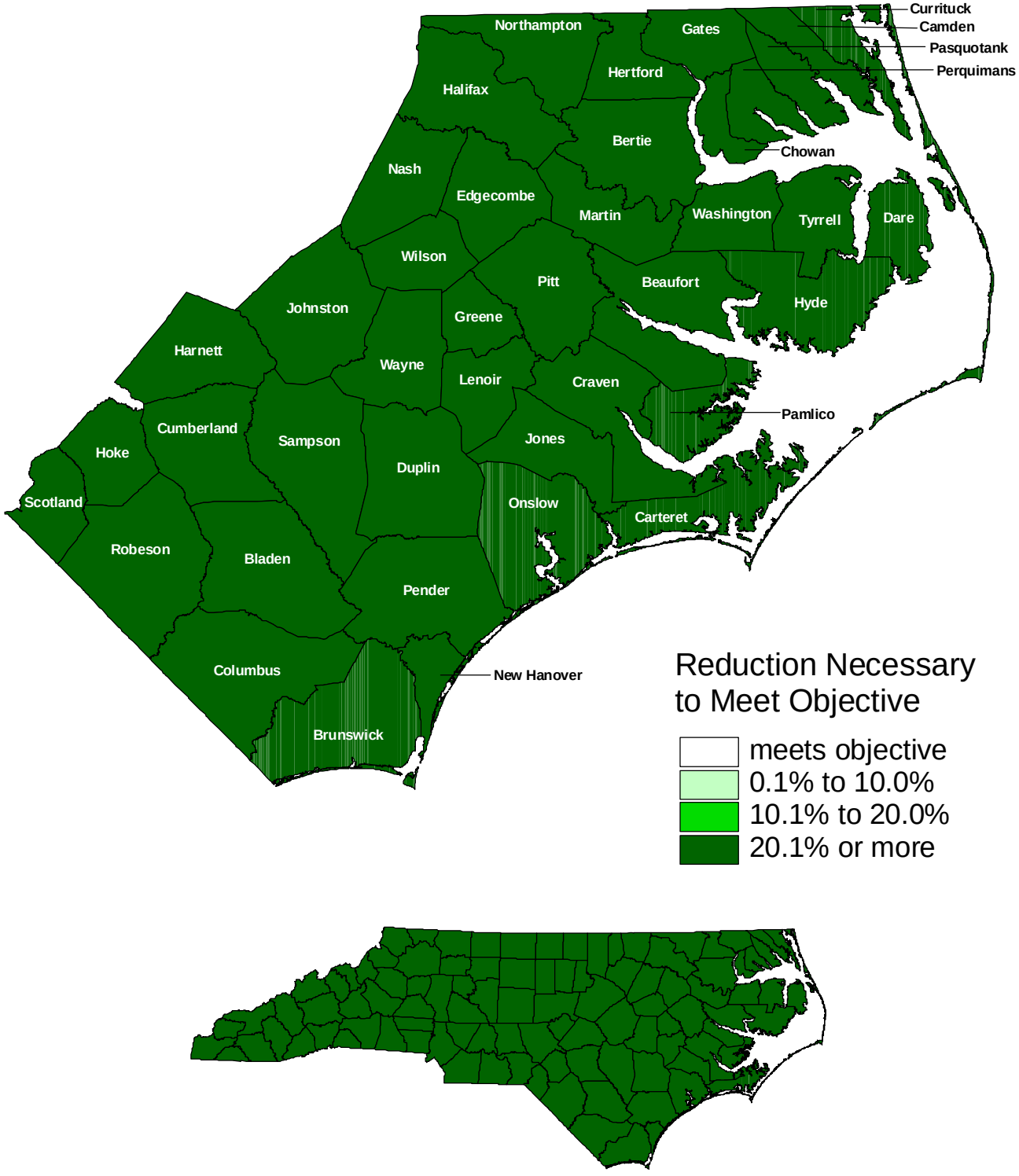
Chronic Obstructive Pulmonary Disease

Map 9.1 Progress Towards Chronic Obstructive Pulmonary Disease Mortality Objective



HP 2010 Objective for Chronic Obstructive Pulmonary Disease Mortality: Reduce chronic obstructive pulmonary disease deaths to no more than 60.0 per 100,000 population aged 45 and older

Chronic Obstructive Pulmonary Disease ICD-9 Codes: 490-496
Based on Five-Year Average, Age-Adjusted Rates Standardized to US 2000 SM
Mortality Rates for Population Aged 45 and Older

Data Source: NC State Center for Health Statistics

CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Chronic obstructive pulmonary disease (COPD) is the fourth leading cause of death in the United States (US), accounting for more than 112,500 deaths in 1998. The term COPD refers to several different diseases, with asthma, chronic bronchitis, and emphysema being the most common. In 1995, there were 14.5 million people with chronic bronchitis and 1.9 million with emphysema. Asthma, the most common type of COPD, affected 14.9 million people; children under the age of 18 accounted for 5.3 million of these cases. The total costs associated with these three conditions exceeded $38 billion in 1998 alone.

All forms of COPD are characterized by chronic airflow obstruction. In chronic bronchitis, inflammation and scarring of the bronchial airways lead to increased mucus production, coughing, and shortness of breath. Emphysema refers to the destruction of the air sacs involved in gas exchange and reduced elasticity of airways in the lung. These pathological changes in the lung lead to air trapping, decreased gas exchange, and obstructed airflow. In asthma, the linings of the airways become inflamed and produce excess mucus, resulting in restricted airflow through the lungs.

Emphysema and chronic bronchitis develop over time, usually appearing in later adulthood. Smoking is the primary cause of these conditions, accounting for 80% to 90% of all cases. People working in certain occupations, such as in agricultural, cotton mills, and paper mills, are at an increased risk for emphysema and chronic bronchitis. Although there is a genetic disorder that causes emphysema, this condition accounts for less than 5% of all cases. In contrast to other forms of COPD, asthma usually develops during childhood. Common triggers for asthma attacks include allergens such as molds, upper respiratory infections, tobacco smoke, and exercise. This chapter focuses on COPD mortality among people aged 45 and older.

Between 1987 and 1997, the age-adjusted COPD mortality rate for the US stayed below the level set forth in *Healthy People 2000*, but disparities in COPD mortality persist. Currently, the COPD death rate for US men is 63% higher than the rate for US women. However, the COPD death rate for females has more than doubled over the last two decades, while the rate for males has remained fairly constant. There are also racial disparities in COPD mortality. The most recent age-adjusted mortality rate for white males in the US exceeds the rate for non-white males by 38%. The death rate for white females is 87% higher than the rate for non-white females. In order to meet objectives set forth in *Healthy People 2010*, substantial reductions in COPD mortality and disparities will be necessary in eastern North Carolina (ENC). All of the counties in ENC will have to reduce their current mortality rates by more than 20% to meet the objective for COPD mortality (see Map 9.1). Disparities in COPD mortality will also need to be addressed. The most recent mortality rate for whites in ENC is 58% higher than the rate for non-whites, and males in ENC have a rate that is 113% higher than the rate for females.

HP 2010 for Chronic Obstructive Pulmonary Disease Mortality

Objective: Reduce chronic obstructive pulmonary disease deaths to no more than 60.0 per 100,000 population aged 45 and older

Baseline: 119.4 chronic obstructive pulmonary disease deaths per 100,000 population aged 45 and older in 1998

Currently, none of the counties in the region meet the objective for chronic obstructive

Crude Mortality Rates for Chronic Obstructive Pulmonary Disease, 1994-1998:

The five-year average, crude COPD mortality rate for ENC (120.3 per 100,000 population aged 45 and older) is similar to the rate for the US (119.1), but 4% higher than the rate (116.2) for the all other North Carolina counties (ONC). The highest crude mortality rates are found in the counties of Tyrrell (217.7), Camden (216.3), Jones (197.9), Pasquotank (160.0), and Hyde (143.2). The crude rates for Camden and Tyrrell counties each exceed the rate for the state by more than 80%. Map 9.2 shows geographic variation in crude COPD mortality rates.

Age-Adjusted Mortality Rates for Chronic Obstructive Pulmonary Disease, 1994-1998:

The five-year average, age-adjusted COPD mortality rate for ENC is 7% higher than the rate for ONC and the US. After adjustment for age differences across populations, the counties with the highest mortality rates are Camden (226.8), Jones (193.9), Tyrrell (184.9), Onslow (166.6), and Cumberland (154.1). The rate for Camden County is more than 90% higher than the rate for NC as a whole. Chowan (77.0), Perquimans (81.5), and Martin (89.3) counties have mortality rates that are considerably lower than the state average, even after adjustment for age (see Table 9.1). County level variation in age-adjusted COPD mortality rates is shown in Map 9.2.

Trends in Chronic Obstructive Pulmonary Disease Mortality, 1979-1998:

In ENC, COPD mortality is growing among all segments of the population. Historically, whites have died from COPD at a higher rate than non-whites, and rates have been higher for men than women. Race and sex specific rates have been highest in white men and lowest in non-white women. COPD mortality trends in ENC follow a pattern similar to the patterns for ONC and the US, with one exception. COPD mortality rates have recently declined for US males, but COPD death rates have risen for both white and non-white men in ENC (see Figure 9.1).

None of the counties in the region currently meet the *Healthy People 2010* objective for COPD mortality (see Map 9.1). All of the counties in the region will have to reduce their current rate by more than 20% in order to meet the objective by 2010. It is also unlikely that the *Healthy People 2010* objective for COPD mortality will be met by any population subgroup (see Figure 9.1). There is also no indication that rates will be declining over the next decade for any group.

Disparities in Chronic Obstructive Pulmonary Disease Mortality, 1979-1998:

As Table 9.1 and Map 9.3 demonstrate, age-adjusted mortality rates for COPD vary tremendously by race and gender. White males in ENC currently die at a rate 21% higher than non-white males, and white females have a mortality rate that is 130% higher than the rate for non-white females. The death rate for males in ENC exceeds the rate for females by 113%. Racial and gender disparities in the region have declined in recent decades (see Figure 9.2), but these reductions have negative implications. The reason for the decreasing disparities is that the growth in the COPD death rate for males has slowed, while the rate for females has grown. Similarly, rates for non-whites have grown dramatically, while rates for whites have only increased slightly. Trends in COPD disparities in ENC have generally followed those for the US (see Figure 9.2).

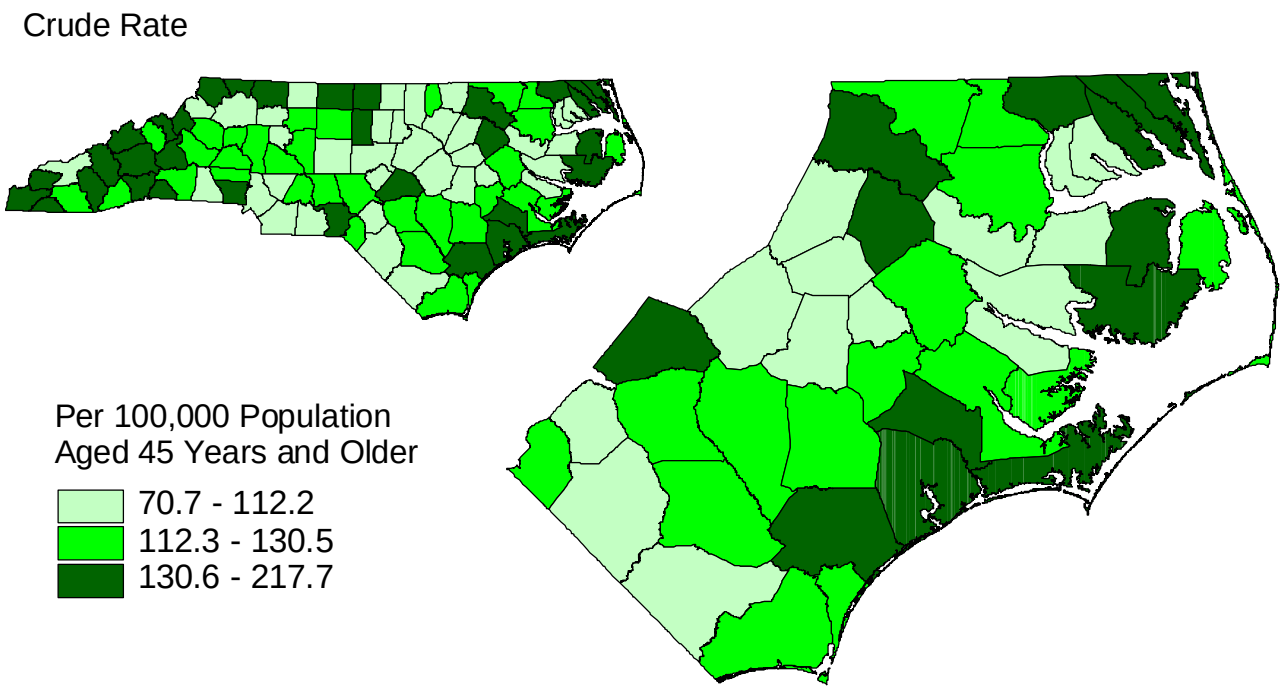
Table 9.1 Chronic Obstructive Pulmonary Disease Mortality in Eastern North Carolina, 1994-1998

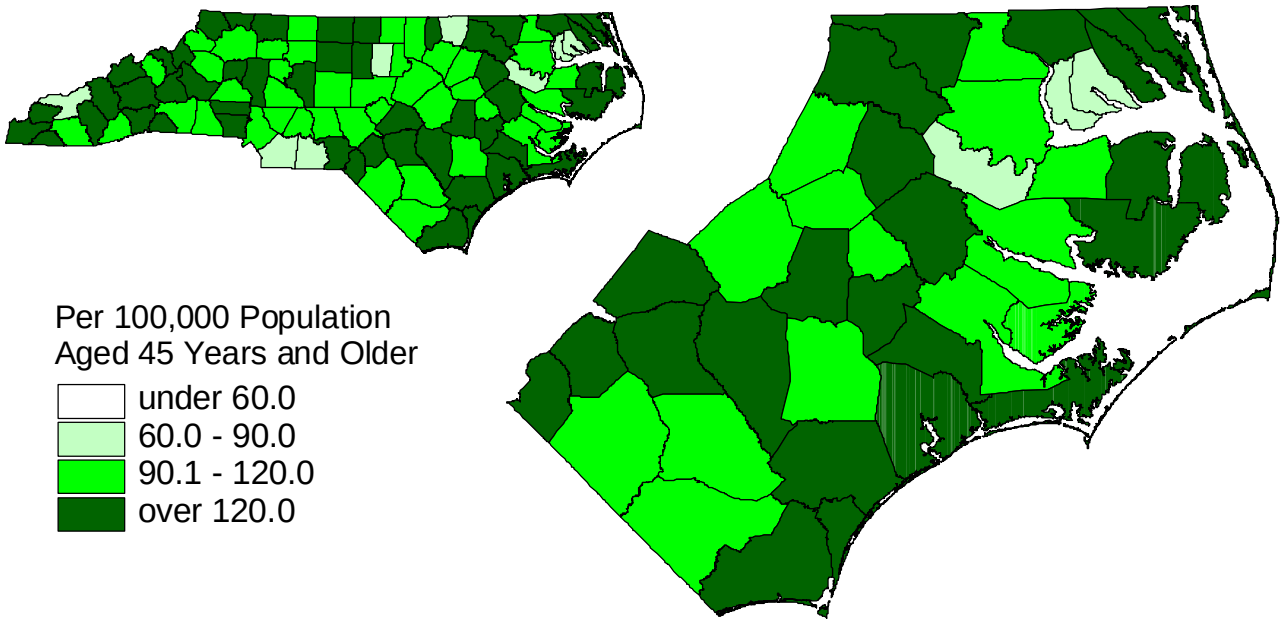
	Totals			Race-Gender Specific Age-Adjusted Death Rates							
		Rates		Non-White Males		Non-White Females		White Males		White Females	
County	Deaths	Crude	Adjusted	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate
Beaufort	94	110.1	104.5	7	92.1	2	18.5	38	166.0	47	113.6
Bertie	47	128.7	117.2	15	194.6	2	18.3	16	207.3	14	110.8
Bladen	72	123.5	117.3	14	170.9	7	54.6	34	225.8	17	68.8
Brunswick	151	112.4	127.3	6	95.9	3	30.8	76	195.5	66	110.8
Camden	27	216.3	226.8	2	189.3	1	56.2	13	324.1	11	201.2
Carteret	153	132.3	137.3	0	0.0	0	0.0	76	169.0	77	125.9
Chowan	26	90.5	77.0	5	156.0	1	12.2	13	140.5	7	52.1
Columbus	100	102.9	101.0	13	122.3	4	24.8	49	191.5	34	77.9
Craven	159	117.4	116.3	16	150.3	9	44.2	71	169.0	63	101.2
Cumberland	439	123.0	154.1	60	202.1	41	73.0	172	235.1	166	138.2
Currituck	38	131.6	139.3	4	303.2	1	88.5	20	190.7	13	99.0
Dare	53	113.2	137.7	0	0.0	0	0.0	28	197.8	25	116.0
Duplin	91	114.8	111.1	19	221.7	7	49.4	44	203.8	21	58.8
Edgecombe	126	136.5	134.2	26	193.8	8	28.3	57	322.4	35	105.9
Gates	25	140.9	132.3	5	176.2	4	96.6	9	192.1	7	102.7
Greene	32	103.9	105.8	4	111.6	2	37.7	15	304.0	11	83.6
Halifax	138	137.9	128.1	45	267.2	11	40.7	43	192.0	39	95.5
Harnett	174	137.3	139.7	9	116.2	4	29.5	87	235.9	74	116.2
Hertford	46	114.6	101.7	8	104.8	5	35.9	14	201.6	19	120.6
Hoke	43	107.2	123.9	10	190.3	8	76.8	11	229.7	14	115.4
Hyde	15	143.2	131.0	4	288.5	2	120.4	6	219.6	3	63.5
Johnston	175	101.1	104.5	13	147.3	6	38.6	97	178.4	59	68.6
Jones	34	197.9	193.9	3	108.0	6	166.9	16	359.4	9	134.2
Lenoir	139	125.9	124.1	26	225.8	10	37.9	55	214.5	48	104.3
Martin	46	93.9	89.3	5	67.7	2	17.8	20	173.5	19	96.3
Nash	161	108.4	112.0	20	162.7	17	77.1	55	138.9	69	102.6
New Hanover	330	129.5	132.8	15	101.9	14	53.0	151	204.7	150	117.9
Northampton	55	129.4	120.5	14	163.9	11	78.1	17	154.3	13	100.3
Onslow	176	134.0	166.6	6	93.5	8	64.4	81	264.5	81	152.4
Pamlico	30	112.7	105.1	2	92.2	2	62.9	12	117.8	14	104.7
Pasquotank	91	160.0	143.8	6	84.6	7	59.1	36	242.0	42	154.1
Pender	93	131.7	134.6	8	113.7	8	71.5	46	242.2	31	105.7
Perquimans	22	94.2	81.5	1	35.2	2	44.1	10	104.8	9	79.8
Pitt	203	121.5	128.9	35	219.6	16	52.4	73	188.8	79	113.7
Robeson	180	105.1	109.6	50	178.2	28	52.5	54	177.8	48	97.1
Sampson	121	124.5	121.8	24	223.1	10	53.9	48	190.6	39	90.4
Scotland	65	115.1	121.7	11	164.7	6	47.7	25	223.5	23	105.2
Tyrrell	16	217.7	184.9	5	465.4	0	0.0	6	237.9	5	146.2
Washington	25	98.8	92.3	3	93.8	1	19.9	10	148.0	11	97.7
Wayne	195	109.5	121.2	18	100.0	4	12.4	96	230.1	77	112.5
Wilson	129	106.3	106.5	27	221.1	6	26.2	52	171.3	44	81.0
ENC 29	2,392	121.7	122.4	331	167.2	147	41.1	1,002	195.9	912	107.5
ENC 41	4,335	120.3	124.4	564	165.2	286	46.3	1,852	200.6	1,633	106.7
ONC	10,275	116.2	116.8	581	144.6	334	45.9	5,026	172.5	4,334	93.7
PNC	7,448	110.2	114.3	537	143.9	302	45.2	3,444	170.5	3,165	94.3
WNC	2,827	132.8	123.0	44	149.7	32	50.7	1,582	177.4	1,169	92.3
NC	14,610	117.4	118.8	1,145	154.0	620	46.0	6,878	178.7	5,967	96.8
US, 1996	104,317	119.1	116.0	4,300	114.8	3,141	52.9	49,330	158.0	47,546	98.8

Chronic Obstructive Pulmonary Disease ICD-9 Codes: 490-496
Age-Adjusted Rates Standardized to US 2000 SM
Total Number of Deaths and Rates for Population Aged 45 and Older
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 9.2 Crude and Age-Adjusted Chronic Obstructive Pulmonary Disease Mortality Rates: North Carolina and Eastern North Carolina, 1994-1998

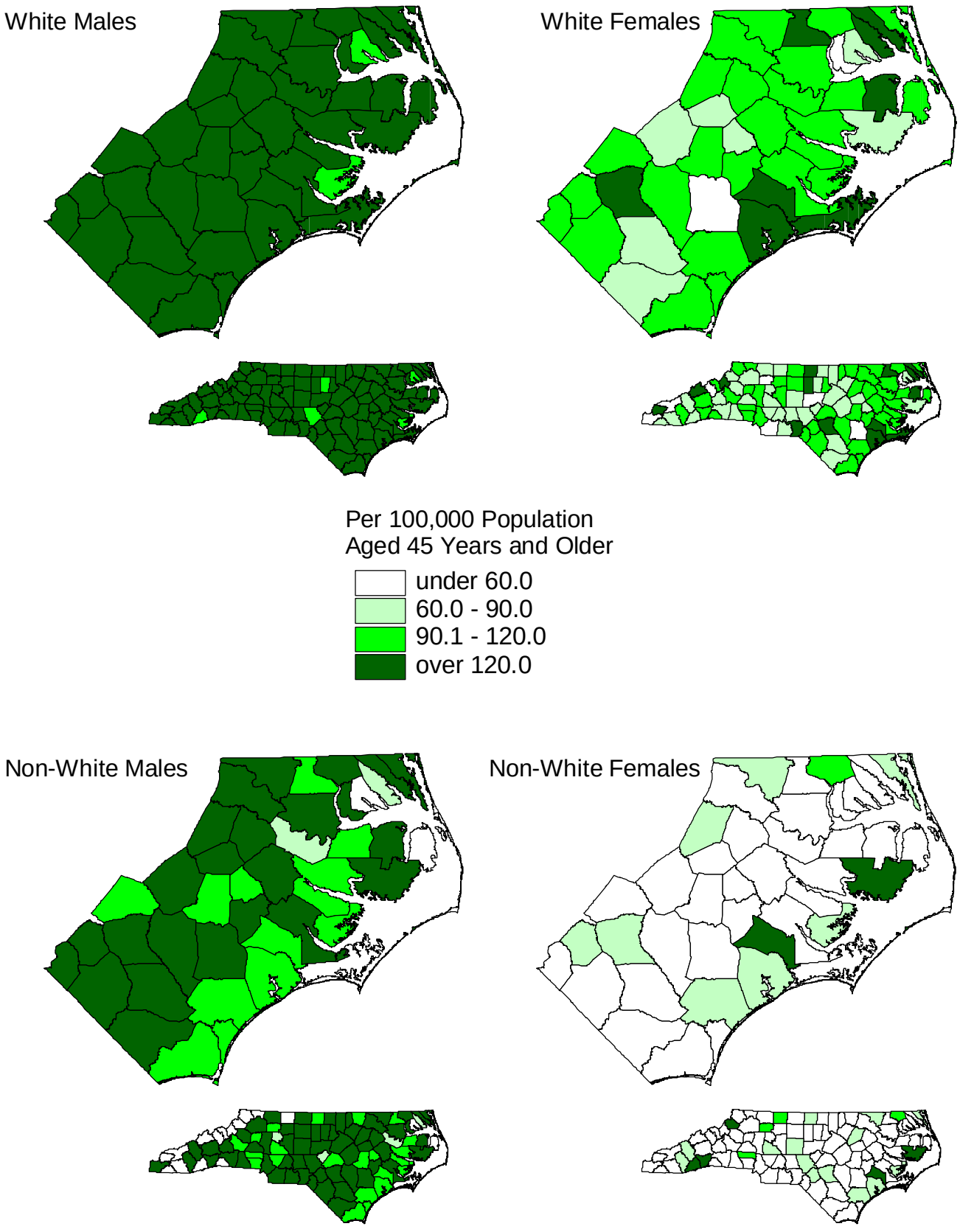




Chronic Obstructive Pulmonary Disease ICD-9 Codes: 490-496
Five-Year Average, Age-Adjusted Rates Standardized to US 2000 SM

Data Source: NC State Center for Health Statistics

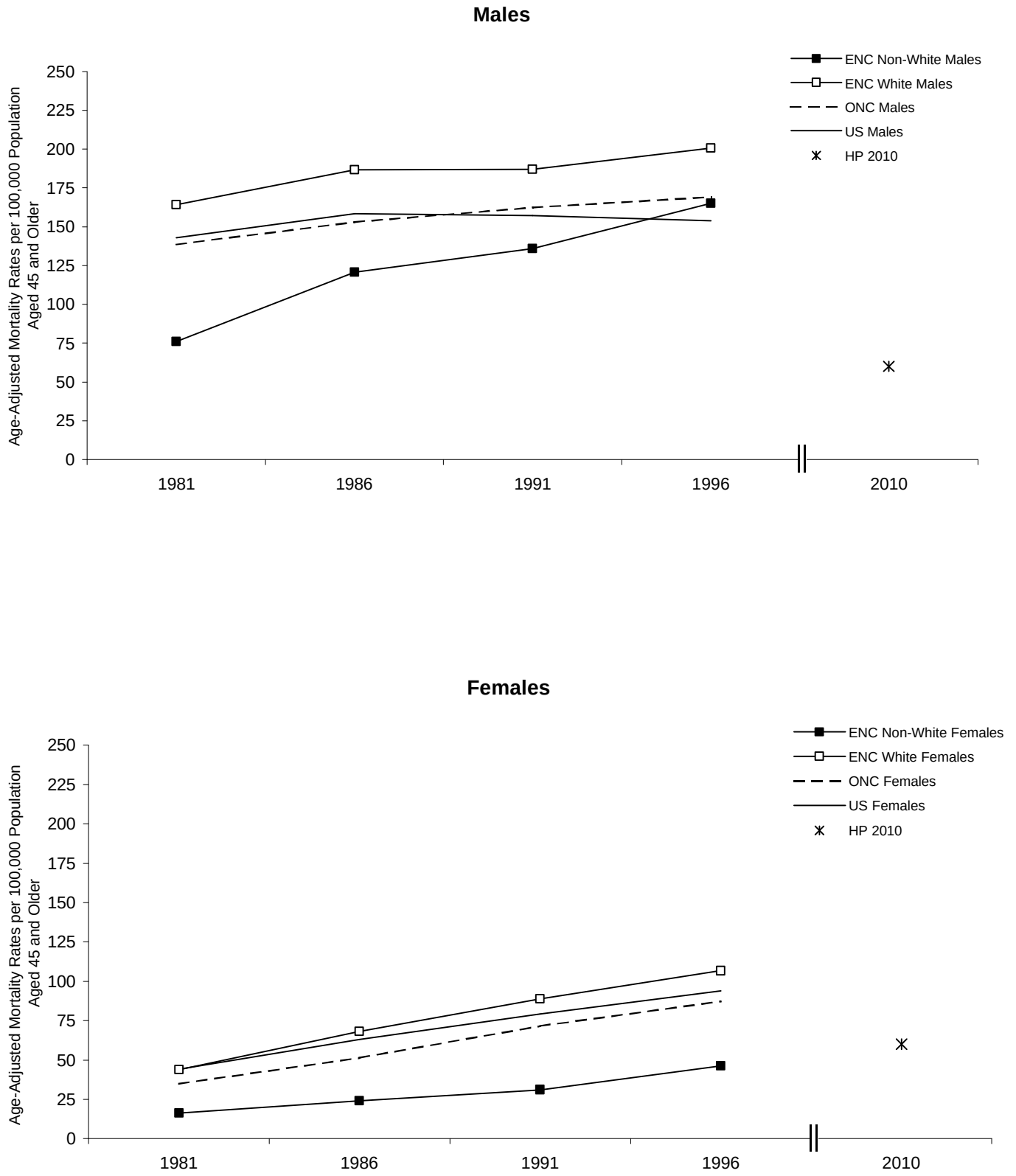
Map 9.3 Race-Gender Specific, Age-Adjusted Chronic Obstructive Pulmonary Disease Mortality Rates: North Carolina and Eastern North Carolina, 1994-1998



Chronic Obstructive Pulmonary Disease ICD-9 Codes: 490-496
Five-Year Average, Age-Adjusted Rates Standardized to US 2000 SM

Data Source: NC State Center for Health Statistics

Figure 9.1 Age-Adjusted Chronic Obstructive Pulmonary Disease Mortality Rates by Gender: Regional and National Trends, 1979-1998



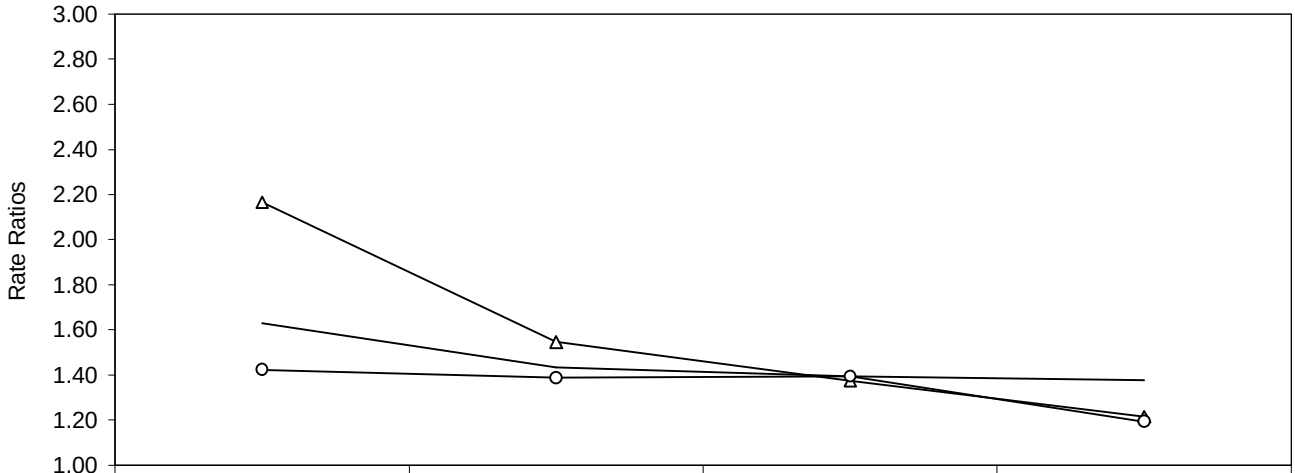
Chronic Obstructive Pulmonary Disease ICD-9 Codes: 490-496
Five-Year Average, Age-Adjusted Rates Standardized to US 2000 SM
US Rates for Middle Year of Five Year Periods
Mortality Rates for Population Aged 45 and Older

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

Figure 9.2 Racial Disparities in Age-Adjusted Chronic Obstructive Pulmonary Disease Mortality Rates by Gender: Regional and National Trends, 1979-1998

Males

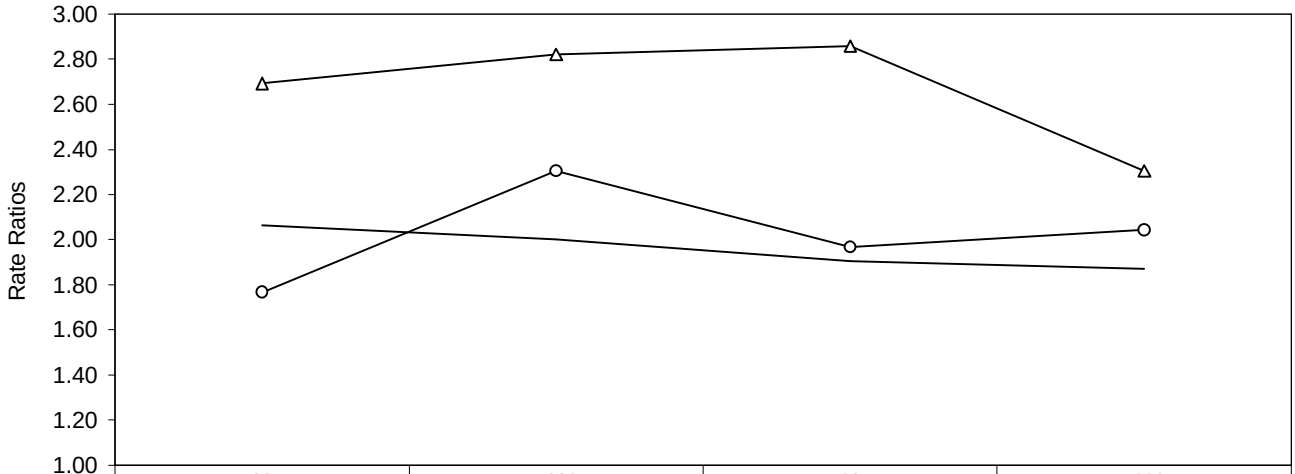
Non-White to White Rate Ratios



	1981	1986	1991	1996
ENC	2.17	1.55	1.37	1.21
ONC	1.42	1.39	1.39	1.19
US	1.63	1.43	1.39	1.38

Females

Non-White to White Rate Ratios



	1981	1986	1991	1996
ENC	2.69	2.82	2.86	2.30
ONC	1.77	2.30	1.97	2.04
US	2.06	2.00	1.90	1.87

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Based on Five-Year Average, Age-Adjusted Rates Standardized to US 2000 SM
US Rates for Middle Year of Five Year Periods
Mortality Rates for Population Aged 45 and Older

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

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

American Lung Association
(http://lungusa.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)

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

Appendix I

ICD-9 Codes for Chronic Obstructive Pulmonary Disease

490: Bronchitis, not specified as acute or chronic
491: Chronic bronchitis
492: Emphysema
493: Asthma
494: Bronchiectasis
495: Extrinsic allergic alveolitis
496: Chronic airway obstruction, not elsewhere classified