
Appendices

Appendix A

Sources of Data

Two main types of data sources were sought for this surveillance report: those that were medical-outcome related (i.e., mortality, morbidity) and those that were exposure related. However, no major databases of exposure data pertinent to respiratory disease in agricultural workers were identified. As a consequence, this report is restricted to health outcomes only.

Multiple-Cause-of-Death Data

The National Center for Health Statistics (NCHS) has made available annual multiple-cause-of-death data files for public use since 1968. These files contain records of all deaths in the United States (approximately two million annually) that are reported to state vital statistics offices. Each death record includes codes for up to 20 conditions listed on the death certificate, including both underlying and contributing causes of death in two fields: the entity axis, which preserves diagnostic detail for all listed conditions and their placement on the death certificate; and the record axis, which reorders the codes alphanumerically, removes redundancies, and occasionally combines some associated conditions. Other data include age, race/ethnicity, sex, and state and county of residence at time of death. In addition, usual industry and occupation codes are available for decedents from some states since 1985. NCHS annually determines that certain quality criteria have been met by usual industry and occupation data from individual states (see Appendix D). Multiple-cause-of-death data for 1988–1998 were used in this report.

For more information: <http://www.cdc.gov/nchs/about/major/dvs/mortdata.htm>

National Health Interview Survey Data

NCHS makes available public-use data from the National Health Interview Survey (NHIS), an annual health survey conducted since 1960. The NHIS is a cross-sectional household interview survey on the health of the U.S. civilian, non-

institutionalized population. The main objective of the NHIS is to monitor the health of the population of the United States through the collection and analysis of survey information on a broad range of health topics. NHIS data are collected annually by personal interview from approximately 40,000 households and include about 100,000 persons, with over-sampling of blacks and Hispanics. Through weighting procedures, estimates can be derived that are representative of the target population. The annual response rate of the NHIS is near 90% of eligible households in the sample. Data from the 1997, 1998 and 1999 surveys were used for this report.

For more information: <http://www.cdc.gov/nchs/nhis.htm>

The Third National Health and Nutrition Examination Survey Data

NCHS makes available public-use data from the third National Health and Nutrition Examination Survey (NHANES III) conducted from 1988 through 1994. NHANES III was designed to provide national estimates of the health and nutritional status of the U.S. civilian, non-institutionalized population. The NHANES III was a complex, multi-stage, stratified, clustered interview and medical survey of about 5,000 individuals per year, with over-sampling of blacks and Hispanics (and certain other groups). Through weighting procedures, estimates can be derived that are representative of the target population. The NHANES III elicited information on demography, chest symptoms, smoking history, industry and occupation, as well as deriving information on many other medical and health-related variables. Of the 39,695 individuals selected in NHANES III, 33,994 (86%) were interviewed and 20,492 undertook spirometry.

For more information: <http://www.cdc.gov/nchs/nhanes.htm>

Appendix A: Sources of Data

Survey of Occupational Injuries and Illnesses Data

The Bureau of Labor Statistics (BLS) Survey of Occupational Injuries and Illnesses (SOII), done in cooperation with participating state agencies, involves data collection by mail from a sample of approximately 250,000 establishments each calendar year. Nearly all industries in the private sector (employers covered by the Occupational Safety and Health Act of 1970) are included. Annual BLS reports of these data incorporate corresponding data from mine operators, provided to BLS by the Mine Safety and Health Administration (MSHA), and from railroad transportation employers, provided to BLS by the Federal Railroad Administration. National estimates of injury and illness incidence rates by industry are developed from the survey data.

Beginning in 1992, the survey was expanded to provide more information on illnesses resulting in days away from work, allowing for more detailed classification of respiratory system diseases. For this report, annual summary data on respiratory illnesses were extracted from BLS annual reports on occupational injuries and illnesses. Data from 1995–2002 SOII surveys were used for this report.

For more information: <http://www.bls.gov/iif/oshsum.htm>

Demographic Data

Statistics on the distribution of agricultural workers by occupation for 1997 and 2002 were obtained from the Bureau of Labor Statistics *Current Population Survey*.

For more information: <ftp://ftp.bls.gov/pub/special.requests/lf/aa97/aat11.txt> and <ftp://ftp.bls.gov/pub/special.requests/lf/aa2002/aat11.txt>

Appendix B

Methods

Mortality Analyses of NCHS Multiple-Cause-of-Death Data

For this report, the number of deaths for each respiratory condition was defined as either (1) the number of decedents for which the condition was coded as the underlying cause of death, or (2) the number of decedents for which the condition was coded as one of the multiple causes of death (i.e., either the underlying or contributing cause of death). For the years 1988–1998, these numbers were tabulated from the record axis of the NCHS multiple-cause-of-death data files. See Appendix C for a listing of the ICD-9 codes that were used in this analysis. The tables in Section 2 of this report are based solely on multiple causes of death whereas the figures in Section 2 are based on both underlying cause and multiple causes of death.

Appendix D shows the states and years with industry and occupation data on death certificates that were used for the mortality analysis.

Deaths for the analysis also were restricted to persons 15 years of age or older, appropriate when examining worker populations. Five age categories were used for the analysis: 15-54, 55-64, 65-74, 75-84, and 85 years or older. Because the age-at-death distribution is slanted toward older ages, there was a fairly even distribution across the five age categories that were used. Race and ethnicity were combined into a single variable for the analysis, categorized as follows: (1) white, non-Hispanic; (2) black, non-Hispanic; (3) other, non-Hispanic; (4) Hispanic; or (5) unknown race/ethnicity.

Deaths were tabulated by agricultural groups and by sex, age, and race/ethnicity. The agricultural groups were defined based on industry and occupation codes shown in Appendix E. Six agricultural groups were defined: (1) crop farm workers, (2) livestock farm workers, (3) farm managers, (4) landscape and horticultural workers,

(5) forestry workers, and (6) fishery workers. The remaining non-agricultural workers were used as a comparison group for the analysis.

Combinations of occupation and industry codes that were used to define agricultural groups are listed in Appendix E.

Although most ICD-9 codes used in the analysis clearly are respiratory diseases, a few might be considered only marginally related. The rationale for including the marginally related diseases was as follows:

- Tuberculosis (010-018): Tuberculosis is an infectious disease caused by *Mycobacterium tuberculosis*. It mainly involves the respiratory tract. Some of the ICD-9 codes explicitly specify other organ systems – for example, code 013 (tuberculosis of the meninges and central nervous system; code 014 (tuberculosis of intestines, peritoneum, and mesenteric glands); code 015 (tuberculosis of bones and joints); code 016 (tuberculosis of genitourinary system); and code 017 (tuberculosis of other organs). However, pulmonary tuberculosis (and other respiratory tuberculosis) predominates in terms of tuberculosis deaths in the United States.
- Mycoses (110-118): Mycoses are fungal infections that can affect various organs, including the lungs and other respiratory organs. Many, but not all of the serious and sometimes fatal mycotic infections do involve the lungs.
- Sarcoidosis (135): Sarcoidosis is a systemic granulomatous inflammatory disease of unknown etiology that typically involves the lungs.

The analysis was accomplished primarily by calculating a proportionate mortality ratio (PMR) for each worker group, for selected respiratory conditions. The PMR is defined as the observed number of deaths with the condition of interest

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(mentioned as either the underlying cause of death or a contributing cause) among all deaths in a specified worker group, divided by the expected number of deaths among those decedents for that condition. For this analysis, PMRs were calculated based on both the underlying cause of death and multiple causes of death (i.e., either underlying or contributing).

For calculating the PMRs, first, deaths from each condition of interest were tabulated by worker group, and for 50 demographic groups (i.e., all combinations of two sex categories, five race/ethnicity categories, and five age categories) within each worker group. This tabulation was performed separately for each of the years 1988–1998. These results were then summed across years to get totals for all demographic groups within each worker group.

The tabulation of observed deaths was performed separately for the underlying cause of death (at the 3-digit level of detail for ICD-9 codes) and for multiple causes of death. Further tabulations were performed for groupings of the 3-digit ICD codes (see Appendix C for a listing of all groupings).

The expected number of deaths for any worker group, for a specific condition, is the number that would have occurred if that worker group had the same proportion of deaths for that condition as did the comparison group. The expected numbers of deaths were calculated by disease and by demographic group for the six worker groups of interest, by multiplying the total number of observed deaths for each worker group by the fraction of deaths for that disease that occurred in the comparison group. The expected deaths then were summed for each worker group across the 50 demographic groups. The number of observed deaths was divided by the sum of expected deaths and then multiplied by 100 to obtain the PMR. A PMR greater than 100 indicates that there were

more deaths associated with the condition in a specified agricultural group than expected.

Lower and upper confidence limits (LCLs and UCLs) for the PMR, at a 95% level of statistical confidence, were calculated in accordance with a method described by Bailar and Ederer.¹ The method applies to the ratio of a Poisson variable to its expectation, and is appropriate for this analysis involving diseases for which the fraction of deaths attributable is relatively small. A PMR was considered to be different from 100 at the 95% level of statistical significance (i.e., $p < 0.05$) if the 95% confidence interval did not overlap 100.

Morbidity Analyses of National Health Interview Survey Data

Because the data from the National Health Interview Survey (NHIS) are based on a sample of the U.S. population, the number of data points can be relatively small when the analysis is restricted to a subgroup such as agricultural workers. Consequently, the three most recent years (1997–1999) for which NHIS results were available in the form of public-use files were combined in the analysis, to obtain a relatively greater statistical stability.

Weights that are inverse to the probability of selection for each respondent are provided with each yearly NHIS data set to enable development of national estimates from the sample data. These weights were applied separately to each year of data.

The estimates derived from the NHIS data sets concerned the number (and percent) of respondents with specific conditions. More specifically, responses were analyzed for the following questions:

¹ Bailar JC, Ederer F [1964]. Significance factors for the ratio of a Poisson variable to its expectation. *Biometrics* 20: 639-643.

- Have you EVER been told by a doctor or other health professional that you had emphysema?
- Have you EVER been told by a doctor or other health professional that you had asthma?
- Have you EVER been told by a doctor or other health professional that you had cancer or a malignancy of any kind? What kind of cancer was it? ... lung?
- During the past 12 months, have you been told by a doctor or other health professional that you had hayfever?
- During the past 12 months, have you been told by a doctor or other health professional that you had sinusitis?
- During the past 12 months, have you been told by a doctor or other health professional that you had chronic bronchitis?

The industry and occupation codes used by NCHS for the NHIS data sets are shown in Appendix F. Three agricultural groups were defined for the NHIS data sets, based on a combination of occupation/industry codes for a respondent's current job as shown in Appendix F. The remaining respondents were classified as non-agricultural workers. The occupation code of 6 (natural mathematical and computer scientists) was included for the forestry and fishery agricultural group because of relatively high proportion of the respondents were identified in the industry code of 2 (forestry and fisheries).

The number (and percent) of individuals in each worker group of interest with each of the above respiratory conditions was calculated. As with the mortality data, a comparison group (non-agricultural workers) was used as a basis for calculating the expected number of workers with each condition. The expected numbers were calculated separately within each of 80 categories representing combinations of sex (male, female), race/ethnicity (white, non-Hispanic; black, non-Hispanic; other, non-Hispanic, Hispanic), age (18-25, 25-34, 35-44, 45-64, 65+), and smoking status (never smoked or ever smoked, based

on the question "Have you smoked at least 100 cigarettes in your entire life?"). The observed and expected numbers then were summed across the 80 demographic categories. Prevalence ratios (PRs), or ratios of summed observed to expected numbers, were calculated and then multiplied by 100 to obtain a convenient reference point, and 95% LCLs and UCLs were calculated according to the method described by Bailar and Ederer¹ for mortality data. (Strictly speaking, the method may not apply directly for some conditions that are not considered rare, but it should provide an adequate approximation for purposes of screening the results to discount those based on very small numbers of observations). A PR was considered to be different from 100 at the 95% level of statistical significance (i.e., $p < 0.05$) if the 95% confidence interval did not overlap 100.

Morbidity Analyses of the third National Health and Nutritional Examination Survey

Results from the third National Health and Nutritional Examination Survey (NHANES III) also are based on a statistical sample of the U.S. population, and weights are provided for each respondent in the public-use data files to enable development of national estimates from the sample data. As with the NHIS data, much of the analysis with the NHANES III data set concerned the number (and percent) of respondents with specific conditions that could be considered respiratory in nature. Although the NHANES data set had fewer respondents overall than NHIS (with one round of survey results rather than three available for analysis), there were more questions for NHANES III that concerned respiratory conditions. Responses were analyzed for the following questions:

- Has a doctor ever told you that you had asthma?
- Has a doctor ever told you that you had chronic bronchitis?
- Has a doctor ever told you that you had emphysema?
- Has a doctor ever told you that you had hay fever?

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- Apart from when you have a cold, does your chest ever sound wheezy or whistling?
- Do you usually cough on most days for 3 consecutive months or more during the year?
- Do you bring up phlegm on most days for 3 consecutive months or more during the year?
- Are you troubled by shortness of breath when hurrying on level ground or walking up a slight hill?
- During the past 12 months, have you had any episodes of stuffy, itchy, or runny nose?
- During the past 12 months, have you had a cold or the flu?
- During the past 12 months, have you had sinusitis or sinus problems?
- During the past 12 months, have you had pneumonia?
- Have you had wheezing or whistling in your chest at any time in the past 12 months?

Industry and occupation codes from NHANES III for the worker groups of interest are similar to one another. The occupation code (for longest job held) was used to define three worker groups for the NHANES III data set as shown in Appendix G.

As with the NHIS data, the number (and percent) of individuals with each of the above respiratory conditions was calculated for each worker group, and expected numbers were calculated separately within each of 80 categories for combinations of sex, race/ethnicity, age, and smoking status. The categories used for sex, race/ethnicity, age, and smoking status were the same as those used for the NHIS data sets. Similarly, the question used for determining smoking status for NHANES III participants was the same as that used for the NHIS —“Have you smoked at least 100 cigarettes in your entire life?”

Prevalence ratios (PRs), or ratios of summed observed to expected numbers, were calculated in the same manner as described for the NHIS data and were then multiplied by 100 to obtain a convenient

reference point. Similarly, 95% LCLs and UCLs were calculated according to the method described for mortality data. (Strictly speaking, the method may not apply directly for some conditions that are not considered rare, but it should provide an adequate approximation for purposes of screening the results to discount those based on very small numbers of observations. A PR was considered to be different from 100 at the 95% level of statistical significance (i.e., $p < 0.05$) if the 95% confidence interval did not overlap 100.

A unique feature of the NHANES data set is the inclusion of spirometry data. The following spirometric parameters were used in the analysis: forced expiratory volume in one second (FEV_1); forced vital capacity (FVC); and peak expiratory flow (PEF). Expected values for each of these measures were obtained on an individual-responder basis, using prediction equations developed by Hankinson et al.² These equations provide expected values for each of the three spirometric parameters based on the subject's sex, race/ethnicity, age, and height. Percent predicted ratios were calculated for each subject for each parameter, and resulting distributions were summarized for each worker group (and a comparison group) in terms of the mean and standard deviation of the distribution.

In addition to the summary statistics described above, prevalence ratios based on the fraction of individuals with obstructive or restrictive abnormalities (using the American Thoracic Society criteria³) were calculated. Individuals with

²Hankinson JL, Odencrantz JR, Fedan KB [1999]. Spirometric reference values from a sample of the general U.S. population. *Am J Respir Crit Care Med* 159: 179-187.

³American Thoracic Society Statement [1991]. Lung function testing: Selection of reference values and interpretative strategies. *Am Rev Respir Dis* 144:1202-1218.

obstructive abnormalities were defined as those for whom the FEV₁/FVC ratio was below the lower limit of normal (LLN), again using prediction equations provided by Hankinson et al.² Subjects with restrictive abnormalities were defined as those with an FEV₁/FVC ratio above the LLN but with an FVC value that was below the LLN.

BLS Data

Unlike the NHIS and NHANES data, public-use data files are not available for the injury and illness data reported by BLS. Consequently, incidence rates summarized by industry for selected types of illness (dust diseases of the lung and respiratory conditions due to toxic agents) were extracted from BLS reports for the most recent years available: 1995-2001.

Demographic Data

Estimates extracted from selected BLS web sites or publications were used to develop the demographic statistics for agricultural workers shown in Section 1 of this report.

Statistics on the distribution of agricultural workers by occupation, for the year 2002 (most recent available), were taken from the *Current Population Survey*. Statistics on the distribution of agricultural workers by the state in which they worked, for the year 2002, also were taken from the *Occupational Employment Survey* and were retrieved (state by state) from the same web site (Table 1-2).

Statistics on the distribution of agricultural groups by sex and race/ethnicity, for the years 1997 and 2002, were taken from the *Current Population Survey* (Figures 1-1 through 1-3).

Appendix C

ICD-9 Codes and Descriptions for Respiratory Diseases Included in the Mortality Analysis

ICD Code	Description	ICD Code	Description
Tuberculosis (010-018)		Other Diseases of Upper Respiratory Tract (cont'd)	
010*	Primary tuberculous infection	477	Allergic rhinitis
011	Pulmonary tuberculosis	478	Other diseases of upper respiratory tract
012	Other respiratory tuberculosis		
013	Tuberculosis of meninges and central nervous system	Pneumonia and Influenza (480-487)	
014	Tuberculosis of intestines, peritoneum, and mesenteric glands	480	Viral pneumonia
015	Tuberculosis of bones and joints	481	Pneumococcal pneumonia
016	Tuberculosis of genitourinary system	482	Other bacterial pneumonia
017	Tuberculosis of other organs	483	Pneumonia due to other specified organism
018	Miliary tuberculosis	485	Bronchopneumonia, organism unspecified
		486	Pneumonia, organism unspecified
		487	Influenza
Mycoses (110-118)		Chronic Obstructive Pulmonary Disease and Allied Conditions (490-496)	
110	Dermatophytosis	490	Bronchitis, not specified as acute or chronic
111	Dermatomycosis, other and unspecified	491	Chronic bronchitis
112	Candidiasis	492	Emphysema
114	Coccidioidomycosis	493	Asthma
115	Histoplasmosis	494	Bronchiectasis
116	Blastomycotic infection	495	Extrinsic allergic alveolitis (hypersensitivity pneumonitis)
117	Other mycoses	496	Chronic airway obstruction, not elsewhere classified
118*	Opportunistic mycoses		
Sarcoidosis (135)		Pneumoconiosis and Other Lung Diseases - External Agents (500-508)	
135	Sarcoidosis	500	Coal workers' pneumoconiosis
Malignant Neoplasms of Trachea/Bronchus/Lung/Pleura (162-163)		501	Asbestosis
162	Malignant neoplasm of trachea, bronchus, and Lung	502	Pneumoconiosis due to other silica or silicates
163	Malignant neoplasm of pleura	503	Pneumoconiosis due to other inorganic dust
		504	Pneumonopathy due to inhalation of other dust
Acute Respiratory Infections (460-466)		505	Pneumoconiosis, unspecified
460	Acute nasopharyngitis [common cold]	506	Respiratory conditions due to chemical fumes and vapors
461*	Acute sinusitis	507	Pneumonitis due to solids and liquids
462	Acute pharyngitis	508	Respiratory conditions due to other and unspecified external agents
463	Acute tonsillitis		
464	Acute laryngitis and tracheitis	Other Diseases of Respiratory System (510-519)	
465	Acute upper respiratory infections of multiple or unspecified sites	510	Empyema
466	Acute bronchitis and bronchiolitis	511	Pleurisy
		512	Pneumothorax
Other Diseases of Upper Respiratory Tract (470-478)		513	Abscess of lung and mediastinum
470*	Deflected nasal septum	514	Pulmonary congestion and hypostasis
471	Nasal polyps	515	Postinflammatory pulmonary fibrosis
472	Chronic pharyngitis and nasopharyngitis	516	Other alveolar and parietoalveolar pneumonopathy
473	Chronic sinusitis	518	Other diseases of lung
474	Chronic disease of tonsils and adenoids	519	Other diseases of respiratory system
475	Peritonsillar abscess		
476*	Chronic laryngitis and laryngotracheitis		

*ICD code had no observed deaths for each of the agricultural groups defined in Appendix D.

Appendix D

States and Years with Industry and Occupation Codes from Death Certificates Used in the Mortality Analysis, 1988–1998

State	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Alaska	X										
Colorado	X	X	X	X	X	X	X	X	X	X	X
Georgia	X	X	X	X	X	X	X	X	X	X	X
Hawaii						X	X	x	X		X
Idaho	X	X	X	X	X	X	X	X	X	X	X
Indiana	X	X	X	X	X	X		X	x		X
Kansas	X	X	X	X	X	X	X	X	X	X	X
Kentucky	X	X	X	X	X	X	X	X	X	X	X
Maine	X	X	X	X	X	X	X	X	X		X
Nevada	X	X	X	X	X	X	X	X	X	X	X
New Hampshire	X	X	X	X	X	X	X	X	X		X
New Jersey	X	X	X	X	X	X	X	X	X	X	X
New Mexico	X	X	X	X	X	X	X	X	X	X	X
North Carolina	X	X	X	X	X	X	X	X	X	X	X
Ohio	X	X	X	X	X	X		X	X	X	X
Oklahoma	X	X	X	X	X	X		x	x		
Rhode Island	X	X	X	X	X	X	X	X	X	X	X
South Carolina	X	X	X	X	X	X	X	X	X	X	X
Tennessee	X										
Utah	X	X	X	X	X	X	X	X	X	X	X
Vermont	X	X	X	X	X	X	X	X	X	X	X
Washington		X	X	X	X	x	x				
West Virginia	X	X	X	X	X	X	X	X	X	X	X
Wisconsin	X	X	X	X	X	X	X	X	X	X	X

NOTE: Upper case 'X' means the occupation/industry data coded from state death certificates met NCHS quality criteria; lower case 'x' means the data did not meet NCHS quality criteria. Data that did not meet NCHS quality criteria comprised 1.8% of the total deaths represented in the mortality analysis.

SOURCE: National Center for Health Statistics multiple cause-of-death data

Appendix E

Agricultural Groups Used in the Mortality Analysis and Their Derivation from the U.S. Bureau of Census Industry and Occupation Codes

Table E-1. Derivation of agricultural groups from U.S. Bureau of Census industry and occupation codes

Census Occupation Code <small>(See Table E-2.)</small>	Census Industry Code <small>(See Table E-2.)</small>				
	010	011	020	031	032
473	crop farm workers	livestock farm workers			
474	landscape and horticultural workers	landscape and horticultural workers	landscape and horticultural workers		
475	farm managers	farm managers	landscape and horticultural workers		
476	landscape and horticultural workers	landscape and horticultural workers	landscape and horticultural workers		
477	farm managers	farm managers		forestry workers	fishery workers
479	crop farm workers	livestock farm workers	landscape and horticultural workers	forestry workers	
483		livestock farm workers			fishery workers
484	crop farm workers	crop farm workers	landscape and horticultural workers		
485	landscape and horticultural workers	landscape and horticultural workers	landscape and horticultural workers	forestry workers	fishery workers
486	landscape and horticultural workers	landscape and horticultural workers	landscape and horticultural workers	forestry workers	
494				forestry workers	
495				forestry workers	
496	forestry workers	forestry workers	forestry workers	forestry workers	
497					fishery workers
498					fishery workers
499					fishery workers

SOURCE: U.S. Bureau of the Census: Classified Index of Industries and Occupations. 1990 Census of Population and Housing, first edition

Appendix E: Agricultural Groups Used in the Mortality Analysis

Table E-2. U.S. Bureau of Census industry and occupation codes used in the mortality data analyses

Industry Codes

Agriculture, Forestry, and Fisheries

- 010 Agricultural production, crops
- 011 Agricultural production, livestock
- 020 Landscape and horticultural services
- 031 Forestry
- 032 Fishing, hunting, and trapping

Occupation Codes

Farming, Forestry, and Fishing Occupations

- 473 Farmers, except horticultural
 - 474 Horticultural specialty farmers
 - 475 Managers, farms, except horticultural
 - 476 Managers, horticultural specialty farms
 - 477 Supervisors, farm workers
 - 479 Farm workers
 - 483 Marine life cultivation workers
 - 484 Nursery workers
 - 485 Supervisors, related agricultural occupations
 - 486 Groundskeepers and gardeners, except farm
 - 494 Supervisors, forestry, and logging workers
 - 495 Forestry workers, except logging
 - 496 Timber cutting and logging occupations
 - 497 Captains and other officers, fishing vessels
 - 498 Fishers
 - 499 Hunters and trappers
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SOURCE: U.S. Bureau of the Census: Classified Index of Industries and Occupations. 1990 Census of Population and Housing, first edition

Appendix F

Agricultural Groups Used in the Morbidity Analysis and Their Derivation from the National Health and Interview Survey (NHIS) Industry and Occupation Codes

NHIS Occupation Code	NHIS Industry Code	
	1 Agriculture	2 Forestry and Fisheries
6	Natural mathematical and computer scientists	
29	farm managers	forestry and fishery workers
30	farm workers	forestry and fishery workers
31	Forestry and fishing occupations	

SOURCE: 1997/1998/1999 National Health Interview Surveys, Sample Adult Person Section – Public Use (pdf files, available from www.cdc.gov/nchs/about/major/nhis/quest_data_related_1997_forward.htm).

Appendix G

Agricultural Groups Used in the Morbidity Analysis and Their Derivation from the Third National Health and Nutrition Examination Survey (NHANES III) Industry and Occupation Codes

NHANES III Occupation Code	NHANES III Industry Code	
	1	2
	Agricultural Production	Agricultural Services, Forestry, Fishing
25	Farm operators, managers, and supervisors	farm managers
26	Farm and nursery workers	farm workers
27	Related agricultural, forestry, fishing	other agricultural workers

SOURCE: Third National Health and Nutrition Examination Survey, Household Adult and Examination Data File Documentation (<http://www.cdc.gov/nchs/about/major/nhanes/datalink.htm>).

