



# SCHS Studies

A Special Report Series by the State Center for Health Statistics  
1908 Mail Service Center, Raleigh, N.C. 27699-1908  
[www.schs.state.nc.us/SCHS/](http://www.schs.state.nc.us/SCHS/)

No. 117

September 1999

## Using Death Certificates to Target Occupation Groups for Health Promotion and Disease Screening in North Carolina

by

Kathryn B. Surles, M.Ed.  
Ziya Gizlice, Ph.D.  
Paul A. Buescher, Ph.D.

### ABSTRACT

**Objectives:** The purpose of this study is to examine occupational mortality differences among working-age North Carolinians in order to target occupation groups for health promotion and disease screening activities related to four site-specific cancers: colon/rectum, prostate, female breast, and cervix. Clinical screening tests are available for each of those types of cancer.

**Methods:** This study uses proportionate mortality ratios (PMRs) to examine associations between occupation and the selected causes of death. The analysis includes 80 occupation categories and three consecutive 5-year time periods. PMRs are generated for male and female decedents in two age groups: 35-49 and 50-64.

**Results:** Significantly high PMRs and high numbers of deaths are observed for colon/rectum cancer among males in executive/administrative/managerial occupations and breast cancer among females working as executives/administrators/managers, secretaries/stenographers/typists, and teachers except postsecondary. Results from other occupational studies are reviewed, and survey results concerning health promotion activities in the state's private sector worksites are summarized.

**Conclusion:** There is a large potential for using the worksite to bring health promotion information and disease screening to North Carolina residents. Results of the present PMR analysis for four cancer sites should be helpful to those efforts.



## Introduction

The use of routinely collected data to examine cause-specific mortality by occupation can identify groups that may have elevated risks. In North Carolina, “usual lifetime occupation” and the corresponding industry reported on the death certificate have been coded since 1984.

Using those data, previous North Carolina studies<sup>1-3</sup> have examined occupational mortality for a large number of causes of death. The purpose of the present study is to focus on four site-specific cancers – colon, prostate, female breast, and cervix – for which clinical screening tests are available. These tests include digital rectal examination, fecal occult blood testing (FOBT), and proctoscopic exams for colorectal cancer; digital rectal examination and the prostate-specific antigen (PSA) test for prostate cancer; mammography and clinical breast examination for breast cancer; and pelvic exam and the Pap test for cervical cancer. The results may be used to design health promotion activities at the worksite, especially programs to promote increased use of cancer screening tests.

Efforts to promote healthy behaviors have increasingly focused on the worksite as a means of reaching large groups of people. In 1992, a national survey found that over 80 percent of private worksites having 50 or more employees offered health promotion activities to their employees.<sup>4</sup> However, smaller worksites were less likely to offer health promotion activities.<sup>5</sup>

In North Carolina, a 1994 survey of private worksites having 10 or more employees was undertaken to determine the extent and nature of private worksite health promotion activities.<sup>6</sup> Public sector worksites were not included.

Results of the 1994 survey showed that health promotion activities consisted mainly of written materials and were more common at worksites having 100 or more employees. Larger worksites were also more likely to offer screening or health education for cancer. About 15 percent of large worksites (100+ employees), compared to three percent of small worksites (10-49 employees), offered cancer screening.<sup>6</sup>

Data from the North Carolina Central Cancer Registry<sup>7</sup> suggest that cancer screening and/or follow-up are far from adequate. In 1997, fifty-seven percent

of invasive colorectal cancers were diagnosed after regional or distant metastasis. Also diagnosed late were 18, 33, and 39 percents of invasive prostate, female breast, and cervical cancers, respectively. The percentages diagnosed late were higher for minorities than for whites.

Data from 1997 Behavioral Risk Factor Surveillance System (BRFSS) show deficits in cancer screening in North Carolina, particularly for colorectal cancer. Only half of age-eligible respondents reported having been screened for colorectal cancer within a year. About 70 percent of women ages 50 and older said they had received breast and cervical cancer screening tests within a year.

The literature on occupational morbidity/mortality is extensive. Some of the more relevant recent studies are cited below. Others, which tend to corroborate this study’s results, are noted in the Discussion.

**Colon:** Adjusting for age and social class, Firth<sup>8</sup> found elevated colon cancer mortality ratios among men working as managers. More recently, Cerhan<sup>9</sup> found elevated risk among white male farmers ages 20-64. In a literature review, Macfarlane<sup>10</sup> found “remarkably consistent evidence that people who are highly physically active could be at reduced risk of cancer of the colon.” Controlling for social class and occupational physical activity, Heineman<sup>11</sup> found elevated colon cancer risk among veterans who were current or former smokers. Evidence of an association between smoking and colon polyps suggests that smoking may primarily affect an early stage in the development of colon cancer.

**Prostate:** Four recent studies<sup>9, 12-14</sup> found positive associations with farming. The most plausible explanation is exposure to hormonally active agricultural chemicals.

**Female Breast:** As reported by Coogan<sup>15</sup> and Calle,<sup>16</sup> several studies have found excess risk of breast cancer in several occupation groups including administrative occupations, teachers, and nurses. After adjusting for a number of known breast cancer risk factors, however, results of the referenced studies offered little support for those associations except slightly elevated risk among administrative support occupations. The Calle study also found excess risk among “executives.”

**Cervix:** Three recent studies<sup>17-19</sup> found elevated risk among manufacturing and service occupations, e.g., apparel manufacturing workers, waitresses, janitors/cleaners, private household workers, and cooks.

The purpose of the present study is to identify high-risk occupations regardless of the underlying risk factors. Occupation groups can be targeted by programs to promote the increased use of cancer screening tests and other health promotion activities. While some risk factors, such as those related to timing of reproduction and physical activity, may be directly related to an occupation, the point here is to identify target groups for cancer education and screening activities, irrespective of the factors that may contribute to excess mortality.

## Methods

This study, like the previous one,<sup>3</sup> follows NIOSH<sup>20</sup> in using age-specific proportionate mortality ratios (PMRs), as described in Appendix A. The analysis includes 80 occupation categories (see Appendix B), and three consecutive 5-year periods: 1984-88, 1989-93, and 1994-98. PMRs are generated for male and female decedents in two age groups: 35-49 and 50-64.

The PMR is a risk measure for a given combination of occupation and cause of death. A PMR greater than 1.00 indicates that the proportion of deaths for an occupation attributed to a particular cause of death is higher than the corresponding proportion for all males or females in the age group. A PMR of 2.00, for example, would indicate that the proportion for that occupation was twice as great. Conversely, a PMR less than 1.00 indicates that the proportion of deaths attributed to that cause is less for the occupational group than for all males or females in the age group. Appendix A describes the calculation of the PMR and its confidence limits.

The reader should keep in mind that an elevated PMR in this study may reflect many factors other than occupational exposure, for example, the socioeconomic, cultural, or lifestyle factors of persons in that occupation. Some PMRs may be elevated due to chance alone. For this reason, this study presents only the cause-occupation group PMRs significant in at least two time periods. Also, by definition, the occupation-age-gender group must have a PMR of 1.00, so an

elevated PMR (greater than 1) for a particular cause will reflect proportionately fewer deaths from other causes.

The user of these data should keep in mind that a small deviation of PMR from 1.00 may be statistically significant where large numbers of deaths are involved. Therefore, a determination of the practical significance of an elevated PMR must consider both the degree of elevation and the number of deaths in the occupation and cause-of-death group.

Table 1 shows the numbers of deaths involved in this study. Highlights of the PMR analysis are given in Tables 2 and 3. PMRs are shown if they are based on 10 or more deaths and are significantly high or low ( $p < .05$ ) in one or both age groups in at least two of the three time periods. The detailed data for all 80 occupation groups are available upon request.

## Results

A total of 213,015 deaths ages 35-64 occurred between 1984 and 1998 in North Carolina. Of these, 135,154 were male and 77,248 were female deaths. For the four cancer sites examined in this report, Table 1 shows the numbers of deaths among males and females ages 35-49 and 50-64. The results displayed in Table 2 show PMRs greater than 1.00 ( $n \geq 10$ ) with significance ( $p < .05$ ) in one or both age groups in at least two of the three time periods studied. Corresponding results for PMRs below 1.00 are found in Table 3.

**Table 1**  
**Numbers of Deaths from Specified Cancers**  
**by Age and Gender**  
**North Carolina 1984-98**

Cancer Site	Males		Females		Total
	35-49	50-64	35-49	50-64	
Colon/Rectum	636	2,392	600	1,951	5,579
Prostate	46	1,315	–	–	1,361
Female Breast	–	–	2,706	5,031	7,737
Cervix	–	–	521	551	1,072
Total	682	3,707	3,827	7,533	15,749

**Table 2**  
**Numbers of Deaths and PMRs Greater than 1.00 by Age and Gender**  
**North Carolina, Three Consecutive 5-Year Time Periods**

Gender/Site/ Occupation Group	Time Period	Number of Deaths for Ages 35-49	PMR for Ages 35-49	Number of Deaths for Ages 50-64	PMR for Ages 50-64
<b>• Males, Colon/Rectum</b>					
Engineers, Architects & Surveyors	1984-88	–	–	22	1.96*
	1989-93	–	–	15	1.40
	1994-98	–	–	22	1.63*
Executive, Administrative & Managerial Occupations	1984-88	16	1.54	71	1.56*
	1989-93	27	2.22*	82	1.44*
	1994-98	22	1.74*	86	1.44*
Social, Recreation & Religious Workers	1984-88	–	–	14	2.18*
	1989-93	–	–	16	2.08*
	1994-98	–	–	15	1.88
Sales Representatives, Finance & Business Services	1984-88	–	–	21	2.36*
	1989-93	–	–	–	–
	1994-98	–	–	17	1.75*
<b>• Females, Breast</b>					
Executive, Administrative & Managerial Occupations	1984-88	36	1.46*	62	1.30
	1989-93	50	1.25	82	1.60*
	1994-98	58	1.33*	106	1.62*
Financial Records Processing Occupations	1984-88	–	–	40	1.71*
	1989-93	16	1.30	30	1.36
	1994-98	13	1.29	36	1.54*
Management Related Occupations	1984-88	18	1.74*	34	2.08*
	1989-93	18	1.43	35	2.03*
	1994-98	32	1.61*	29	1.28
Secretaries, Stenographers and Typists	1984-88	54	1.35*	119	2.12*
	1989-93	59	1.47*	79	1.36*
	1994-98	45	1.28	77	1.44*
Teachers, Except Postsecondary	1984-88	51	1.67*	78	1.76*
	1989-93	55	1.65*	79	1.80*
	1994-98	56	1.69*	84	1.71*

\*p < .05, n ≥ 10.

Note: A dash (–) indicates that a PMR was not calculated due to fewer than 10 deaths.

**Table 3**  
**Numbers of Deaths and PMRs Below 1.00 by Age and Gender**  
**North Carolina, Three Consecutive 5-Year Time Periods**

Gender/Site/ Occupation Group	Time Period	Number of Deaths for Ages 35-49	PMR for Ages 35-49	Number of Deaths for Ages 50-64	PMR for Ages 50-64
<b>• Males, Colon/Rectum</b>					
Construction Trades Except Supervisors	1984-88	–	–	48	0.75*
	1989-93	20	0.89	50	0.73*
	1994-98	20	0.65	58	0.72*
Freight, Stock & Material Handlers	1984-88	11	0.84	29	0.65*
	1989-93	11	0.79	26	0.63*
	1994-98	–	–	34	0.97
<b>• Females, Breast</b>					
Housewives, Homemakers	1984-88	212	0.81*	590	0.81*
	1989-93	209	0.86*	529	0.85*
	1994-98	159	0.75*	393	0.74*
Private Household Service Occupations	1984-88	11	0.48*	56	0.75*
	1989-93	12	0.65	20	0.38*
	1994-98	–	–	24	0.68

\*p < .05, n ≥ 10.

Note: A dash (–) indicates that a PMR was not calculated due to fewer than 10 deaths.

For prostate, cervical, and female colorectal cancer, no such patterns of significantly high or low PMRs were observed. The results for industry groups generally reflect those obtained for occupation groups, e.g., significantly high PMRs for colon cancer among males in religious organizations and breast cancer among females in elementary and secondary schools, significantly low PMRs for colon cancer among males in construction, and no remarkable results for prostate and cervical cancer.

In addition to high PMRs, high numbers of deaths in a subpopulation are a public health concern. This is especially true if a high PMR and high number occur simultaneously. Such is the case for colon cancer among males in executive/administrative/managerial occupations and breast cancer among females working as executives/administrators/managers, secretaries/stenographers/typists, and teachers except postsecondary.

## Discussion

This study's results for prostate, cervical, and female colorectal cancer are largely unremarkable. However, the results for male colon cancer and female breast cancer are noteworthy.

Other studies tend to corroborate the findings for excess breast cancer risk among secretaries/typists,<sup>21</sup> professional/managerial/clerical workers,<sup>22</sup> and teachers.<sup>21, 22</sup> As reported by Pollán,<sup>23</sup> several studies have shown elevated breast cancer mortality in upper socio-economic status occupations, suggesting that reproductive history and case detection (i.e. screening behavior) may be factors. In addition, the benefits of physical activity are suggested by Coogan<sup>24</sup> and Thune.<sup>25</sup>

Teachers comprise one of the largest single occupation groups among women in the United States,<sup>16</sup>

and they are very accessible. Therefore, the significantly high PMRs found in both age groups and all three time periods are worthy of consideration for targeting elementary and secondary teachers for health promotion activities, especially early breast cancer screening. Research indicates that mortality due to breast cancer can be reduced by 30 percent among women 50 and older through the use of mammography and clinical breast examination.<sup>26</sup> In North Carolina, breast cancer is the leading cause of cancer deaths among women ages 25-54. It is second only to lung cancer at older ages.

PMR analysis showed significantly low risk of breast cancer death for housewives and private household service occupations. Interestingly, those occupations with low PMRs for breast cancer had excess risk of death from heart disease, while those with high PMRs for breast cancer were at low risk of death from heart disease. A separate PMR analysis excluding diseases of the heart and occupation groups with reduced breast cancer risk produced slightly smaller but still significant PMRs for teachers in five of six time periods.

For male colon cancer, significantly high risk was found in five of the six time period-age categories for executive/administrative/managerial occupations. Contrast this with the significantly low PMRs for men in the construction trades. Physical activity is a possible factor, although the observed PMRs may reflect to some extent competing risks among the causes of death. For example, among men in the construction trades, the previous study<sup>3</sup> found significantly high PMRs for chronic liver disease/cirrhosis, lung cancer, and at younger ages, several categories of injury deaths.

There may be limitations to the results of this study due to problems in the accuracy of recording occupation on the death certificate. The National Institute for Occupational Safety and Health (NIOSH)<sup>20</sup> reviewed several studies that compared the death certificate information about occupation and industry with employment information from interviews conducted before death or interviews with next-of-kin. Most of those studies compared fewer than 400 death certificates with interview information. For white males, the agreement for occupation ranged from 53 to 69 percent. Percent agreement for white and black females was a little higher, while for black males the agreement was lower. The fact that specific occupations

are most often combined into groups for this study reduces this problem to some degree. Results of this study may also be limited by the PMR method of analysis, as discussed earlier.

Nevertheless, there is a large potential for using the worksite to bring health promotion information and disease screening to North Carolina residents. Assuming that the screening tests available for each cancer site were effective, that test results were reliable, and that appropriate testing, follow-up, and treatment occurred, the numbers in Table 1 suggest the potential for saving many lives among the working-age population in North Carolina.

## References

<sup>1</sup>Surles KB et al. Occupational mortality among North Carolina males 1984-1986: a death rate analysis. *SCHS Studies*, 47, December 1988.

<sup>2</sup>Surles KB et al. Occupational mortality among North Carolina females 1984-1986: a death rate analysis. *SCHS Studies*, 50, April 1989.

<sup>3</sup>Surles KB et al. Occupational mortality among working-age North Carolinians, 1988-97. *SCHS Studies*, 115, May 1999.

<sup>4</sup>US Department of Health and Human Services, Public Health Service. 1992 national survey of worksite health promotion activities: summary. *American Journal of Health Promotion*, 1993, 7:452-464.

<sup>5</sup>Linnal L et al. Health promotion in small businesses: comparison of national and state-level findings. Presented at the 13th annual Wellness in the Workplace Conference, Baltimore, MD, May 1994.

<sup>6</sup>Leiss JK and Burt, MS. Private sector worksite health promotion activities in North Carolina: results from the 1994 survey. *CHES Studies*, 92, March 1995.

<sup>7</sup>North Carolina Central Cancer Registry, Selected cancers by stage at diagnosis 1997. Printout produced June 16, 1999.

- <sup>8</sup>Firth HM et al. Male cancer mortality by occupation: 1973-86. *New Zealand Medical Journal*, 1993; 106(961):328-30.
- <sup>9</sup>Cerhan JR et al. Cancer mortality among Iowa farmers: recent results, time trends, and lifestyle factors (United States). *Cancer Causes and Control*, 1998; 9:311-19.
- <sup>10</sup>Macfarlane GJ and Lowenfels. Physical activity and colon cancer. *European Journal of Cancer Prevention*, 1994; 3:393-98.
- <sup>11</sup>Heineman EF et al. Increased risk of colorectal cancer among smokers: results of a 26-year follow-up of US veterans and a review. *International Journal of Cancer*, 1995; 59:728-38.
- <sup>12</sup>Keller-Byrne JE et al. Meta-analyses of prostate cancer and farming. *American Journal of Industrial Medicine*, 1997; 31:580-86.
- <sup>13</sup>Buxton, JA et al. Occupational risk factors for prostate cancer mortality in British Columbia, Canada. *American Journal of Industrial Medicine*, 1999; 35:82-86.
- <sup>14</sup>Krstev S et al. Occupational risk factors and prostate cancer in U.S. blacks and whites. *American Journal of Industrial Medicine*, 1998; 34:421-30.
- <sup>15</sup>Coogan PF et al. Variation in female breast cancer risk by occupation. *American Journal of Industrial Medicine*, 1996; 30:430-37.
- <sup>16</sup>Calle EE et al. Occupation and breast cancer mortality in a prospective cohort of US women. *American Journal of Epidemiology*, 1998; 148(2):191-197.
- <sup>17</sup>Alterman T et al. Occupation and cervical cancer: an opportunity for prevention. *Journal of Women's Health*, 1997; 6(6):649-57.
- <sup>18</sup>Savitz DA et al. Occupation and cervical cancer. *Journal of Occupational and Environmental Medicine*, 1995; 37(3):357-61.
- <sup>19</sup>Sala M et al. A death certificate-based study of occupation and mortality from reproductive cancers among women in 24 US states. *Reproductive Cancer and Occupation*, 1998; 40(7):632-39.
- <sup>20</sup>Burnett C et al. Mortality by occupation, industry, and cause of death: 24 reporting states, 1984-1988. National Institute for Occupational Safety and Health, DHHS (NIOSH) Publication No. 97-114, June 1997.
- <sup>21</sup>Morton WE. Major differences in breast cancer risks among occupations. *Journal of Occupational and Environmental Medicine*, 1995; 37(3):328-35.
- <sup>22</sup>Rubin CH et al. Occupation as a risk identifier for breast cancer. *American Journal of Public Health*, 1993; 83(9):1311-15.
- <sup>23</sup>Pollán M et al. High risk occupations for breast cancer in the Swedish female working population. *American Journal of Public Health*, 1999; 89(6):875-81.
- <sup>24</sup>Coogan PF et al. Physical activity in usual occupation and risk of breast cancer (United States), *Cancer Causes and Control*, 1997; 8:626-31.
- <sup>25</sup>Thune I et al. Physical activity and the risk of breast cancer, *The New England Journal of Medicine*, 1997; 336(18):1269-75.
- <sup>26</sup>U.S. Department of Health and Human Services, Public Health Service. *Healthy People 2000: National Health Promotion and Disease Prevention Objectives*. DHHS Publication No. (PHS) 91-50212. U.S. Government Printing Office, Washington, September 1990.

## Appendix A

### PMRs and Significance Testing

The age-gender-specific PMR for an occupation indicates whether the proportion of deaths attributed to a particular cause of death is higher (greater than 1.00) or lower (less than 1.00) than the corresponding proportion for the age-gender group as a whole.

PMRs for the four age-gender groups used in this report were computed as follows:

Occupation	Cause of Death		
	Cause X	Other Causes	All Causes
Occupation Y	A	B	$N_1$
Other Occupations	C	D	$N_2$
All Occupations	$M_1$	$M_2$	T

A = observed number of deaths for a specific occupation and cause-of-death combination for the age-gender group

E (A) = expected number of deaths for a specific occupation and cause-of-death combination for the age-gender group

$$E(A) = \frac{M_1 N_1}{T}$$

$$PMR = \frac{A}{E(A)}$$

The 95% confidence limits for the age-gender-specific PMR were determined as follows:

The observed numbers of deaths for the occupation and cause-of-death combinations (A's) are distributed approximately as Poisson random variables. For each observed number of deaths (A), a Poisson distribution was generated with the mean (l) equal to the observed number of deaths. From each distribution, two approximate numbers of deaths corresponding to 0.025 and 0.975 probability levels were obtained. In turn, these two numbers of deaths were each divided by the expected number of deaths to obtain 95% lower and upper confidence limit estimates for the PMR. For each occupation and cause combination, a lower confidence limit greater than 1.00 indicates a significantly high PMR while an upper confidence limit below 1.00 indicates a significantly low PMR.

For the detailed results of this PMR analysis, readers may contact the State Center.



## Appendix B

### Eighty Occupation Categories Used in 1988-97 PMR Analysis (Codes are Bureau of Census Equivalents to the Standard Occupation Classification, U.S. Department of Commerce.)

Codes	Occupation
003-022	Executive, Administrative & Managerial Occupations
023-037	Management Related Occupations
043-063	Engineers, Architects & Surveyors
064-068	Mathematical & Computer Scientists
069-083	Natural Scientists
084-089	Health Diagnosing Occupations
095-106	Health Assessment and Treating Occupations
113-154	Teachers Postsecondary
155-159	Teachers Except Postsecondary
163	Counselors
164-165	Librarians, Archivists & Curators
166-173	Social Scientists & Urban Planners
174-177	Social, Recreation & Religious Workers
178-179	Lawyers & Judges
183-199	Writers, Artists, Entertainers & Athletes
203-208	Health Technologists & Technicians
213-218	Engineering & Related Technologists & Technicians
223-225	Science Technicians
226-235	Technicians, Except Health, Engineering & Science
243	Sales Supervisors and Proprietors
253-257	Sales Representatives, Finance & Business Services
258-259	Sales Representatives, Commodities Except Retail
263-278	Sales Workers, Retail and Personal Services
283-285	Sales Related Occupations
303-307	Supervisors, Administrative Support Occupations
308-309	Computer Equipment Operators
313-315	Secretaries, Stenographers and Typists
316-323	Information Clerks
325-336	Records Processing Occupations, Except Financial
337-344	Financial Records Processing Occupations
345-347	Duplicating, Mail & Other Office Machine Operators
348-353	Communications Equipment Operators
354-357	Mail & Message Distributing Occupations
359-374	Material Recording, Scheduling & Distributing Clerks
375-378	Adjusters & Investigators
379-389	Miscellaneous Administrative Support Occupations
403-407	Private Household Service Occupations
413-415	Supervisors, Protective Service Occupations
416-417	Firefighting & Fire Prevention Occupations

## Appendix B (continued)

<b>Codes</b>	<b>Occupation</b>
418-424	Police & Detectives
425-427	Guards
433-444	Food Preparation & Service Occupations
445-455	Health Service Occupations
456-469	Personal Service Occupations
473-476	Farm Operators & Managers
477-484	Farm Occupations, Except Managerial
485-489	Related Agricultural Occupation
494-496	Forestry and Logging Occupations
497-499	Fishers, Hunters & Trappers
503	Mechanics Supervisors
505-519	Vehicle & Mobile Equipment Mechanics & Repairers
523-534	Electrical & Repairers, Except Supervisors
535-549	Miscellaneous Mechanics & Repairs
553-558	Construction Trades Supervisors
563-599	Construction Trades Except Supervisors
613-617	Extractive Occupations
628	Precision Production Occupations Supervisors
634-655	Precision Metal Working Occupations
656-659	Precision Woodworking Occupations
666-674	Precision Textile, Apparel & Furnishings Machine Workers
675-684	Precision Workers, Assorted Materials
686-688	Precision Food Production Occupations
689-699	Precision Inspectors, Testers, & Related Workers
703-725	Machine Operators & Tenders, Except Precision
726-733	Woodworking Machine Operators
734-737	Printing Machine Operators
738-749	Textile, Apparel & Furnishings Machine Operators
753-779	Machine Operators, Assorted Materials
783-795	Fabricators, Assemblers & Hand Working Occupations
796-799	Production Inspectors, Testers, Samplers & Weighers
803-814	Motor Vehicle Operators
823-834	Transportation Occupations, Except Motor Vehicles
843-859	Material Moving Equipment Operators
864-865	Handlers, Equipment Cleaners, Helpers & Laborers
866-874	Helpers, Construction & Extractive Occupations
875-889	Freight, Stock & Material Handlers
903-905	Military Occupations
914	Housewives, Homemakers
917	Unemployed, Never Worked, Disabled
Other	Other (Students, Volunteers, Retired, etc.)



**State of North Carolina**  
**Department of Health and Human Services**  
**State Health Director**

A. Dennis McBride, M.D., M.P.H.

**Division of Public Health**

Ann F. Wolfe, M.D., M.P.H., Director

**State Center for Health Statistics**

John M. Booker, Ph.D., Director

[www.schs.state.nc.us/SCHS/](http://www.schs.state.nc.us/SCHS/)

The NC Department of Health and Human Services does not discriminate on the basis of race, color, national origin, sex, religion, age or disability in employment or the provision of services.

---

Department of Health and Human Services  
State Center for Health Statistics  
1908 Mail Service Center  
Raleigh, NC 27699-1908  
919/733-4728

700 copies of this public document were printed at a cost of \$153.23 or 22¢ per copy.

