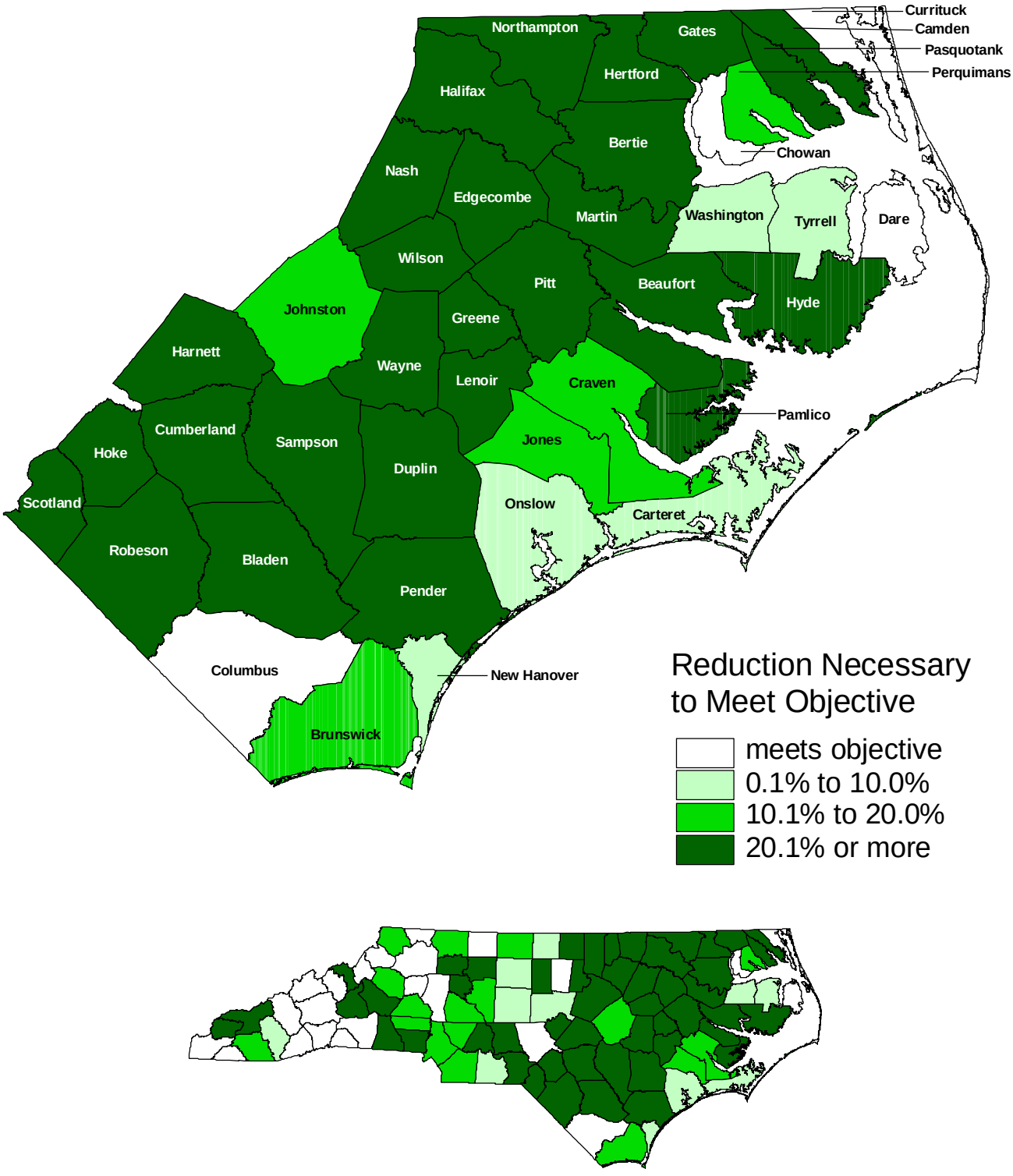
Diabetes

Map 13.1 Progress Towards Diabetes Mortality Objective



2010 Objective for Diabetes Mortality:
Reduce diabetes deaths to no more than 19.2 per 100,000 population

Diabetes ICD-9 Code: 250
Based on Five-Year Average, Age-Adjusted Rates Standardized to US 2000 SM

Data Source: NC State Center for Health Statistics

DIABETES

Diabetes is a common and costly condition. Each year 800,000 Americans are diagnosed with diabetes. An estimated 15.7 million Americans have diabetes, but 5.4 million are not aware that they have the disease. Diabetes is the seventh leading cause of death in the United States (US), accounting for more than 64,750 deaths in 1998. The annual costs of diabetes in the US exceeded $98 billion in 1998, with $44 billion spent on medical care and $54 billion associated with costs of disability and mortality.

Diabetes develops when the body fails to produce enough insulin or becomes resistant to the hormone. As a result, the blood sugar level rises and the body is deprived of energy. There are two main types of diabetes. Type 1 diabetes, a condition in which the pancreas fails to produce insulin, usually develops in childhood or adolescence. People with Type 1 diabetes must take daily insulin injections to survive. Type 1 diabetes accounts for 5 to 10% of all diabetes cases. Type 2 diabetes, which accounts for 90 to 95% of all cases, occurs when the body fails to produce enough insulin and becomes resistant to the hormone. Type 2 diabetes usually develops during adulthood, but it can also affect children. People with Type 2 diabetes can control their illness with oral medications or insulin, diet, and exercise. The obesity epidemic in the US has lead to an increase in the occurrence of Type 2 diabetes in recent years.

The cause of diabetes is unknown, but certain risk factors are known to increase the chances of developing the disease. Type 1 diabetes is more common in people whose parents or siblings have the disease. The main risk factors for Type 2 diabetes are advancing age, obesity, and physical inactivity. The burden of diabetes is also greater among racial minorities who have prevalence rates up to 5 times higher than whites, as well as higher rates of complications. Although diabetes is a chronic, incurable disease, the disease can be controlled through the use of medications, diet, exercise, and other self-care strategies. If not properly controlled, diabetes can lead to: blindness, pregnancy complications, dental disease, kidney disease, nerve disease, lower limb amputation, hypertension, heart disease, and stroke.

Four objectives related to diabetes were included in *Healthy People 2000*, but none were met. In fact, data indicate that the incidence, prevalence, complications, and death rate of the disease all increased. Disparities in diabetes mortality have also persisted. For example, the national age-adjusted mortality rate for non-whites is 92% higher than the rate for whites. The racial mortality gap is even larger in eastern North Carolina (ENC), where the non-white diabetes death rate exceeds the rate for whites by 169%. Reducing the disease burden and eliminating disparities associated with diabetes will be a major challenge in the coming decade. Although *Healthy People 2010* does not contain an objective for diabetes mortality, we suggest an objective of 19.2 diabetes deaths in 2010. In order to meet this objective, 27 of 41 counties in the region will have to reduce their current rates by more than 20% (see Map 13.1).

2010 OBJECTIVE FOR DIABETES MORTALITY

Objective: Reduce diabetes deaths to no more than 19.2 per 100,000 population

Baseline: 24.0 diabetes deaths per 100,000 population in 1996

Currently, four counties in the region meet the objective for diabetes mortality.

Crude Mortality Rates for Diabetes, 1994-1998:

The overall burden of diabetes is greater in ENC than in all other counties of the state (ONC) and the US as indicated by the greater five-year average, crude rate for the eastern region (see Table 13.1). Bertie County has the highest crude death rate in the region with 62.8 deaths per 100,000 population. Hyde (49.4), Robeson (48.1), Hertford (43.4), and Scotland (40.1) counties also have high crude mortality rates. The diabetes death rate in each of these five counties exceeds the rates for ONC and the US by more than 70%. As Map 13.2 shows, high crude rates are found in the northern area of the region.

Age-Adjusted Mortality Rates for Diabetes, 1994-1998:

After adjustment for age variation, the five-year average diabetes mortality rate in ENC (29.8) exceeds the rate for ONC (23.6) and the rate for the US (24.0) by 24% (see Table 13.1). The highest age-adjusted mortality rate is found in Bertie County (59.8 deaths per 100,000 population), followed by Robeson (57.5), Scotland (45.8), Hertford (39.1), and Hyde (39.1) counties. The age-adjusted death rates for Bertie County and Robeson County are more than twice as high as the rates for the ONC and the US. The geographic pattern of age-adjusted mortality rates in ENC is shown in Map 13.2.

Trends in Diabetes Mortality, 1979-1998:

As Figure 13.1 indicates, age-adjusted mortality rates for diabetes have been rising in the region, state, and nation. The current trend towards growing diabetes mortality will have to be halted or reversed in order for the eastern region to meet the 2010 objective of 19.2 diabetes deaths per 100,000. Of the 41 counties in the region, 27 (66%) will have to reduce their current death rates by more than 20% to meet the objective by 2010. Five counties will have to reduce their current rate by 10% to 20%. Currently, four of the counties in the region meet the objective (see Map 13.1).

Disparities in Diabetes Mortality, 1979-1998:

As Figure 13.2 demonstrates, the diabetes mortality gap between whites and non-whites has been growing in ENC and ONC over the last 20 years, while national disparities have leveled off. Within North Carolina (NC), much of the excess mortality is concentrated among minority populations in the east, as shown in Maps 13.2 and 13.3. In ENC, the diabetes death rate has risen 54% over the last 20 years, as compared to 49% and 36% increases for ONC and the US, respectively. Figure 13.1 shows a rapid and disproportionate increase in the mortality rates for non-whites in ENC. During the last two decades, the age-adjusted diabetes mortality rate for non-whites increased 89%, while the rate for whites only rose 33%. During the early 1980's, disparities in diabetes mortality were greater in ONC than ENC, but in recent years disparities in ENC have grown as large as those in ONC. Currently, non-white males in ENC and ONC die at a rate approximately 120% greater than the rate for white males, while national mortality rate for non-whites is about 60% higher than the white rate. Racial disparities among females are even more pronounced. The current death rate for non-white females in ENC and ONC is approximately 200% higher than the rates for white females. National rates for non-white females are 118% higher than rates for white females.

Table 13.1 Diabetes Mortality in Eastern North Carolina, 1994-1998

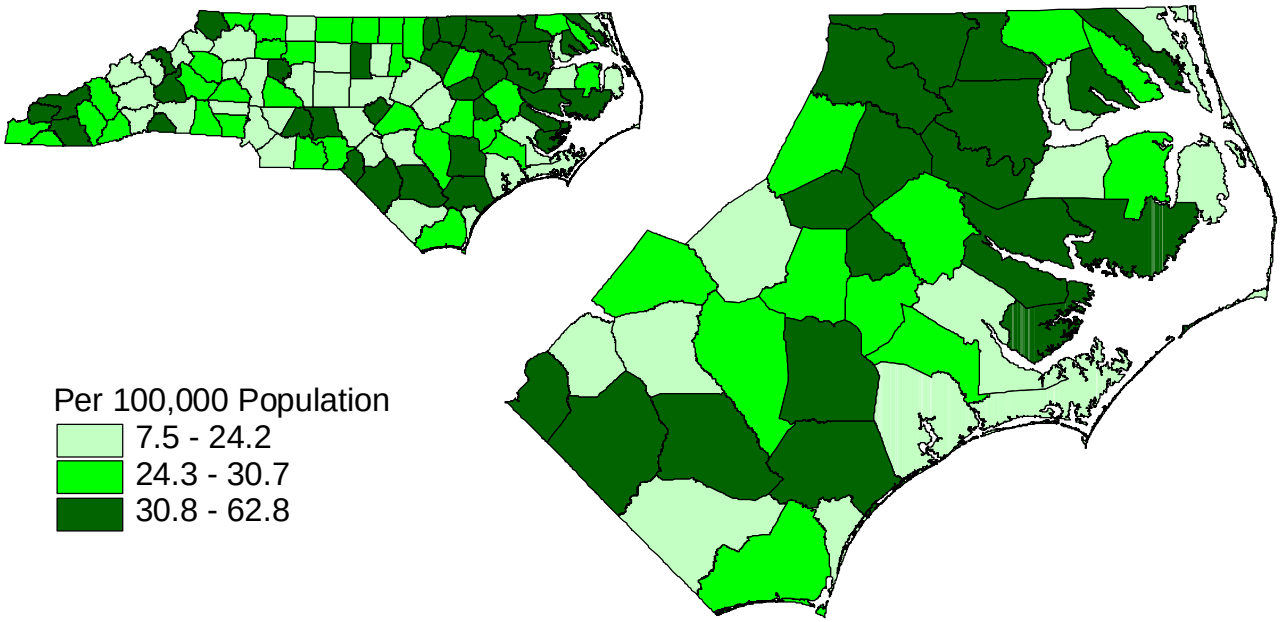
	Totals			Race-Gender Specific Age-Adjusted Death Rates							
		Rates		Non-White Males		Non-White Females		White Males		White Females	
County	Deaths	Crude	Adjusted	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate
Beaufort	78	36.0	31.0	14	52.1	28	73.0	19	29.5	17	14.9
Bertie	64	62.8	59.8	19	94.5	23	62.3	10	59.3	12	36.8
Bladen	58	38.6	34.4	15	63.5	16	43.7	7	17.4	20	30.0
Brunswick	82	26.1	24.1	13	74.4	9	31.4	24	17.1	36	22.6
Camden	10	31.8	29.0	1	28.6	2	43.6	3	20.0	4	26.1
Carteret	66	22.7	20.5	2	28.9	2	17.4	30	23.7	32	18.4
Chowan	16	22.6	17.0	6	67.0	4	21.7	2	5.4	4	9.4
Columbus	51	19.7	18.6	8	27.7	18	37.0	10	10.4	15	12.5
Craven	95	21.8	23.8	13	35.9	29	52.8	27	23.6	26	14.7
Cumberland	308	21.0	34.6	65	59.1	94	57.5	84	33.3	65	18.1
Currituck	12	14.8	15.6	0	0.0	1	30.8	6	24.5	5	13.0
Dare	10	7.5	8.2	0	0.0	0	0.0	4	6.3	6	9.6
Duplin	71	32.7	30.1	14	51.6	31	74.1	9	12.4	17	16.8
Edgecombe	89	31.9	32.9	16	33.5	37	44.4	19	35.6	17	19.0
Gates	15	30.4	27.8	5	65.1	4	36.1	4	28.7	2	9.5
Greene	28	32.5	31.7	3	27.9	7	37.1	6	30.3	12	31.6
Halifax	98	34.8	32.4	26	49.5	36	45.1	17	27.6	19	17.5
Harnett	110	27.8	30.1	12	44.2	28	68.4	27	23.1	43	24.4
Hertford	48	43.4	39.1	14	56.2	21	56.7	5	22.1	8	15.9
Hoke	34	24.2	29.5	5	20.4	14	44.2	9	30.6	6	19.0
Hyde	13	49.4	39.1	3	70.7	4	61.6	3	37.7	3	23.2
Johnston	111	22.4	23.3	10	34.0	20	46.7	39	25.7	42	17.1
Jones	13	28.3	25.3	2	38.9	3	21.6	2	14.3	6	33.7
Lenoir	83	28.1	25.9	12	30.2	40	58.5	19	21.4	12	9.6
Martin	51	39.6	36.2	11	55.3	22	63.6	11	33.3	7	11.7
Nash	115	26.8	28.0	23	54.9	33	52.7	23	22.5	36	19.0
New Hanover	150	21.0	21.3	17	39.5	43	58.9	35	15.2	55	15.3
Northampton	41	39.5	30.8	14	54.3	17	41.7	7	23.0	3	7.7
Onslow	73	9.9	21.3	8	38.5	15	43.2	22	18.8	28	17.2
Pamlico	23	38.6	30.2	7	97.2	4	48.6	3	10.1	9	25.5
Pasquotank	49	28.8	28.0	13	59.7	18	52.2	7	14.1	11	15.0
Pender	64	35.6	32.6	10	58.8	23	73.9	17	22.5	14	16.7
Perquimans	17	31.6	24.3	5	69.9	4	32.6	4	19.8	4	12.7
Pitt	154	25.7	33.2	24	46.2	63	71.6	30	24.7	37	19.0
Robeson	269	48.1	57.5	67	65.3	121	80.8	38	44.3	43	30.7
Sampson	78	30.2	27.2	21	62.9	24	45.2	18	21.9	15	13.1
Scotland	70	40.1	45.8	14	87.3	32	90.5	11	27.4	13	20.9
Tyrrell	5	27.0	21.3	3	86.0	1	33.4	1	13.9	0	0.0
Washington	16	23.7	21.8	2	18.1	6	36.6	2	14.8	6	20.0
Wayne	165	29.5	35.6	30	53.0	61	68.9	29	22.7	45	23.0
Wilson	110	32.2	32.2	15	38.1	38	57.5	19	21.1	38	25.9
ENC 29	1,628	27.0	28.8	305	48.0	554	53.8	343	22.5	426	17.8
ENC 41	3,013	27.1	29.8	562	51.0	996	55.8	662	23.0	793	18.4
ONC	5,944	23.4	23.6	707	51.5	1,093	51.8	2,002	22.9	2,142	16.3
PNC	4,508	23.0	24.8	617	50.4	959	50.9	1,412	23.7	1,520	16.6
WNC	1,436	24.6	20.5	90	61.2	134	59.6	590	21.4	622	15.6
NC	8,957	24.5	25.4	1,269	51.4	2,089	53.6	2,664	22.9	2,935	16.9
US, 1996	61,767	23.3	24.0	4,817	38.9	7,439	42.7	22,829	24.4	26,682	19.6

Diabetes ICD-9 Code: 250
Age-Adjusted Rates Standardized to US 2000 SM
Total Number of Deaths and Rates for Five-Year Period, except US

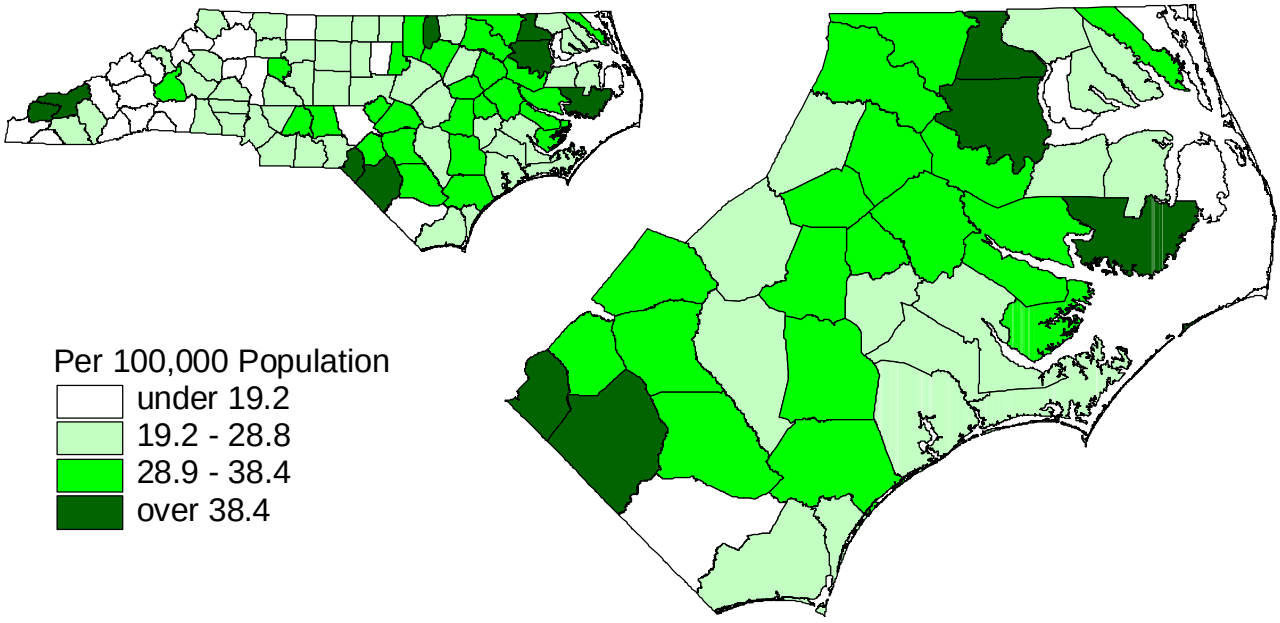
NC Data Source: NC State Center for Health Statistics
US Data Source: National Center for Health Statistics

Map 13.2 Crude and Age-Adjusted Diabetes Mortality Rates: North Carolina and Eastern North Carolina, 1994-1998

Crude Rate



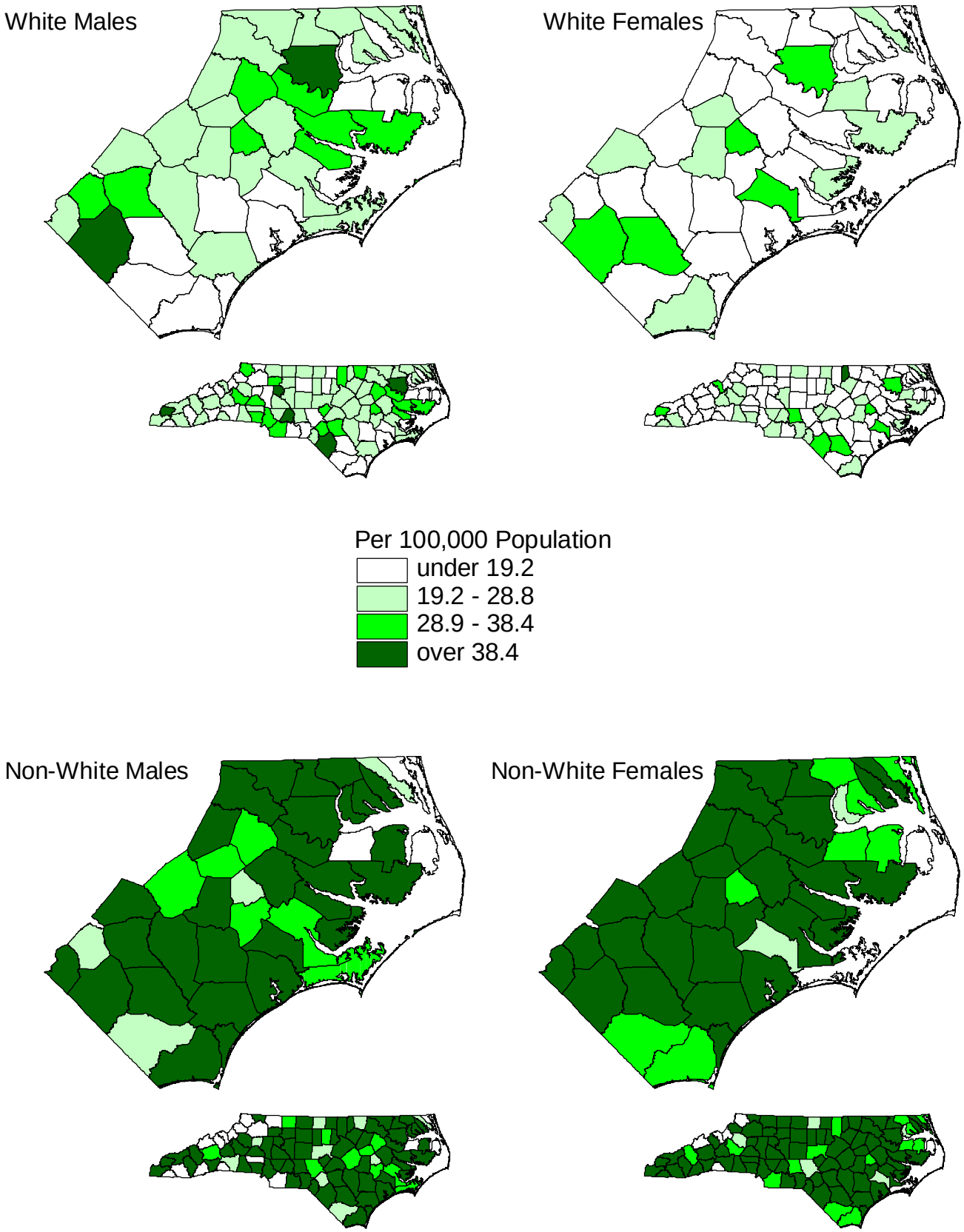
Age-Adjusted Rate



Diabetes ICD-9 Code: 250
Five-Year Average, Age-Adjusted Rates Standardized to US 2000 SM

Data Source: NC State Center for Health Statistics

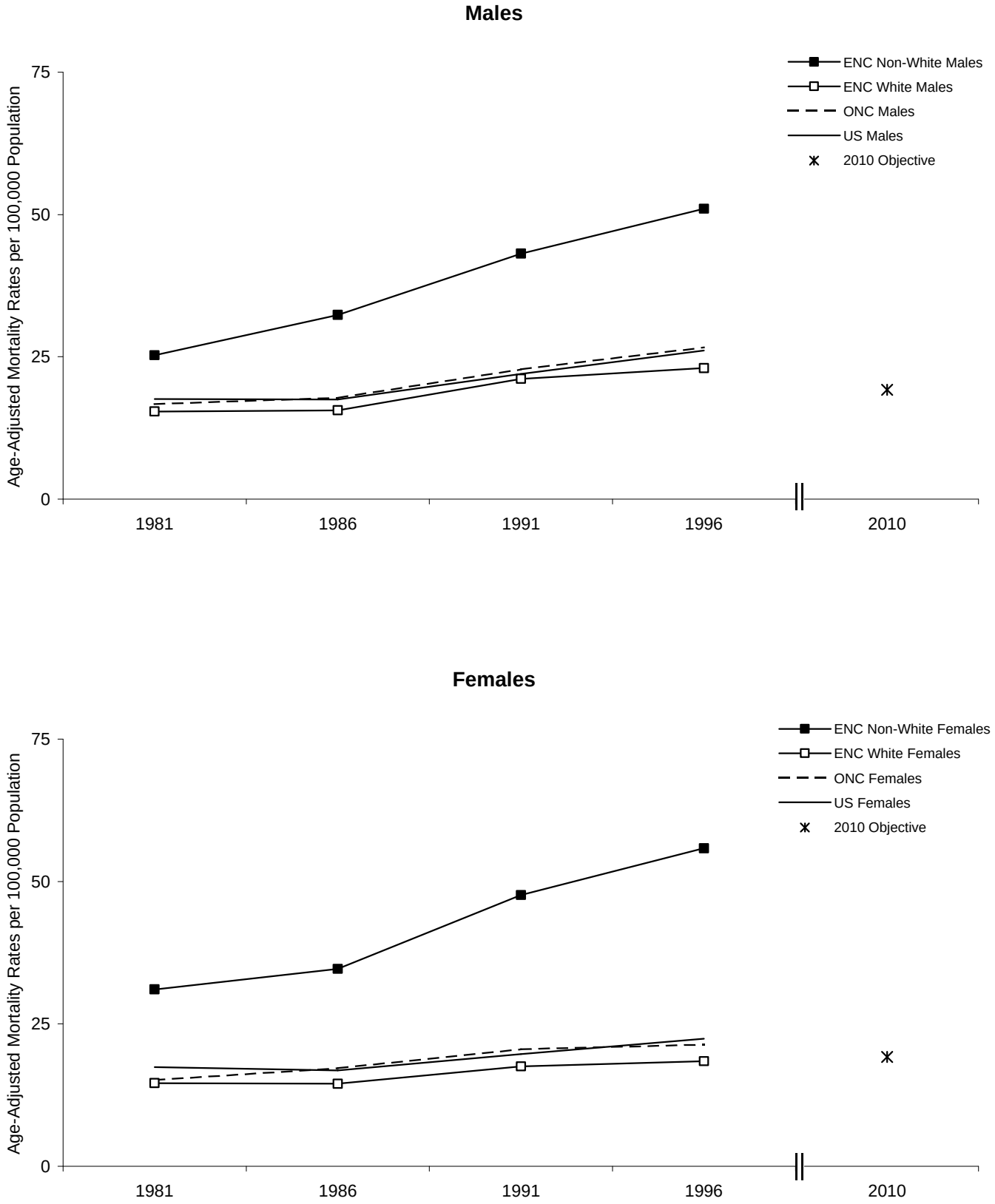
Map 13.3 Race-Gender Specific, Age-Adjusted Diabetes Mortality Rates: North Carolina and Eastern North Carolina, 1994-1998



Diabetes ICD-9 Code: 250
Five-Year Average, Age-Adjusted Rates Standardized to US 2000 SM

Data Source: NC State Center for Health Statistics

Figure 13.1 Age-Adjusted Diabetes Mortality Rates by Gender: Regional and National Trends, 1979-1998



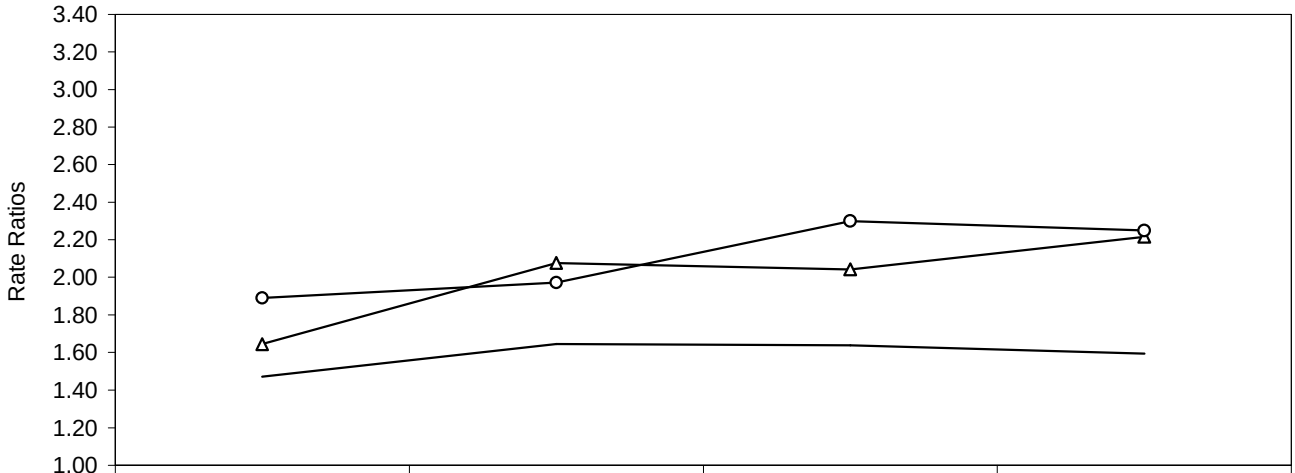
Diabetes ICD-9 Code: 250
Five-Year Average, Age-Adjusted Rates Standardized to US 2000 SM
US Rates for Middle Year of Five Year Periods

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

Figure 13.2 Racial Disparities in Age-Adjusted Diabetes Mortality Rates by Gender: Regional and National Trends, 1979-1998

Males

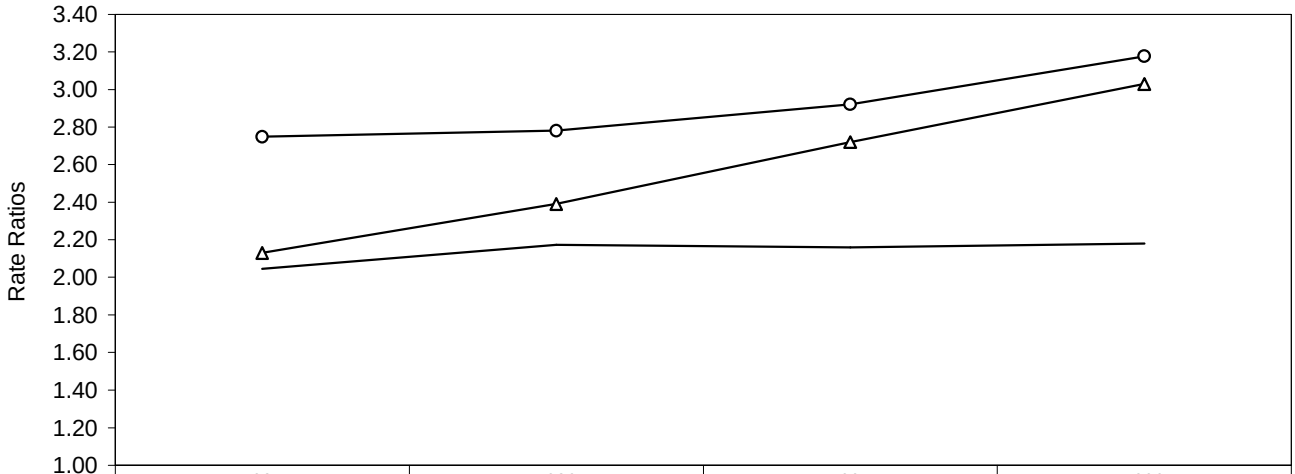
Non-White to White Rate Ratios



	1981	1986	1991	1996
ENC	1.64	2.08	2.04	2.22
ONC	1.89	1.97	2.30	2.25
US	1.47	1.64	1.64	1.59

Females

Non-White to White Rate Ratios



	1981	1986	1991	1996
ENC	2.13	2.39	2.72	3.03
ONC	2.75	2.78	2.92	3.18
US	2.04	2.17	2.16	2.18

Diabetes ICD-9 Code: 250
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 DIABETES

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American Diabetes Association
(http://www.diabetes.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 Institute for Diabetes and Digestive and Kidney Diseases
(http://www.niddk.nih.gov)

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

APPENDIX M

ICD-9 Code for Diabetes

250: Diabetes mellitus