Agreement of Latest and Longest Occupation and Industry as Reported in the 1980 National Health Interview Survey

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The effectiveness of using the latest occupation instead of usual in studies of chronic disease was assessed by comparing latest and usual occupation for agreement. The 1980 National Health Interview Survey Occupational Supplement collected information on both latest and longest job and the lengths of the jobs. We compared the latest occupation and industry with the longest (usual) occupation and industry for agreement. For men, the industry agreement was 68.1% and the occupation agreement was 69.9%. Women had slightly higher agreement: 70.3% for industry and 70.5% for occupation. The percent of agreement varied by industry or occupation and age, sex, race, respondent, and length of latest job. We conclude that the percentage of agreement of latest occupation and industry with usual is sufficient for analyses of National Health Interview Survey chronic disease data using latest occupation or industry.

Epidemiologic studies of the relationship between workplace exposures and chronic disease often use information on past employment as a surrogate for exposure. Preferably this information is the lifetime work history, but, in fact, work histories are seldom available. Instead, summary measures are usually collected. These summary measures are most often either the current or last occupation and industry or the usual occupation and industry.

Surveillance studies often use information collected in record systems established for other purposes. Examples of these record systems are death certificates, Social Security records, hospital medical records, cancer registries, employment records, and union records. If only current occupation and industry summary measures are available, questions arise regarding the validity of the use of these measures in the study of chronic disease.

A few reports have compared the current occupation and industry of persons with their usual occupation and industry to determine how well the current represents the usual. In conjunction with an occupational mortality study by Guralnick,[1] a comparison was made by Kaplan et al[2] of the usual occupation data from death certificates with the current occupation data from the census for white men age 45 to 64 years. The data were coded to detailed categories and then grouped into nine major categories. They compared death certificate occupations and the census occupations for agreement at both levels of detail. Agreement was 61% for the detailed categories and 71% for the major categories.

Gute and Fulton[3] compared usual industry data from death certificates with findings from an interview survey. The survey was conducted before death, and collected information on the last industry of employment for married white men aged 60 to 64 years. It also collected the same information for their wives. For men, the agreement between the usual and last industry was 62% for the detailed categories and 78% for major categories. For women, the agreement was 65% for detailed categories and 69% for major categories.

A study of cases from a cancer registry[4] obtained work histories from interviews with the case subjects or with proxies. Usual occupation or industry was determined by summing the time employed in each industry or occupation and selecting the occupation or industry with the longest employment. The usual occupation or industry was compared with the latest occupation or industry. Black and white men and women between the ages of 40 and 84 years were included. Overall, the agreement was 73.6% for occupation, ranging from

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62.5% for black women to 78.9% for white men, and 76.6% for industry, ranging from 65.3% for black women to 82.2% for white men.

The National Health Interview Survey (NHIS) annually collects information on both acute and chronic health conditions and on the current or latest job of persons in the labor force. The National Institute for Occupational Safety and Health requested that the NHIS also collect data on the usual job of all persons ever employed to use in an analysis of the chronic health conditions. The 1980 NHIS Occupational Supplement was developed and administered for this purpose. Using this information on occupation and industry, this report examines how well the latest occupation or industry represents the usual occupation or industry.

Methods

The NHIS is a continuing nationwide household survey conducted by the National Center for Health Statistics. The survey collects information on demographic and personal characteristics, health conditions, health-related characteristics, and medical care utilization from a sample of US household occupants. Households are selected based on a multistage probability sampling plan designed to make each week's sample representative of the entire noninstitutionalized population of US civilians.[5] Although the NHIS routinely collects employment information on the latest job of persons in the labor force, the 1980 survey collected information from all persons every employed about their latest job and the longest job ever held. The 1980 NHIS also collected information about the length of both the latest job and the longest job. The information on the latest job was collected directly from the person if he or she were available at the time of the initial visit. If the person was not available, a household respondent gave the information. The information on the longest job and the lengths of the jobs was collected directly from each person, unless they were mentally or physically incapable of answering. The survey contained information on 72,909 persons over the age of 17 years. Of these persons, 97.5% of the men and 90.9% of the women reported a latest occupation or industry. This analysis includes those 68,549 persons.

In the query for the longest job, job is defined as "a specific kind of work for one employer." The occupation and industry associated with this job may in fact not be the longest occupation and industry of the person. However, for this report, we are assuming that the occupation and industry of the longest job are the usual occupation and industry of the person. We refer to either the current or last job as the "latest occupation and industry." The classification system used for occupation and industry was the 1970 Bureau of the Census system.[6] The industry classification consisted of 215 detailed categories arranged into 13 major groups and 29 subgroups. The occupation classification system had 417 detailed categories arranged into 12 major groups and 20 subgroups.

We compared the latest industry and the usual industry for exact agreement of the detailed categories. We compared occupation in the same manner. The estimated percentages of agreement were computed using the latest occupation or industry as the denominator. These percentages are estimates of US population percentages. The estimated standard errors were calculated using a special program for computing estimates from complex survey data.[7] The results are reported as the estimated percentage of persons whose latest occupation or industry detailed category is the same as their usual occupation or industry detailed category.

The tables present the percentages of agreement for men and women, by race, and by age group. Four age groups were formed: 18 to 29 years, 30 to 44 years, 45 to 64 years, and 65 years and older. We tested for differences in agreement by race and by age for the all occupations and all industries combined using t tests, with adjustment for multiple comparisons.

The respondent is the person who supplied the information on the latest job. We looked at the percentage of agreement for four different groups of respondents: self, spouse, parent, and other. We tested for differences using t tests, with adjustment for multiple comparisons.

Data on the length of latest job were grouped into five categories: less than 1 year, 1 to 5 years, 6 to 10 years, 11 to 20 years, and greater than 20 years. Using the estimated agreement standard errors, we did four weighted regression analyses. We tested for trends in the percentages of occupation agreement in relation to the length of the latest job for men and for women. We performed the same analyses for the percentages of industry agreement.

We compared the percentages of agreement for men whose usual activity in the last 12 months was working with those who were retired. For women, the comparison was between those whose usual activity was working and those whose usual activity was categorized as "keeping house." We tested for differences using t tests, with adjustment for multiple comparisons.

Results

The percentages of agreement between the latest and usual occupation and latest and usual industry are shown in Table 1. Overall, 68.1% of the men had identical codes for occupation. For industry the agreement was 69.9%. For women, the overall agreement for occupation was 70.5% and for industry was 70.3%. The difference between white and black men was not significant. Black women had statistically significantly higher percentages of agreement for both occupation and industry than white women.

For both men and women, agreement increased with age. For men, the largest increase was between the 18 to 29 age group and the 30 to 44 age group. This difference was significant. Women showed a different pattern, with little change between the two younger age groups, but with significant increases for the 45 to 64 age group and the 65 and older age group compared with the younger age groups.

TABLE 1
Sample Size and Estimated Percentage of Agreement between Latest and Usual Employment for Occupation and Industry (Estimated Standard Error) by Sex, Race, Age, Respondent, Years in Last Job, and Usual Activity

Group	Men			Women		
	n	Occupation	Industry	n	Occupation	Industry
Race						
White	29,549	68.0 (0.3)	70.0 (0.3)	30,995	70.0 (0.3)	69.8 (0.3)
Black	2,902	68.5 (1.0)	69.2 (0.9)	3,795	73.7 (0.8)	74.4 (0.8)
Other	687	71.0 (1.9)	70.7 (1.9)	621	73.9 (1.9)	72.8 (1.9)
Age, yr						
18–29	9,677	64.0 (0.5)	65.7 (0.5)	10,155	65.6 (0.5)	66.4 (0.5)
30–44	9,328	68.7 (0.5)	71.2 (0.5)	9,751	66.9 (0.5)	67.0 (0.5)
45–64	9,574	70.0 (0.5)	71.5 (0.5)	10,127	73.0 (0.5)	71.7 (0.5)
65+	4,559	72.2 (0.7)	73.0 (1.2)	5,378	81.8 (0.6)	81.2 (0.6)
Respondent						
Self	16,692	63.9 (0.4)	65.6 (0.4)	28,391	69.0 (0.3)	68.9 (0.3)
Spouse	12,064	72.3 (0.4)	74.5 (0.4)	3,592	74.7 (0.8)	74.0 (0.8)
Parent	2,937	72.8 (0.9)	73.9 (0.9)	1,945	75.8 (1.0)	75.6 (1.0)
Other	1,445	73.5 (1.2)	74.3 (1.2)	1,483	81.8 (1.0)	81.8 (1.0)
Years in last job						
<1	5,933	34.7 (0.7)	36.9 (0.7)	8,543	41.8 (0.6)	40.4 (0.6)
1–5	10,294	54.9 (0.5)	57.9 (0.5)	14,553	68.9 (0.4)	68.1 (0.5)
6–10	4,800	75.7 (0.6)	78.0 (0.6)	5,143	88.1 (0.5)	88.3 (0.5)
11–20	4,749	89.0 (0.5)	89.4 (0.5)	3,876	96.2 (0.3)	95.9 (0.4)
21+	4,341	99.2 (0.1)	99.2 (0.1)	1,862	99.4 (0.2)	99.5 (0.2)
Usual activity						
Working	24,953	68.0 (0.3)	70.1 (0.3)	17,445	68.5 (0.4)	69.3 (0.4)
Retired	4,896	72.0 (0.7)	73.0 (0.6)			
Keeping house				15,134	73.0 (0.4)	71.6 (0.4)
Other	3,289	63.7 (0.9)	64.1 (0.9)	2,832	69.7 (1.0)	70.0 (1.0)
Total	**33,138**	**68.1 (0.3)**	**69.9 (0.3)**	**35,411**	**70.5 (0.3)**	**70.3 (0.3)**

The percentage of agreement was lowest for the self-reported group for both the men and women. The difference between the self-reported and the other respondent groups was significant. Fifty-four percent of the male respondents were self, compared with 80.2% of the women. There was very little difference between whites and blacks in these percentages.

Tests for trends using regression showed a statistically significant increase in agreement with length of latest job for both men and women; that is, the longer the latest job was held, the more likely it was that the latest job and the usual job were the same. If the years in the latest job was more than 20, agreement was more than 99%.

For those whose usual activity in the last 12 months was working, the percentage of agreement was approximately the same as for the group total. This was true for both men and women and for occupation and industry. Men who were retired and women whose usual activity was keeping house reported significantly higher percentages of agreement than those usually working.

Tables 2 through 5 report percentages of agreement according to industry or occupation categories for men and women by race and by age groups. Only the two older age groups are shown since persons under 45 years would not be as likely to be included in studies of chronic diseases. Tables showing percentage of agreement for the detailed industry and occupation codes are available from the authors.

Discussion

This report is more comprehensive than any previous study comparing latest and usual occupation or industry. The data permit national estimates of percentages of agreement for detailed occupation and industry categories, with standard errors to indicate the reliability of the estimates and to use for statistical testing. Information is presented for white and black men and women and for four age groups. This information can be used in interpreting the results of surveillance studies of chronic disease that use latest occupation and industry data.

Misclassification of exposure indicators, such as occupation and industry, can distort the results of an epidemiologic study.[8] Our analysis shows that, if current occupation and industry are used as surrogates for usual, the percentage of misclassification differs for different occupation and industry groups. The quantitative knowledge about misclassification presented in the tables can be used in adjusting the results of studies that use the current or latest occupation and industry as a surrogate for usual occupation and industry. From the estimate of the effect obtained from the observed data, the order of magnitude of the true effect can be estimated using the percentage of misclassification.[9]

Data from the detailed tables should also be useful in evaluating employment data for future studies. If the only employment information available is the current or

TABLE 2

Estimated Percentage of Latest Detailed Industry Categories that Agreed with Usual Detailed Industry Categories (Estimated Standard Error) According to Industry for Men by Race and by Age

Latest Industry	Race		Age, yr	
	White	Black	45 to 64	65+
All industries	70.0 (0.29)	69.2 (0.93)	71.5 (0.50)	73.0 (0.70)
Agriculture	81.4 (1.12)	85.7 (3.85)	81.7 (2.08)	86.9 (1.66)
Forestry and fisheries	73.9 (5.85)	56.6 (30.09)	77.9 (9.05)	78.8 (13.87)
Mining	67.5 (2.09)	60.7 (13.16)	77.1 (3.33)	90.4 (3.49)
Construction	71.4 (0.88)	66.1 (2.95)	70.9 (1.58)	74.6 (2.22)
Manufacturing	72.2 (0.52)	73.3 (1.69)	76.0 (0.87)	77.3 (1.28)
Food and kindred products	69.4 (1.99)	68.4 (6.03)	70.9 (3.17)	71.9 (4.52)
Textile mill products	79.0 (2.61)	79.1 (7.12)	78.5 (4.32)	81.3 (5.49)
Apparel and other finished products	76.4 (3.81)	43.7 (12.60)	86.8 (4.54)	56.7 (9.55)
Lumber and wood products	66.7 (2.76)	70.9 (7.40)	69.9 (4.46)	68.8 (6.10)
Furniture and fixtures	63.9 (3.21)	69.1 (10.47)	61.9 (6.45)	56.7 (9.35)
Printing, publishing, and allied industries	73.5 (2.07)	78.4 (7.40)	75.0 (3.99)	68.2 (5.43)
Chemicals and allied products	73.7 (2.02)	80.0 (6.05)	80.7 (3.10)	78.3 (5.23)
Stone, clay, and glass products	74.9 (3.07)	62.6 (10.02)	79.4 (4.99)	84.1 (6.51)
Primary metal industries	81.3 (1.77)	80.1 (4.58)	87.0 (2.51)	88.6 (3.18)
Fabricated metal product	66.5 (2.00)	69.6 (6.42)	67.5 (3.18)	77.7 (4.78)
Machinery, except electrical	67.8 (1.44)	72.9 (5.55)	69.1 (2.71)	74.3 (3.93)
Electrical machinery, equipment, and supplies	71.1 (1.83)	55.8 (7.66)	75.4 (3.41)	88.7 (3.66)
Transportation equipment	76.1 (1.32)	78.0 (3.51)	81.6 (1.92)	78.0 (3.57)
All other and unspecified manufacturing industries	72.4 (1.37)	76.1 (4.22)	76.3 (2.21)	81.2 (3.20)
Transportation	73.2 (1.18)	74.4 (3.11)	78.7 (1.77)	85.9 (2.15)
Railroad	89.3 (1.58)	72.3 (7.35)	90.8 (2.51)	94.4 (2.08)
All other	68.0 (1.44)	74.9 (3.49)	75.2 (2.15)	79.2 (3.38)
Communication	84.3 (1.97)	70.6 (9.56)	90.7 (2.71)	92.3 (5.31)
Electric, gas, and sanitary services	75.5 (2.04)	65.0 (5.89)	79.0 (3.19)	75.0 (4.62)
Wholesale trade	66.4 (1.42)	55.8 (5.86)	68.3 (2.52)	75.4 (3.58)
Retail trade	66.3 (0.82)	65.1 (2.88)	64.1 (1.55)	65.4 (2.10)
Eating and drinking places	64.9 (1.92)	71.6 (4.72)	52.6 (4.03)	60.4 (6.27)
Other retail trade	66.6 (0.90)	62.7 (3.55)	66.3 (1.68)	66.1 (2.25)
Finance, insurance, and real estate	62.0 (1.38)	57.7 (5.51)	54.9 (2.44)	62.2 (3.28)
Services	65.4 (0.68)	65.0 (2.04)	65.4 (1.25)	61.1 (1.81)
Personal services	76.5 (2.84)	76.6 (6.49)	75.8 (4.93)	89.9 (4.00)
Miscellaneous business services	52.3 (2.07)	51.6 (5.83)	48.2 (3.88)	47.7 (5.92)
Repair services	65.5 (2.00)	66.9 (6.69)	62.6 (4.17)	62.7 (6.07)
Amusement and recreation services	64.8 (2.63)	70.4 (8.51)	48.5 (5.34)	56.2 (7.32)
Medical and other health services	69.6 (1.68)	67.9 (4.51)	71.6 (3.03)	68.8 (4.08)
Educational services	69.8 (1.33)	70.3 (3.91)	70.4 (2.18)	61.7 (3.87)
Private households	40.2 (6.17)	57.9 (8.74)	55.3 (11.59)	41.3 (8.67)
Other miscellaneous services	63.9 (1.47)	57.9 (5.14)	67.0 (2.66)	56.3 (3.71)
Government	70.7 (1.06)	72.9 (2.72)	72.7 (1.53)	67.9 (2.80)
Federal	75.6 (1.39)	77.0 (3.25)	78.1 (1.87)	79.6 (3.16)
State	61.8 (2.74)	52.1 (9.14)	61.2 (4.15)	55.1 (6.86)
Local	68.2 (1.94)	73.0 (5.27)	67.6 (3.16)	52.0 (5.87)

latest job, the decision about its usefulness in a chronic disease study must be made. Information presented in this paper on percentages of agreement by industry, occupation, sex, race, age, and length of job can be used in making this decision.

Some of the similarities or differences between percentages of agreement may be due to the methods of data collection. The percentages of agreement for occupation and industry are very similar for the groups shown in Table 1. This may be partially due to the fact that usual occupation and usual industry are actually the occupation and industry associated with the longest job for one employer. Usual occupation would ideally be the longest occupation held taking all employers into consideration. The same would be true for longest industry.

The respondent could also be a factor in producing similarities or differences. Since the percentage of agreement for self-respondents was lower than for other types of respondents, as shown in Table 1, it is possible that some of the differences in percentage of agreement could be due to different percents of self-respondents. We looked at the percent of respondents in each category for white and black women. There was little difference, and black women reported higher percentages of matching than white women for all respondent categories. Therefore, a difference in respondents cannot explain the higher percentage of agreement for black women. Similarly, the higher percent of self-respondents for women would not explain the higher percentages of agreement for women than for men. Nevertheless, the respondent undoubtedly has an effect on the percentage of agreement for the different groups.

The percentages of agreement between current and

TABLE 3

Estimated Percentage of Latest Detailed Occupation Categories that Agreed with Usual Detailed Occupation Categories (Estimated Standard Error) According to Occupation for Men by Race and by Age

Latest Occupation	Race		Age, yr	
	White	Black	45 to 64	65+
All occupations	68.0 (0.30)	68.5 (0.95)	70.0 (0.49)	72.2 (0.70)
Professional, technical, and kindred workers	75.0 (0.72)	73.2 (3.09)	80.5 (1.11)	83.8 (1.77)
Engineers and architects	77.6 (1.54)	47.3 (14.82)	85.2 (2.07)	85.4 (3.90)
Scientists	75.0 (3.09)	74.0 (15.05)	83.6 (4.89)	83.3 (8.86)
Health workers	85.4 (1.67)	69.8 (9.68)	92.8 (2.24)	93.4 (2.85)
Teachers, including college	80.3 (1.69)	83.6 (5.93)	83.1 (2.62)	82.5 (5.75)
Engineering and science technicians	69.8 (2.21)	76.0 (8.83)	73.9 (3.85)	82.8 (7.93)
All other professional, technical, and kindred workers	70.7 (1.17)	72.3 (4.52)	74.8 (1.96)	80.5 (2.90)
Managers and administrators, except farm	67.4 (0.75)	57.9 (4.48)	68.9 (1.15)	74.9 (1.79)
Sales workers	59.2 (1.22)	62.4 (6.66)	57.6 (2.14)	65.8 (2.98)
Clerical and kindred workers	61.6 (1.21)	65.7 (3.05)	61.0 (2.07)	64.6 (3.01)
Bookkeepers	53.8 (5.85)	61.9 (21.61)	45.0 (9.94)	39.9 (15.53)
Office machine operators	64.8 (5.26)	54.3 (12.77)	58.8 (10.06)	69.9 (24.32)
Mail handlers, postal clerks, and telegraph messengers	70.8 (2.97)	79.1 (5.81)	72.2 (3.96)	87.3 (4.96)
Secretaries, stenographers, typists, and receptionists	55.8 (6.74)	44.5 (24.77)	54.6 (11.14)	40.9 (19.01)
All other clerical workers	60.3 (1.42)	63.7 (3.73)	58.7 (2.61)	61.9 (3.47)
Craftsmen and kindred workers	71.8 (0.58)	72.1 (2.12)	74.8 (0.98)	79.7 (1.25)
Carpenters	68.7 (1.74)	68.7 (7.43)	68.5 (3.33)	79.6 (3.75)
Other construction craftsmen	75.6 (1.16)	76.3 (3.52)	81.0 (1.87)	80.4 (2.62)
Mechanics and repairmen	69.7 (1.25)	70.8 (4.16)	72.0 (2.07)	75.6 (3.36)
Metal craftsmen, except mechanics	74.3 (1.58)	78.0 (6.04)	78.0 (2.73)	89.2 (2.66)
All other craftsmen	71.0 (1.02)	68.0 (4.22)	73.5 (1.71)	78.0 (2.19)
Operatives, except transport	66.0 (0.90)	71.1 (2.28)	69.2 (1.57)	70.2 (2.18)
Transport equipment operatives	65.6 (1.29)	70.9 (2.86)	72.0 (2.17)	68.5 (3.19)
Laborers, except farm	61.3 (1.18)	66.1 (2.40)	60.9 (2.20)	59.6 (2.96)
Farmers and farm managers	87.8 (1.35)	94.4 (5.47)	86.1 (2.52)	93.8 (1.45)
Farm laborers and farm foremen	71.8 (2.39)	87.0 (4.66)	76.4 (4.23)	68.1 (4.49)
Service workers, except private household	58.8 (1.12)	61.7 (2.44)	55.2 (1.99)	47.9 (2.42)
Cleaning service	51.2 (1.93)	57.6 (3.50)	47.5 (2.96)	43.3 (3.52)
Food service	64.0 (2.13)	75.0 (4.43)	60.4 (4.88)	65.5 (5.68)
Health and personal service	65.0 (2.92)	74.2 (5.91)	62.7 (5.76)	71.2 (5.93)
Protective service	59.8 (2.17)	47.4 (5.84)	61.1 (3.78)	31.9 (4.59)
Private household workers	84.0 (10.42)	56.7 (19.17)	70.9 (17.56)	55.0 (19.38)

usual occupation and industry found in our study were somewhat higher than those found in the two earliest studies.[2,3] There are several possible explanations for these differences. The source of our data was different from that of the other studies. Our sample size was much larger, covering all occupations and industries. The data from the studies were collected in different time periods and there may have been changes in job mobility and in the makeup of the work force. The NHIS collected information on the longest job for one employer, rather than the usual occupation and industry. This could have resulted in some inaccurate estimates of agreement.

Our study was most similar to the recent report on data collected on cases from a cancer registry.[4] Occupational information was collected directly from the case subject or a proxy. The same coding system was used for both studies, but the cancer registry study grouped some occupations and some industries for comparison, whereas ours compared the detailed codes. The greatest difference was that their study included only cancer cases, whereas ours was drawn from the general population. Their sample size was also much smaller than ours. The overall percentage of agreement from the cancer registry was higher than ours, with 73.6% for occupation and 76.6% for industry. That compares with our occupation agreement of 68.1% for men and 70.5% for women and industry agreement of 69.9% for men and 70.3% for women. This can probably be accounted for by their broader comparisons using the grouped codes. Our percentages were lower for white men and higher for black women. These and other differences may be explained by the sources of the data and the sample sizes.

One objective of this paper was to determine the effect of using current occupation or industry to evaluate the relationship of employment and chronic health conditions. We show that latest industry and occupation from data collected in the NHIS agrees with usual occupation or industry about 70% of the time for all occupations or industries combined. This varies with the specific occupation or industry. An accepted surveillance method is the analysis of large numbers of death certificates using the information on usual occupation and industry and

TABLE 4
Estimated Percentage of Latest Detailed Industry Categories that Agreed with Usual Detailed Industry Categories (Estimated Standard Error) According to Industry for Women by Race and by Age

Latest Industry	Race		Age, yr	
	White	Black	45 to 64	65+
All industries	69.8 (0.30)	74.4 (0.76)	71.7 (0.47)	81.2 (0.57)
Agriculture	77.7 (2.13)	87.9 (4.11)	86.7 (2.56)	90.0 (2.67)
Forestry and fisheries	56.4 (10.24)	100.0 –*	69.2 (15.03)	0.0 –*
Mining	67.9 (4.64)	45.6 (22.84)	72.3 (9.20)	83.1 (15.73)
Construction	59.6 (2.68)	75.0 (9.94)	73.2 (4.72)	83.9 (5.00)
Manufacturing	71.7 (0.66)	72.9 (1.86)	74.0 (0.96)	84.9 (1.10)
Food and kindred products	70.1 (2.02)	74.0 (5.15)	69.2 (3.26)	84.7 (3.22)
Textile mill products	85.3 (1.73)	73.6 (5.49)	83.4 (3.01)	93.4 (2.13)
Apparel and other finished products	82.6 (1.27)	83.2 (3.44)	83.6 (1.97)	90.6 (1.79)
Lumber and wood products	74.9 (4.79)	57.9 (24.89)	83.8 (7.67)	90.0 (9.48)
Furniture and fixtures	66.8 (3.79)	49.2 (13.75)	72.2 (6.00)	70.6 (9.59)
Printing, publishing, and allied industries	60.4 (2.36)	72.6 (9.73)	62.8 (4.19)	69.2 (5.35)
Chemicals and allied products	71.3 (2.94)	61.1 (8.77)	72.9 (4.60)	82.4 (6.17)
Stone, clay, and glass products	63.3 (4.29)	67.0 (19.62)	69.9 (6.56)	84.9 (7.19)
Primary metal industries	65.4 (4.47)	54.9 (13.11)	66.8 (8.25)	72.1 (10.89)
Fabricated metal products	65.1 (3.00)	73.6 (9.78)	66.4 (5.23)	75.8 (7.12)
Machinery, except electrical	61.7 (2.67)	64.6 (8.61)	72.0 (4.37)	75.4 (7.24)
Electrical machinery, equipment and supplies	70.1 (1.83)	79.8 (5.07)	73.6 (2.73)	84.3 (4.09)
Transportation equipment	69.8 (2.74)	59.7 (6.21)	76.5 (3.27)	74.6 (5.34)
All other and unspecified manufacturing industries	72.3 (1.39)	74.3 (4.51)	71.0 (2.39)	88.4 (2.43)
Transportation	65.3 (2.29)	53.3 (8.38)	71.7 (3.88)	82.5 (5.22)
Railroad	76.8 (5.70)	67.7 (26.80)	67.9 (10.37)	95.3 (4.59)
All other transportation	63.9 (2.46)	52.3 (8.58)	72.4 (4.18)	74.8 (7.66)
Communication	84.8 (1.83)	86.1 (4.27)	90.6 (2.36)	98.0 (1.42)
Electric, gas, and sanitary services	71.3 (3.94)	100.0 –*	70.7 (6.20)	94.8 (5.12)
Wholesale trade	62.8 (1.91)	57.8 (8.49)	64.9 (3.31)	85.9 (3.45)
Retail trade	67.4 (0.62)	74.7 (2.02)	68.5 (1.07)	77.8 (1.34)
Eating and drinking places	69.9 (1.20)	78.8 (2.86)	72.3 (2.09)	74.3 (3.05)
Other retail trade	66.4 (0.71)	71.3 (2.98)	67.2 (1.25)	78.8 (1.47)
Finance, insurance, and real estate	67.0 (1.05)	75.8 (3.35)	68.3 (2.00)	77.6 (2.87)
Services	70.4 (0.45)	74.3 (1.06)	71.2 (0.78)	80.8 (0.85)
Personal services	77.5 (1.53)	78.9 (3.99)	81.8 (2.50)	83.5 (2.79)
Miscellaneous business services	54.6 (1.91)	48.0 (5.08)	52.2 (3.24)	79.0 (5.11)
Repair services	55.9 (4.34)	48.9 (13.47)	49.6 (9.08)	89.5 (9.80)
Amusement and recreation services	63.6 (2.78)	72.1 (10.63)	68.9 (5.20)	78.1 (5.71)
Medical and other health services	72.2 (0.83)	74.6 (2.04)	72.0 (1.48)	74.6 (2.09)
Educational services	78.2 (0.76)	74.7 (2.38)	79.8 (1.26)	89.0 (1.30)
Private households	68.1 (1.93)	83.3 (1.65)	69.2 (2.36)	83.3 (1.71)
Other miscellaneous services	59.1 (0.17)	65.9 (2.93)	59.1 (2.15)	69.3 (2.68)
Government	70.2 (1.30)	75.6 (2.50)	72.9 (2.11)	72.8 (3.27)
Federal	73.5 (1.75)	78.7 (3.17)	77.4 (2.51)	71.7 (4.75)
State	70.9 (2.83)	69.9 (7.29)	68.2 (5.01)	78.3 (6.16)
Local	64.9 (2.47)	72.8 (4.62)	68.0 (4.42)	71.1 (6.07)

* Accurate computation of SE is not possible.

the cause of death. Studies comparing the death certificate information with information on occupation and industry from other, supposedly more accurate sources, have found agreements of 50% to 80%.[2,3,10–15] The death certificate-based surveillance studies have been able to identify some occupations with higher risks for certain causes of death which they recommend for more in-depth studies.[16–19] Since the percentage of misclassification resulting from the use of NHIS latest occupation or industry falls into the range of misclassification estimated for death certificate studies, the availability of only the latest occupation and industry should not rule out the use of NHIS data for the surveillance of chronic diseases.

Since record systems established for purposes other than conducting epidemiologic studies are now being adapted for this use, it is very important that the collection of occupation and industry information be improved. The 1988 NHIS collects information on the kind of work (occupation) done the longest and the industry in which this kind of work was done. This information should give a more accurate representation of usual occupation and industry than the longest job for one employer. Since death certificates are often used for occupational mortality studies, improved information collection through the vital statistics system is essential. This is particularly true for women. A total of 9.38% of the women in the NHIS sample were coded to the category "not reported or never worked," which includes housewives who have never been employed. For

TABLE 5
Estimated Percentage of Latest Detailed Occupation Categories that Agreed with Usual Detailed Occupation Categories (Estimated Standard Error) According to Occupation for Women by Race and by Age

Latest Occupation	Race		Age, yr	
	White	Black	45 to 64	65+
All occupations	70.0 (0.29)	74.7 (0.76)	73.0 (0.46)	81.8 (0.55)
Professional, technical, and kindred workers	77.5 (0.62)	77.8 (2.34)	82.0 (1.16)	89.4 (1.20)
Engineers and architects	76.7 (6.95)	59.2 (34.16)	60.5 (17.83)	100.0 –*
Scientists	73.3 (4.30)	62.1 (17.27)	92.4 (5.23)	100.0 –*
Health workers	85.9 (1.01)	83.4 (3.58)	90.1 (1.60)	93.6 (2.10)
Teachers, including college	82.2 (0.91)	81.1 (4.38)	86.1 (1.84)	92.9 (1.41)
Engineering and science technicians	67.6 (4.00)	100.0 –*	77.4 (6.83)	91.0 (8.67)
All other professional, technical, and kindred workers	65.0 (1.32)	67.4 (4.14)	69.3 (2.41)	77.6 (3.34)
Managers and administrators, except farm	61.3 (1.08)	59.8 (4.67)	65.2 (1.84)	78.1 (2.20)
Sales workers	63.9 (1.00)	77.8 (4.42)	65.3 (1.73)	80.7 (1.86)
Clerical and kindred workers	69.5 (0.50)	70.2 (1.63)	73.2 (0.83)	79.9 (1.21)
Bookkeepers	75.3 (1.22)	62.2 (9.37)	79.7 (2.01)	88.7 (2.21)
Office machine operators	68.3 (2.39)	66.3 (6.44)	63.7 (5.14)	68.6 (9.38)
Mail handlers, postal clerks, and telegraph messengers	62.0 (4.47)	78.6 (7.33)	62.0 (7.29)	81.7 (8.38)
Secretaries, stenographers, typists, and receptionists	73.4 (0.79)	76.4 (2.92)	77.9 (1.29)	82.9 (1.97)
All other clerical workers	64.8 (0.76)	67.8 (2.19)	68.2 (1.32)	74.5 (1.99)
Craftsmen and kindred workers	66.7 (1.76)	64.2 (5.85)	71.8 (2.85)	76.9 (3.34)
Carpenters	57.4 (15.19)	0.0 –*	0.0 –*	0.0 –*
Other construction craftsmen	53.8 (7.08)	51.1 (20.43)	46.0 (15.31)	64.8 (16.78)
Mechanics and repairmen	60.5 (7.15)	84.9 (14.12)	78.0 (10.23)	84.8 (13.85)
Metal craftsmen, except mechanics	67.0 (7.06)	42.3 (22.29)	66.3 (11.47)	54.9 (20.25)
All other craftsmen	68.6 (1.96)	68.4 (6.52)	73.6 (3.14)	78.1 (3.53)
Operatives, except transport	75.0 (0.74)	76.0 (1.83)	76.4 (1.16)	86.9 (1.08)
Transport equipment operatives	62.3 (4.20)	44.3 (10.31)	81.3 (5.31)	74.8 (12.79)
Laborers, except farm	61.6 (2.51)	74.1 (5.88)	69.2 (4.54)	81.2 (5.04)
Farmers and farm managers	86.4 (3.69)	100.0 –*	84.6 (5.58)	100.0 –*
Farm laborers and farm foremen	74.4 (3.09)	86.4 (4.77)	89.1 (3.18)	85.0 (3.79)
Service workers, except private household	67.8 (0.71)	72.3 (1.47)	69.6 (1.17)	74.9 (1.53)
Cleaning service	65.3 (2.17)	67.4 (2.97)	63.5 (2.93)	79.0 (3.21)
Food service	65.3 (1.14)	75.4 (2.37)	69.4 (1.77)	72.7 (2.42)
Health and personal service	71.6 (1.03)	74.9 (2.37)	72.9 (1.87)	75.0 (2.39)
Protective service	57.7 (5.61)	55.7 (9.11)	65.1 (9.13)	100.0 –*
Private household workers	68.0 (2.12)	79.1 (1.90)	67.3 (2.50)	82.9 (1.89)

* Accurate computation of SE is not possible.

those less than 65 years old, the percentage was 7.62; for those 65 and older it increased to 18.10. In contrast to these percentages, in a sample of over 100,000 death certificates for women for the year 1984, 47.9% of those less than 65 years old were coded to the category "not reported or housewife"; for those older than 65, the percentages was 63.0 (NIOSH, unpublished data). This disparity indicates a need for increased awareness by funeral directors for the importance of this information.

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