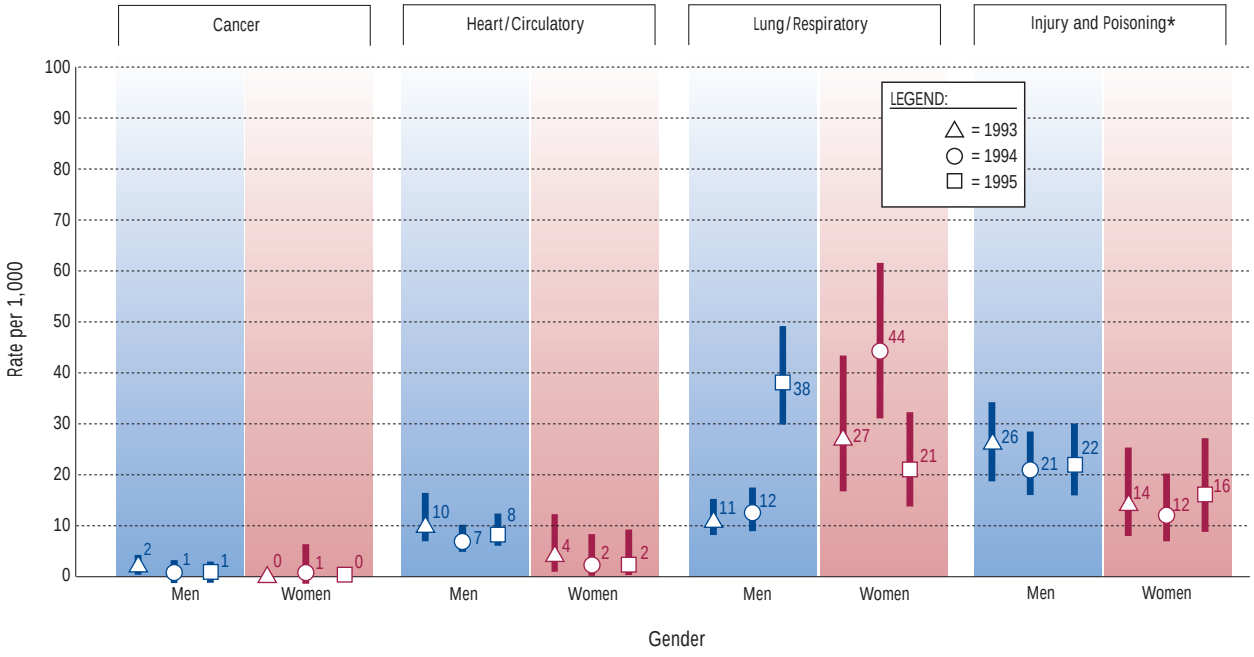
Figure 16 (continued). Rates per 1,000 for Selected Diagnostic Categories by Gender, Age, and Occupation

Diagnostic Category	Occupational Group	Age	Rate per 1,000 Men	Rate per 1,000 Women
Heart/Circulatory	Management, Administrative, and Clerical	<40	0	0
		40+	0	0
	Scientific	<40	0	0
		40+	5	0
	Professional	<40	0	0
		40+	3	0
	Technical	<40	0	0
		40+	18	48
	Bargaining Units	<40	5	0
		40+	50	19
	Miscellaneous	<40	0	0
		40+	0	0
Lung/Respiratory	Management, Administrative, and Clerical	<40	0	42
		40+	0	3
	Scientific	<40	0	0
		40+	0	0
	Professional	<40	0	27
		40+	6	0
	Technical	<40	46	0
		40+	55	0
	Bargaining Units	<40	81	89
		40+	125	130
	Miscellaneous	<40	0	0
		40+	0	0
Injury and Poisoning	Management, Administrative, and Clerical	<40	26	10
		40+	12	9
	Scientific	<40	0	0
		40+	2	0
	Professional	<40	4	0
		40+	6	0
	Technical	<40	33	45
		40+	23	0
	Bargaining Units	<40	105	71
		40+	46	74
	Miscellaneous	<40	0	0
		40+	0	0

Time Trends

Over the three-year period, the rates of cancer, heart/circulatory and lung/respiratory conditions, and injury and poisoning did not change for women. Among men, this was also true with one exception—lung/respiratory conditions. In 1995, the rate of lung/respiratory conditions increased significantly from 1993 and 1994. This increase resulted from an increase in acute respiratory infections, especially diagnoses for sore throat and laryngitis.

Figure 17. Age-Adjusted Rates for Selected Diagnostic Categories by Gender, 1993 to 1995



*For 1993, rate based on external causes of injury data; for 1994 and 1995, rate based on injury and poisoning data.

Occupational Sentinel Health Events

An occupational sentinel health event (SHEO) is a disease, disability, or injury whose occurrence may serve as a warning signal that workplace conditions may need to be changed or additional attention may be required to reduce its occurrence. Injuries and poisonings resulting from accidents in the workplace as well as 64 disease conditions have been identified as SHEOs from studies of workplace exposures and disease in many different industries (appendix K). Although SHEOs may indicate an occupational exposure, many SHEOs can also result from non-occupational exposures or may reflect the combined effects of both occupational and nonoccupational exposures. Because the occupational status of many SHEOs is uncertain, we assess them in the following three categories (appendix K has additional information about what diseases and conditions are included in each SHEO).

Definitely SHEOs: Consists of diseases that are unlikely to occur in the absence of an occupational exposure. Asbestosis, a lung condition resulting from exposure to asbestos, is an example of this group.

Possibly SHEOs: Includes such conditions as lung cancer and carpal tunnel syndrome, which may or may not be related to occupation. Additional information about the person's hobbies, personal habits, and work history are required to establish a link between disease and occupation. For example, lung cancer can result from asbestos exposure as well as smoking. Carpal tunnel syndrome may result from a job requiring typing or from a hobby such as playing piano.

Accidents: Includes all types of on-the-job accidents and resulting health conditions. Accidents specifically identified as occurring in the home, on the farm, or during recreation are excluded.

We identified 28 of the 301 health events (9%) reported in 1995 as SHEOs, and 24 of the SHEOs involved accidents (figures 18 and 19). Fourteen accidents were specifically indicated as occurring in the workplace. A total of 254 workdays were missed as a result of these workplace accidents; almost half (43%) of the accidents occurred in workers in the 40-49 age group; over half (57%) occurred in the bargaining units group. Of the four SHEOs that did not result from a specific accident, one involved carpal tunnel syndrome. This BNL worker, who was in the 50-59 age group and the technical support/supervisory (E) group, missed a total of 29 days due to this diagnosis.

Figure 18. Characteristics of Health Events for SHEOs and Days Absent by Gender

		Total Number of Workers	Total Number of Health Events	Total Number of Health Conditions	Total Number of Days Absent
Men	Definite	10	11	14	225
	Possible	3	4	4	122
	Accident	10	10	11	277
	Total	**23**	**25**	**29**	**624**
Women	Definite	3	3	3	29
	Possible	0	0	0	0
	Accident	0	0	0	0
	Total	**3**	**3**	**3**	**29**

Figure 19. Number of Accidents by Gender, Age, and Occupation*

	Age Group - Men					Age Group - Women		
Occupation	16-29	30-39	40-49	50-59	60+	30-39	40-49	Total
Professional			1					1
Administrative (NE)					1			1
Tech Support/ Supv (NE)		1	4					5
Technical	1		1	1	1			4
Bargaining Units	2	4	3	1		1	2	13
Total	**3**	**5**	**9**	**2**	**2**	**1**	**2**	24

*Blank space is equal to zero.

Disability Among Active Workers

At BNL, a worker is placed on long-term disability when absent six months. Thirty-six workers were placed on long-term disability in 1995 (figure 20). Information about the medical reason for the disability was available for 32 of the 36 workers. Among these 32 workers, 8 were on disability for back disorders; 7 for cancer; 4 for heart disease, 3 for diabetes; 2 each for mental disorders and sprains and strains; and 1 each for arthritis, connective tissue disease, fracture, kidney stones, phlebitis, and stroke. The sites of the 7 cancers were 2 each of breast and lung, and 1 each of bladder, pancreas, and leukemia. While workers aged 50 to 59 made up 23% and workers aged 60+ made up 9% of the work force, 50-59 year olds accounted for 36% and 60+ year olds for 25% of the disabled workers.

Two women and two men who went on disability in 1995 died before the end of the year. The causes of death were leukemia, lung cancer, heart disease, and a stroke. These were also the reasons each worker went on disability, except for the one death from heart disease. The reason for the disability was not reported for this worker. Because these deaths occurred among workers who were on disability, they are not included in the Deaths Among Active Workers section of this report. Disabled workers were excluded from other analyses that focus on active workers. BNL did not report disability data in 1993 or 1994.

Figure 20. Workers Placed on Long-Term Disability by Gender, Age, and Occupation*

	Age Group - Men					Age Group - Women				
Occupation	16-29	30-39	40-49	50-59	60+	16-29	30-39	40-49	50-59	Total
Management				1						1
Scientific					1					1
Professional					1				1	2
Administrative (E)		1						1		2
Tech Support/ Supv (E)		1		2	1					4
Administrative (NE)							1	1		2
Tech Support/ Supv (NE)					1					1
Clerical and Support Wage							1	1		2
Technical								1	1	2
Bargaining Units	1	2	2	7	5	1			1	19
Total	1	4	2	10	9	1	2	4	3	36

*Blank space is equal to zero.

Deaths Among Active Workers

During 1995, all five deaths that occurred among active workers were men. As in 1993 and 1994, the predominant causes of death were cancer and heart disease. Four deaths were due to heart/circulatory disease and the other to cancer of the bladder. All three deaths that occurred in the 40-49 age group were the result of heart disease. These men were all in different occupational groups (figure 21).

Figure 21. Active Workers Who Died by Gender, Age, and Occupation*

Occupational Group	Age Group - Men		
	40-49	50-59	60+
Scientific			1
Professional	1		
Tech Support/ Supv (E)	1		
Tech Support/ Supv (NE)		1	
Miscellaneous	1		
Total	**3**	**1**	**1**

*Blank space is equal to zero.

OSHA-Recordable Events

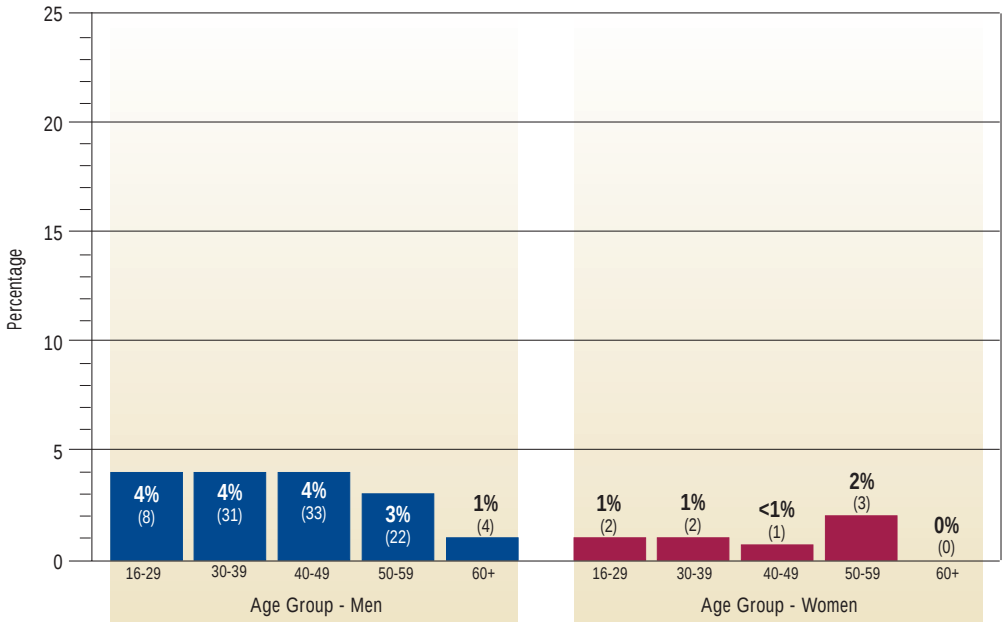
The Occupational Safety and Health Administration (OSHA) requires employers to maintain a record of occupational injuries and illnesses occurring among employees and to make that information available to OSHA on request. Employers maintain the information from these OSHA-recordable events in the OSHA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

The percentage of men with an OSHA event was four times greater (4%) than for women (1%) in 1995. The occurrence of OSHA-recordable injuries did not appear to be related to age except for the 60+ group (figure 22). Workers in the oldest age group had a lower occurrence of OSHA-recordable events than the younger age groups. The average number of workdays lost or with restricted activity was similar for women (10.5 days) and men (9.6 days) (figure 24).

With the exception of men and women in the technical support/supervisory (NE) and technical groups and men in the bargaining units group, no more than 2% of the workers in any occupational group had an OSHA event. For men and women combined, the bargaining units (10.8%), technical (6.9%), and technical support/supervisory (NE) (5.1%) groups had the highest percentages of workers with an OSHA event (figures 23). Men in the bargaining units group (12.7%) had the highest percentage of workers with an OSHA-recordable event among all occupational groups.

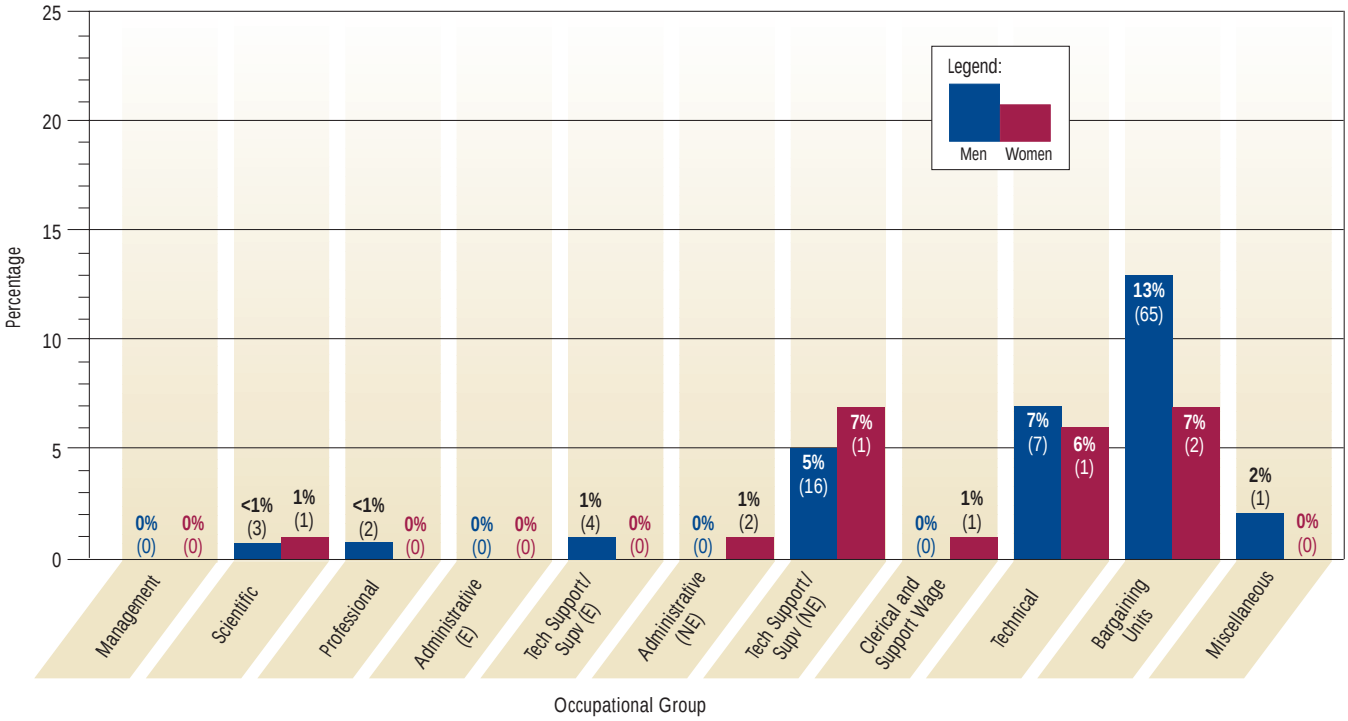
The average number of days lost or restricted was quite low for most occupational groups (figure 25). Technical support/supervisory (NE) workers had the highest average number of workdays lost or with restricted activity (17.7 days). The administrative (NE) (12.5 days) and bargaining units groups (9.6 days) also had a high average number of workdays lost or with restricted activity. Among the administrative (NE) group, this number represents two OSHA events: One worker had 11 days lost and the other 14 days lost (figure 25). Appendices L-N contain more detailed data about the number of OSHA events and days of work lost or with restricted activity for men and women in different age and occupational groups.

Figure 22. Workers with at Least One OSHA Event by Gender and Age*



*Numbers in parentheses represent the number of workers with at least one event.

Figure 23. Workers with at least One OSHA Event by Gender and Occupation*



*Numbers in parentheses represent the number of workers with at least one event.

Figure 24. Lost and Restricted Workdays by Gender and Age

Men

Age Group	Total Number of Days Lost/Restricted	Total Number of OSHA Events	Average Number of Days Lost/Restricted
16-29	40	8	5.0
30-39	415	34	12.2
40-49	309	35	8.8
50-59	235	23	10.2
60+	2	4	0.5
Total	**1,001**	**104**	**9.6**

Women

Age Group	Total Number of Days Lost/Restricted	Total Number of OSHA Events	Average Number of Days Lost/Restricted
16-29	14	2	7.0
30-39	52	2	26.0
40-49	11	1	11.0
50-59	7	3	2.3
60+	0	0	0.0
Total	**84**	**8**	**10.5**

Figure 25. Lost and Restricted Workdays by Gender and Occupation

Men

Occupation	Total Number of Days Lost/Restricted	Total Number of OSHA Events	Average Number of Days Lost/Restricted
Management	0	0	0.0
Scientific	0	3	0.0
Professional	1	2	0.5
Administrative (E)	0	0	0.0
Tech Support/ Supv (E)	0	4	0.0
Administrative (NE)	0	0	0.0
Tech Support/ Supv (NE)	318	17	18.7
Clerical and Support Wage	0	0	0.0
Technical	49	7	7.0
Bargaining Units	630	70	9.0
Miscellaneous	3	1	3.0
Total	**1,001**	**104**	**9.6**

Women

Occupation	Total Number of Days Lost/Restricted	Total Number of OSHA Events	Average Number of Days Lost/Restricted
Management	0	0	0.0
Scientific	0	1	0.0
Professional	0	0	0.0
Administrative (E)	0	0	0.0
Tech Support/ Supv (E)	0	0	0.0
Administrative (NE)	25	2	12.5
Tech Support/ Supv (NE)	0	1	0.0
Clerical and Support Wage	0	1	0.0
Technical	0	1	0.0
Bargaining Units	59	2	29.5
Miscellaneous	0	0	0.0
Total	**84**	**8**	**10.5**

Diagnostic and Accident Categories for OSHA-Recordable Events

Over 80% of the health conditions reported were for injury and poisoning. Sprains and strains were the most common type of OSHA-recordable injury (41%) among men and women. This type of injury accounted for four of the nine injury diagnoses reported among women. Open wounds were also reported relatively frequently. Twenty-eight percent of the OSHA injuries reported by men were open wounds (figures 26, 29, 30, and 32). Sixteen (55%) of the 29 open wounds were on the fingers.

Seven OSHA events were not the result of a specific accident. Four of these events had diagnoses related to the muscles and skeleton, with two diagnoses of back problems and one each for arthritis and rheumatism.

Figure 26. Health Conditions by Gender and Diagnostic Category*

Diagnostic Category	Total Number of Health Conditions Reported	
	Men	Women
Digestive	1	
Endocrine/Metabolic	2	
Heart/Circulatory	1	
Muscles and Skeleton	12	1
Nervous System		1
Skin	1	
Unspecified Symptoms	5	
Injury and Poisoning	105	9
• Fractures - Upper Limb	2	1
• Back Sprains and Strains	26	3
• Other Sprains and Strains	17	1
• Internal Injuries - Thorax, Abdomen, Pelvis	1	
• Open Wounds - Head, Neck, Trunk	6	
• Open Wounds - Upper Limb	21	1
• Open Wounds - Lower Limb	2	
• Superficial Injuries	5	1
• Bruises	9	2
• Foreign Bodies Entering Orifice	3	
• Injuries to Nerves and Spinal Cord	1	
• Unspecified Injuries	9	
• Adverse Reactions to Non-medical Substances	2	
• Adverse Reactions to External Causes	1	

*Blank space is equal to zero.

The type of accident was not reported for 6 of the 105 OSHA events that resulted from an accident. Among the 99 OSHA-recordable events that included a description of the accident, the types of accidents reported most were "other" accidents (74%) and falls (16%) (figure 27 and appendix U). Of the 73 other accidents, 47% involved overexertion and strenuous movements, and 29% involved cutting or piercing instruments or objects (figure 28). Except for falls, the type of accident did not appear systematically related to age (figure 31) or occupational category (figure 33). Falls were more common among women in the 40-49 and 50-59 age groups and among men less than 50 years old. They were a significant contributor of lost and restricted workdays (figure 27). For both men and women, workers in the technical support/supervisory (NE) and bargaining units groups reported falls more often than other occupational groups. Among the 16 falls, 11 resulted from tripping or slipping.

Figure 27. Types of Accidents and the Number of Lost or Restricted Workdays by Gender*

	Men			Women		
Accident Category	Number of Accidents	Number of Days Restricted	Number of Days Lost	Number of Accidents	Number of Days Restricted	Number of Days Lost
Motor Vehicle Traffic	1	10	6			
Motor Vehicle Nontraffic	1		1			
Poisoning - Nonmedicinal	2	1	1			
Falls	13	104	117	3	3	15
Natural/Environmental Factors	3					
Submersion/Suffocation/Foreign Bodies	3		1			
Other Accidents	69	229	265	4	10	56

*Blank space is equal to zero.

Figure 28. Types and Number of Accidents that Occurred Within the Category of Other Accidents by Gender*

	Total Number of Accidents Reported	
Other Accidents	Men	Women
Caught In or Between Objects		1
Cutting/Piercing Instrument/Object	20	1
Explosion of a Pressure Vessel	1	
Explosive Material	1	
Machinery Accident	1	
Overexertion and Strenuous Movements	32	2
Struck by an Object	14	

*Blank space is equal to zero.

Figure 29. Injuries Associated with Each Type of Accident by Gender*

Type of Injury	Type of Accidents — Men							Type of Accidents — Women	
	Motor Vehicle Traffic	Motor Vehicle Nontraffic	Poisoning - Non-medicinal	Falls	Natural / Environmental Factors	Submersion / Suffocation / Foreign Bodies	Other Accidents	Falls	Other Accidents
Fractures - Upper Limb				1			1		1
Back Sprains and Strains				2			21	1	2
Other Sprains and Strains		1		5			10	1	
Internal Injuries - Thorax, Abdomen, Pelvis							1		
Open Wounds - Head, Neck, Trunk				3			3		
Open Wounds - Upper Limb				1			20		1
Open Wounds - Lower Limb							1		
Superficial Injuries				1	2		1	1	
Bruises							8	2	
Foreign Bodies Entering Orifice						3			
Injuries to Nerves and Spinal Cord							1		
Unspecified Injuries	1			2			4		
Adverse Reactions to Nonmedical Substances			2						
Adverse Reactions to External Causes					1				

*Blank space is equal to zero.

Figure 30. Three Diagnostic Categories Reported Most Often by Gender and Age

		16-29	30-39	40-49	50-59	60+
Men	Most Common Diagnostic Category	Sprains and Strains	Sprains and Strains	Sprains and Strains	Open Wounds	Open Wounds
	Second Most Common Diagnostic Category	Muscles and Skeleton; Fractures-Upper Limb	Open Wounds; Bruises	Open Wounds	Sprains and Strains	Sprains and Strains
	Third Most Common Diagnostic Category	Open Wounds (1)	Unspecified Injuries (1)	Muscles and Skeleton; Superficial Injuries	(2)	None
Women	Most Common Diagnostic Category	Sprains and Strains	Nervous System	Muscles and Skeleton	Bruises	None
	Second Most Common Diagnostic Category	Open Wounds (1)	Sprains and Strains (1)	Sprains and Strains (1)	Fractures-Upper Limb; Sprains and Strains	None
	Third Most Common Diagnostic Category	None	None	None	Superficial Injuries (1)	None

(1) This diagnostic category was reported the same number of times as the one above it.
(2) More than two diagnostic categories tied.

Figure 31. Three Accident Categories Reported Most Often by Gender and Age

		16-29	30-39	40-49	50-59	60+
Men	Most Common Accident Category	Other Accidents	Other Accidents	Other Accidents	Other Accidents	Other Accidents
	Second Most Common Accident Category	Falls	Falls	Falls	None	None
	Third Most Common Accident Category	None	Submersion/ Suffocation/Foreign Bodies	Natural/ Environmental Factors	None	None
Women	Most Common Accident Category	Other Accidents	Other Accidents	Falls	Falls	None
	Second Most Common Accident Category	None	None	None	Other Accidents	None
	Third Most Common Accident Category	None	None	None	None	None

Figure 32. Three Diagnostic Categories Reported Most Often by Gender and Occupation

		Management	Scientific	Professional	Administrative (E)	Tech Support/ Supv (E)	Administrative (NE)
Men	Most Common Diagnostic Category	None	Open Wounds	Sprains and Strains	None	Open Wounds	None
	Second Most Common Diagnostic Category	None	Fractures	Open Wounds	None	None	None
	Third Most Common Diagnostic Category	None	None	None	None	None	None
Women	Most Common Diagnostic Category	None	Fractures - Upper Limb	None	None	None	Sprains and Strains
	Second Most Common Diagnostic Category	None	None	None	None	None	Muscles and Skeleton
	Third Most Common Diagnostic Category	None	None	None	None	None	None

		Tech Support/ Supv (NE)	Clerical and Support Wage	Technical	Bargaining Units	Miscellaneous
Men	Most Common Diagnostic Category	Sprains and Strains	None	(2)	Sprains and Strains	Sprains and Strains
	Second Most Common Diagnostic Category	Open Wounds	None	None	Open Wounds	None
	Third Most Common Diagnostic Category	Muscles and Skeleton; Unspecified Symptoms	None	None	Muscles and Skeleton	None
Women	Most Common Diagnostic Category	Sprains and Strains	Nervous System	Open Wounds	Sprains and Strains	None
	Second Most Common Diagnostic Category	Bruises (1)	None	None	Superficial Injuries (1)	None
	Third Most Common Diagnostic Category	None	None	None	Bruises (1)	None

(1) This diagnostic category was reported the same number of times as the one above it.
(2) More than two diagnostic categories tied.

Figure 33. Three Accident Categories Reported Most Often by Gender and Occupation

		Management	Scientific	Professional	Administrative (E)	Tech Support / Supv (E)	Administrative (NE)
Men	Most Common Accident Category	None	Other Accidents	Other Accidents	None	Other Accidents	None
	Second Most Common Accident Category	None	Falls	None	None	None	None
	Third Most Common Accident Category	None	None	None	None	None	None
Women	Most Common Accident Category	None	Other Accidents	None	None	None	Falls
	Second Most Common Accident Category	None	None	None	None	None	Other Accidents (1)
	Third Most Common Accident Category	None	None	None	None	None	None

		Tech Support / Supv (NE)	Clerical and Support Wage	Technical	Bargaining Units	Miscellaneous
Men	Most Common Accident Category	Other Accidents	None	Other Accidents	Other Accidents	Other Accidents
	Second Most Common Accident Category	Falls	None	Motor Vehicle Traffic; Poisoning - Nonmedicinal	Falls	None
	Third Most Common Accident Category	Submersion / Suffocation / Foreign Bodies	None	Submersion / Suffocation / Foreign Bodies (1)	Natural / Environmental Factors	None
Women	Most Common Accident Category	Falls	None	Other Accidents	Falls	None
	Second Most Common Accident Category	None	None	None	Other Accidents (1)	None
	Third Most Common Accident Category	None	None	None	None	None

(1) This accident category was reported the same number of times as the one above it.

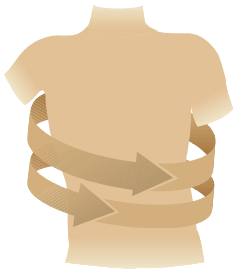
Rates of OSHA-Recordable Events

Overall, men in the bargaining units, technical, and miscellaneous groups had the highest rates for all occupational health conditions combined. Among women, bargaining units and technical workers had the highest rates (figure 34). Most of the OSHA health conditions involved occupational injuries. When the category of injury and poisoning was considered separately, the bargaining units group had the highest rate for men and the technical group for women (figure 35). Occupational injuries were responsible for 442 days of restricted activity and 643 days lost from work. For both men and women, the bargaining units had the most lost and restricted workdays (appendix N). This occupational group accounted for 17% of the work force but reported 64% of the OSHA-recordable events. They were responsible for 55% of the restricted workdays and 70% of the lost workdays.

Bargaining units workers were at a 8.3 times higher risk than other workers for injury and poisoning (appendix W). Their risk of sprains and strains was at least 12.5 times higher than other workers. Thirty-five of the 47 sprains and strains reported in the work force occurred among bargaining unit workers (appendix S). They were also at almost five times greater risk of open wounds to the arm and hand and over 10 times greater risk of bruises. Fifty-five percent of the open wounds to the arm and hand and 73% of the bruises were recorded in this occupational group. In comparison with other occupational groups, the bargaining units workers are at greater apparent risk for occupational injuries. The magnitude of this risk could be exaggerated if there is substantial underreporting of occupational injuries among other workers, but injuries among the bargaining unit workers are worthy of more evaluation. Additional analysis may identify subgroups within the bargaining units workers who are at particular risk, or may reveal opportunities for injury reduction efforts that could contribute to a reduction in injury rates, lower health care costs, and improved productivity among these workers.

Figure 34. Rates per 1,000 for all Diagnostic Categories Combined by Gender, Age, and Occupation

All Diagnostic Categories

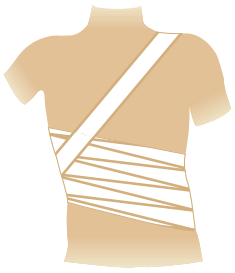


Occupational Group	Age	Rate per 1,000 Men	Rate per 1,000 Women
Management, Administrative and Clerical	<40	0	10
	40+	0	6
Scientific	<40	12	0
	40+	5	34
Professional	<40	0	0
	40+	6	0
Technical	<40	42	45
	40+	47	95
Bargaining Units	<40	171	18
	40+	158	37
Miscellaneous	<40	0	0
	40+	143	0

Figure 35. Rates per 1,000 for Injury and Poisoning by Gender, Age, and Occupation

Diagnostic Category

Injury and Poisoning



Occupational Group	Age	Rate per 1,000 Men	Rate per 1,000 Women
Management, Administrative and Clerical	<40	0	5
	40+	0	3
Scientific	<40	12	0
	40+	5	34
Professional	<40	0	0
	40+	6	0
Technical	<40	36	45
	40+	33	95
Bargaining Units	<40	148	18
	40+	132	37
Miscellaneous	<40	0	0
	40+	143	0

Glossary

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

Age-Adjusted Rate: A rate that has been mathematically adjusted to account for the effects of differences in the age composition between groups. This allows one rate per group to be compared.

Age-Specific Rate: A rate that is calculated for a group that is a specific age (e.g., 16 to 29 years old). Only people in the specific age group are included in the calculation of the rate. The purpose of calculating age-specific rates is to identify differences in the rate that occur as the age changes. Any differences that are related to age can be seen by comparing age-specific rates for the different age groups.

Confidence Interval: A mathematical procedure used to determine in what range the true value of an event is likely to be. The width of the confidence interval (i.e., how wide the range is) is affected by the size of the group being studied and how often the event whose true value is sought occurs. Generally, as the size of the group or the frequency of the event increases, the width of the confidence interval decreases. The level of confidence, for example a 95% confidence level, indicates the percentage (e.g., 95%) of time that the true value is expected to fall within the confidence interval if the mathematical procedure is repeated 100 times.

Demographics: Characteristics of human populations related to their size, density, distribution, and health.

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

Diagnosis Rate: The number of occurrences of a given disease or health condition observed among DOE workers during a given time period per 1,000 DOE workers at risk of getting that disease during the time period. It is calculated as follows (using 1995 as the time period):

$$\text{Diagnosis rate for a disease during 1995 (per 1,000 DOE workers)} = \frac{\text{Number of occurrences of the disease reported during 1995}}{\text{Number of DOE workers at risk for the disease during 1995}} \times 1{,}000$$

Diagnostic Category: A particular type of disease, a group of related health conditions, or diseases that all affect the same organ system. Cancer is an example of a diagnostic category that contains a particular type of disease, and pregnancy/childbirth is an example of one that contains a group of related health conditions. Lung/respiratory is an example of a diagnostic category that contains diseases that all affect the same organ system.

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

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

Health Condition: A specific disease or medical condition. Health conditions are grouped together to form diagnostic categories. Tuberculosis is a specific disease that is part of the diagnostic category of infections/parasites. A fractured arm is a specific health condition included in the diagnostic category of injury and poisoning.

Health Event: An absence from work that lasted at least five consecutive workdays.

ICD-9-CM Code: An abbreviation for the *International Classification of Diseases, Ninth Revision, Clinical Modification*. It is internationally accepted as a standardized system for the classification of disease and health data collected from medical records and is useful to describe the disease and health characteristics of a population.

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

OSHA Event: An abbreviation used throughout this report for an OSHA-recordable event.

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

Person-Year: A unit of measurement combining the number of people being studied with the time that each was observed equivalent to one person followed for one year. For example, 5 persons followed for one year contribute five person-years, as do 10 people each followed for half a year. In the epidemiologic surveillance reports, rates are often expressed as the number of events per 1,000 person-years.

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

Explanation of Diagnostic Categories

Throughout this report, health conditions have been grouped into a number of diagnostic categories which come from the *International Classification of Diseases* (ICD-9-CM). For the text of this report the categories are abbreviated to make the report easier to read. In the appendixes a different set of abbreviations was used for the categories. These names are the same as the ones used in previous annual reports. The table that begins on the next page lists the categories in numeric order according to ICD-9-CM and gives examples of common diseases included in each category. The last column of the table below links the category names in the reports and the appendixes to the table that begins on the next page.

Diagnostic Categories Used in This Report	Diagnostic Categories Used in the Appendix and Previous Annual Reports	ICD-9-CM Codes
Benign Growths	Benign and Other Neoplasms	210-229,235-239
Blood	Blood and Blood Forming Organs	280-289
Cancer	Malignant Neoplasms	140-208,230-234
Digestive	Digestive System	520-579
Endocrine/Metabolic	Endocrine and Metabolic Diseases	240-279
Existing Birth Condition	Congenital Anomalies	740-759
Genitourinary	Genitourinary System	580-629
Heart/Circulatory	Circulatory System	390-459
Infections/Parasites	Infectious and Parasitic Diseases	001-139
Injury and Poisoning	Injury and Poisoning	800-999
Lung/Respiratory	Respiratory System	460-519
Mental	Mental Disorders	290-319
Muscles and Skeleton	Musculoskeletal System	710-739
Nervous System	Nervous System and Sense Organs	320-389
Pregnancy/Childbirth	Pregnancy and Childbirth	630-676
Skin	Skin and Subcutaneous Tissue	680-709
Unspecified Symptoms	Symptoms, Signs and Ill-Defined Conditions	780-799

Categories and Subcategories of Diagnoses	ICD-9-CM Codes	Diseases
All conditions	001-V82	All reported health events
Infectious and parasitic diseases	001-139	Diseases caused by bacteria, viruses, and parasites
• Intestinal infections	001-009	Infections of the bowel or gut
• Tuberculosis	010-018	TB in the lungs and other organs
• Zoonotic bacterial diseases	020-027	Bacterial diseases that animals transmit to humans
• Other bacterial diseases	030-041	Whooping cough, diphtheria, strep throat, and gangrene
• Human Immunodeficiency Virus (HIV) infection	042	AIDS
• Poliomyelitis and other nonarthropod diseases of central nervous system	045-049	Viral meningitis (swelling of the layers covering the brain and spinal cord); viral encephalitis (swelling of the brain); and polio
• Viral diseases accompanied by exanthem	050-057	Diseases accompanied by rashes or blisters like chickenpox, measles, shingles, and herpes
• Arthropod-borne viral diseases	060-066	Encephalitis (swelling of the brain) caused by bites from virus-carrying ticks or mosquitoes
• Other diseases caused by viruses and chlamydiae	070-079	Viral hepatitis, mumps, rabies, and mononucleosis
• Rickettsioses and other arthropod-borne diseases	080-088	Rocky Mountain spotted fever, malaria, and lyme disease
• Other spirochetal diseases	100-104	Trench mouth and Weil's disease (jaundice caused by coil-shaped bacteria)
• Mycoses	110-118	Athlete's foot; fungal infections of fingernails and toenails; and thrush
• Helminthiases	120-129	Pinworms, tapeworms, roundworms, whipworms
• Other infectious and parasitic diseases	130-136	Lice, chiggers, scabies, and mites
• Late effects of infectious or parasitic diseases	137-139	Side effects of TB, chickenpox, or polio even though the disease is no longer active
Malignant neoplasms	140-208, 230-234	All cancers, regardless of the part of the body affected
• Lip, oral cavity, and pharynx	140-149	Lip, mouth, throat, and tongue
• Digestive organs and peritoneum	150-159	Cancers of the stomach, esophagus (tube that transports food to the stomach), intestines, colon, rectum, anus, liver, pancreas, and gallbladder
• Respiratory system and intrathoracic organs	160-165	Sinuses, throat, voice box, lungs, and heart
• Bone, connective tissue, and skin	170-173	Bone, muscle, ligament, tendon, blood vessels, fat, and skin
• Genitourinary organs	179-189	Cervix, uterus, prostate, kidney, and bladder
• Other and unspecified sites	190-199	Eye, brain, and thyroid
• Lymphatic and hematopoietic tissue	200-208	Leukemia, lymphoma, Hodgkin's disease, multiple myeloma, lymphosarcoma, and reticulum cell sarcoma
• Carcinoma in situ	230-234	A cancer that is confined to the site of origin (has not spread to neighboring tissue)
Benign neoplasms and neoplasms of uncertain behavior and unspecified nature	210-229, 235-239	Tumors that are not cancerous or do not exhibit cancerous behavior, regardless of the part of the body affected
Endocrine, nutritional, and metabolic diseases and disorders of the immune system	240-279	Diseases affecting the hormone secreting glands and organs. Overactive thyroid; underactive thyroid; vitamin deficiency; diabetes; gout; and problems affecting the antibody producing system
Disorders of the blood and blood forming organs	280-289	Anemia and hemophilia (excludes leukemia)
Mental disorders	290-319	Psychiatric diagnoses - Nonpsychotic disorders: depression; anxiety, fear, and stress disorders; alcoholism; drug dependence; and eating disorders, such as anorexia; Psychotic disorders: dementia, schizophrenia, and manic depression
Diseases of the nervous system and sense organs	320-389	Huntington's chorea; Alzheimer's and Parkinson's disease; epilepsy; multiple sclerosis; migraine; diseases of the eye, such as cataract and glaucoma
• Inflammatory diseases of the central nervous system	320-326	Bacterial meningitis (swelling of the layers covering the brain and spine); bacterial encephalitis (swelling of the brain); and brain and spinal abscesses

(continued)

Categories and Subcategories of Diagnoses	ICD-9-CM Codes	Diseases
• Hereditary and degenerative diseases of the central nervous system	330-337	Alzheimer's and Parkinson's disease, tremors, and Huntington's chorea
• Other disorders of the central nervous system	340-349	Multiple sclerosis (MS), cerebral palsy, epilepsy, and migraine
• Disorders of the peripheral nervous system	350-359	Nerve disorders of the face, carpal tunnel syndrome, muscular dystrophy
• Disorders of the eye	360-379	Inflammation and ulcers of the eye and eyelid; detached retina; pink eye; problems with tear ducts; glaucoma; and cataracts
• Diseases of the ear and mastoid process	380-389	Infections of the outer, middle, or inner ear; ringing of the ears; hearing loss
Diseases of the circulatory system	390-459	Rheumatic fever, heart murmurs, heart attacks, angina, hardening of the arteries, varicose veins, hemorrhoids, and phlebitis
• Acute rheumatic fever	390-392	High fever and joint pain with possible heart damage
• Chronic rheumatic heart disease	393-398	Long lasting swelling and damage to the heart which results from rheumatic fever
• Hypertensive disease	401-405	High blood pressure
• Ischemic heart disease	410-414	Heart attack and angina
• Diseases of pulmonary circulation	415-417	Blood clots in the lung and pulmonary aneurysm (bulge that develops in the wall of the pulmonary artery, which is the artery that carries blood to the lungs)
• Other forms of heart disease	420-429	Swelling of the inner lining, middle lining, or sac enclosing the heart; heart failure; and irregular heartbeat
• Cerebrovascular disease	430-438	Stroke, bleeding in the brain, and blockage or low blood flow in blood vessels of the brain
• Diseases of the arteries and capillaries	440-448	Hardening of the arteries; aneurysm (bulge that develops in the walls of arteries); and blood clots
• Diseases of the veins, lymphatics, and other	451-459	Phlebitis (swelling of a vein) and thrombophlebitis (swelling of a vein which has a blood clot)
Diseases of the respiratory system	460-519	Colds, sinusitis, laryngitis, pneumonia, influenza, chronic bronchitis, asthma, and emphysema
• Acute respiratory infections	460-466	Colds, sore throat, sinus infections, swollen tonsils, and bronchitis
• Other diseases of the upper respiratory tract	470-478	Allergies, hay fever, sinus infections, bronchitis, and sore throat that continue for a long time
• Pneumonia and influenza	480-487	"The flu" and pneumonia caused by a bacteria or virus
• Chronic obstructive pulmonary diseases and allied conditions	490-496	Emphysema and asthma
• Pneumoconiosis and other lung diseases caused by external agents	500-508	Black lung; miners' asthma; asbestosis; silicosis; berylliosis; and conditions caused by chemical fumes and vapors
• Other diseases of respiratory system	510-519	Pleurisy (swelling of the lining of the lungs), collapsed lung, and respiratory failure
Diseases of the digestive system	520-579	Diseases affecting the teeth and mouth, salivary glands, digestive tract, and the abdominal cavity. Examples include dental abscess, ulcers, appendicitis, hepatitis (excluding viral hepatitis), cirrhosis of the liver, gallstones, pancreatitis, abdominal hernia, and intestinal polyps
• Diseases of the oral cavity, salivary glands, and jaw	520-529	Tooth problems (too many, too few, abnormal shape or size, cavities, bleeding gums, toothaches), and infections and swelling of the mouth, jaw, and tongue
• Diseases of the esophagus, stomach, and duodenum	530-537	Ulcers of the esophagus (tube that transports food to the stomach), stomach, and small intestine; indigestion; and uncontrollable vomiting
• Appendicitis	540-543	Swelling of the appendix (rupture, surgery, or both may result)
• Hernia of the abdominal cavity	550-553	Ruptures of the groin and diaphragm (muscle which separates the chest area from the lower part of the trunk)
• Noninfectious enteritis and colitis	555-558	Crohn's disease and swelling of the intestine and colon
• Other diseases of the intestines and peritoneum	560-569	Irritable bowel syndrome, blockage of the intestine, constipation, and diarrhea
• Other diseases of digestive system	570-579	Diseases of the liver, gallbladder, and pancreas; hepatitis; blood in stool; and bleeding in the stomach and intestine

(continued)

Categories and Subcategories of Diagnoses	ICD-9-CM Codes	Diseases
Diseases of the genitourinary system	580-629	Diseases affecting the kidneys, the prostate, and testes; benign breast diseases; infertility (male and female); diseases of the ovary; pelvic inflammatory disease; and menstrual disorders
• Nephritis, nephrotic syndrome, and nephrosis	580-589	Swelling of the kidney; swelling of the small blood vessels in the kidney; and kidney failure
• Other diseases of the urinary system	590-599	Swelling and infection of the kidney and bladder; kidney stones; and difficulty urinating
• Diseases of the male genital organs	600-608	Enlarged prostate; swelling of the scrotum and prostate; and abscess of the prostate
• Disorders of the breast	610-611	Benign tumors, cysts, and infections of the breast
• Inflammatory disease of the female pelvic organs	614-616	Swelling of the uterus, ovary, fallopian tubes, or cervix
• Other diseases of the female genital tract	617-629	Conditions associated with menopause and postmenopause; PMS; infertility; and cramps
Complications of pregnancy, childbirth, and the puerperium	630-676	Miscarriage; complications of pregnancy, such as hemorrhage; pregnancy-related high blood pressure; preeclampsia; and premature labor or other complications of labor
• Ectopic and molar pregnancy	630-633	Development of fetus outside the uterus and growth of cysts
• Other pregnancy with abortive outcome	634-639	Miscarriage and complications associated with miscarriage
• Complications mainly related to pregnancy	640-648	Abnormal bleeding and possible miscarriage; infections; high blood pressure caused by pregnancy; and premature labor
• Normal delivery, and other indications for care in pregnancy, labor, and delivery	650-659	Delivery requiring little or no assistance; multiple births; breech birth; and problems of the fetus or placenta which affect care of mother
• Complications occurring mainly in the course of labor and delivery	660-669	Long labor; unusually fast delivery; and abnormal bleeding after delivery
• Complications of the puerperium	670-676	Infections of the breast; blood clot in lung; and varicose veins
Diseases of the skin and subcutaneous tissue	680-709	Acne, cellulitis, sunburn, psoriasis, and seborrhea
• Infections of the skin and subcutaneous tissue	680-686	Abscesses, boils, hair-containing cysts, and pus-filled blisters
• Other inflammatory conditions of skin and subcutaneous tissue	690-698	Skin rashes caused by detergents, oils, greases, solvents, sun, food, drugs, or medicine
• Other diseases of the skin and subcutaneous tissue	700-709	Corns, calluses, heat rash, swollen hair follicles, acne, and ingrown fingernails and toenails
Diseases of the musculoskeletal system and connective tissue	710-739	Arthritis, systemic lupus erythematosus, ankylosing spondylitis, herniated interverte-bral disc ("slipped disc"), lumbago, sciatica, rheumatism, tendonitis, and osteoporosis
• Arthropathies and related disorders	710-719	Arthritis; joint pain and stiffness; and other diseases of the connective tissue which supports and connects internal organs, forms bones and blood vessel walls, and attaches to bones
• Dorsopathies	720-724	Swelling of the spine; rheumatoid arthritis of the spine; lumbago; and sciatica
• Rheumatism, excluding the back	725-729	Swelling and degeneration of joints, muscles, tendons; tennis elbow; and bursitis
• Osteopathies, chondropathies, and acquired musculoskeletal deformities	730-739	Fracture caused by bone disease; osteoporosis; curvature of the spine; flat foot; hammer toe; and development of deformities of the nose, toes, feet, legs, arms, and hands
Congenital anomalies	740-759	Spina bifida; cleft palate; harelip; and various chromosomal anomalies, such as Klinefelter's syndrome
Certain conditions originating in the perinatal period	760-779	Maternal high blood pressure; maternal malnutrition; ectopic pregnancy; breech birth; fetal malnutrition or slow growth; injuries related to birth trauma; and perinatal jaundice
Symptoms, signs, and ill-defined conditions	780-799	Blackout, chills, dizziness, fatigue, pallor, abnormal weight loss, undiagnosed chest pain, and heartburn
• Symptoms	780-789	Hallucinations, fainting, convulsions, dizziness, fatigue, fever, sleep disturbance, rash, headache, sore throat, chest pain, nausea, vomiting, and heartburn
• Nonspecific abnormal findings	790-796	Abnormal x-ray, blood, stool, and urine test results

(continued)

Categories and Subcategories of Diagnoses	ICD-9-CM Codes	Diseases
• Ill-defined and unknown causes of morbidity and mortality	797-799	Senility; asphyxia; respiratory arrest; nervousness; and unexplained death within 24 hours of onset of symptoms
Injury and poisoning	800-999	Dislocation of joints; sprains and strains of associated muscles; concussions; bruises; cuts; internal injuries from crushing, puncture, tearing or blunt impact; burns; blisters; poisoning; frostbite; heatstroke; and complications of medical or surgical care
• Fractures, all sites	800-829	Cracks or breaks of any bone
• Dislocations	830-839	Separation of a bone from its normal socket or joint
• Sprains and strains of joints and adjacent muscles	840-848	Strains are injuries to muscle from overuse or stretching the muscle beyond its normal limit; sprains are injuries involving tearing or overextending the ligaments of a joint
• Intracranial injuries excluding those with skull fractures	850-854	Concussions; internal bruises; and bleeding within the head without a fracture of the bones of the skull
• Internal injuries of the thorax, abdomen, and pelvis	860-869	Bruising, crushing, tearing, or rupturing the chest, abdomen, and pelvis and the organs within these areas of the body
• Open wounds	870-897	Animal bites; cuts; lacerations; punctures; and amputations, excluding the arteries and veins
• Other injuries and late effects of external causes	900-999	Miscellaneous injuries, including injuries to the arteries and veins; problems that occur an extended period of time after the injury has taken place (“late effects”); superficial bruises and abrasions; burns; post-injury shock; poisoning; toxic side effects of chemicals; heatstroke; electrocution; and altitude sickness
Supplementary classifications related to personal or family history of disease	V10-V19	Covers situations in which the person is not ill or injured but has a personal or family history of problems, such as cancer, mental illness, allergies, or arthritis that may affect his or her risk of illness
Supplementary classifications related to health care for reproduction and child development	V20-V28	Problems related to pregnancy, postpartum care, contraception, outcome of delivery, and physical development of child
Contact with health services for reasons other than illness or injury	V50-V59	Care for workers who have been treated previously for an illness or injury that is no longer present but who receive care to complete treatment or prevent recurrence

Reader Response

To help us serve your information needs better, please take a moment to answer the following questions. Then fold this postage paid form into thirds along the dotted lines, **tape** (do not staple) it together, and return to us. Thank you for sharing your thoughts with us!

1) Overall, the information in this report was (circle one...)

Too detailed About right Not detailed enough

2) Are there additional topics you would like to see covered in future reports?

Yes No

If yes, please list additional topics:

_____
_____
_____
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_____

3) Please list suggestions for improving the Epidemiologic Surveillance reports:

_____
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_____

4) Which of the following occupational categories best describes the type of work you do? (check one...)

_____ Management/Administrative
_____ Technical
_____ Professional/Scientific
_____ Crafts/Trades
_____ Clerical

5) I am employed by (check one...)

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_____ Other Federal agency
_____ Military
_____ State or Local government
_____ Other

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BNL 1995 Appendices

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