

7. Breast Cancer mortality in Appalachia

Breast cancer is the second most common form of cancer among women in the U.S. Known risk factors for breast cancer include late age at first birth, early menarche, late menopause, and family history of breast cancer (DHHS, 1999). Environmental factors that may influence geographic disparities in breast cancer outcomes include education and the availability and utilization of mammography screening services.

Death rates resulting from breast cancer have generally been higher in the Northeast and Midwestern regions of the U.S over the past five decades, and although incidence rates have increased, death rates from breast cancers have remained stable (Pickle *et al*, 1996).

With the exception of white women ages 35 to 64, breast cancer death rates used in this analysis suggest an excess of breast cancer mortality among Appalachian women compared with the non-Appalachian U.S. (Figure 6 and 7 – Section I). Both in the Appalachian region and the non-Appalachian U.S., death rates from breast cancer rank third among death rates used in this analysis for black women aged 35 to 64 and fourth among white women ages 35 to 64. Among elderly white women, deaths rates for breast cancer rank sixth in both Appalachia and the non-Appalachian U.S. and elderly black women in the non-Appalachian U.S. For elderly black women in Appalachia, breast cancer mortality ranks eighth.

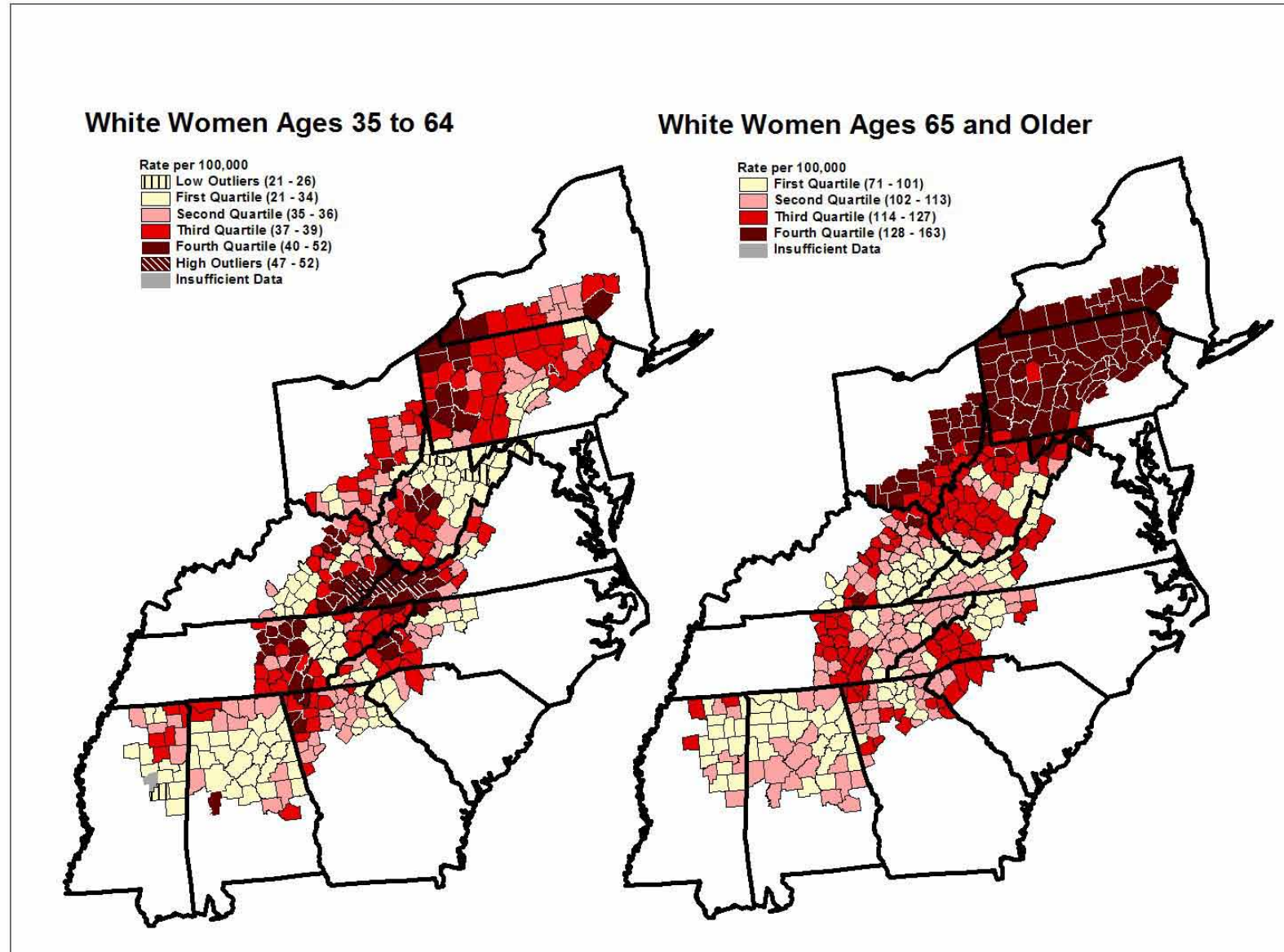
County –Level Rates of Breast cancer Mortality in Appalachia

County level rates of mortality from breast cancer are shown on pages 56-57. County-level breast cancer death rates range from 21 to 52 death per 100,000 among white women ages 35 to 64, from 71 to 163 deaths per 100,000 among elderly white women, from 33 to 68 deaths per 100,000 among black women ages 35 to 64, from 92 to 191 deaths per 100,000 among elderly black women. While the magnitude of the death rates is larger for black women of both age groups, there appears to be greater disparity in the county-level rates among white women of both age groups.

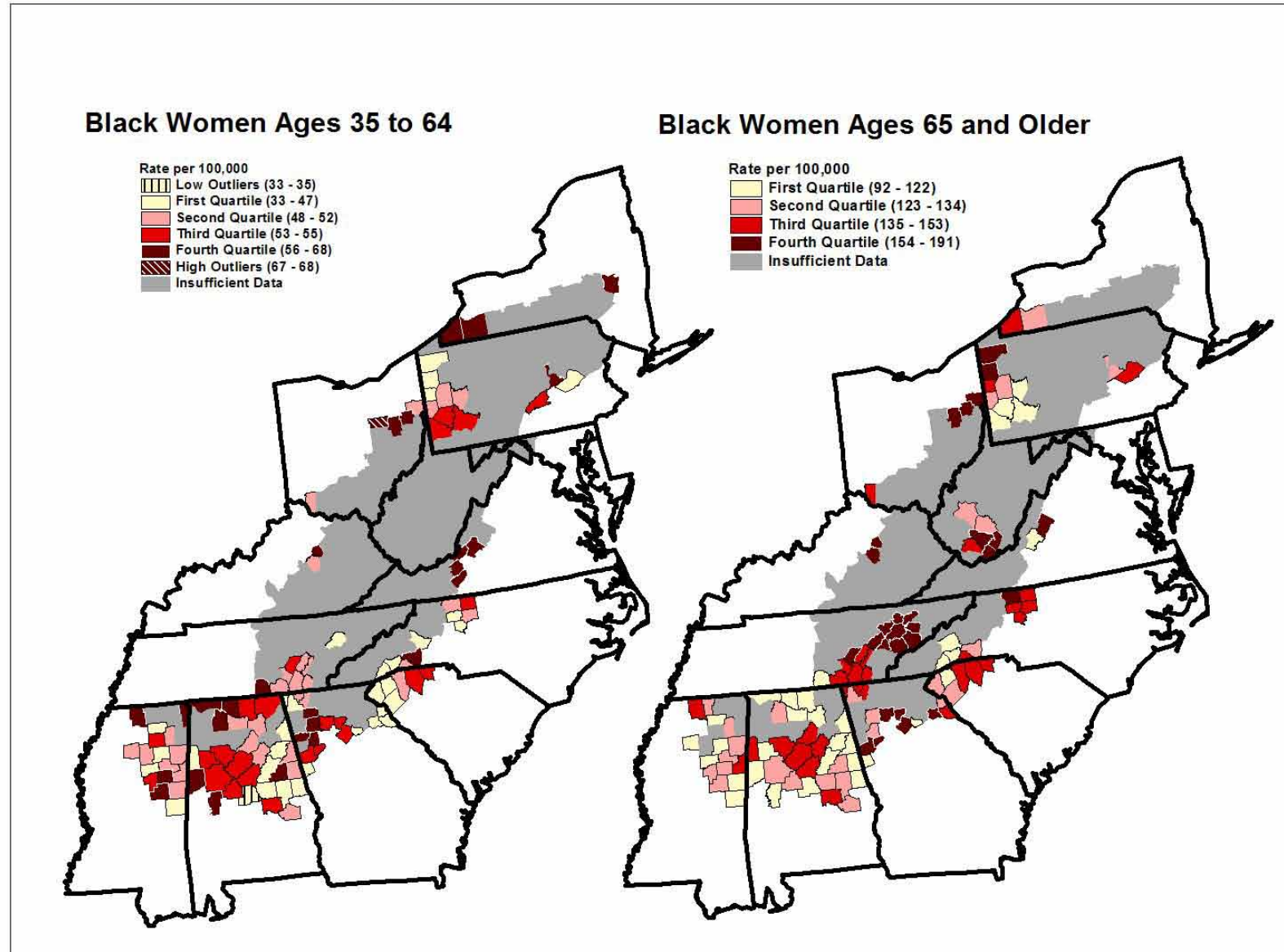
There is considerable variation in the geographic patterns of breast cancer mortality both among race/ethnic and age groups. In general, high death rates from breast cancer are predominant in the northern portions of the Appalachian region among elderly white women. A clear north-south gradient occurs among the distribution of breast cancer death rates for elderly white women. Among white women ages 35 to 64, a similar geographic gradient does not appear. In fact, one of the most striking aspects of this distribution is the presence of high outlier counties in Eastern Kentucky and Western Virginia. With the exception of these counties, high breast cancer death rates appear more evenly distributed throughout the region among women ages 35 to 64 with groups of counties in Western Pennsylvania, Central West Virginia, Western North Carolina, Central Tennessee and Northern Georgia. Geographic patterns of breast cancer mortality among black women are less clear however there are several interesting comparisons in the distributions among death rates for the two age groups. Areas which show consistently high death rates among black women include Central Mississippi and Eastern Ohio. However, there is a high level of inconsistency in the

relative death rates among the two age groups in Northern Mississippi and Western Pennsylvania. A group of Northern Mississippi counties have among the highest breast cancer death rates for black women ages 35 to 64 and among the lowest for elderly black women. A similar pattern can be seen in Western Pennsylvania.

Smoothed Breast Cancer Death Rate, 1990-1997



Smoothed Breast Cancer Death Rate, 1990-1997



8. Colorectal Cancer Mortality In Appalachia

Colorectal cancer is the second leading cause of cancer-related deaths in the U.S. (DHHS, 1999). In addition to dietary risk factors, which include a high-fat, low-fiber diet, people who have a family history of colorectal cancer are at higher risk (Pickle *et al*, 1996). Age is also an important risk factor with people over the age of 50 at higher risk.

Death rates from colorectal cancer have been higher in the Northeastern and Upper-Midwest portions of the U.S. However, substantial geographic and demographic variability in rates of colorectal cancer mortality have been documented. In 1996, colorectal cancer death rates were 37% higher among blacks than whites and are generally higher among men than women (Pickle *et al*, 1996; DHHS, 1999).

We have found similar demographic patterns in this analysis with generally higher colorectal cancer death rates among blacks and among men compared to women within each ethnic group. Among persons ages 35 to 64, Appalachian excess in colorectal cancer mortality, relative to the non-Appalachian U.S., occurs among all groups except black women. Among the elderly, colorectal cancer death rates are similar to those of the non-Appalachian U.S. (Figure 6 and 7 – Section I).

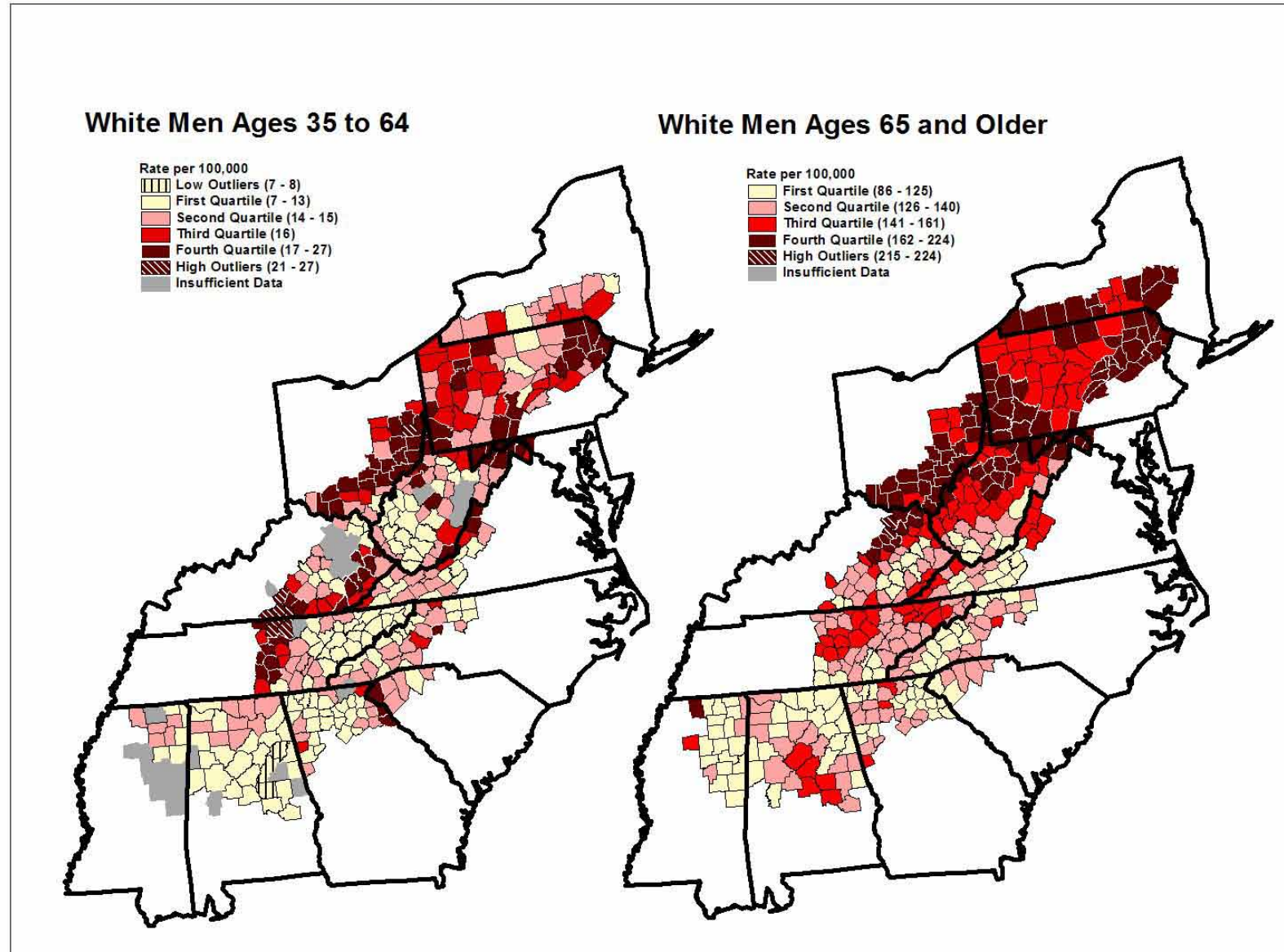
County-Level Rates of Colorectal Cancer Mortality

County level colorectal cancer death rates are shown on pages 59-62. County-level colorectal cancer death rates range from 7 to 27 deaths per 100,000 among white men ages 35 to 64, from 86 to 224 deaths per 100,000 among white men ages 35 to 64, from 18 to 50 among black men ages 35 to 64, from 131 to 281 deaths per 100,000 among elderly black men, 6 to

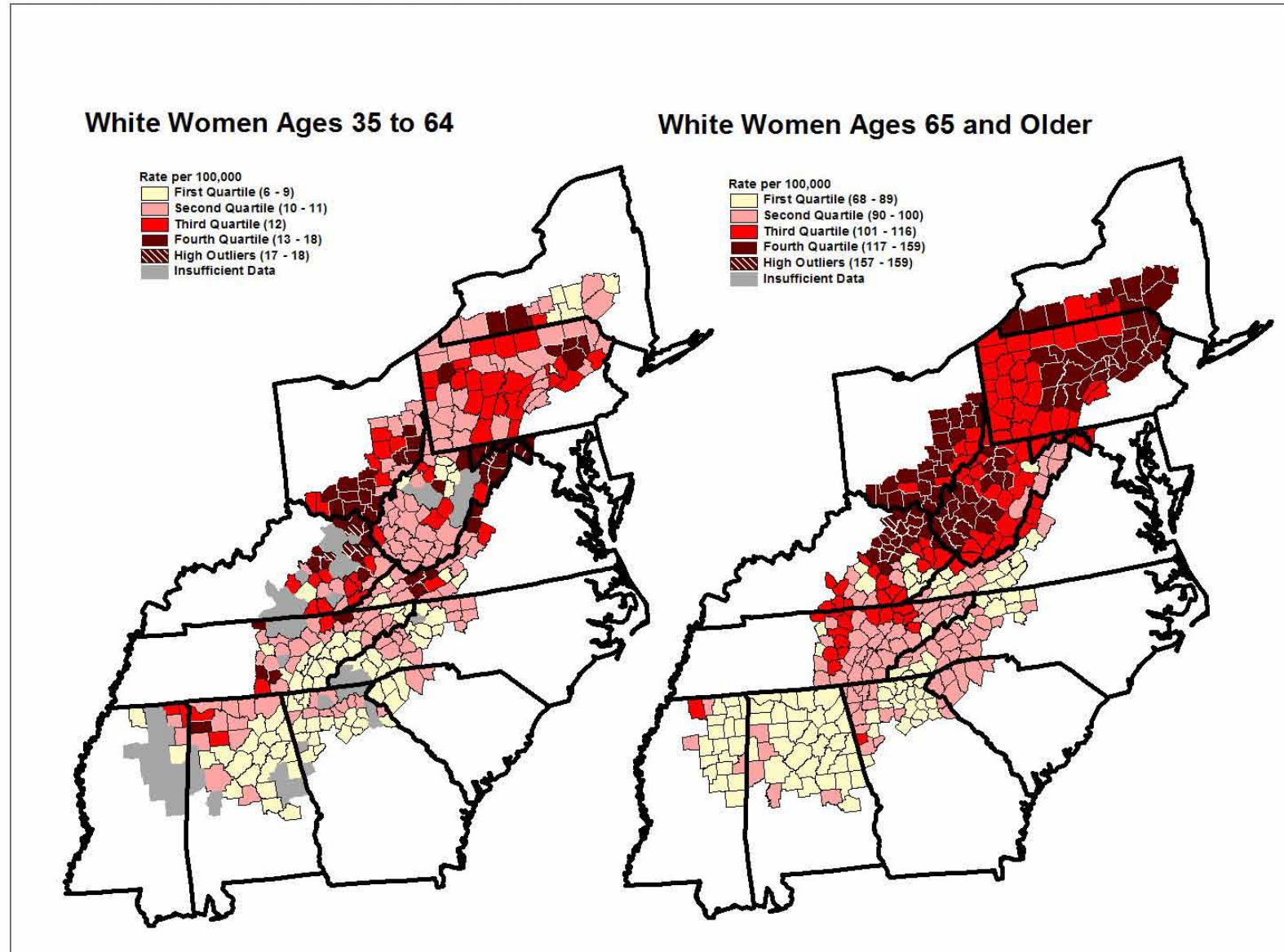
18 deaths per 100,000 among white women ages 35 to 64, from 68 to 159 deaths per 100,000 among elderly white women, from 13 to 22 deaths per 100,000 among black women ages 35 to 64, and from 87 to 246 deaths per 100,000 among elderly black women. The disparity among county level death rates from colorectal cancer in Appalachia is greatest among elderly black men and women (Appendix C). Among persons ages 35 to 64, the greatest regional disparities occur among black men and white men.

Fairly consistent geographic patterns are evident in the distribution of colorectal cancer death rates among the white demographic subgroups. In general, high death rates from colorectal cancer are predominant in the northeastern portions of the Appalachian region and clear north-south gradients are evident. This pattern is most evident among elderly white men and women. No clear geographic patterns are evident among black men and women, although a limited number of counties had sufficient data to calculate death rates among black men and women. Among white men of both age groups, high colorectal cancer death rates appear among counties primarily in New York, Pennsylvania, West Virginia, and Southeastern Ohio. One exception to this pattern is a large group of high outliers counties in South-Central Kentucky and North-Central Tennessee among white men ages 35 to 64.

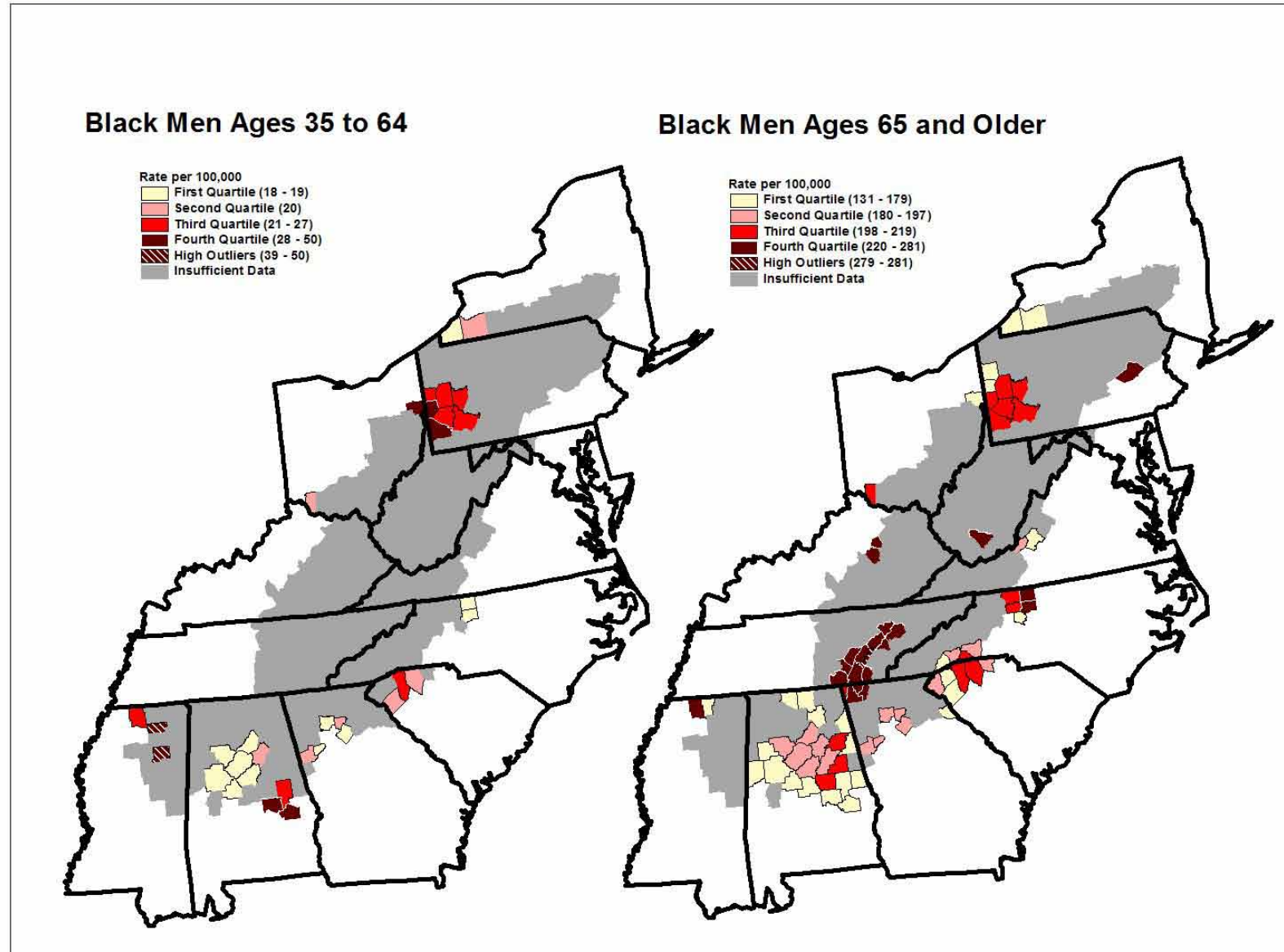
Smoothed Colorectal Cancer Death Rate, 1990-1997



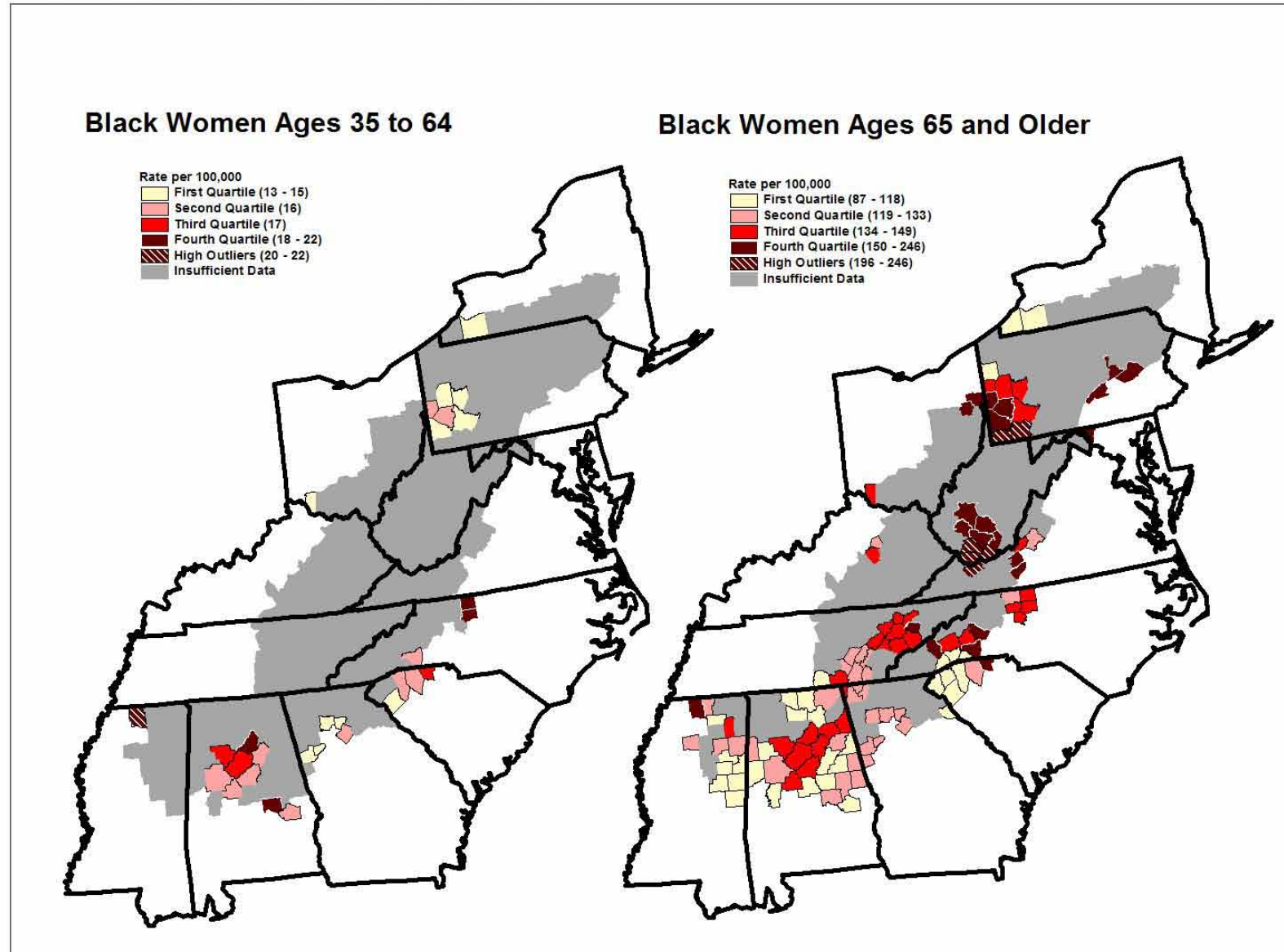
Smoothed Colorectal Cancer Death Rate, 1990-1997



Smoothed Colorectal Cancer Death Rate, 1990-1997



Smoothed Colorectal Cancer Death Rate, 1990-1997



9. Lung Cancer mortality In Appalachia

Lung Cancer is the leading cause of cancer deaths in the U.S. (DHHS, 1999). Most lung cancer cases are attributable to cigarette smoking although increasing evidence has suggested that exposure to second-hand smoke and occupational chemicals increases lung cancer risk (Pickle *et al* 1996). Considerable geographic variation in lung cancer mortality has been documented with high death rates occurring in the Eastern and Western U.S., although there have been considerable gender/ethnic differences in both rates and geographic distribution of lung cancer deaths. Lung cancer death rates have been generally higher for black men.

Regional lung cancer death rates in this study indicate excesses in lung cancer mortality in Appalachia for both persons ages 35 to 64 and 65 and older, with a larger regional disparity occurring among persons ages 35 to 64 (Section I – Figure 4 and 5). Among gender/ethnic groups aged 35 to 64, Appalachian excess in lung cancer death rates occurs among all groups except black women. Among the elderly, Appalachian excess occurs only for white men (Section I - Figure 6 and 7).

County-Level Rates of Lung Cancer Mortality

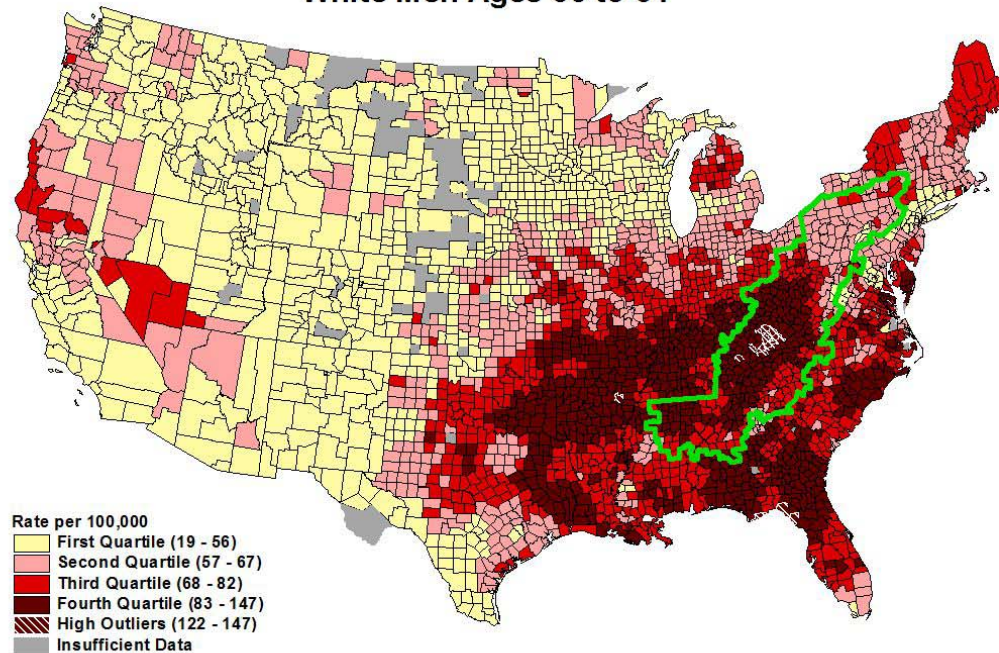
National maps for white men and white women are shown on pages 64-65 to highlight the general geographic trends and differences in lung cancer mortality across the country. These maps depict a strong geographic gradient which exist between western and eastern U.S. counties among white men with generally higher rates in the Southeastern portion of the U.S. Among white women, geographic gradients are less apparent with high rate counties occurring along the Pacific coast, South-central, and Northeastern portions of the country. Another important feature of these maps is the presence of high

outlier counties (unusually high death rates) in the Appalachian region. These maps reveal the largest clusters of high outlier counties exist in the Central Appalachian region for both white men and women ages 35 to 64. The complete set of national maps is presented in Appendix A.

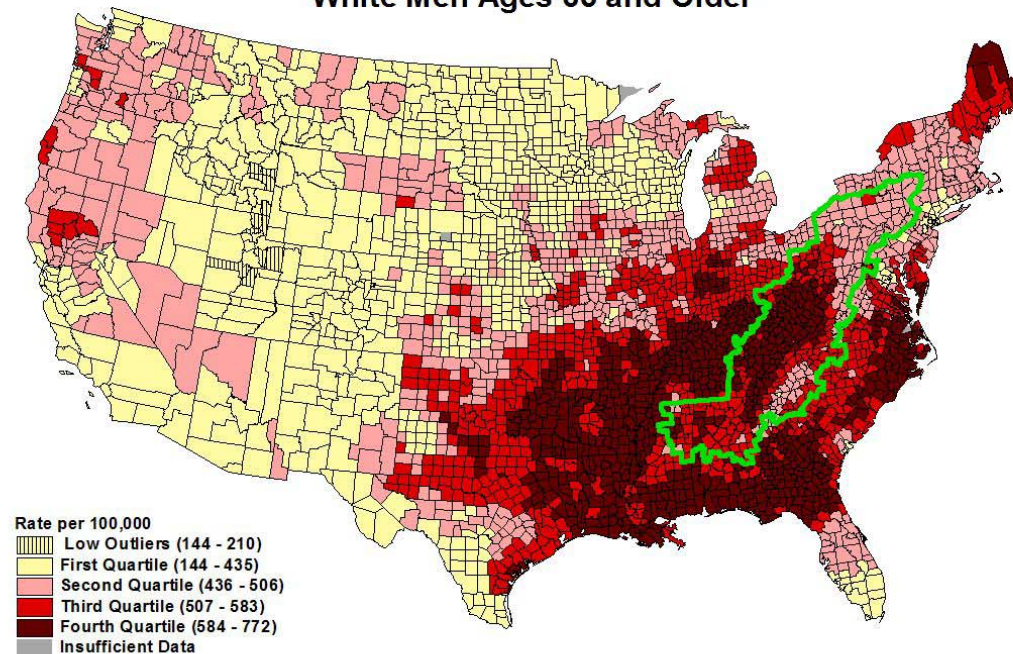
County level rates of mortality from lung cancer are shown for the Appalachian region on pages 66-69. County-level lung cancer death rates range from 48 to 147 death per 100,000 among white men ages 35 to 64, from 414 to 772 deaths per 100,000 among elderly white men, from 74 to 180 deaths per 100,000 among black men ages 35 to 64, from 360 to 971 deaths per 100,000 among elderly black men, 23 to 69 deaths per 100,000 among white women ages 35 to 64, from 125 to 368 deaths per 100,000 among elderly white women, from 24 to 77 deaths per 100,000 among black women ages 35 to 64, and from 84 to 368 deaths per 100,000 among elderly black women.

Fairly consistent geographic patterns are evident in the distribution of lung cancer death rates among the geographic subgroups within the Appalachian region. In general, high death rates from lung cancer are predominant in the central portion of the Appalachian region including counties in Southwestern Pennsylvania, West Virginia, Eastern Kentucky, and Western Virginia. Among white men of both age groups, high lung cancer death rates appear to cluster primarily in Eastern Kentucky, Southern West Virginia, and Western Virginia with high outlier counties in Eastern Kentucky among white men and women ages 35 to 64. Geographic patterns of lung cancer death rates for black populations are fairly consistent with those for white populations, with generally low rates of lung cancer mortality in the southern portion of the region.

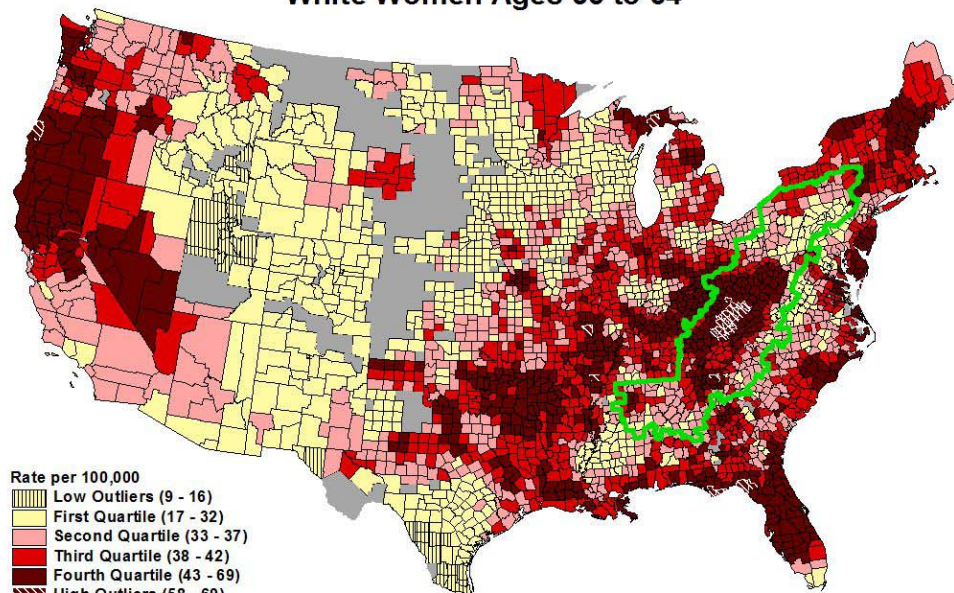
White Men Ages 35 to 64



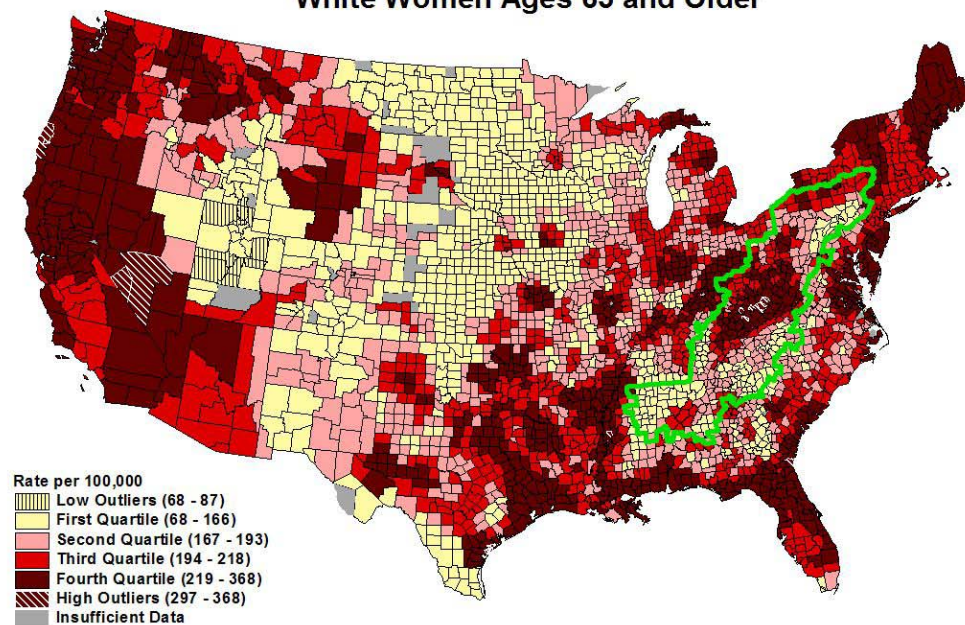
White Men Ages 65 and Older



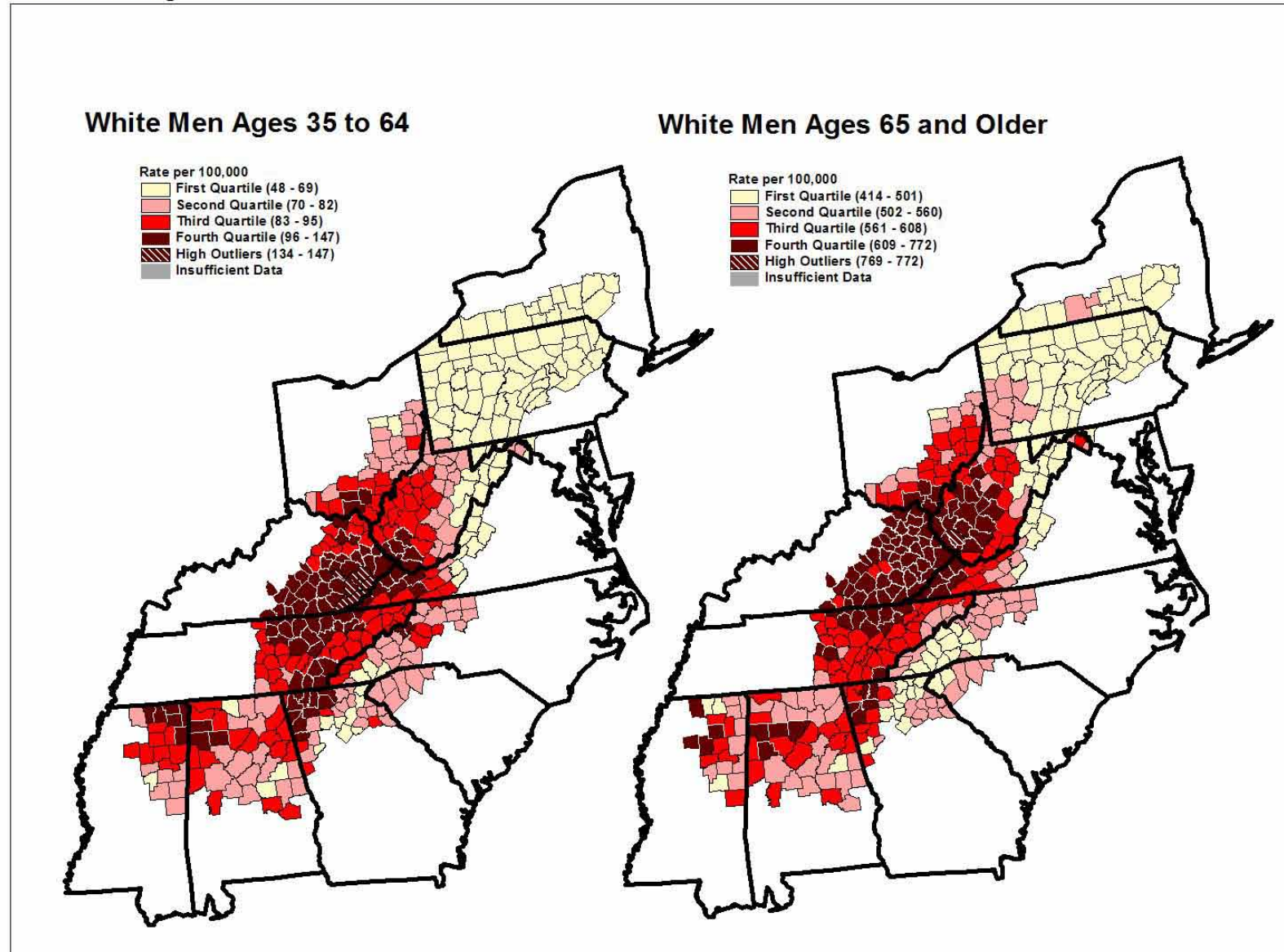
White Women Ages 35 to 64



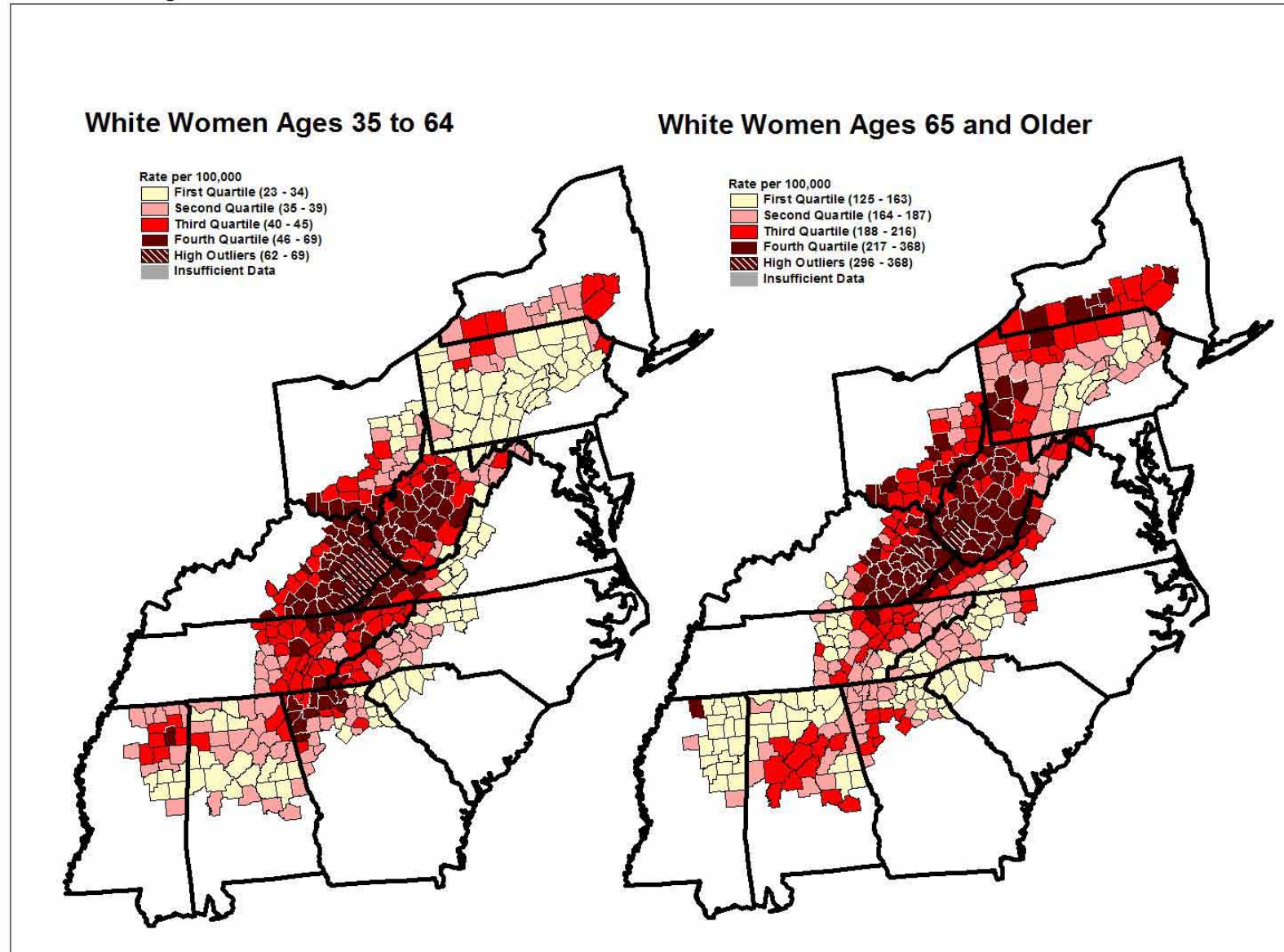
White Women Ages 65 and Older



Smoothed Lung Cancer Death Rate, 1990-1997

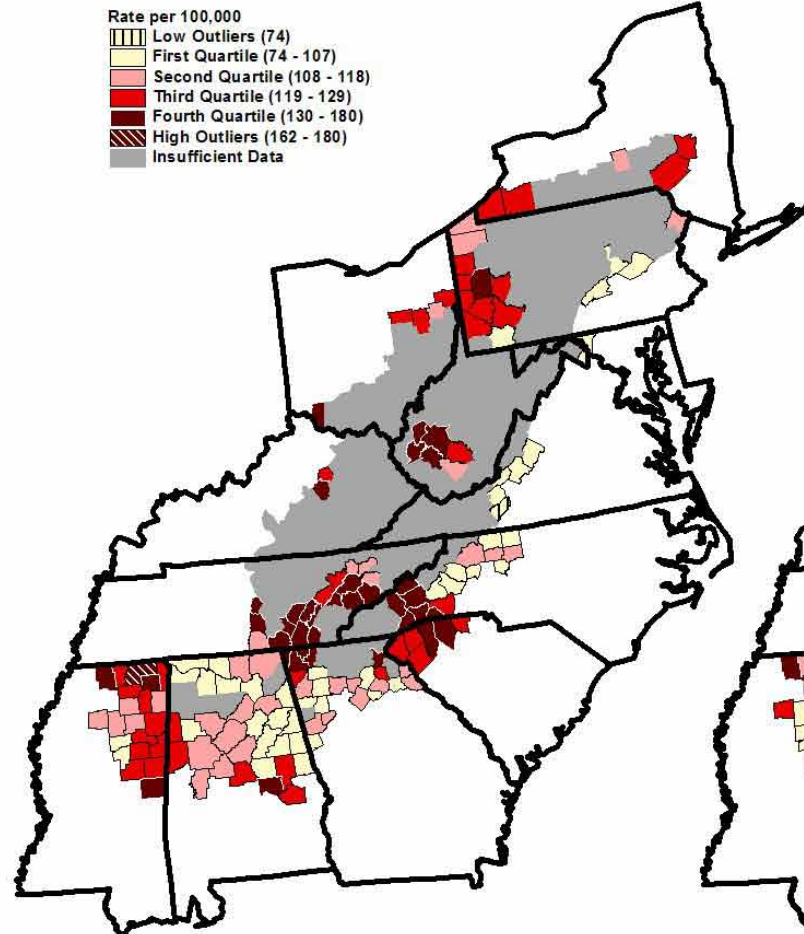


Smoothed Lung Cancer Death Rate, 1990-1997

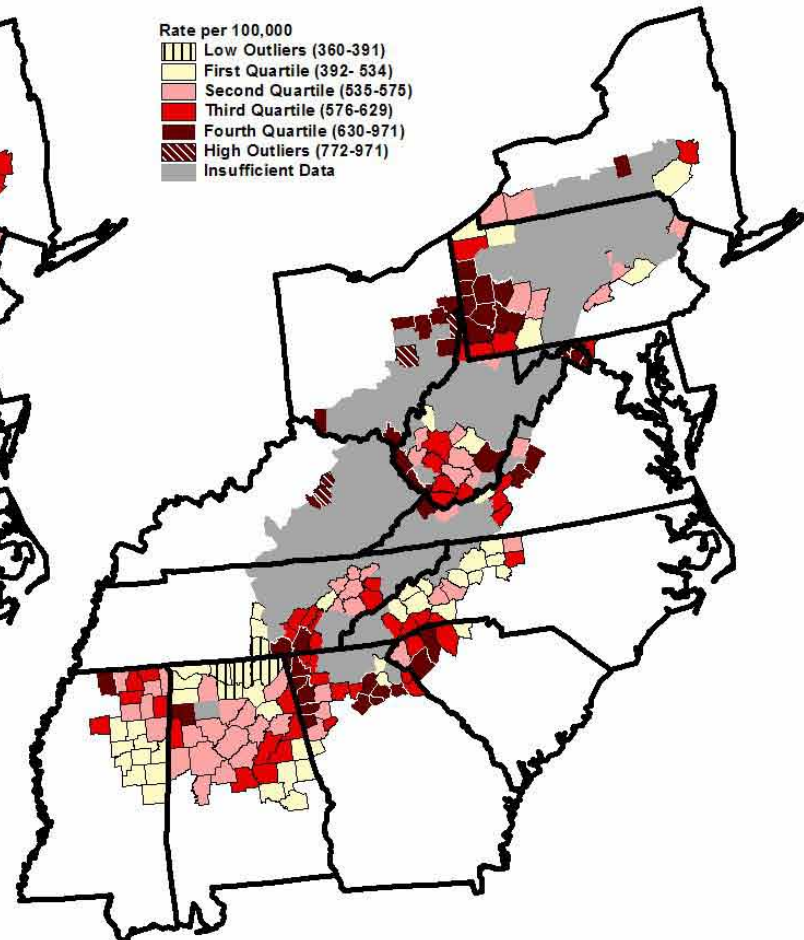


Smoothed Lung Cancer Death Rate, 1990-1997

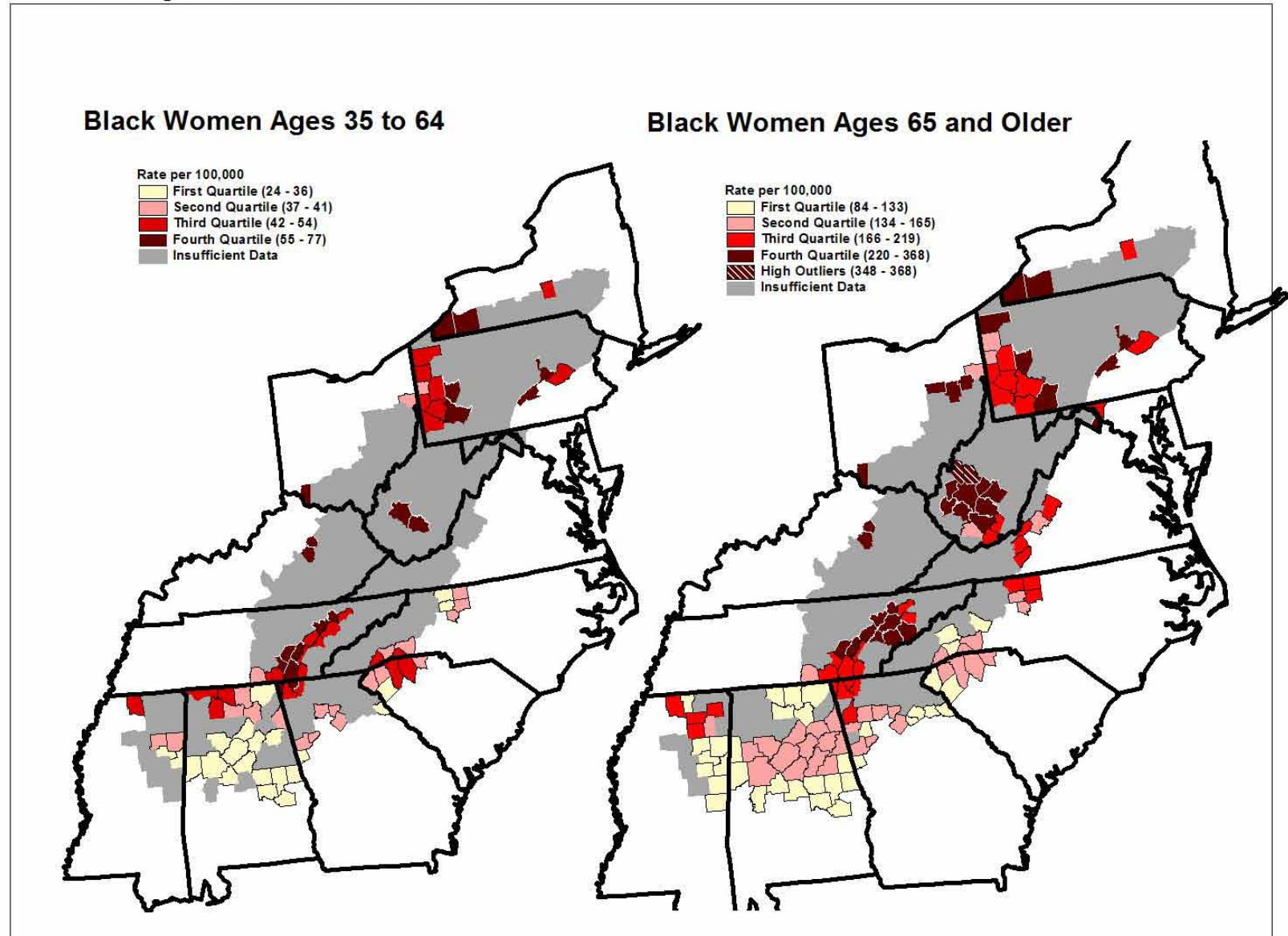
Black Men Ages 35 to 64



Black Men Ages 65 and Older



Smoothed Lung Cancer Death Rate, 1990-1997



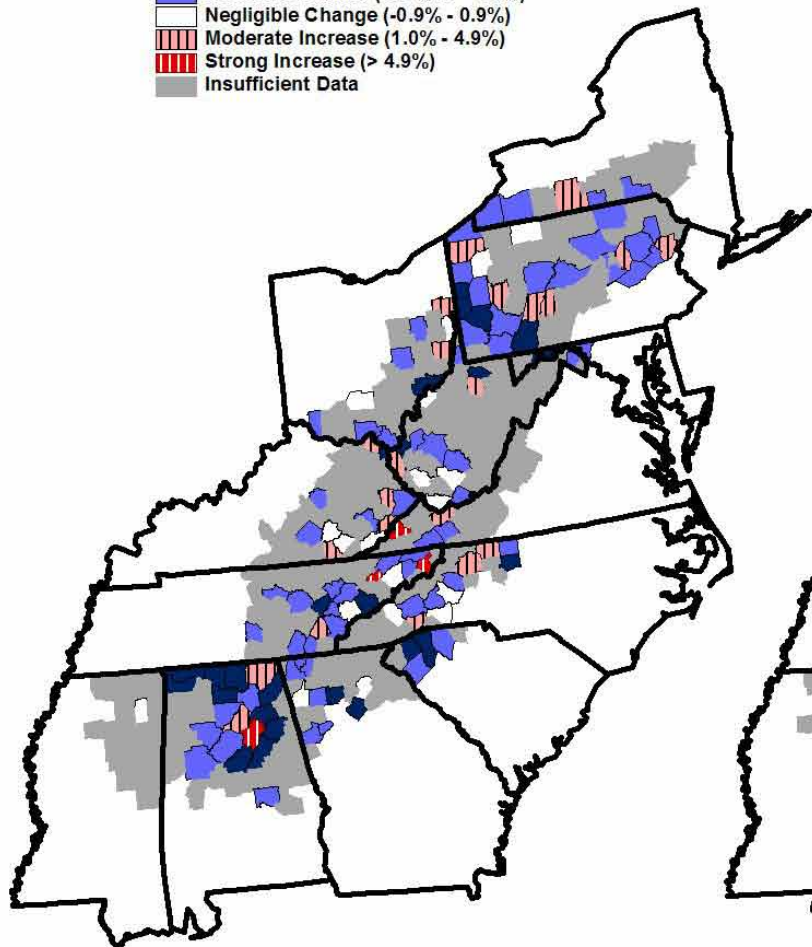
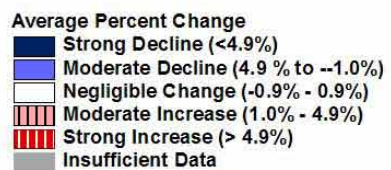
10. County Trends in Lung Cancer Mortality

Maps depicting trends for lung cancer death rates over the period 1985-1997 are presented on pages 71-74. Over recent decades, death rates from lung cancer have increased 3.5 times among men and almost 7 times among women (Pickles *et al*, 1996). The county-level trends presented in the following maps suggest considerable geographic and demographic variation in trends of lung cancer mortality. For most counties in the region there were insufficient data to calculate county-level lung cancer mortality trends for black population subgroups (refer to Section I B. County level Mortality Analyses and the Technical Appendix B for details on the estimation of mortality trends).

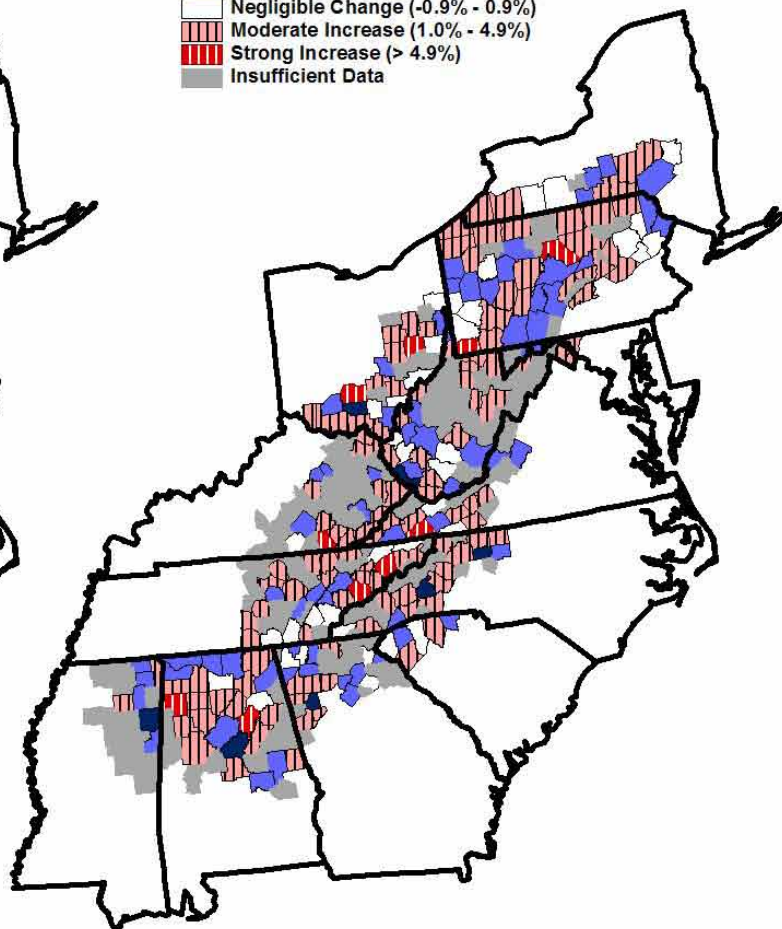
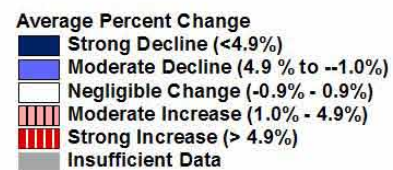
The dominant trends for persons ages 35 to 64 suggest moderate to strong declines in lung cancer mortality over the study period. However, a number of counties have experienced moderate increase and a few have experienced strong increases. Counties experiencing increases do not appear to cluster in specific areas and are generally scattered throughout the region. In contrast to persons ages 35 to 64, the dominant lung cancer mortality trends among the elderly indicate moderate to strong increases in mortality. These trends are consistent with national trends over recent decades. Most counties experiencing increase among elderly white women are experiencing strong increases.

Trends in Lung Cancer Mortality, 1985-1997

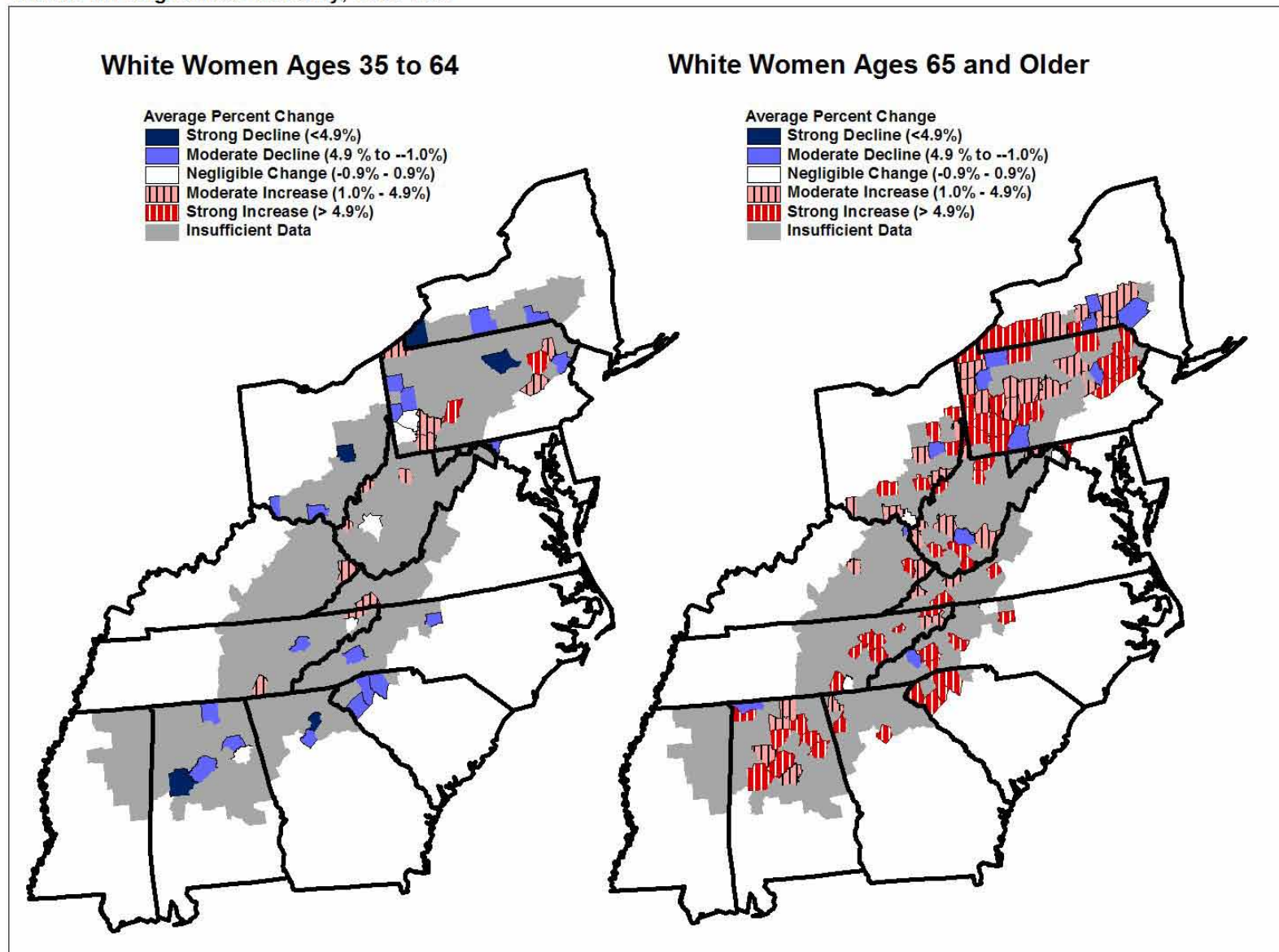
White Men Ages 35 to 64



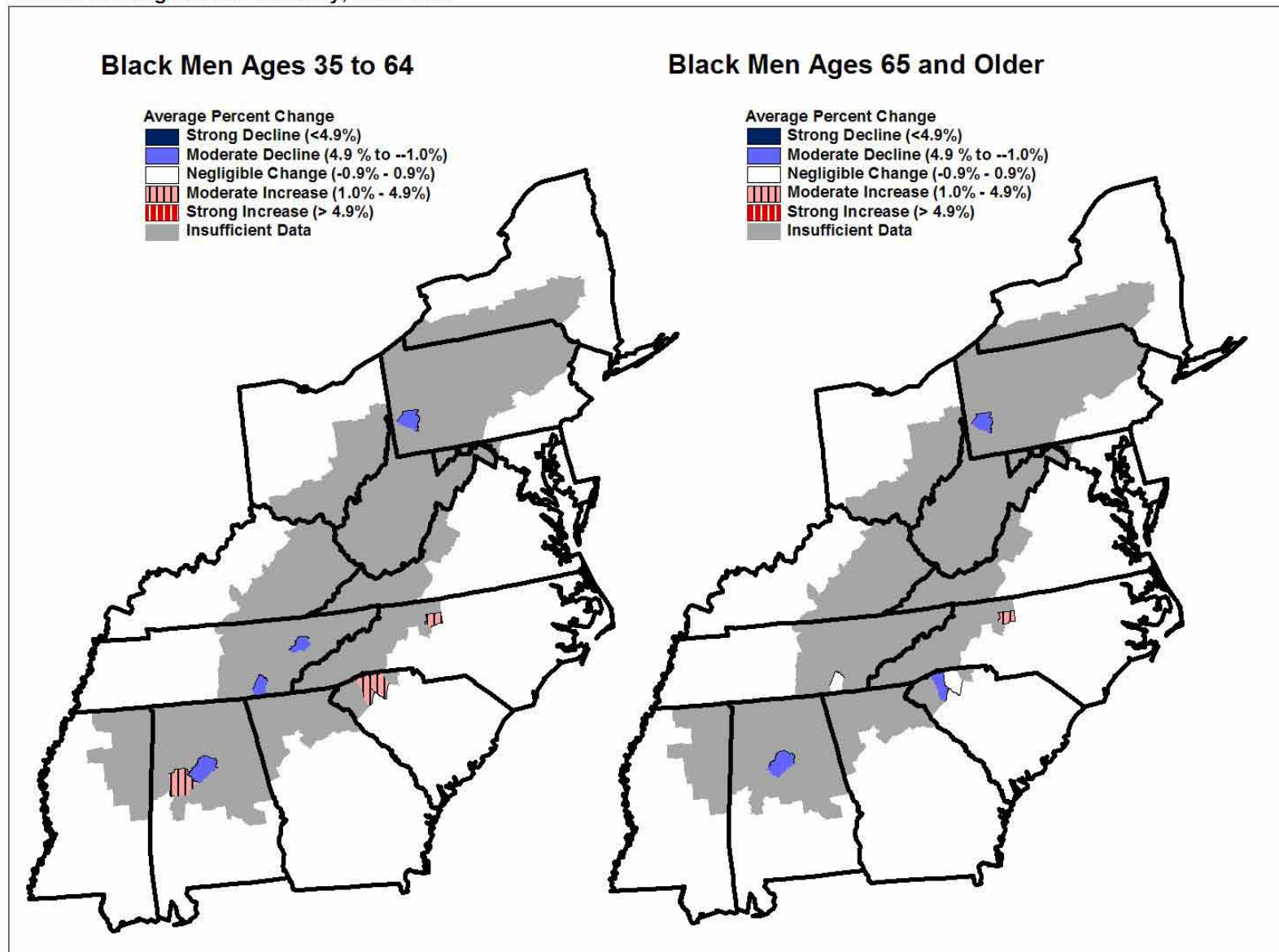
White Men Ages 65 and Older



Trends in Lung Cancer Mortality, 1985-1997



Trends in Lung Cancer Mortality, 1985-1997



Trends in Lung Cancer Mortality, 1985-1997

