

Heart Disease

HEART DISEASE

Heart disease, the leading cause of death in both North Carolina (NC) and the United States (US), claimed the lives of more than 724,000 Americans in 1998. A variety of conditions fall under the category of heart disease such as: rheumatic heart disease, irregular heart rhythms, and diseases of the linings, valves, and vessels of the heart (see Appendix A).

Most of the diseases of the heart are caused by atherosclerosis, a condition in which cholesterol deposits develop in the walls of arteries. For example, atherosclerosis of the coronary arteries is the primary cause of heart attacks, a major cause of heart disease mortality. In turn, heart attacks are often a contributing factor in deaths due to congestive heart failure and cardiac dysrhythmias. Other conditions that are grouped under the heading of heart disease have different etiologies. Rheumatic fever, for example, can be a complication of streptococcal pharyngitis. Microorganisms are also responsible for other forms of heart disease such as bacterial endocarditis and viral myocarditis. However, these conditions only account for a small proportion of overall heart disease mortality.

Considerable reduction in national mortality rates for heart disease have occurred over the last two decades. The age-adjusted mortality rate for the nation has fallen by 27%, but disparities have persisted. Heart disease is still a major problem for certain groups in the population. National age-adjusted mortality rates are 54% higher for men than women and 9% higher for non-whites than whites. As compared to whites, the rate for non-whites is 3% higher among men and 15% higher among women. Heart disease disparities in eastern North Carolina (ENC) and NC are even more pronounced than those for the nation. In ENC, the age-adjusted mortality rate for non-whites exceeds that of whites by 17%, and the heart disease death rate for men is 63% higher than the rate for women. Greater reductions in mortality and health disparities will be necessary to meet national goals for heart disease by 2010.

Although there is no specific objective for reducing heart disease mortality in *Healthy People 2010*, we formulated an objective based on the method used to develop the objective for coronary heart disease mortality. We suggest a goal for 2010 of 224.0 heart disease deaths per 100,000 population. To meet this objective, the current rate would have to be reduced by more than 20% in 32 of 41 counties in ENC (see Map 1.1).

2010 OBJECTIVE FOR HEART DISEASE MORTALITY

Objective: Reduce heart disease deaths to no more than 224.0 per 100,000 population

Baseline: 280.0 heart disease deaths per 100,000 population in 1997

Currently, none of the counties in the region meet the objective for heart disease mortality.

Crude Mortality Rates for Heart Disease, 1994-1998:

The overall burden of heart disease is 3% higher in ENC than it is in all other NC counties (ONC), as demonstrated by the greater five-year average, crude mortality rate for ENC (see Table 1.1). Hyde County has the highest five-year average crude mortality rate in the region, with 524.3 deaths per 100,000 population. High crude rates are also found in the counties of Beaufort (413.9), Washington (408.9), Columbus (394.9), and Halifax (391.5). Map 1.2 shows regional variation in crude rates at the county level.

Age-Adjusted Mortality Rates for Heart Disease, 1994-1998:

After adjustment for age variation, ENC has a significantly higher (15%) five-year average heart disease mortality rate than ONC (see Table 1.1). Thirty-one of the 41 eastern counties (76%) have a higher rate than the statewide rate. In addition to having the highest crude rate in the region, Hyde County also has the highest age-adjusted rate, with 427.5 deaths per 100,000. The counties of Scotland (407.4), Washington (378.5), and Columbus (376.7) have the next highest rates. As shown in Map 1.2, Hyde County is part of an area with high age-adjusted mortality rates surrounding the Pamlico Sound and extending across the northern portion of the region. There is also a band of high mortality along the southwestern border of the region that includes Scotland, Robeson, Bladen, and Brunswick Counties. County level variation in race and sex specific, age-adjusted mortality rates is shown in Map 1.3.

Trends in Heart Disease Mortality, 1979-1998:

As Figure 1.1 demonstrates, the declining rates of heart disease in ENC follow the trend for the nation, although the rate for ENC has consistently been higher than the US rates. The age-adjusted mortality rate for the region has fallen 27% over the last 20 years. While ENC has experienced improvements in heart disease mortality, the death rate for the region is higher than the rest of the state and the nation. In addition, none of the counties in the region currently meet the objective for heart disease mortality (see Map 1.1). In order to meet the objective for heart disease mortality by 2010, all counties in the region will have to reduce their rates by more than 10%, and most (32 of 41) by 20% or more.

Disparities in Heart Disease Mortality, 1979-1998:

Table 1.1 and Map 1.3 show considerable differences in heart disease mortality rates by race and gender. In ENC, mortality rates for non-whites peaked in the mid-1980s, while rates for whites have been declining consistently (see Figure 1.1). Rates have fallen for both groups since the mid-1980s, but most dramatically for white males. These trends have resulted in increasing disparities (see Figure 1.2). While racial disparities are declining for the nation as a whole, they are growing in North Carolina. The racial gap in mortality is smaller in ENC than in ONC, mainly because of the high rates for whites in the east and the larger declines in mortality for whites in ONC. Currently, the regional death rate for heart disease among non-whites is 17% higher than the rate for whites. Non-white females have a death rate 20% greater than white females, and the rate for non-white males is 18% higher than white males. It is important to note that there are seven counties where white males have higher death rates than non-white males, and eight counties with greater mortality among white females than non-white females. Perhaps more striking is the difference in mortality rates between men and women. The current regional heart disease death rate for males exceeds that of females by 63%. However, the mortality gap between men and women is shrinking, primarily as a result of large declines in mortality for men.

Table 1.1 Heart Disease Mortality in Eastern North Carolina, 1994-1998

County	Totals			Race-Gender Specific Age-Adjusted Death Rates							
	Deaths	Rates		Non-White Males		Non-White Females		White Males		White Females	
		Crude	Adjusted	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate
Beaufort	896	413.9	359.7	117	482.9	142	314.9	290	462.6	347	287.1
Bertie	375	367.8	340.8	119	570.0	106	303.2	77	348.7	73	208.7
Bladen	569	378.7	337.6	111	462.5	100	274.0	192	481.1	166	237.0
Brunswick	960	305.2	294.1	78	424.6	70	250.3	458	327.2	354	245.6
Camden	78	247.7	250.6	9	331.1	10	251.4	27	259.2	32	216.3
Carteret	917	314.9	299.0	23	442.4	27	223.3	468	387.8	399	234.1
Chowan	261	369.3	278.0	43	451.0	50	271.4	81	306.1	87	213.9
Columbus	1,020	394.9	376.7	175	591.5	179	373.4	347	490.3	319	255.8
Craven	1,073	246.6	291.0	140	421.1	160	275.2	397	346.9	376	225.5
Cumberland	2,424	165.0	301.1	397	406.1	413	262.8	868	381.7	746	228.4
Currituck	214	264.0	282.0	19	568.6	14	239.1	100	318.6	81	215.6
Dare	300	226.1	275.1	8	580.0	9	314.2	134	288.6	149	248.1
Duplin	718	330.5	313.5	118	458.7	92	213.0	266	436.7	242	233.9
Edgecombe	897	321.2	337.0	229	508.9	223	268.7	221	458.2	224	229.7
Gates	169	342.9	335.0	31	392.3	31	286.3	62	478.5	45	236.8
Greene	223	259.1	257.7	41	353.2	41	225.3	82	398.0	59	158.2
Halifax	1,104	391.5	364.2	256	517.6	241	299.2	300	478.8	307	264.7
Harnett	1,028	259.6	293.3	126	511.7	117	295.9	380	335.2	405	222.5
Hertford	388	350.8	310.5	113	520.0	90	232.6	84	394.1	101	214.6
Hoke	265	188.5	258.1	65	348.9	74	236.5	73	320.6	53	161.1
Hyde	138	524.3	427.5	24	617.0	19	297.4	46	515.7	49	360.4
Johnston	1,414	284.9	309.1	123	442.9	104	230.4	613	399.2	574	239.9
Jones	156	339.0	323.8	27	436.2	24	208.1	55	475.8	50	256.4
Lenoir	1,021	346.0	328.2	186	513.2	188	261.5	306	424.4	341	258.9
Martin	438	340.2	315.6	106	515.1	80	234.1	117	439.9	135	233.3
Nash	1,212	282.7	302.9	170	424.4	193	307.9	443	400.5	406	209.9
New Hanover	1,864	260.9	274.9	175	408.4	234	312.6	702	328.3	753	210.0
Northampton	378	364.2	291.8	117	470.6	94	238.6	85	300.0	82	196.5
Onslow	982	132.6	326.7	86	441.6	76	218.3	422	394.1	398	275.9
Pamlico	206	345.4	258.3	33	508.5	26	226.9	73	320.7	74	185.1
Pasquotank	536	315.3	302.2	94	463.8	104	298.8	175	397.1	163	199.2
Pender	505	280.7	274.3	87	569.2	95	267.5	160	273.0	163	208.9
Perquimans	197	365.7	268.3	34	460.8	23	182.8	76	316.1	64	204.7
Pitt	1,306	217.6	290.5	207	396.0	247	276.9	431	379.4	421	210.4
Robeson	1,636	292.7	360.0	415	459.6	491	331.1	358	466.1	372	257.6
Sampson	818	316.8	289.1	130	389.2	148	279.7	275	365.7	265	209.1
Scotland	605	346.9	407.4	98	523.4	133	375.7	172	496.4	202	326.2
Tyrrell	68	366.7	288.1	5	162.0	11	202.6	29	459.9	23	249.1
Washington	276	408.9	378.5	53	546.1	50	326.2	93	485.8	80	257.3
Wayne	1,453	259.7	323.6	213	388.5	263	298.4	505	415.0	472	247.8
Wilson	1,099	321.6	331.0	198	533.2	189	278.2	338	384.1	374	254.7
ENC 29	17,079	283.4	313.4	2,819	465.0	2,823	271.1	5,783	394.3	5,654	234.6
ENC 41	30,187	271.1	311.2	4,799	455.1	4,981	280.0	10,381	386.1	10,026	232.6
ONC	66,975	263.6	271.6	5,437	419.8	5,642	266.4	28,149	342.6	27,747	264.4
PNC	48,052	245.6	272.5	4,845	418.7	5,040	267.2	19,044	341.6	19,123	203.6
WNC	18,923	323.7	270.0	592	428.8	602	260.7	9,105	347.0	8,624	206.1
NC	97,162	265.9	282.9	10,236	435.7	10,623	272.5	38,530	353.0	37,773	211.1
US, 1996	733,361	276.4	288.3	43,186	370.4	44,661	263.6	316,889	358.2	328,625	228.6

Heart Disease ICD-9 Codes: 390-398, 402, 404-429

Age-Adjusted Rates Standardized to US 2000 SM

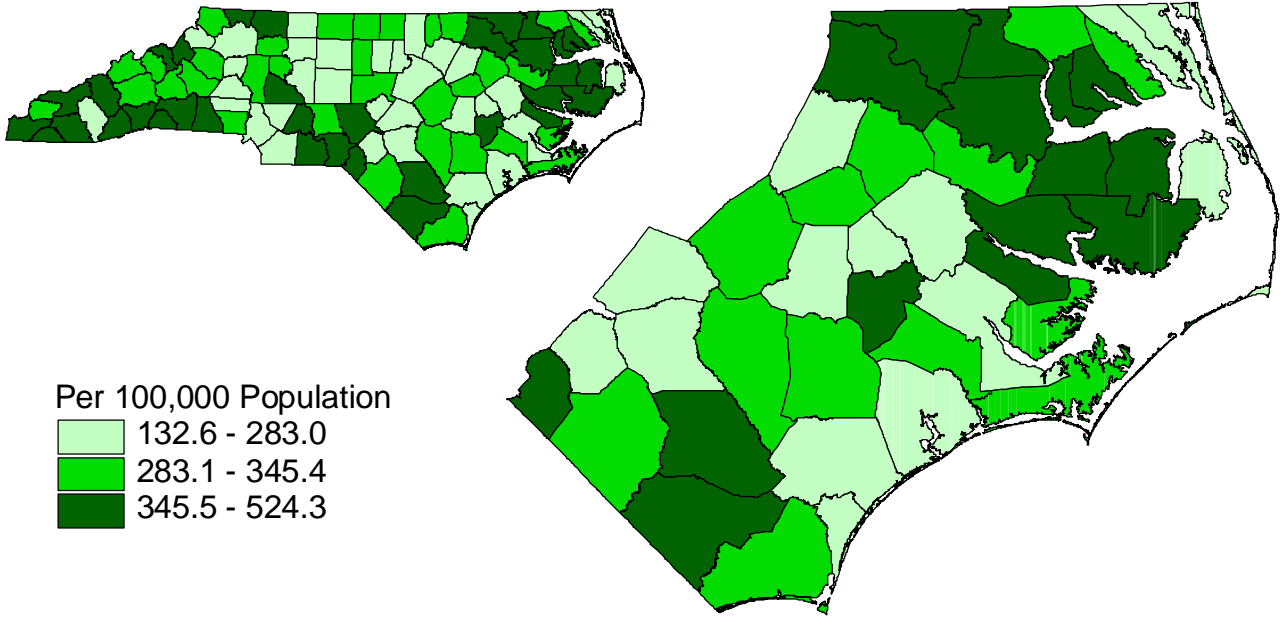
Total Number of Deaths and Rates for Five-Year Period, except US

NC Data Source: NC State Center for Health Statistics

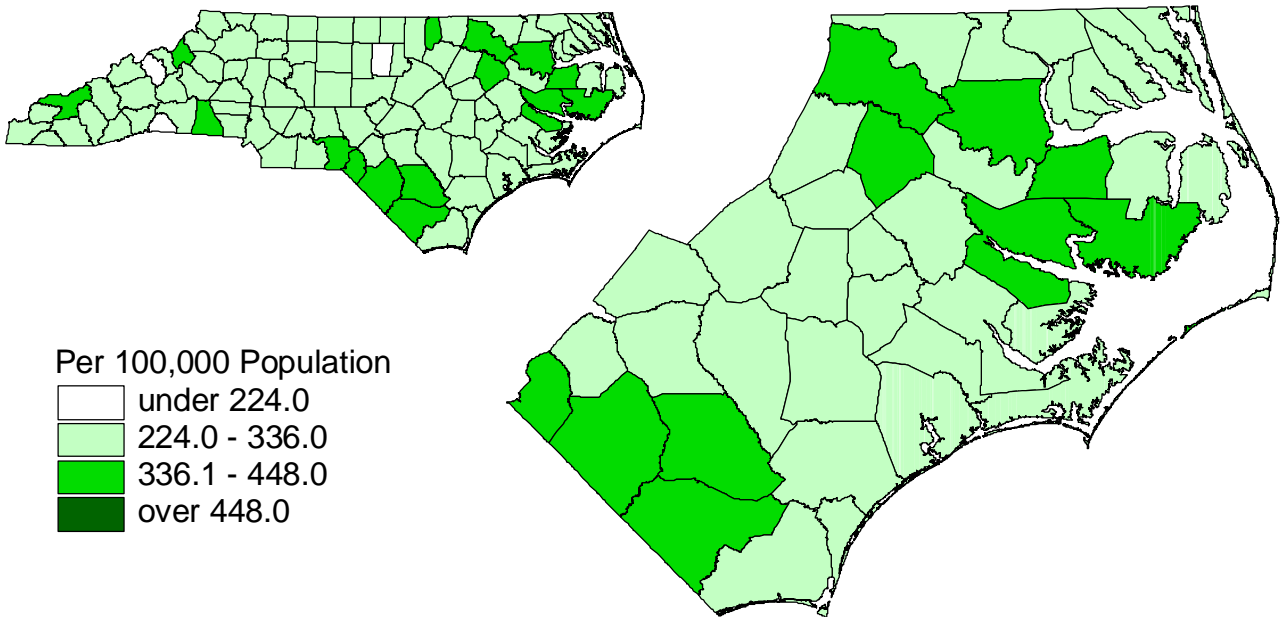
US Data Source: National Center for Health Statistics

Map 1.2 Crude and Age-Adjusted Heart Disease Mortality Rates: North Carolina and Eastern North Carolina, 1994-1998

Crude Rate



Age-Adjusted Rate

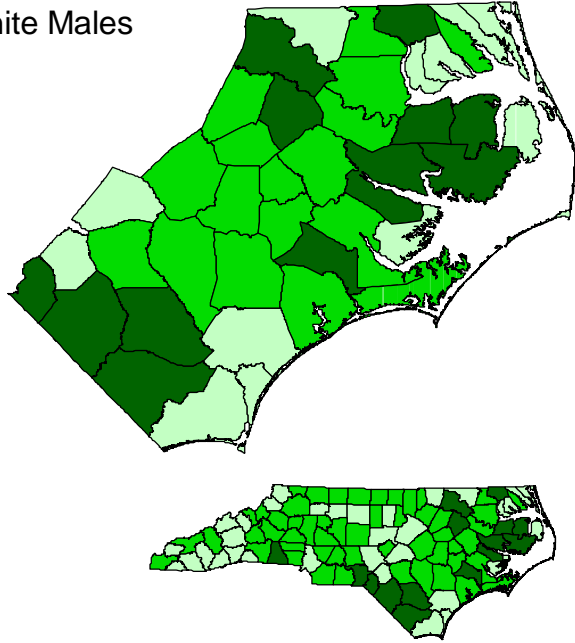


Heart Disease ICD-9 Codes: 390-398, 402, 404-429
Five-Year Average, Age-Adjusted Rates Standardized to US 2000 SM

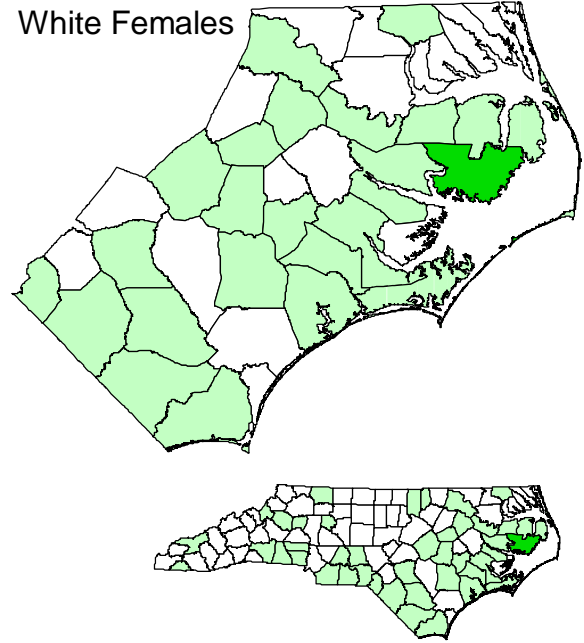
Data Source: NC State Center for Health Statistics

Map 1.3 Race-Gender Specific, Age-Adjusted Heart Disease Mortality Rates: North Carolina and Eastern North Carolina, 1994-1998

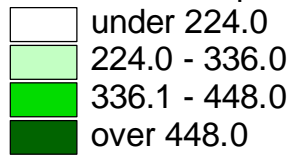
White Males



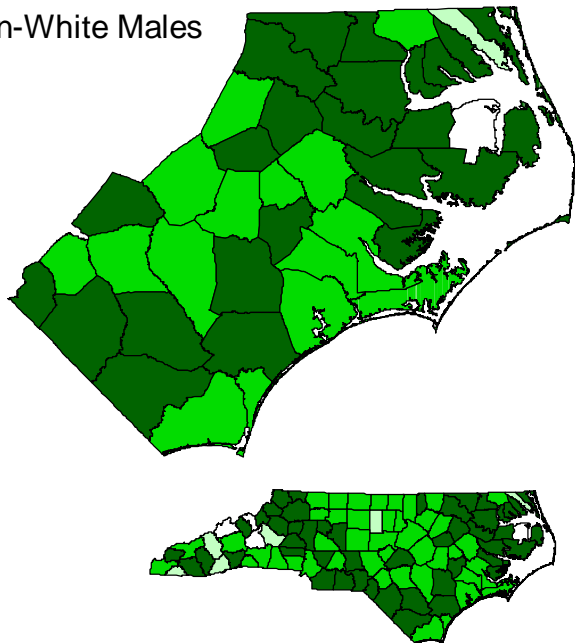
White Females



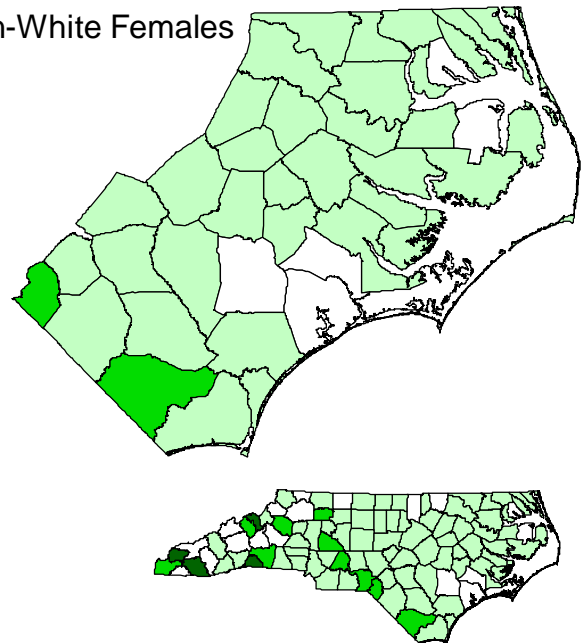
Per 100,000 Population



Non-White Males



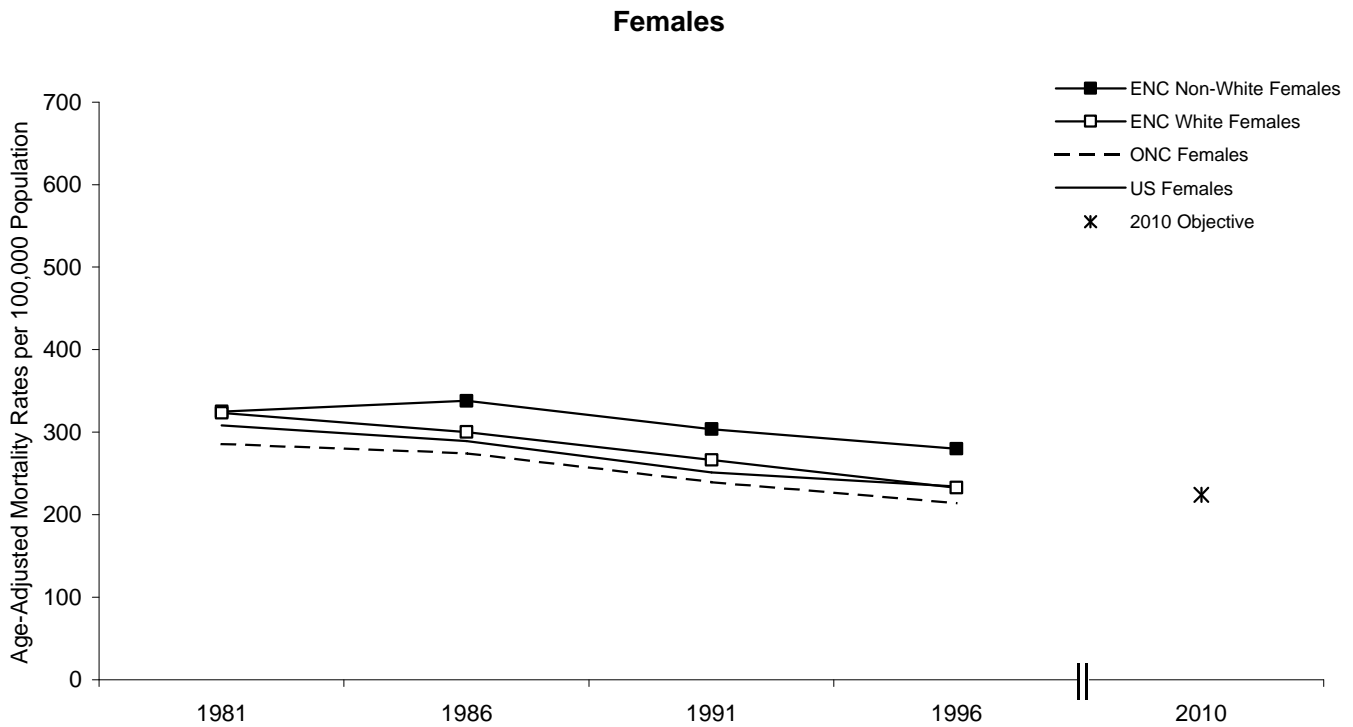
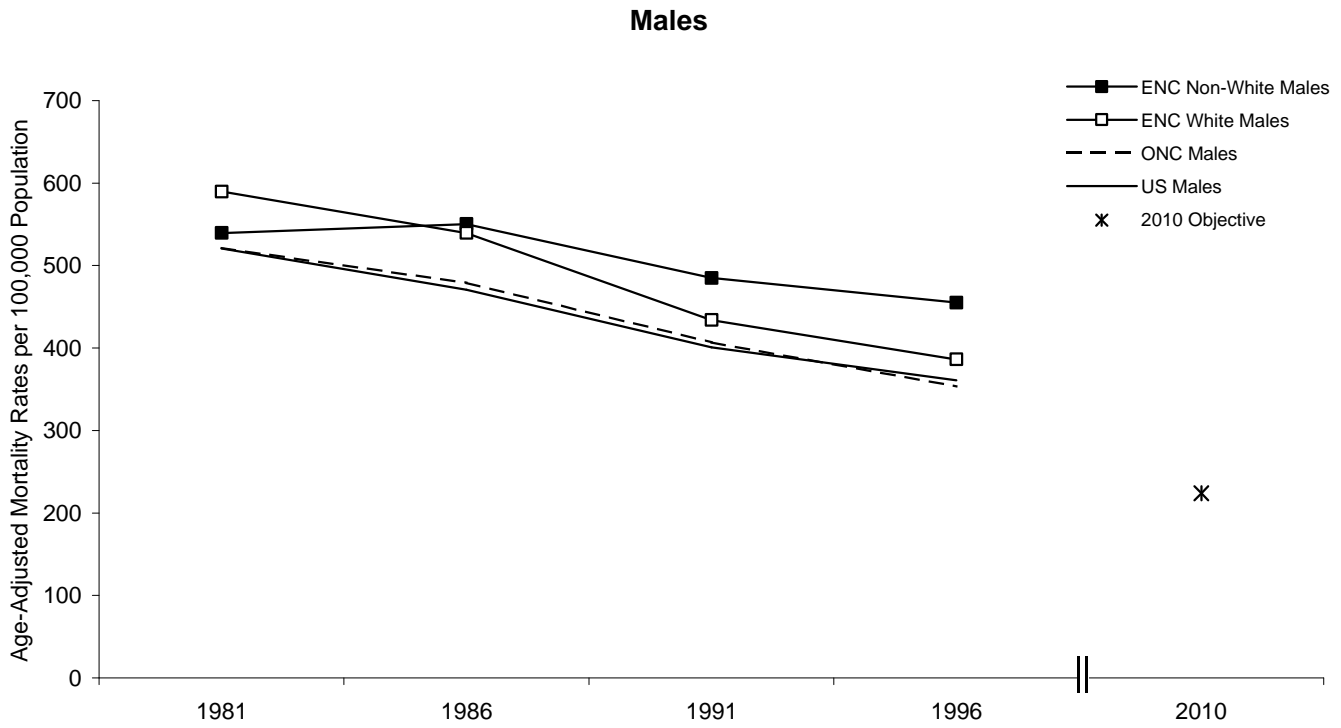
Non-White Females



Heart Disease ICD-9 Codes: 390-398, 402, 404-429
Five-Year Average, Age-Adjusted Rates Standardized to US 2000 SM

Data Source: NC State Center for Health Statistics

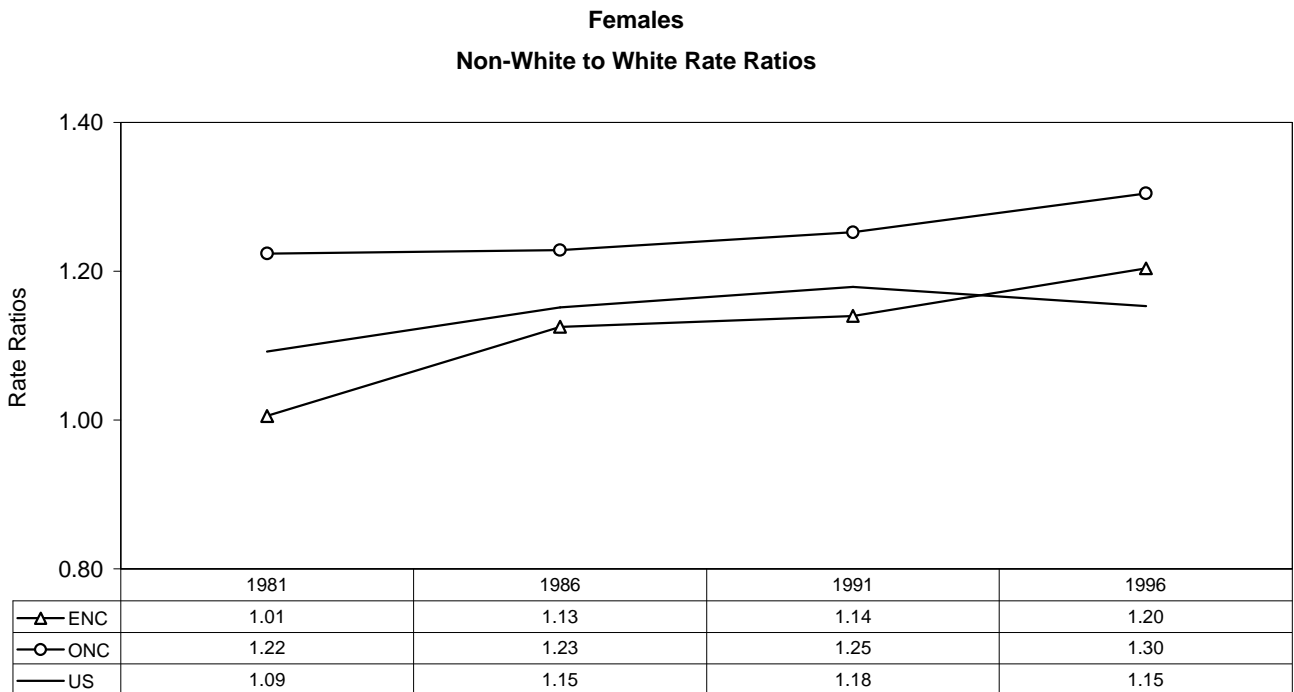
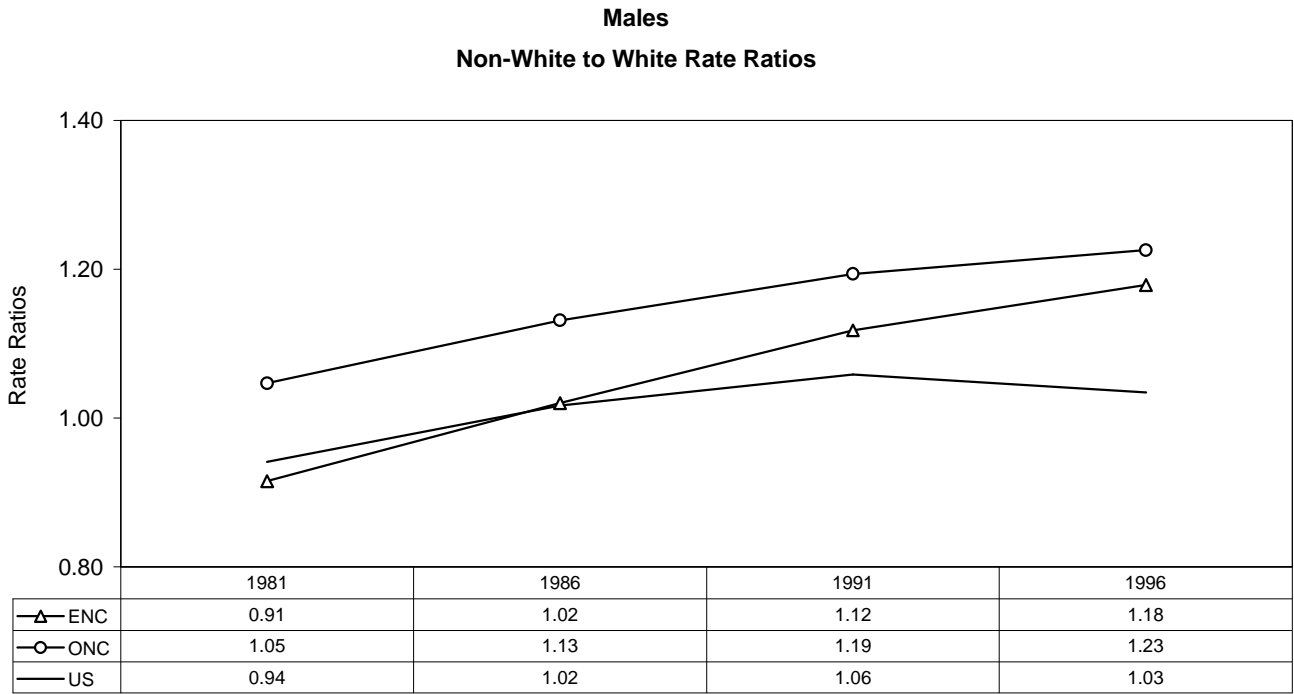
Figure 1.1 Age-Adjusted Heart Disease Mortality Rates by Gender: Regional and National Trends, 1979-1998



Heart Disease ICD-9 Codes: 390-398, 402, 404-429
 Five-Year Average, Age-Adjusted Rates Standardized to US 2000 SM
 US Rates for Middle Year of Five Year Periods

NC Data Source: NC State Center for Health Statistics
 US Data Source: National Center for Health Statistics

Figure 1.2 Racial Disparities in Age-Adjusted Heart Disease Mortality Rates by Gender: Regional and National Trends, 1979-1998



Heart Disease ICD-9 Codes: 390-398, 402, 404-429
Based on Five-Year Average, Age-Adjusted Rates Standardized to US 2000 SM
US Rates for Middle Year of Five Year Periods

NC Data Source: NC State Center for Health Statistics
US Data Source: National Center for Health Statistics

SOURCES OF INFORMATION ABOUT HEART DISEASE

American Heart Association (1999). *2000 Heart and Stroke Statistical Update*. Dallas, TX: American Heart Association.

Centers for Disease Control and Prevention (1999). Achievements in public health, 1900-1999: Decline in deaths from heart disease and stroke-- United States, 1900-1999. *Morbidity and Mortality Weekly Report*, 48 (30): 649-656.

Governor's Task Force for Healthy Carolinians (2000). *Healthy Carolinians 2010: North Carolina's Plan for Health and Safety*. Raleigh, NC: Department of Health and Human Services.

Huston, S. L., Yemisi, A., and Lengerich, E. J. (1997). *The Burden of Cardiovascular Disease in North Carolina: Mortality, Costs, and Risk Factor Data*. Raleigh, NC: North Carolina Division of Community Health.

National Center for Health Statistics (1999). *Health, United States, 1999*. With Health and Aging Chartbook. Hyattsville, MD: National Center for Health Statistics.

National Center for Health Statistics (1999). *Healthy People 2000 Review, 1998-1999*. Hyattsville, MD: Public Health Service.

United States Department of Health and Human Services (2000). *Healthy People 2010*. 2nd ed. With Understanding and Improving Health and Objectives for Health Improvement. 2 vols. Washington, DC: U. S. Government Printing Office.

American Heart Association
(<http://www.americanheart.org>)

Centers for Disease Control and Prevention
(<http://www.cdc.gov>)

Healthy People 2010
(<http://web.health.gov/healthypeople>)

National Center for Health Statistics
(<http://www.cdc.gov/nchs>)

National Heart, Lung, and Blood Institute
(<http://www.nhlbi.nih.gov>)

North Carolina Heart Disease and Stroke Prevention Task Force
(<http://startwithyourheart.com>)

North Carolina State Center for Health Statistics
(<http://www.schs.state.nc.us/SCHS>)

Appendix A

ICD-9 Codes for Heart Disease

- 390: Rheumatic fever without mention of heart involvement
- 391: Rheumatic fever with heart involvement
- 392: Rheumatic chorea
- 393: Chronic rheumatic pericarditis
- 394: Diseases of mitral valve
- 395: Diseases of aortic valve
- 396: Diseases of mitral and aortic valves
- 397: Diseases of other endocardial structures
- 398: Other rheumatic heart diseases
- 402: Hypertensive heart disease
- 404: Hypertensive heart and renal disease
- 405: Secondary hypertension
- 410: Acute myocardial infarction
- 411: Other acute and subacute forms of ischemic heart disease
- 412: Old myocardial infarction
- 413: Angina pectoris
- 414: Other forms of chronic ischemic heart disease
- 415: Acute pulmonary heart disease
- 416: Chronic pulmonary heart disease
- 417: Other diseases of pulmonary circulation
- 420: Acute pericarditis
- 421: Acute and subacute endocarditis
- 422: Acute myocarditis
- 423: Other diseases of pericardium
- 424: Other diseases of endocardium
- 425: Cardiomyopathy
- 426: Conduction disorders
- 427: Cardiac dysrhythmias
- 428: Heart failure
- 429: Ill-defined descriptions and complications of heart disease