

APPENDIX A SURVEILLANCE SYSTEM DESCRIPTIONS

Overview

The data described in this document represent compilations from several surveillance systems administered by various government agencies. In general, numerators and denominators are determined differently from one system to the next. This appendix provides a description of each of the surveillance systems used as data sources for much of the information contained in this chartbook. The appendix also provides contact information for acquiring additional details about the systems or using those systems for surveillance or research. Table A-1 describes selected surveillance systems.

Bureau of Labor Statistics (BLS) of the U.S. Department of Labor

BLS, under the U.S. Department of Labor, was established in 1884 and is charged with collecting annual data on occupational safety and health. BLS publishes either repeating annual bulletins or one-time bulletins addressing specific topics. Each BLS office is responsible for a program that gathers information about the American worker. The Office of Employment and Unemployment Statistics administers the Current Population Survey (CPS), and the Office of Safety, Health, and Working Conditions administers the Survey of Occupational Injuries and Illnesses (SOII) and the Census of Fatal Occupational Injuries (CFOI).

Current Population Survey (CPS)

BLS compiles statistics on the employment status and related data using CPS. This survey is published in a series of reports including, of most importance, the annual *Employment and Earnings* report. This survey provides denominators for many of the injury and illness incidence rates presented in this chartbook.

Table A-1. Descriptions of selected surveillance systems

Name of system	Agency	Employment and occupation coding (exposure surrogates)	Sample derivation/ population definition	Primary interest of data system	Fatal or nonfatal outcome	Injury or illness
ABLES*	NIOSH	None presently; NAICS and Bureau of the Census occupation codes planned	Adults (16 yr) with blood lead levels 25 µg/dL from 28 States	Facilitate State lead poisoning intervention; track trend and magnitude of adult lead exposures	Nonfatal	Illness
CFOI	BLS	BLS Occupational Injury and Illness Classification System, industry and occupations	All injury deaths identified through death certificates, workers' compensation reports, medical examiner reports, OSHA reports, and news media reports, verified to exclude duplicate counting	Counts of fatalities by various characteristics: worker, employer, and incident	Fatal	Injury
CWXSP	NIOSH	None	Working coal miners employed in underground coal mines	Degree of radiographic opacity	Nonfatal	Illness
HARS	All States report to CDC	Surveillance Branch, Division of HIV/AIDS Prevention (requests occupation and industry information for the health care setting only)	All cases nationwide	Monitoring the HIV epidemic	Nonfatal	Illness
MSHA Mine/ Contractor Address/ Employment and Accident/Injury/ Illness Database	MSHA	MSHA classifications for industry (mineral commodity) and occupation	Population of miners whose employment/injuries/ illnesses are required to be reported under 30 CFR Part 50	Counts and rates of fatalities, injuries, and illnesses occurring on mine property	Fatal and nonfatal	Injury and illness

See footnote at end of table.

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Table A-1 (Continued). Descriptions of selected surveillance systems

Name of system	Agency	Employment and occupation coding (exposure surrogates)	Sample derivation/ population definition	Primary interest of data system	Fatal or nonfatal outcome	Injury or illness
Multiple-Cause-of-Death Data	NCHS	Coding available for selected States. Coding according to Bureau of the Census occupation and industry codes	Death records include codes for up to 20 conditions cited on death certificates, information from all States in the United States	Cause of death (underlying and contributory), occupation and industry codes where available	Fatal and nonfatal	Injury and illness
NaSH	NCID	NCID-generated coding	Convenience sample and sample drawn from NNIS	Incidence and trends of occupationally acquired infections in health care settings	Nonfatal	Illness
NEISS	CPSC for NIOSH (and others)	Bureau of the Census classification	Hospitals (65 of 91 stratified nationally on size) collect occupational identifiers	Injury and illness cases identified as work-related in emergency departments of participating hospitals	Nonfatal	Injury and illness
NHAMCS	NCHS	None	Representative sample of hospital emergency room visits	Type of injury or incident, body part, cause of incident; demographics of individual; work-relatedness by treating professional	Nonfatal	Injury
NHANES	NCHS	Bureau of the Census occupation and industry regrouped by NCHS	Cross-sectional household survey interviews, representative sample of U.S. civilian population	Characterizes health and nutritional status of U.S. civilian noninstitutionalized population	Not	Illness

See footnote at end of table.

(Continued)

Table A-1 (Continued). Descriptions of selected surveillance systems

Name of system	Agency	Employment and occupation coding (exposure surrogates)	Sample derivation/ population definition	Primary interest of data system	Fatal or nonfatal outcome	Injury or illness
NOMS	NIOSH using NCHS data	Bureau of the Census classification	Death certificates from NCHS	Cause of death, occupation and industry where available	Fatal	Illness
NSSPM	NIOSH using NCHS data	Bureau of the Census classification	Death certificates from NCHS	Cause of death (underlying and contributory), occupation and industry where available	Fatal	Illness
NTOF	NIOSH	Industry and occupation coding using 1980 and 1990 Bureau of the Census data	Death certificates from 52 U.S. vital statistics reporting units in 50 States for workers aged 16 or older	Represents the minimum number of work-related deaths in the United States for a given period	Fatal	Injury
Sentinel Counties Study of Acute Hepatitis	NCID	None	6 counties in the United States and convenience sample	Provides source data of viral hepatitis infection in the United States	Nonfatal	Illness
SENSOR	NIOSH	Varies by participating State and SENSOR condition	Case-based reporting from a variety of sources including physicians, agencies, workers' compensation, etc. Catchment area varies from geographic area (counties) to entire State	Case-based surveillance directly linked to intervention activities to maximize prevention	Fatal and nonfatal	Injury and illness

See footnote at end of table.

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Table A-1 (Continued). Descriptions of selected surveillance systems

Name of system	Agency	Employment and occupation coding (exposure surrogates)	Sample derivation/ population definition	Primary interest of data system	Fatal or nonfatal outcome	Injury or illness
SOII	BLS	Industry coding using the SIC system, occupation coding using 1990 Bureau of the Census system	Stratified random sample of all private industry employers of one or more workers	The number of work-related injuries and illnesses reported by employers on the OSHA 200 Log	Nonfatal	Injury and illness
<i>staffTRAK-TB</i>	National Center for HIV, STD, and TB Prevention	1990 Bureau of the Census for population and housing and 1992 Bureau of the Census industry and occupation coding; also includes CDC NNIS coding for occupations	Demonstration project—participating health departments	Tuberculin skin testing targeting health departments	Nonfatal	Illness
VHSP	NCID	NCID-generated coding	All acute cases reported to local health departments	Identifies risk factors for infection	Nonfatal	Illness

*Abbreviations: ABLES = Adult Blood Lead Epidemiology and Surveillance Program; AIDS = acquired immune deficiency syndrome; BLS = Bureau of Labor Statistics; CDC = Centers for Disease Control and Prevention; CFOI = Census of Fatal Occupational Injuries; CPSC = Consumer Product Safety Commission; CWXSP = Coal Workers' X-Ray Surveillance Program; HARS = HIV/AIDS Reporting System; HIV = human immunodeficiency virus; MSHA = Mine Safety and Health Administration; NAICS = North American Industrial Classification System; NaSH = National Surveillance System for Hospital Health Care Workers; NCHS = National Center for Health Statistics; NCID = National Center for Infectious Diseases; NEISS = National Electronic Injury Surveillance System; NHAMCS = National Hospital Ambulatory Medical Care Survey; NHANES = National Health and Nutrition Examination Survey; NIOSH = National Institute for Occupational Safety and Health; NNIS = National Nosocomial Infection Surveillance System; NOMS = National Occupational Mortality Surveillance System; NSSPM = National Surveillance System for Pneumoconiosis Mortality; NTOF = National Traumatic Occupational Fatalities Surveillance System; OSHA = Occupational Safety and Health Administration; SENSOR = Sentinel Event Notification System for Occupational Risk; SIC = standard industrial classification; SOII = Survey of Occupational Injuries and Illnesses; *staffTRAK-TB* = Surveillance for Tuberculosis Infection in Health Care Workers; STD = sexually transmitted disease; TB = tuberculosis; VHSP = Viral Hepatitis Surveillance Program.

CPS is a monthly survey of households conducted for BLS by the Bureau of the Census through a scientifically selected sample that represents the civilian noninstitutional population. Respondents are interviewed to obtain information about the employment status of each member of the household aged 15 years and older, although data are routinely published on those aged 16 and older. The inquiry relates to activity or status during the calendar week (Sunday through Saturday) that includes the 12th day of the month. This is known as the “reference week.” Actual field interviewing is conducted in the following week, referred to as the “survey week.” The concepts and definitions underlying labor force data have been modified but not substantially altered since the inception of the survey in 1940.

Each month, about 50,000 occupied units are eligible for interview. The sample provides estimates for the Nation as a whole and provides data for model-based estimates for individual States and other geographic areas. Some 3,200 of these households are contacted but not interviewed because the occupants are not at home after repeated calls or are unavailable for other reasons. This figure represents a noninterview rate for the survey that ranges between 6% and 7%. In addition to the 50,000 occupied units, 9,000 sample units in an average month are visited but found to be vacant or otherwise not eligible for enumeration.

Part of the sample is changed each month. Three-fourths of the sample is common from one month to the next, and one-half is common with the same month a year earlier. Since 1953 (when the current 4–8–4 rotation system was adopted), households are interviewed for 4 consecutive months, leave the sample for 8 months, and then return to the sample for the same 4 months of the following year. Estimates obtained from CPS include employment, unemployment, earnings, hours worked, and other indicators. They are available for various demographic characteristics including age, sex, race, marital status, and education. They are also available by occupation, industry, and class of worker. Supplemental questions are also often added to the regular CPS questionnaire to produce estimates on other topics including school enrollment, income, previous work experience, health, employee benefits, and work schedules.

This information for the employed applies to the job held in the reference week. Persons with two or more jobs are classified in the job at which they worked the greatest number of hours. The unemployed are classified according to their last job. The occupational and industrial classification of CPS data is based on the coding systems used in the 1990 census until recently. Over the next years, BLS will begin using the newly developed North American Industry Classification System (NAICS) (www.census.gov/epcd/www/naics.html).

For further information contact

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Survey of Occupational Injuries and Illnesses (SOII)

The annual SOII is a surveillance system in which employer reports are collected by BLS from private industry establishments. About 165,000 establishments were included in the 1997 survey. A two-part survey is conducted and provides estimates for the United States and separately for participating States. Part 1, which has been collected since 1972, provides estimates of the number and incidence of injuries and illnesses by Standard Industrial Classification (SIC). Part 2, which was added to the survey in 1992, provides estimates of demographic characteristics of workers with injuries and illnesses involving time away from work. Part 2 also provides data on the circumstances of the injuries and illnesses with time away from work.

The survey sample is selected using stratified random sampling from all private industry employers of one or more workers. MSHA and the Department of Transportation's Federal Railroad Administration provide comparable occupational injury and illness data for coal, metal mining, nonmetal mining, and for railroad activities. The survey also gathers information on the average number of workers employed and the total hours worked at each establishment during the year. The survey collects the number of work-related injuries and illnesses that the employer has recorded on the Annual Log and Summary of Occupational Injuries and Illnesses (OSHA No. 200) kept by each establishment [29 CFR* 1904; OSHA 2000a]. Injury is a single reporting category. Illnesses are divided into seven broad categories: skin diseases or disorders, dust diseases of the lungs, respiratory conditions due to toxic agents, poisoning, disorders due to physical agents, disorders associated with repeated trauma, and all other occupational illnesses. These data are called the industry summary data (Part 1 of the survey). Since 1972, this information has been used to identify industries with high rates of injuries and illnesses.

*Code of Federal Regulations. See CFR in references.

In 1992, a second part was added that collects descriptive information about a sample of the cases that resulted in at least 1 day away from work. Establishments take this information from workers' compensation reports, insurance forms, or other supplementary records (for example, the OSHA Form 101—Supplementary Record of Occupational Injury and Illness [29 CFR 1904; OSHA 2000b]). These data are called the case and demographic data. The descriptive information includes the personal characteristics of the injured or ill worker: industry, occupation, race/ethnicity, sex, age, and length of service with the employer. The injury or illness is characterized with information on the nature of the injury or illness; the part of body affected; the event or exposure leading to the injury or illness; and the source (the object, substance, bodily motion) that directly produced the injury or illness. The number of days away from work is collected as a surrogate for the severity of the case.

Industry is coded using the 1987 SIC Manual [OMB 1987], and occupation is coded using the 1990 Bureau of the Census classification system. For manufacturing industries, information is available at the 4-digit SIC level. For all other industries, the most detailed level is 3-digit. The nature of the injury or illness, the part of body affected, the source of injury or illness, and the event are coded according to the Occupational Injury and Illness Classification System developed by BLS [1992]. This system provides coding at four levels, from 1-digit to 4-digit, although not all categories can be expanded to the 4-digit level. NAICS will be used to code industry beginning with the 2003 survey (see Appendix B).

The complex statistical design of the annual survey required BLS to design special computer software to calculate estimates and variances. Data are not released when estimates do not meet publication guidelines as determined by BLS. The self-employed; farms with fewer than 11 employees; private households; and Federal, State, and local government agencies are excluded from the survey.

From 1972 through 1997, BLS disseminated this summary data either in a BLS publication or on the Internet. Information is available about the number and rates of all injuries and the seven illness categories by industry. The categories of all injuries and all illnesses are divided into cases without lost workdays and lost-workday cases. Lost-workday cases are further divided into cases with restricted work activity only and cases with days away from work. Selected information is available by number of employees. Information about workers with injuries and illnesses requiring recuperation away from work and the characteristics of their injuries and illnesses is available for 1992 through 1997.

For further information contact

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Census of Fatal Occupational Injuries (CFOI)

CFOI is a Federal and State cooperative program that each year accesses multiple data sources to compile a complete roster of occupational fatal injuries. Since 1992, the fatality census has been conducted in all 50 States and the District of Columbia. CFOI includes data for all fatal work injuries—those that are covered by the Occupational Safety and Health Administration (OSHA) or other Federal or State agencies and those that are outside the scope of regulatory coverage.

A fatality is included in the census if the decedent was working for pay, compensation, or profit at the time of the event; engaged in a legal work activity; or present at the site of the incident as a requirement of his or her job. These criteria are generally broader than those used by Federal and State agencies. Thus any comparison between BLS census counts and those released by other agencies should take into account the different coverage requirements and definitions. Fatalities that occur during a person's commute to or from work are excluded from the BLS census.

An injury is defined as any intentional or unintentional wound or damage to the body resulting from (1) acute exposure to energy such as heat or electricity or kinetic energy from a crash, or (2) the absence of such essentials as heat or oxygen caused by an event, incident, or series of events within a single workday or shift. Included are open wounds, intracranial and internal injuries, heatstroke, hypothermia, asphyxiation, acute poisonings resulting from a short-term exposure limited to the worker's shift, suicides and homicides, and work injuries listed as underlying or contributory causes of death. Occupational fatal illnesses are not reported in the BLS census.

Data for CFOI are compiled from various Federal, State, and local administrative sources (including death certificates, workers' compensation reports and claims, reports to various regulatory agencies, medical examiner reports, and police reports) as well as news reports. Multiple sources are accessed because studies have shown that no single source captures all

occupational fatalities. Source documents are matched so that each fatality is counted only once. To ensure that a fatality occurred while the decedent was at work, information is verified from two or more independent source documents, or from a source document and a followup questionnaire.

Approximately 30 data elements are collected, coded, and tabulated, including information about the worker, the fatal incident, and the machinery or equipment involved. Industry and occupation describe the job the worker held at the time of the fatal incident. Industry is classified according to the 1987 SIC system. Occupation is coded according to the Bureau of the Census occupational classification system. Industry data are typically reported separately for the public and private sectors. The BLS Occupational Injury and Illness Classification System is used to classify the nature of the injury, part of body affected, primary and secondary sources of injury, and the exposure leading to the fatality. Other data elements include the worker's age, sex, and race; the time of day that the fatal event occurred; the activity the worker was performing when injured; and the location where the event occurred.

States may identify additional fatal work injuries after data collection closeout for a reference year. Other fatalities excluded from the published count because of insufficient information to determine work relationship may be subsequently verified as work related. States have 1 year to update their initial published counts. This procedure ensures that fatality data are disseminated as quickly as possible, and that no legitimate case is excluded from the counts.

Approximately 8 months after the end of the reference year, BLS publishes summary data in a national news release. Articles and detailed tables containing national and State data are published regularly in the BLS quarterly publication *Compensation and Working Conditions* and occasionally in the *Monthly Labor Review*. Other products of the CFOI program include profiles of occupations, industries, or types of events; a yearly compendium (*Fatal Workplace Injuries in [year]: A Collection of Data and Analysis*); and a data file for researchers that is available through a letter of agreement to protect confidentiality of workers and companies. Most of the published reports are available on the BLS Web site (www.bls.gov/iif/oshcfoi1.htm). States also produce news releases and reports on State-specific hazards. A list of participating agencies and their phone numbers is available in the 1998 news release on the BLS CFOI Internet site.

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Centers For Disease Control and Prevention (CDC), U.S. Department of Health and Human Services

CDC is one of eight public health agencies in the U.S. Department of Health and Human Services with the mission of promoting health and quality of life by preventing and controlling disease, injury, and disability. CDC added prevention to its mission after an increasing percentage of its resources were spent on preventing diseases rather than controlling existing ones (www.cdc.gov/aboutcdc.htm#mission). CDC consists of 12 centers, institutes, and offices in 10 locations and additional employees in State health departments, quarantine offices, and other countries.

National Institute for Occupational Safety and Health (NIOSH)

NIOSH, an institute within CDC, was established by the Occupational Safety and Health Act of 1970. NIOSH maintains a range of surveillance systems and produces a wide variety of reports. These range from the approximately biennial work-related lung disease (WoRLD) reports to one-time reports covering a group of diseases or conditions over several years, such as *Fatal Injuries to Workers in the United States, 1980–1989: a Decade of Surveillance* [NIOSH 1993], *Mortality by Occupation, Industry, and Cause of Death: 1984–1988* [NIOSH 1997], and the *Atlas of Respiratory Disease Mortality, United States: 1982–1993* [Kim 1998]. Reports describing point prevalence of a range of diseases or conditions in certain industries (such as health hazard evaluation surveys) or project reports are generally accessible through the NIOSH Web site (www.cdc.gov/niosh/pubs.html).

National Electronic Injury Surveillance System (NEISS)

The Consumer Product Safety Commission (CPSC) developed NEISS to monitor injuries involving consumer products and to serve as a source for followup investigation of selected product-related injuries [McDonald 1994]. Data are collected at 101 hospitals selected from a stratified probability sample of all hospitals in the United States and its territories. The sampling frame was stratified by hospital size (determined by the annual total of emergency department visits) and geographic region, and the final sample of 101 hospitals was then selected. NIOSH entered into an interagency agreement to collect work-related injury data in 67 of the 101 hospitals. Each injury case in the sample was assigned a statistical weight based on the inverse of the hospital's probability of selection, and this weight was used to calculate national estimates. Confidence intervals (CIs) were calculated using methods described in detail elsewhere [Layne and Landen 1997].

A work-related case was defined as any injury sustained during (1) work for compensation, (2) volunteer work for an organized group, or (3) a work task on a farm. The *Operational Guidelines for Determination of Injury at Work* were provided to hospital coders to identify work-related injuries [NIOSH 1993]. Unlike CPSC consumer product data, the work-related data collected for NIOSH included all cases regardless of whether a consumer product was involved in the injury event.

Estimates of numbers of workers, used to calculate injury rates, were derived from the monthly Current Population Survey (CPS) of BLS, a national, population-based household survey that includes approximately 50,000 households each month [BLS 1997]. For this report, injury and illness rates were estimated as the number of cases per 100 full-time workers (2,000 working hr/full-time worker). Workers less than 16 years of age were excluded from this analysis.

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National Occupational Mortality Surveillance System (NOMS)

NOMS was developed to provide information about work-related deaths by industry and occupation using the United States Standard Certificate of Death. Information about the occupation of the decedent has been recorded since 1900, but this information has not been readily accessible until recently.

Over the last decade, NIOSH, the National Center for Health Statistics (NCHS), the National Cancer Institute (NCI), and Bureau of the Census have collaborated to (1) improve the quality of the occupational data collected on death certificates, (2) develop routine standardized coding of this information by State health departments, and (3) partially reimburse selected States for producing these data. The first report using these data was a Monthly Vital Statistics Report Supplement, based on the 1984 data from 12 States [Rosenberg et al. 1993]. The data included cause-specific estimates of relative risk for broad occupation and industry categories for both male and female workers.

The United States Standard Certificate of Death requests information about the usual occupation and kind of business or industry for each decedent. Beginning in 1983, an increasing number of State health departments have coded this information using standardized coding procedures. Twenty-four State health departments included the data in the coded death certificate information provided to NCHS for 1 or more years from 1984 through 1988.

The information about occupation and industry was coded according to the 1980 Bureau of the Census classification [Bureau of the Census 1982]. The underlying cause of death was coded according to the International Classification of Diseases, Ninth Revision (ICD-9) [WHO 1977]. Data included in this chartbook are based on an analysis of 185 selected causes of death for male workers and 188 selected causes for female workers. The analysis includes deaths that occurred in the 24-State reporting area among residents of one of the 24 States. The criteria for inclusion in the analysis differed for male and female workers. For male workers, all white and black decedents aged 20 and older were included. For female workers, decedents reported in the occupation category of “Housewives, homemakers” were not included in either the occupation or industry analysis. Therefore, all white and black female decedents aged 20 and older with an occupation code other than “Housewives, homemakers” were included.

Age-standardized proportionate mortality ratios (PMRs) for the four race-sex groups reported in this chartbook were calculated using a computer program developed at NIOSH [Dubrow et al. 1993]. For each race-sex group, the program calculates PMRs by comparing the proportion of deaths from a specific cause within an occupation or industry group with the proportion of deaths from that cause for all occupations or industries. Age stratification was done by 5-year age groups. The program provides 95% confidence limits for the PMRs. The limitations of PMR studies include potential inaccuracy of cause of death and imprecise exposure classification based on usual occupation [Breslow and Day 1987]. In addition, information is lacking about length of employment and possible confounders such as smoking, alcohol, or socioeconomic status. Although PMR studies are useful for hypothesis generation [Checkoway et al. 1989], lack of population data precludes obtaining death rates [Rothman 1986]. The PMR indicates only whether the age-standardized proportion of deaths from a specific cause appears to be higher or lower than the expected proportion for an occupation or industry. Also, the PMR for one cause of death may be relatively high if proportions of other causes of death are relatively low [DeCouflé et al. 1980]. Thus the PMR for each cause of death depends on the PMRs computed for the other causes in an occupation or industry analysis. This can be especially important if the occupation under study has relatively high or low mortality due to some common cause of death. If the PMR is low, the PMR for other causes may be artificially inflated. The PMR will be a poor estimate of the risk of death if the population-based standardized mortality ratio (SMR) for all causes for an occupation or industry group is greatly above or below 100.

Prior publications from this system include *Mortality by Occupation, Industry, and Cause of Death, 24 Reporting States (1984–1988)* [NIOSH 1997], which includes a data diskette for those years. More recent versions are being mounted on a Web-accessible version at the NCI.

For further information contact

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National Surveillance System for Pneumoconiosis Mortality (NSSPM)

NSSPM is a pneumoconiosis mortality surveillance system developed and maintained by the Division of Respiratory Disease Studies, NIOSH. The system provides statistics for the surveillance of occupational respiratory diseases in an easily accessible, user-friendly format. The data are a subset of national mortality data obtained annually from NCHS since 1968. Currently, NSSPM contains death certificate information for 1968–1996 for all U.S. decedents aged 15 and older identified with any type of pneumoconiosis listed as either an underlying or contributing cause of death. Additional information includes age, race, sex, and State and county of residence at the time of death. Usual occupation and industry of each decedent have been available for several States since 1985.

Types of pneumoconioses included in the NSSPM are based on International Classification of Diseases coding categories (ICD–8 [WHO 1967] from 1968–1979, and ICD–9 [WHO 1977] from 1979–1996): asbestosis, coal workers’ pneumoconiosis (CWP), silicosis, byssinosis, other/unspecified pneumoconioses, and all pneumoconioses aggregated.

NSSPM is designed to generate a variety of summary statistics, tables, charts, and maps. Examples of the types of statistics this system generates are counts of deaths, crude and age-adjusted rates, and years of potential life lost by year, age group, race, sex, and usual occupation or industry at the national, State, and county levels. Data from additional sources, such as population statistics, comparative standard population, and life table values are incorporated into the system.

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Coal Workers’ X-Ray Surveillance Program (CWXSP)

The United States Federal Coal Mine Health and Safety Act of 1969 mandated several programs as part of a broad lung disease prevention effort. One program, CWXSP, makes available radiographic chest exami-

nations to working coal miners at all underground coal mines in the United States. Examinations are available to miners on a voluntary basis at least once every 5 years. If the results indicate radiographic evidence of coal workers' pneumoconiosis (CWP), the miner is given the right [under 30 CFR Part 90] to transfer to an area of the mine where exposures are continuously at or below 1 mg/m³ respirable coal dust. This program provides secondary (medical monitoring) occupational disease prevention efforts for the mining industry.

The operation of CWXSP is guided by regulations published in Title 42 of the Code of Federal regulations [42 CFR 37]. In brief, the regulations specify the following:

- Every new miner must be examined within 6 months of employment and again 3 years later.
- If the 3-year X-ray shows signs of CWP, a third X-ray must be taken 2 years later.
- After these initial examinations, miners are eligible to have a voluntary chest X-ray once every 5 years.
- At NIOSH-certified facilities, miners can receive radiographic examinations that consist of chest radiographs and supporting demographic and work history information.
- Chest radiographs must be classified by at least two NIOSH-certified readers according to a standardized system for classifying radiographs of the pneumoconioses [ILO 1980].
- A final determination value is based on these classifications.
- A final determination value of small opacity profusion category 1/0 or higher is accepted as evidence of CWP.
- A miner with evidence of CWP may choose to transfer to a low-dust work environment.

For further information contact

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National Traumatic Occupational Fatalities Surveillance System (NTOF)

NTOF is composed of information obtained from death certificates from the 52 U.S. vital statistics reporting units in the 50 States, New York City, and the District of Columbia for workers aged 16 and older for whom an external cause of death [WHO 1977] was noted, and for whom the certifier entered a positive response to the *Injury at Work?* item.

The industry and occupation on death certificates are defined as the “usual” industry and occupation of the victim. Industry and occupation narratives were coded according to the 1980 and 1990 Bureau of the Census classification schemes [Bureau of the Census 1982, 1992]. These data are reported by the major industry and occupation divisions as defined by the Bureau of the Census.

Limitations of death certificates used to ascertain work-related fatality information have previously been described [Russell and Conroy 1991; Stout and Bell 1991; NIOSH 1993]. Incomplete or unclear information on the death certificate and the lack of a national standard for completing the *Injury at Work?* item on the death certificate during this period are particular problems.

For much of the period this system has been used, no standardized guidelines were available for completing the *Injury at Work?* item on the death certificate. This item was subject to certifier interpretation. Although the lack of standardized reporting of this item may result in both false positives and false negatives, the numbers reported here are apt to represent the minimum number of occupational deaths that occurred in the United States during the period.

Death certificates ask for the “usual” occupation and industry of the person who died, which may not necessarily reflect the occupation or industry engaged in at the time of the fatal injury. Studies comparing death certificate entries for usual occupation and industry with information about occupation and industry at the time of death found agreement for occupation in 64% to 74% of the cases, and for industry in 60% to 76% of the cases [Karlson and Baker 1978; Baker et al. 1982; Davis 1988; Schade and Swanson 1988; Massachusetts Department of Public Health 1989]. Some studies indicate that although death certificates ask for the “usual” occupation and industry, the information recorded on the death certificates is more likely to reflect occupation or industry at time of death rather than lifetime employment [Davis 1988; Schade and Swanson 1988]. For these reasons, the possibility exists that for any surveillance system

based on death certificates, cases may be misclassified with respect to industry and occupation.

Denominator data were obtained from BLS CPS, a sample survey of the civilian noninstitutional population. These data were extracted from the BLS *Employment and Earnings* and the CPS monthly employment files [BLS 1981–1996; BLS 1992]. Fatality rates were calculated as average annual deaths per 100,000 workers. Rates were not calculated for cells with fewer than three cases because of the instability of rates based on small numbers. Frequencies and rates are presented for the civilian workforce only because denominator data are not easily obtainable for military personnel.

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Sentinel Event Notification System for Occupational Risk (SENSOR)

The original concept of SENSOR was based on a communicable disease surveillance model: providers (individual practitioners or health care facilities) reported disease cases to a health department. It had two organizational components—a network of sentinel providers (individual practitioners, laboratories, or clinics) who identified and reported the occupational cases, and a surveillance center in a State agency that analyzed reports and took action (confirmed cases and collected additional information through case followup, evaluated worksite factors, and recommended interventions). SENSOR created a cooperative, State-Federal effort to develop State capacity for recognizing, reporting, following up, and preventing selected occupational conditions. Initially, 10 States participated by focusing on one or more selected occupational conditions (acute pesticide-related illness and injury, asthma, carpal tunnel syndrome (CTS), lead poisoning, noise-induced hearing loss, and silicosis).

The SENSOR program of today is different from the original concept. Case identification has been enhanced to include not only physician reporting but information sources such as death certificates, hospital discharge data, and workers' compensation records. Intervention activities have been

broadened to include information dissemination, education, referral to enforcement agencies, and consultation. Currently, 13 States (California, Florida, Kentucky, Massachusetts, Michigan, Minnesota, New Jersey, New York, Ohio, Oregon, Texas, Utah, and Washington) have SENSOR programs for one or more of the following occupational conditions: acute pesticide poisoning, asthma, CTS, lead poisoning, noise-induced hearing loss, amputations, silicosis, and youth occupational injury.

For further information contact

Asthma and silicosis surveillance at NIOSH/CDC are coordinated through the:

Public Health Surveillance Team
Surveillance Branch
Division of Respiratory Disease Studies
National Institute for Occupational Safety and Health
1095 Willowdale Road, MS HG900
Morgantown, WV 26505–2888
Telephone: 304–285–6115

Pesticide-related illness and injury surveillance activities at NIOSH/CDC are coordinated through the:

Medical Section
Surveillance Branch
Division of Surveillance, Hazard Evaluations, and Field Studies
4676 Columbia Parkway, MS R21
Cincinnati, OH 45226
Telephone: 513–841–4448

CTS and noise surveillance are coordinated through the:

Surveillance Branch
Division of Surveillance, Hazard Evaluations, and Field Studies
4676 Columbia Parkway, MS R17
Cincinnati, OH 45226
Telephone: 513–841–4303

SENSOR coordination occurs through the:

Surveillance Branch
Division of Surveillance, Hazard Evaluations, and Field Studies
4676 Columbia Parkway, MS R17
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Telephone: 513–841–4303

Adult Blood Lead Epidemiology and Surveillance Program (ABLES)

The ABLES program is a national model for developing State-based surveillance. The surveillance of elevated blood lead levels (BLLs) provides the public health community (local, State, Federal) with essential data for monitoring adult lead poisoning and setting priorities for in-depth research, intervention, and information dissemination. The public health objective of the ABLES program is to eliminate exposures that result in workers having BLLs greater than 25 µg/dL of whole blood [DHHS 1990].

In 1998, the nationwide ABLES consisted of 27 State programs funded by NIOSH. These programs collect BLL data from local health departments, private health care providers, and private and State reporting laboratories. State ABLES use their data to (1) conduct followups with physicians, workers, and employers, (2) target onsite inspections of worksites, (3) provide referrals to cooperating agencies in the event regulatory action is necessary, and (4) conduct hazard surveillance to identify workplace exposures and control technology solutions. Findings from ABLES data have been used to identify high-risk industries, occupations, and tasks, including radiator repair shops, battery recycling operations, and construction-related jobs such as bridge repair and home remodeling. State educational materials for preventing adult and take-home lead poisoning are listed on the NIOSH Web site (www.cdc.gov/niosh/ables.html).

An essential criterion for ABLES is a State requirement that laboratories report BLL results to the State health department or designee. The lowest BLL to be reported varies from State to State. However, the reporting of *all* BLLs, elevated or not, is extremely useful for analyzing trends in these data. State ABLES programs are required to develop effective, well-defined working relationships with childhood lead poisoning prevention programs within their State. Lead may be taken home from the workplace on clothes or in cars, thus potentially exposing spouses and children. Children who come in contact with lead-exposed workers should be targeted for blood lead screening. Results are presented to the public via ABLES reports in the CDC *Morbidity and Mortality Weekly Report*.

For further information contact

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Mining Injury and Employment Statistics

Data were obtained from the Mine Safety and Health Administration (MSHA) databases of reported employment and reported cases of accident/injury/illness for mine operators as well as independent contractors working on mine property as required under 30 CFR Part 50 [MSHA 1999]. The historical data (presented in Figure 6-1 for the period 1911-1995) were derived from several different sources [MSHA 1999; Adams and Wrenn 1941; Adams and Kolhos 1941; Reese et al. 1955; MSHA 1984].

According to 30 CFR Part 50, mine operators and independent contractors whose employees perform certain types of work on mine property are required to file a *Mine Accident, Injury, and Illness Report (Form 7000-1)* [30 CFR 50.20; MSHA 2000a] for reportable incidents within 10 working days after the accident or injury, or 10 working days following the illness diagnosis. The term “reportable injury” as defined by MSHA includes all incidents that require medical treatment or result in death, loss of consciousness, inability to perform all job duties, or temporary assignment or transfer to another job. Injuries involving “first-aid only” are not reportable. (First-aid only is defined as one-time treatment and subsequent observation of minor scratches, cuts, burns, splinters, etc. that do not ordinarily require medical care, even if it was provided by a physician or a registered health care professional.) Information reported on MSHA Form 7000-1 includes demographics of the injured or ill worker such as age, sex, years of total mining experience, years of experience at current mine, where the incident occurred (i.e., underground, surface, plant/mill), days away from work, days of restricted work activity, source of the injury, body part(s) injured, and a narrative description of the incident.

Also, under 30 CFR Part 50, mine operators and independent contractors whose employees perform certain types of work on mine property are required to file a *Quarterly Mine Employment and Coal Production Report (MSHA Form 7000-2)* [30 CFR 50.30; MSHA 2000b] within 15 days after the end of each calendar quarter. This information is reported in the address and employment files and includes the address and other contact

information, production of clean coal tonnage, average number of persons employed during the reporting period, and the corresponding number of hours worked for each type of operation (designated by MSHA as operational subunits that include underground operations, strip operations, plants or mills, etc.).

Commodity differences for type of employer (mining operators versus independent contractors).—The five commodity groups of coal (anthracite and bituminous), metal, nonmetallic minerals (nonmetal[†]), stone, and sand and gravel are based on a modification of the six ‘cavass classes’ designated by MSHA for mine operators. The only modification combines anthracite coal and bituminous coal into coal. Because independent contractors may work at multiple mining operations associated with a diversity of commodities, a ‘cavass class’ is not designated for independent contractors. Rather, independent contractors report employment under two aggregates: (1) all coal locations, and (2) all metal, nonmetal, stone, and sand and gravel locations. As a result of these reporting differences, fatality and injury rates for independent contractors can only be computed for coal and metal/nonmetal locations. However, within these two aggregates, independent contractors report employment separately for each type of operation (designated by MSHA as operational subunits that include underground operations, strip operations, plants or mills, etc.). Consequently, fatality and injury rates can be computed for both mine operators and independent contractors by type of operation.

Injury data inclusion criteria.—For the period 1988 to 1997, only cases that were coded as a degree injury 1–6 were included. This excludes reportable incidents not associated with an injury (degree injury 0), illnesses (degree injury 7), and nonoccupational injuries and illnesses that are maintained in the MSHA files because they occurred on mine property. Of those cases coded degree injury 1–6, office workers were excluded from analyses by excluding both employee hours and injuries reported for office locations (MSHA subunit code = 99).

Selection criteria for fatalities.—The number of fatalities used for the analyses varies from the number of fatalities reported in the MSHA accident/injury/illness databases as follows:

1. Seventeen fatalities attributed to and associated with a contractor code of “ZZZ” were excluded from all analyses. Although these fatalities occurred on mine property, the victims were not

[†]Depending on the context, the term ‘nonmetal’ may refer to either (1) the class of nonmetallic mineral that includes clays, salt, phosphates, etc. or (2) nonmetallic minerals, stone, and sand and gravel. In the current context, the first definition applies.

employees of either an independent contractor or mine operator. Rather, these victims were on mine property for other reasons (e.g., visitors, customers) when they were fatally injured.

2. Three fatalities attributed to mine operators were excluded from all analyses. Although fatally injured on mine property, the victims were nonemployees and minors (aged 5, 15, and 16).
3. Four additional fatalities were included in all analyses, two for independent contractors and two for mine operators per subsequent MSHA errata file. Two of these fatalities were originally reported in the database as nonfatal injuries.
4. One independent contractor fatality was excluded as not having occurred on mine property per subsequent MSHA errata file.

Selection criteria for lost-workday cases.—Lost-workday cases include only those cases that resulted in total or partial permanent disabilities, days away from work, or days of restricted work activity (MSHA degree of injury codes 2 through 5). The number of lost workdays were computed by summing the days away from work and days of restricted work activity, with one exception. For injuries resulting in total or partial permanent disabilities, lost workdays were the statutory days charged to the incident [MSHA 1998] whenever the statutory days exceeded the lost workdays reported or when lost workdays were unreported.

Calculation of injury rates.—Injury rates for the period 1988–1997 were computed using employment estimates derived from total hours worked. Full-time workers were calculated by dividing total hours by 2,000 hours/worker. Nonfatal injury rates were constructed per 100 full-time workers, and fatal injury rates per 100,000 full-time workers. Of note, MSHA publishes both fatal and nonfatal injury rates on the basis of 200,000 hours worked, which is equivalent to 100 full-time workers. Fatality rates for the historical data (Figure 6–1) were computed using average numbers of workers, because of the lack of exposure hours during the first few decades of this century.

Determining the type of incident associated with the injury.—MSHA's accident/injury/illness classification scheme was used to establish the type of incident associated with a fatality or nonfatal injury [MSHA 1998]. The type of incident is identical to MSHA's accident/injury/illness with two exceptions:

1. Both fatal and nonfatal cases classified as a *fall of highwall or rib* (accident/injury/illness code = 06) or as a *fall of roof or back* (accident/injury/illness code = 07) are reported under the type of incident *fall of ground*.

2. Nonfatal injury cases occurring underground and classified under *machinery* (accident/injury/illness = 17) were reclassified as a *fall of ground* if the source of the injury was *caving rock, ore, etc.* (MSHA source of injury code = 90). This reclassification is consistent with the way in which MSHA classifies similar incidents that resulted in a fatal injury. Typically, the victim is operating a roof bolter or continuous miner and is struck by caving rock from the mine roof or rib.

MSHA data compared with other surveillance systems.—The mining data presented in this report may differ from mining industry data for the same period using NTOF and CFOI surveillance systems. Both NTOF and CFOI use the 1987 SIC Manual [OMB 1987] to categorize fatal injuries by industry. The SIC classification scheme includes oil and gas extraction in the mining industry. MSHA excludes oil and gas extraction, as regulatory authority is delegated to OSHA. In addition, MSHA data include only incidents that occur on mine property. Therefore, an injury occurring during the course of work, but off mine property, is excluded from the MSHA file. NTOF and CFOI systems would capture this type of injury.

For more information please see *Injuries, Illnesses, and Hazardous Exposures in the Mining Industry, 1986–1995: A Surveillance Report* [NIOSH 2000]. The report summarizes available data on work-related fatal and nonfatal injuries in the mining industry for the 10-year period 1986–1995.

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or

Mining Surveillance and Statistical Support Activity
National Institute for Occupational Safety and Health
Spokane Research Laboratory
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National Center for Health Statistics (NCHS)

NCHS is one of 12 centers, institutes, and offices of CDC. As the Nation's principal health statistics agency, NCHS provides statistical information to guide actions and policies to improve the health of the American people. NCHS surveys and data systems provide fundamental public health and health policy statistics that are used to track changes in health and health care delivery. Statistics are obtained through a broad-based program of ongoing and special studies in partnership with State government, including household interview surveys, examination surveys, surveys of health care providers, and collection of statistics on birth and death. NCHS participates with other agencies, such as NIOSH, and maintains some data systems collaboratively, such as NOMS. Further information is accessible through its Web site (www.cdc.gov/nchs/about.htm).

National Hospital Ambulatory Medical Care Survey (NHAMCS)

The National Ambulatory Medical Care Survey (NAMCS) was begun in 1973 to collect data on the use of ambulatory medical care services provided by office-based physicians. In 1992, NHAMCS was inaugurated to expand the scope of data collection to the medical services provided by hospital outpatient departments and emergency departments. Together, NAMCS and NHAMCS data provide an important tool for tracking ambulatory care use in the United States. These surveys along with a third survey, the National Survey of Ambulatory Surgery, constitute the ambulatory care component of the National Health Care Survey, which measures health care use across various types of providers.

Approximately 2,500 physicians are in the NHAMCS sample each year. The four-stage probability sample design used in the survey involves (1) primary sampling units, (2) hospitals within primary sampling units, (3) emergency departments within hospitals and/or clinics within outpatient departments, and (4) patient visits within emergency departments and/or clinics. Approximately 500 hospitals are in the sample each year. Hospitals are defined as facilities having an average patient stay of less than 30 days or those whose speciality is general (medical or surgical) or children's general. Clinic types are general medicine including internal medicine and primary care, surgery, pediatrics, obstetrics and gynecology, and other, such as neurology and psychiatry.

The Bureau of the Census is responsible for NHAMCS data collection. Information is collected on patient characteristics such as age, sex, race, expected source of payment, reason for visit, diagnoses, place of injury

occurrence, whether the injury was work-related, whether the injury was intentional, cause of injury, diagnostic and screening services, medications, disposition, and providers seen. Data have been collected on work-related injury visits since 1995. Beginning in 1997, verbatim text that describes the cause of injury may be analyzed. As with all probability sample surveys, the sample data may not have enough cases to produce reliable estimates for some subgroups.

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National Health and Nutrition Examination Survey (NHANES)

NCHS makes available public-use data from NHANES, a series of national surveys initiated in 1960. The fundamental purpose of these surveys is to characterize the health and nutritional status of the civilian noninstitutionalized population of the United States. The third National Health and Nutrition Examination Survey (NHANES III), conducted from 1988 to 1994, was a cross-sectional household interview and physical examination survey of the U.S. civilian noninstitutionalized population aged 2 months and older. NHANES III data were collected in 81 counties across the Nation from approximately 30,000 respondents among 39,696 persons selected for participation. Adults aged 17 and older constituted 20,050 respondents.

On the basis of the NHANES III adult (aged 17 and older) household interview, chronic obstructive pulmonary disease (COPD) was defined as a *yes* response to either of the following questions: (1) Has a doctor ever told you that you had chronic bronchitis? or (2) Has a doctor ever told you that you had emphysema? Asthma was defined as a *yes* response to the question, “Has a doctor ever told you that you had asthma?” Prevalence rates for COPD and for asthma were estimated for nonsmokers (using sample weights and adjustment for nonresponses) by usual industry (using the 44 industry categories as regrouped by NCHS in the NHANES III data files). Survey Data Analysis (SUDAAN) software was used to estimate variances, enabling calculation of 95% CIs for COPD and asthma prevalence rates.

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Multiple-Cause-of-Death Data

Each year since 1968, NCHS has made public-use data files available on multiple causes of death. These public-use files contain records of all U.S. deaths that are reported to State vital statistics offices (approximately 2 million annually). Each death record includes codes for up to 20 conditions listed on the death certificate, including both underlying and contributory causes of death. Other data include age, race, sex, and State and county of residence at the time of death. In addition, usual occupation and industry codes have been available for decedents from some States since 1985, and NCHS annually determines that certain quality criteria have been met by usual industry and occupation data from selected States.

Potential limitations of multiple-cause-of-death data include underreporting or overreporting of conditions on the death certificate by certifying physicians, incomplete or unclassified reporting of usual occupation and industry, and nonspecificity of codes.

For further information contact

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National Center for Infectious Diseases (NCID)

NCID is one of 12 centers, institutes, and offices of CDC. The mission of NCID is to prevent illness, disability, and death caused by infectious diseases in the United States and around the world. To accomplish this goal, NCID staff work in partnership with local and State public health officials, other Federal agencies, medical and public health professional associations, infectious disease experts from academic and clinical practice,

and international and public service organizations. NCID accomplishes its mission by conducting surveillance, epidemic investigations, epidemiologic and laboratory research, training, and public education programs to develop, evaluate, and promote prevention and control strategies for infectious diseases. Further information about NCID is available through its Web site (www.cdc.gov/ncidod/about.htm).

National Surveillance System for Hospital Health Care Workers (NaSH)

NaSH is a surveillance system that began in 1995 through the NCID Hospital Infections Program. NaSH focuses on surveillance of exposures and infections among hospital-based health care workers. The purpose of NaSH is to monitor national trends; identify newly emerging hazards for health care workers; assess the risk of occupational infection; and evaluate preventive measures, including engineering controls, work practices, protective equipment, and postexposure prophylaxis to prevent occupationally acquired infections. Participating hospitals are not randomly selected; they are usually hospitals that have previously participated in the National Nosocomial Infections Surveillance (NNIS) system and have also volunteered to participate in NaSH. Participating hospitals benefit by being able to conduct occupational health surveillance, analyze their data in an integrated system, and compare these data with a national database.

Initial entry of a health care worker into NaSH usually occurs during the provision of health care at the hospital's Employee Health Service for a relevant event (e.g., routine tuberculin skin test, initial assessment or followup after an exposure to blood, or initial assessment or followup after an exposure to a vaccine-preventable disease). Not all hospital employees have NaSH records.

The system collects the following data on health care workers: demographic information (identifying data is not sent to CDC), occupation, vaccination history, serologic results, immune status for vaccine-preventable diseases (including hepatitis B virus), TB exposure test and therapy status, detailed information on the nature of the exposure to blood/body fluids and bloodborne pathogens, postexposure prophylaxis treatment, information about exposures and infections from vaccine-preventable diseases such as measles, and information about exposures to infectious TB. Hospitals provide CDC with denominator data related to number of staff once a year. Every 2 years, participating hospitals distribute a survey to employees to be filled out anonymously that asks about history of needlesticks or sharps injuries; the purpose of this survey is to assess underreporting of incidents in the NaSH system.

For further information contact

Office of Surveillance
National Center for Infectious Diseases
1600 Clifton Road, NE, MS D59
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Sentinel Counties Study of Acute Viral Hepatitis

Although CDC conducts nationwide surveillance for acute viral hepatitis, several factors make it difficult to assess accurately changes in incidence of disease and risk factors associated with transmission: underreporting, failure to apply appropriate case definitions, and incomplete serologic testing and epidemiologic evaluation of all reported cases. To define the incidence and epidemiology of all types of viral hepatitis more accurately, a program of intensive surveillance for acute viral hepatitis was begun in several “Sentinel Counties” in 1979. Six counties currently participate in this system: Tacoma-Pierce County, WA; Pinellas County, FL; Jefferson County, AL; Denver, CO; Multnomah, OR; and San Francisco, CA.

All patients reported to the health departments participating in the Sentinel Counties Study of Acute Viral Hepatitis who meet the following clinical criteria for acute viral hepatitis are eligible for the study: (1) discrete date of onset of symptoms or jaundice and (2) liver enzymes greater than 2.5 times the upper limit of normal. For patients with non-A, non-B hepatitis (including those who test positive for hepatitis C antibodies), other possible causes of liver injury are excluded by interviewing the diagnosing physician and abstracting the medical record. All patients with acute viral hepatitis have serum drawn within 6 weeks of onset of symptoms and shipped to CDC for testing. Patients also complete a detailed epidemiologic interview.

The Sentinel Counties Study of Acute Viral Hepatitis has provided precise data on the significant sources of viral hepatitis infection in the United States and the contribution of these sources to disease incidence. In recent years, major changes have occurred in the incidence and epidemiology of the different types of viral hepatitis in the United States. Many of these changes were first recognized in the Sentinel Counties. For example, the Sentinel Counties study has been the primary source for data showing that hepatitis C is the etiologic agent of most non-A, non-B hepatitis and for describing the epidemiology and natural history of those diseases.

For further information contact

Hepatitis Branch
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Viral Hepatitis Surveillance Program (VHSP)

The Hepatitis Branch of NCID operates VHSP, which obtains national surveillance data on clinical, serologic, and epidemiologic data pertaining to risk factors for viral hepatitis. Cases are submitted to the program by State governments. Limitations of the system include underreporting of cases and frequent omission of occupation on case records. [VHSP 1999]

For further information contact

Hepatitis Branch
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National Center for HIV, STD, and TB Prevention (NCHSTP)

NCHSTP is one of 12 centers, institutes, and offices of CDC. The Center is responsible for public health surveillance, prevention research, and programs to prevent and control HIV infection and AIDS, other sexually transmitted diseases (STDs), and TB. Center staff work in collaboration with government and nongovernment partners at community, State, national, and international levels, applying well-integrated multidisciplinary programs of research, surveillance, technical assistance, and evaluation.

For further information contact

Communications Office
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Surveillance of Health Care Workers with HIV/AIDS

Since 1981, all 50 States, the District of Columbia, and U.S. Trusts and Territories have reported AIDS cases, without names or other identifying information, to CDC's HIV/AIDS Reporting System (HARS). In addition to HIV risk information, the HARS case report form also requests information about past employment and occupation in the health care setting.

In 1991, CDC's HIV/AIDS Surveillance Branch developed a standardized protocol for State and local health departments to investigate in greater detail any cases of HIV infection or AIDS in health care workers without a behavioral or transfusion risk for HIV. The health departments are requested to investigate reports of health care workers who may have occupationally acquired HIV infection even if they have not yet met the criteria of the AIDS surveillance case definition and the State does not have formal requirements for HIV infection reporting. The reporting sources for potential cases of occupational transmission in health care workers include health care providers, HARS, and two sources within the CDC Hospital Infections Program: the Postexposure Prophylaxis Failure Study and the National Surveillance System for Hospital Health Care Workers.

The standardized protocol for investigating potential cases of occupational transmission in health care workers consists of a medical records review, an incident report review, discussion with the health care worker's health care provider, an interview by health department staff, and a laboratory investigation. The data are used to determine which occupations are at risk, where and how exposures to HIV commonly occur, the sources of transmission, effective prevention strategies, and HIV postexposure prophylaxis recommendations. The data also are used by manufacturers to create safer designs for medical devices and personal protective equipment.

Following an investigation by the State or local health department, cases of HIV infection in health care workers may be determined to be associated with a nonoccupational risk, or may be classified as cases of *possible* or *documented* occupational HIV transmission. Health care workers with *possible* occupational transmission are those with a history of occupational exposure to blood, other body fluids, or HIV-infected laboratory material who report no other risk factors for HIV infection but for whom no seroconversion associated with any of the occupational exposures was documented. Health care workers with *documented* occupational transmission have had documented evidence of HIV seroconversion in temporal association with an occupational exposure and have no other

known exposure to HIV during the same period of time; also included in this category are those persons infected with HIV strains that are closely related to the occupational exposure source by deoxyribonucleic acid (DNA) sequencing.

For further information contact

Surveillance Branch
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National Center for HIV, STD, and TB Prevention
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Surveillance for Tuberculosis Infection in Health Care Workers (staffTRAK-TB)

CDC recommends periodic tuberculin skin testing of health care workers with a potential for exposure to *Mycobacterium tuberculosis*. However, many health care facilities (e.g., hospitals, correctional facilities, long-term care facilities, and health departments) do not have a system for identifying and tracking workers due for tuberculin skin testing or a means of analyzing aggregate data. To facilitate the surveillance for TB infection in health care workers in health departments, CDC developed a software package called *staffTRAK-TB* to track, analyze, and report information pertaining to tuberculin skin testing surveillance in health care workers. The software allows the collection of data for each health care worker including demographic information, occupation, work location, multiple tuberculin skin test results, and results of evaluations determining if clinically active TB is present. Programmed reports include lists of workers due and overdue for skin tests, and skin test conversion rates by occupation and worksite. Standardizing types of occupations and work locations allows data from multiple facilities to be aggregated and compared. Data transfers to CDC can be performed via floppy diskettes.

In 1995, CDC implemented tuberculin skin testing demonstration projects in selected health departments and hospitals in the United States. The tuberculin skin testing demonstration project is designed to help participating sites develop model tuberculin skin test programs consistent with CDC *Guidelines for Preventing the Transmission of Mycobacterium tuberculosis in Health-Care Facilities* and to facilitate local data analysis and evaluation of tuberculin skin testing programs. Results of tuberculin skin testings are entered into the *staffTRAK-TB* software and tuberculin skin testing data **without** personal identifiers (e.g., name, social security

number, or address) and are transferred to CDC at least quarterly from each of the participating sites. This project will allow CDC to gain information about the incidence of occupationally related tuberculin skin testing conversions among health care workers in the participating sites and determine if research is needed.

For further information contact

Division of Tuberculosis Elimination
National Center for HIV, STD, and TB Prevention
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