

Disparity and Geography

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What Do We Mean by Geography in the Context of Health Disparity?

► Urban-rural

- ▷ “Urbanized areas” with urban people
- ▷ Metropolitan areas with urban and others
- ▷ Micropolitan places with urban and other people
- ▷ Rural is often a “residual” classification

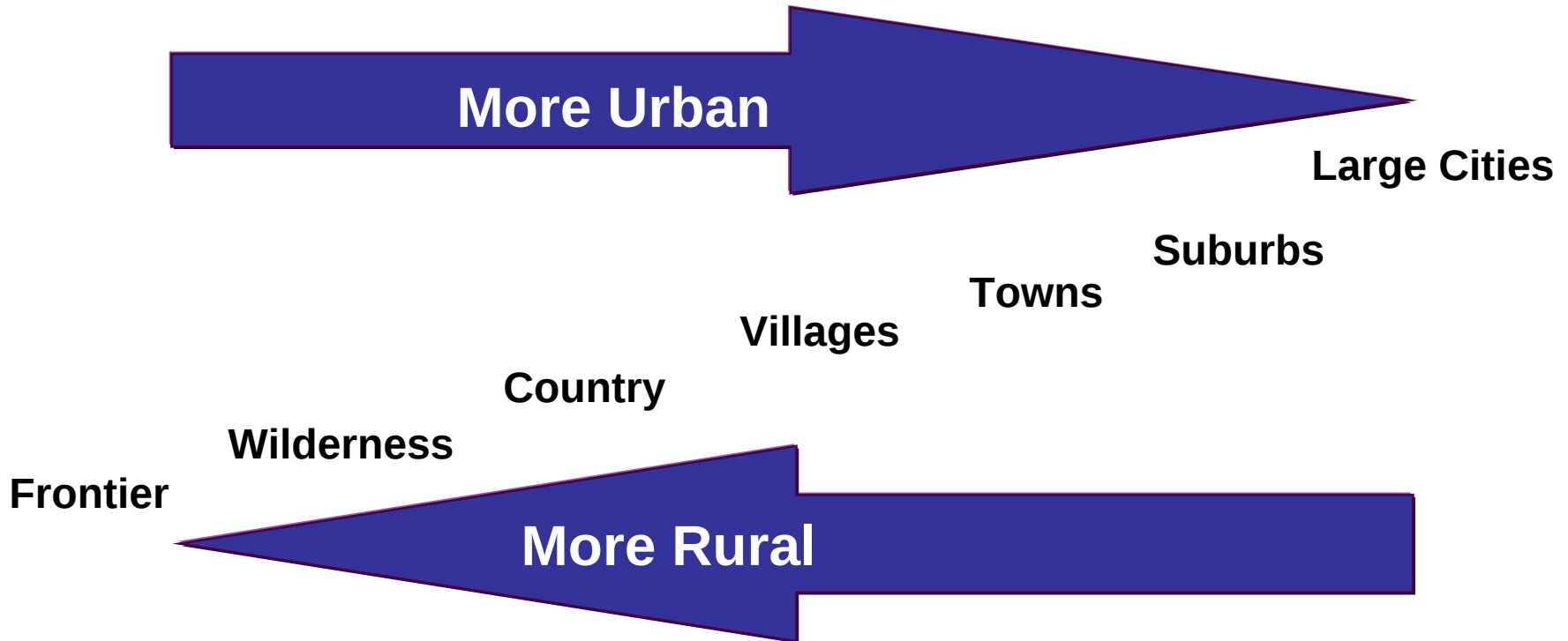
► Regions of America

► Distance to care

► “Neighborhoods”

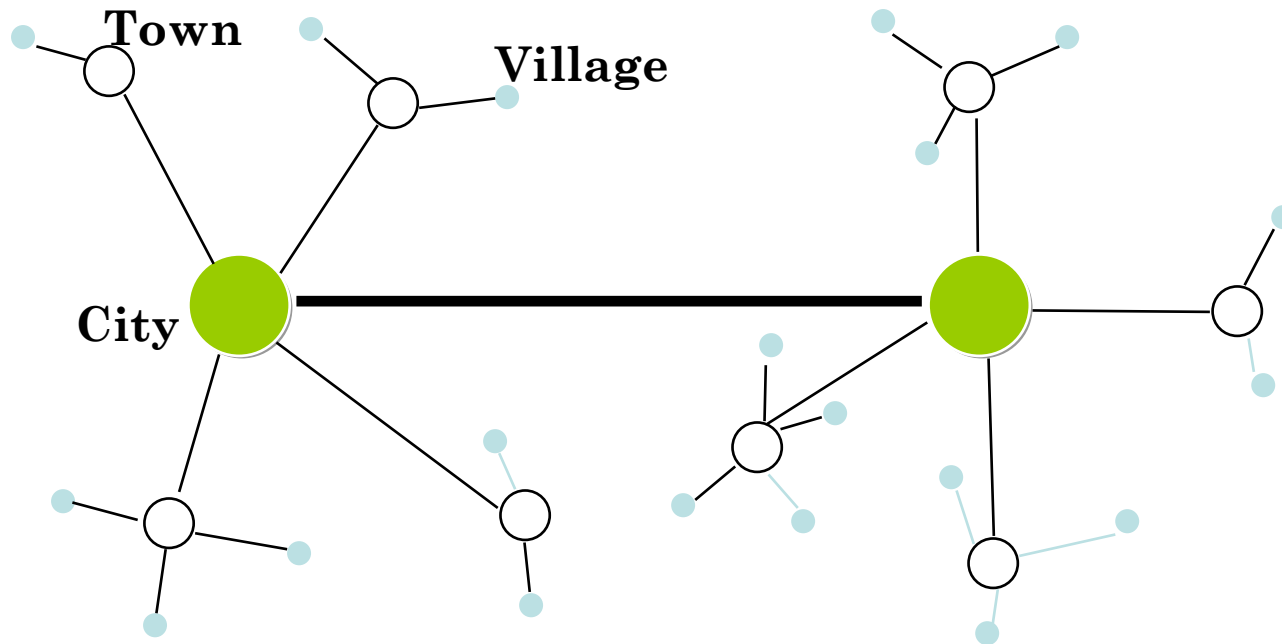
Is there an Urban-Rural Continuum?

Many think of the relationship of geography and social activity along this continuum



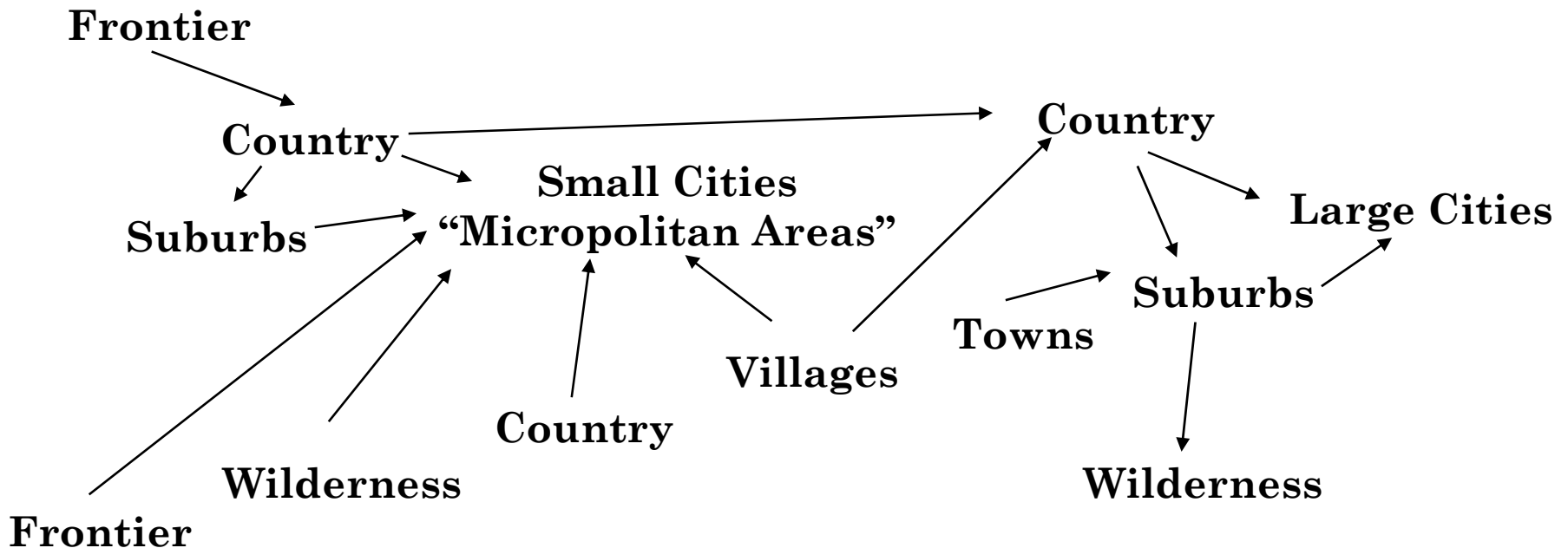
The Theory of Central Places

“Idealizes” Human Spatial Organization



Center-Periphery instead of Urban-Rural

Geographical Reality: Physical and economic Influences dominate in a “random” way



Very little known about the effects of this spatial organization on health

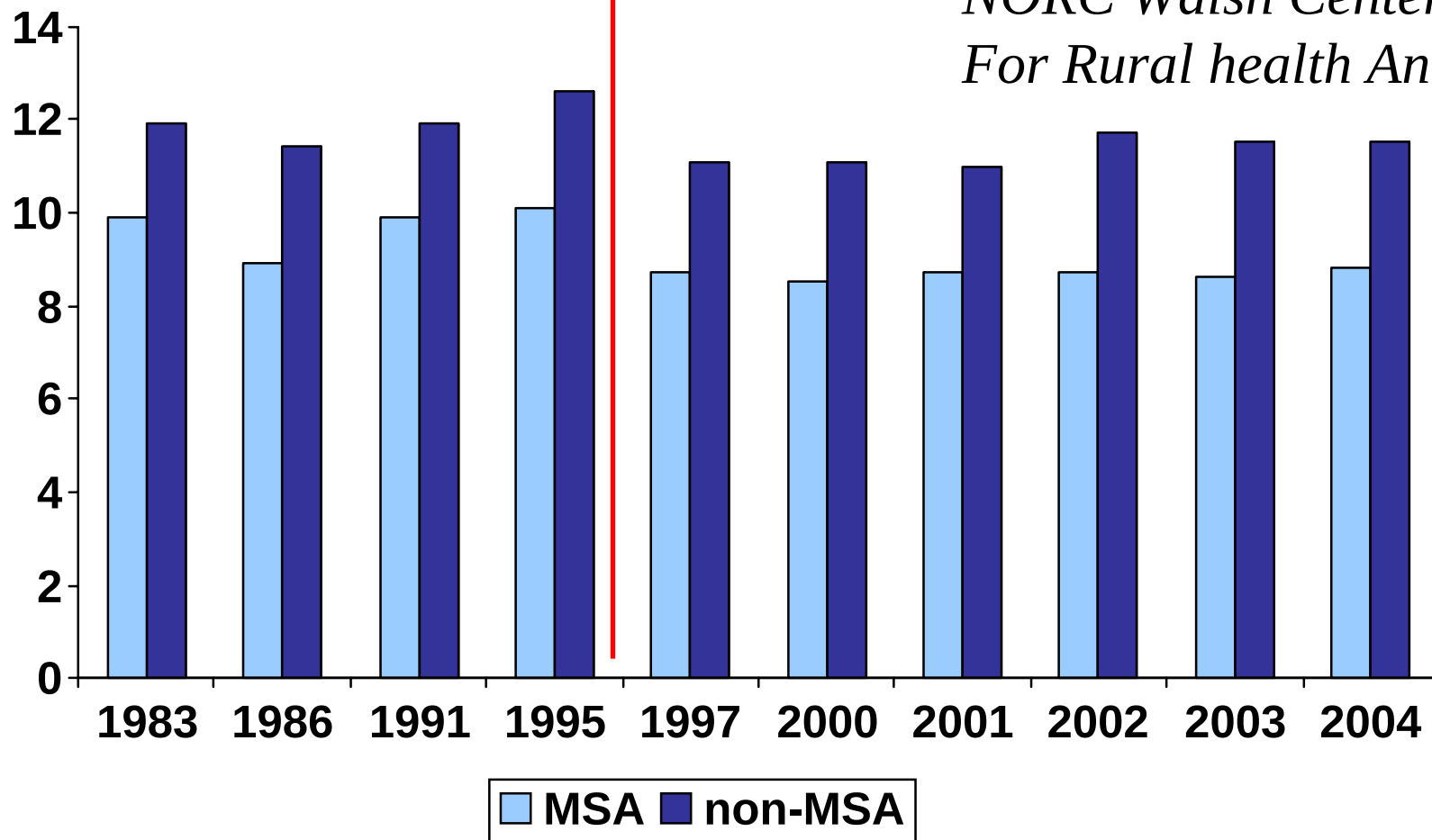
Self-Reported Health Status

National Health Interview Survey

% with Fair or
Poor Health
(5 point scale)

Survey redesign

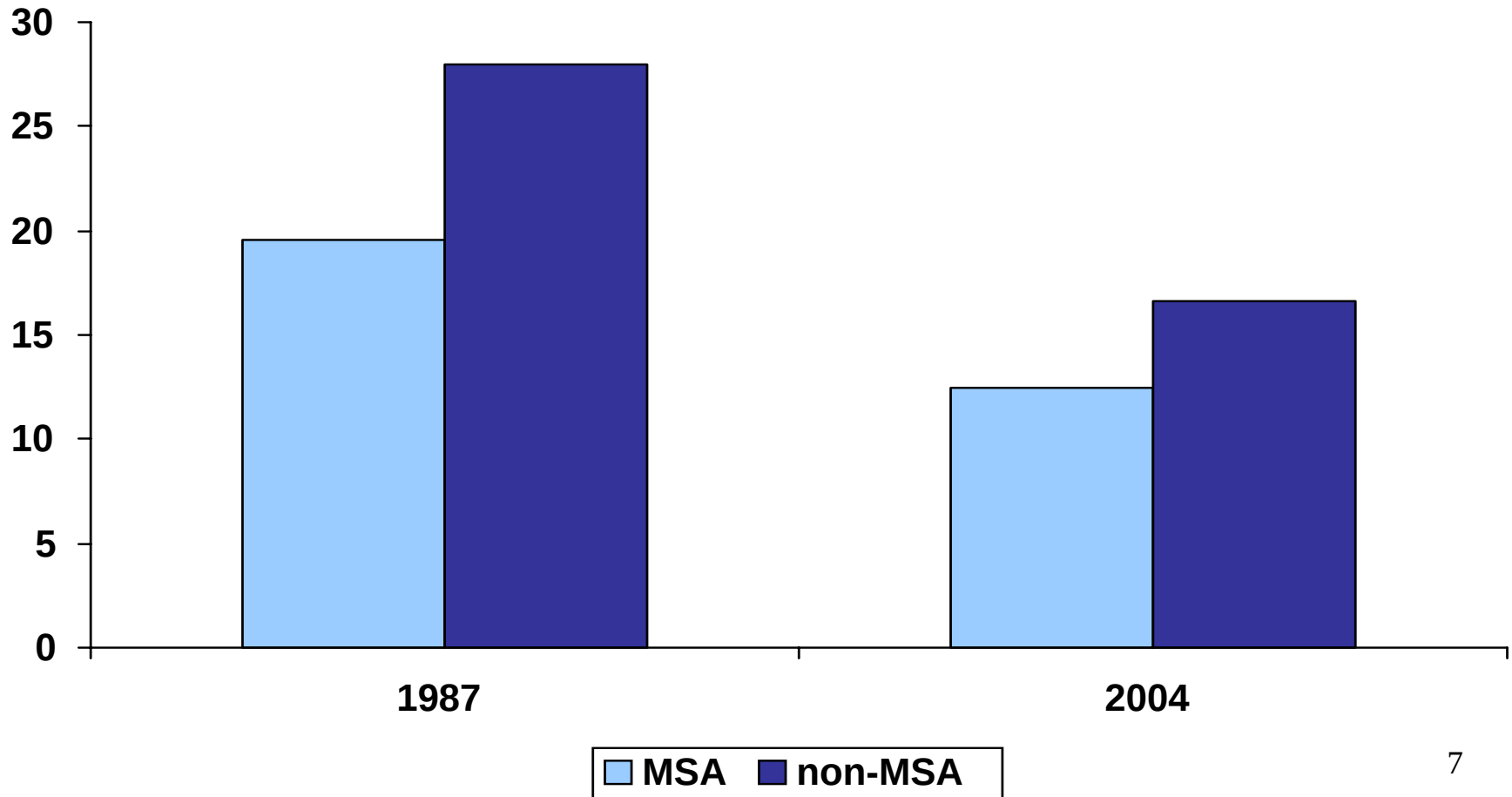
*Julie Schoenman
NORC Walsh Center
For Rural health Analysis*



Self-Reported Health Status

National Medical Expenditure Survey / Medical Expenditure Panel Survey

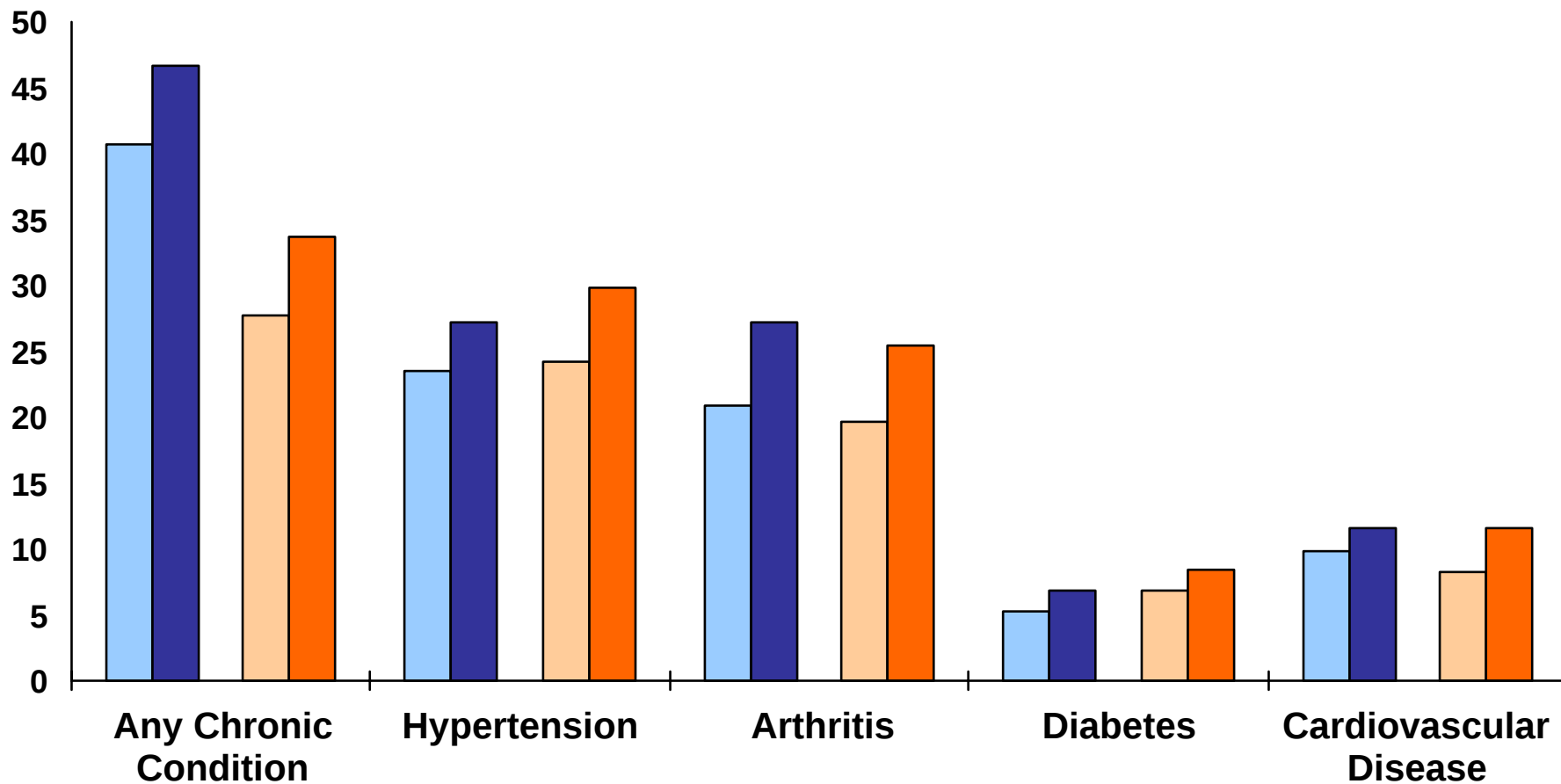
% with Fair or
Poor Health
(4 point scale)



Presence of Chronic Conditions

National Medical Expenditure Survey / Medical Expenditure Panel Survey

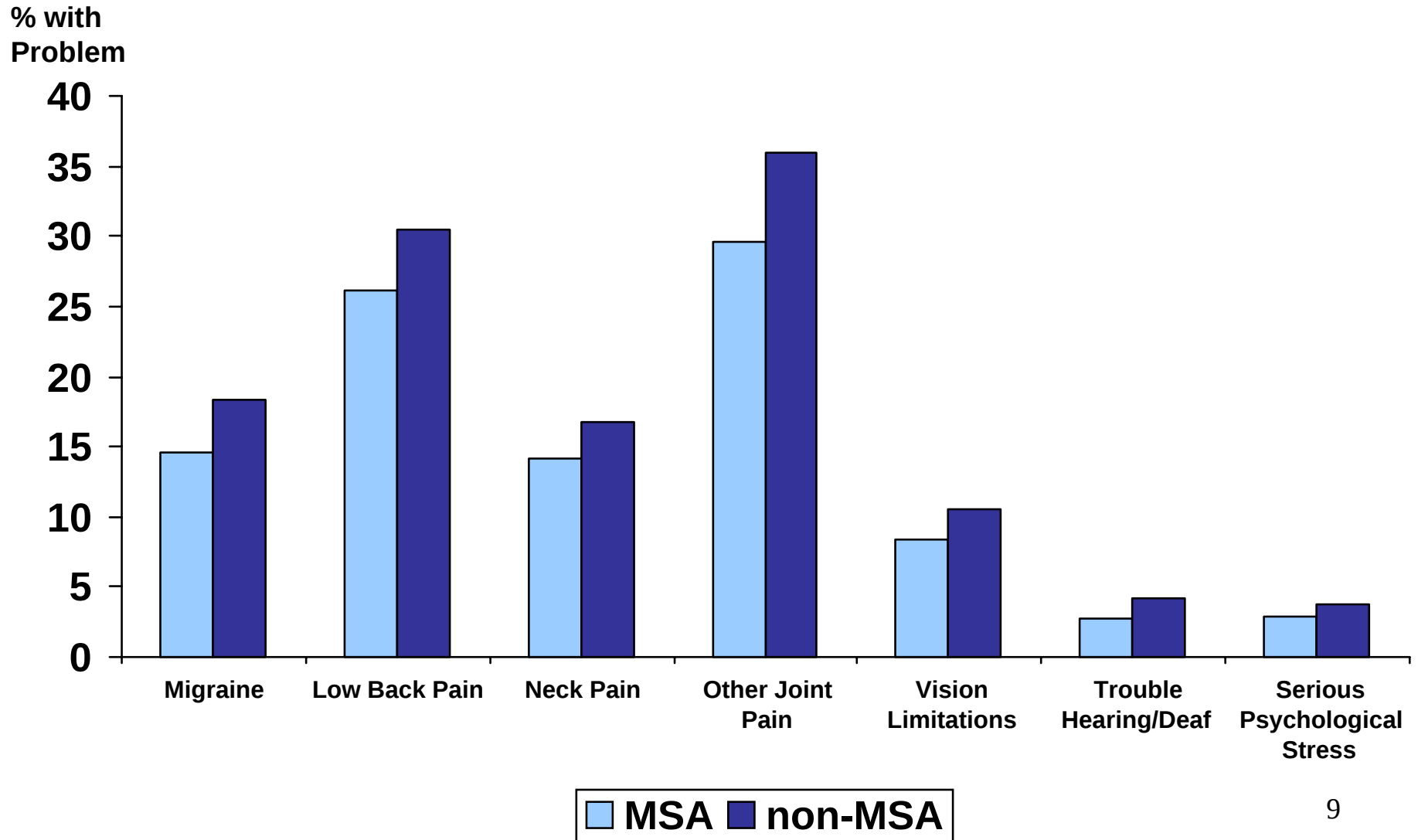
% with
Condition



1987, MSA 1987, non-MSA 2004, MSA 2004, non-MSA

Presence of Health Problems

National Health Interview Survey - 2004



Evidence from Mid-to-Late 1990s

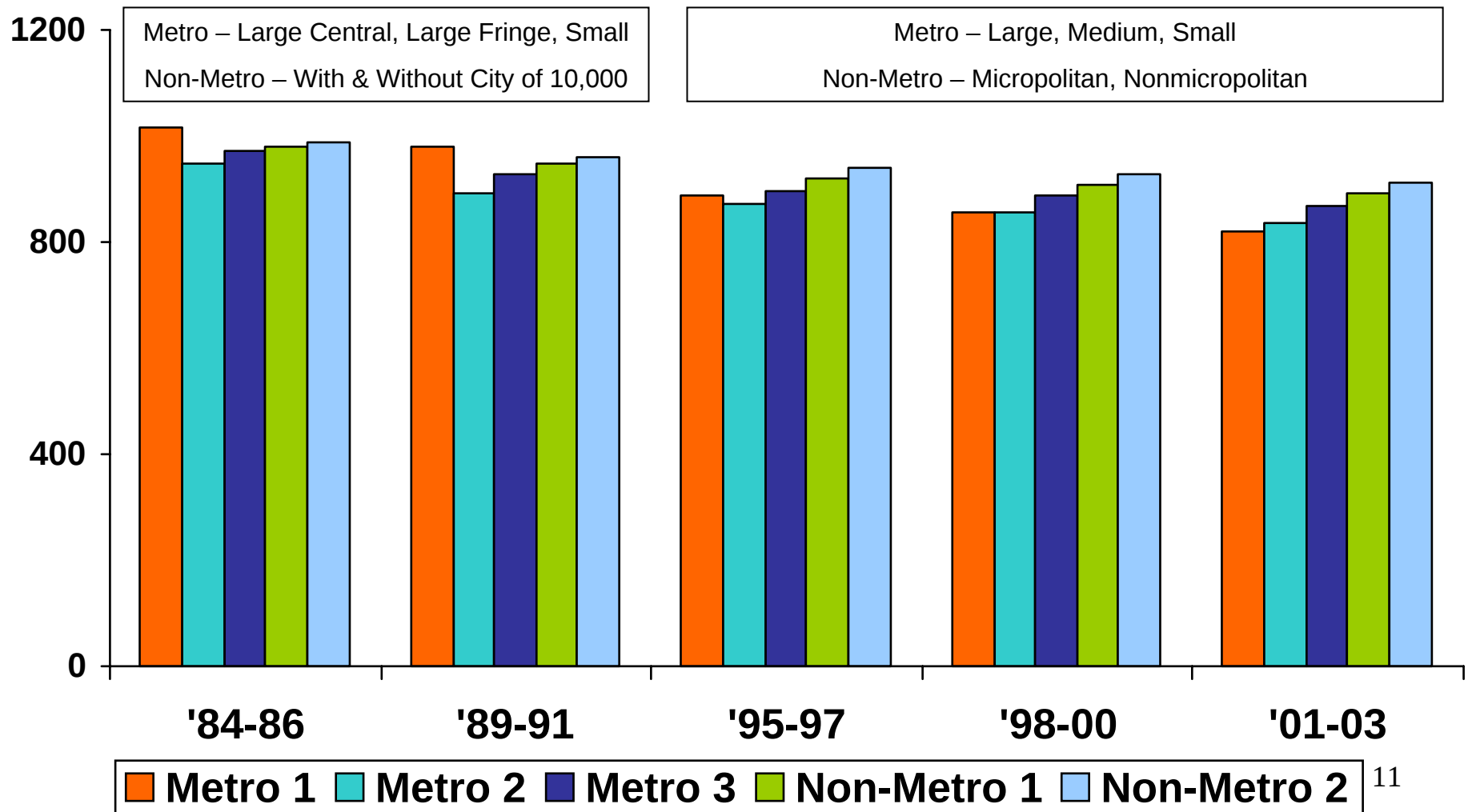
Health U.S. 2001, Urban and Rural Health Chart Book

- ▶ **Non-metro counties, especially those without a city of 10,000, had higher rates of:**
 - ▷ **Cigarette smoking (adolescents and adults)**
 - ▷ **Obesity (especially for women)**
 - ▷ **Overall death rates (children, young adults, elderly)**
 - ▷ **Death rates from COPD (men)**
 - ▷ **Death rates from unintentional injuries and MVAs**
 - ▷ **Suicides (men)**
 - ▷ **Health related limitation of activity**
 - ▷ **Total tooth loss among the elderly**

Age-Adjusted Mortality Rates

National Vital Statistics System

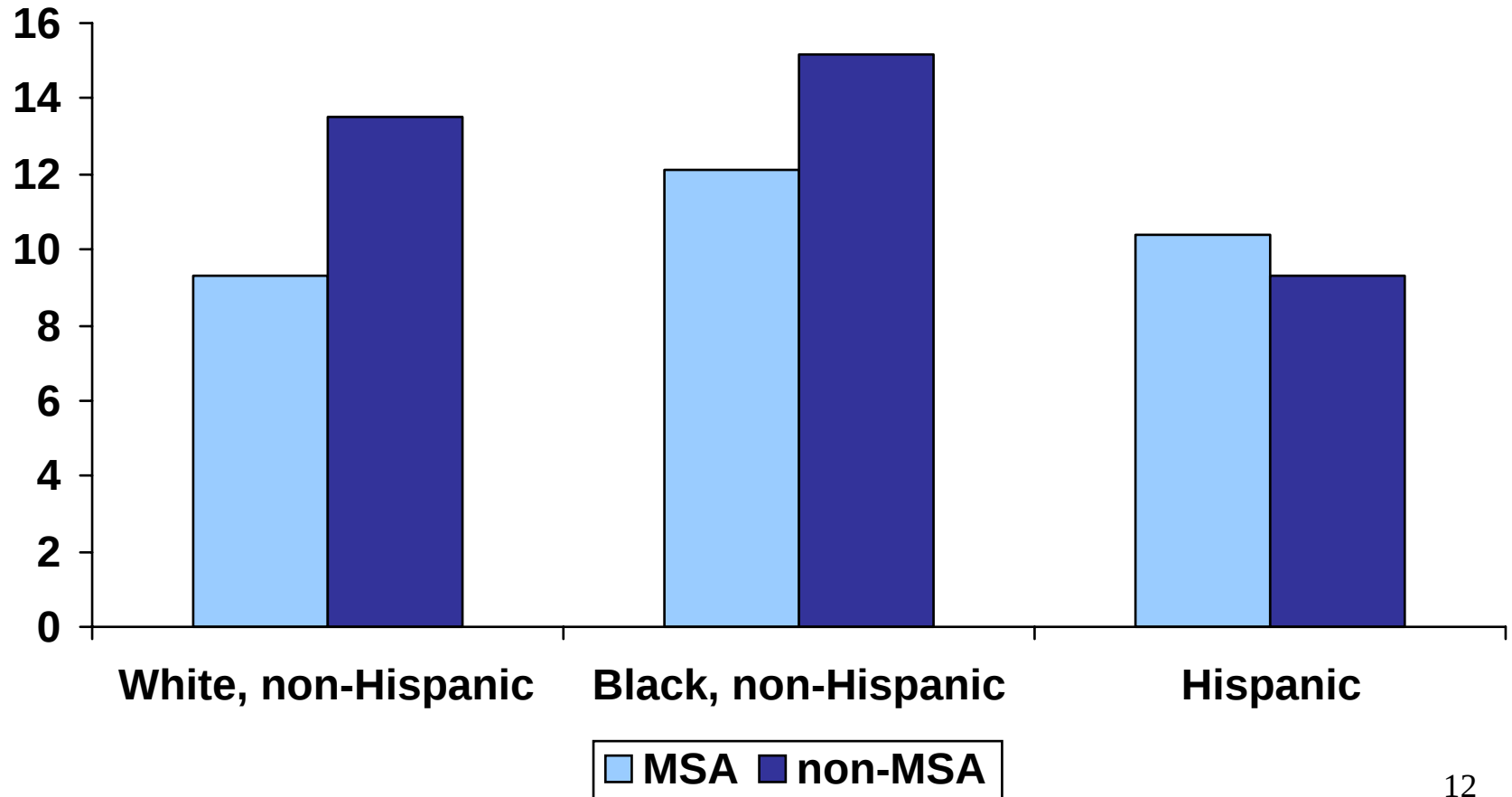
Per 100,000 Pop.



Disparities in Health Status

Medical Expenditure Panel Survey - 2004

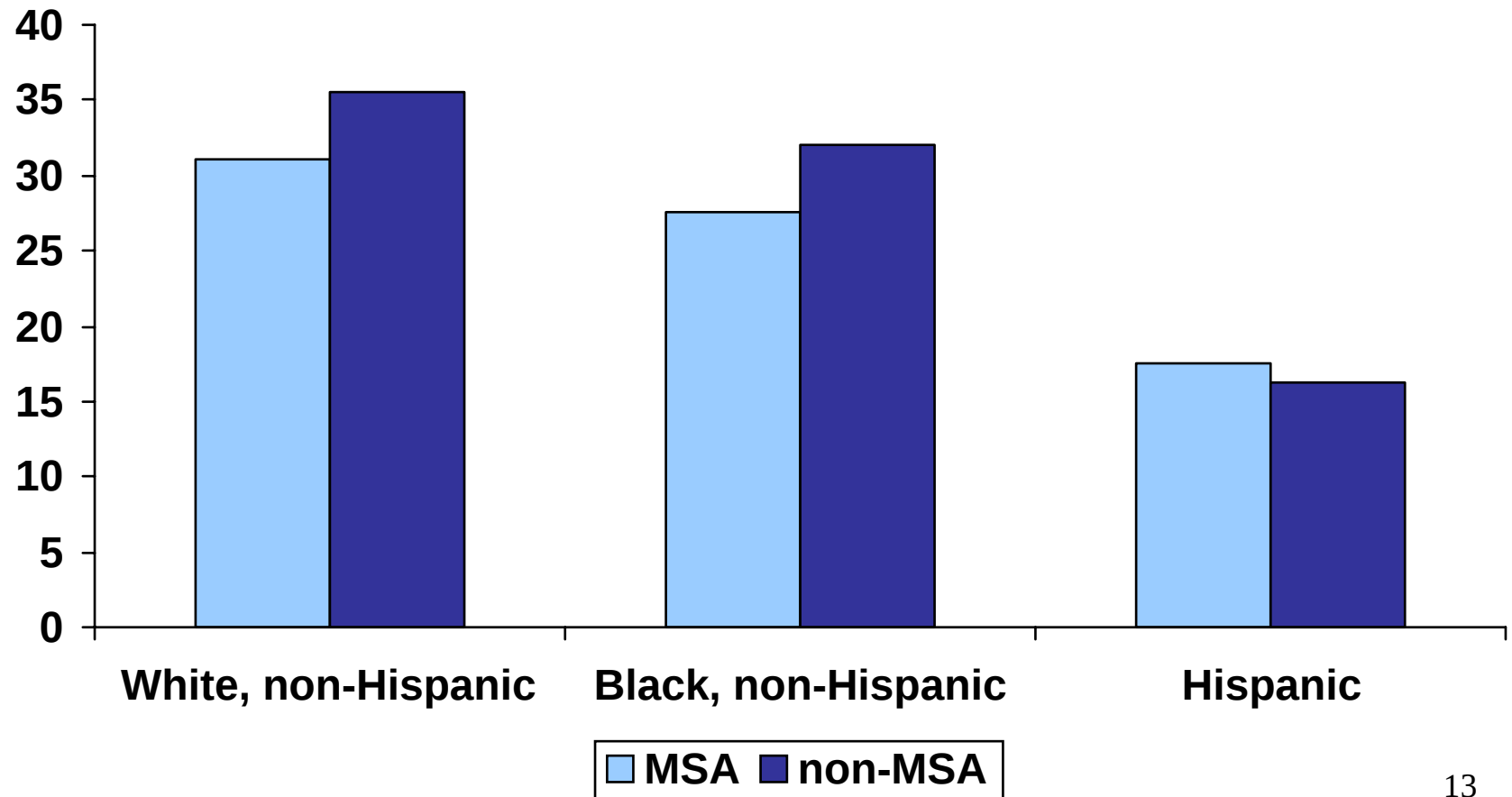
% Reporting Fair
or Poor Health



Disparities in Chronic Conditions

Medical Expenditure Panel Survey - 2004

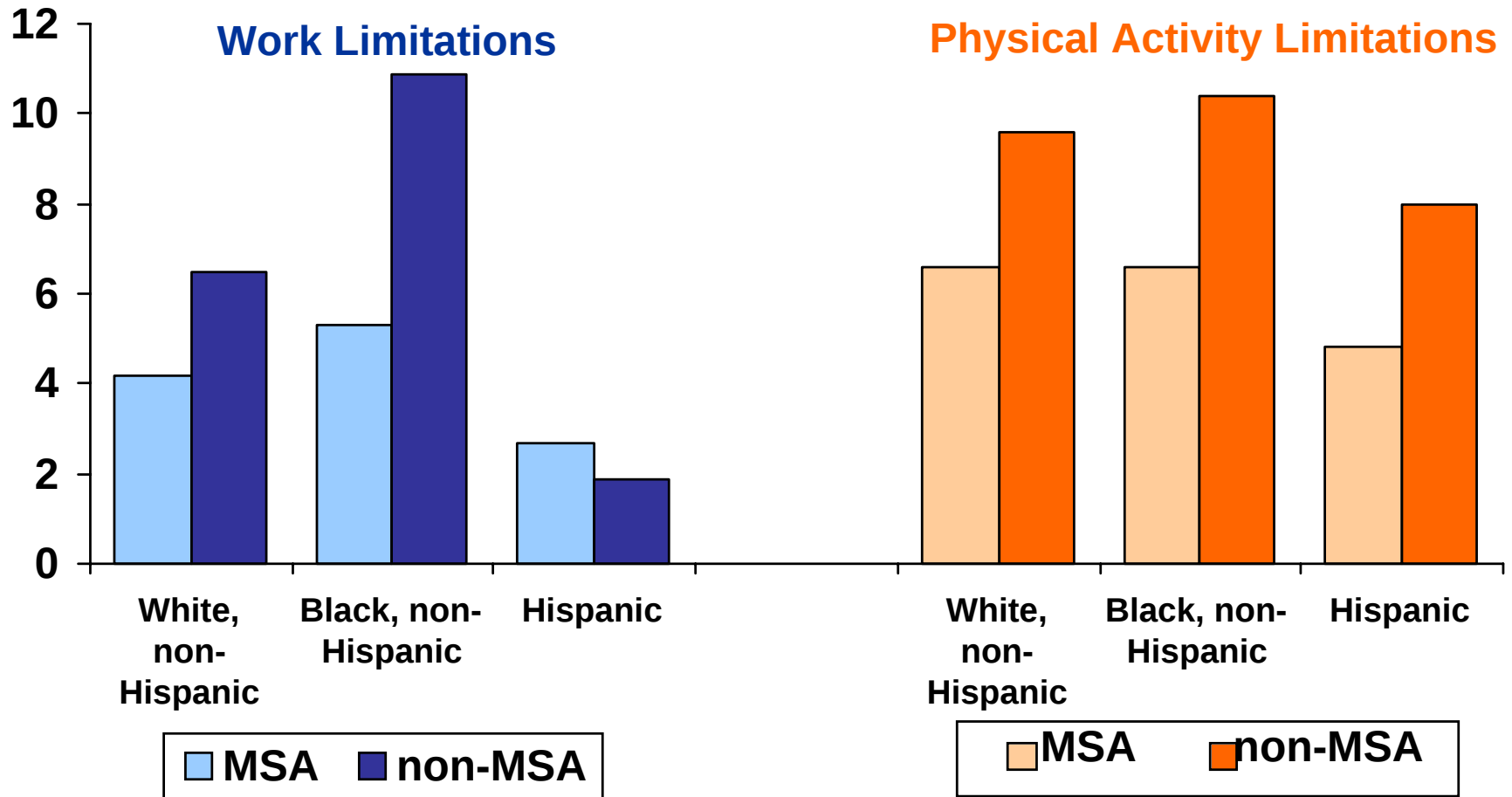
% with Any
Chronic Condition



Disparities in Activity Limitations

Medical Expenditure Panel Survey - 2004

% with Total /
Serious Limitation



Net Rural Difference, an Example

Percent who self-report health fair or poor

Rural 17.4%

Urban 9.9%

Difference of 7.5 percentage points

After adjusting for age, income, race, gender

Modeled percent who self-report health fair or poor

Rural 13.5%

Urban 11.6%

Difference of 1.9 percentage points

That is, $(7.5 - 1.9) / 7.5 = 75\%$ of the rural-urban gap is explainable by age, income, gender, race.

The Neighborhood

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

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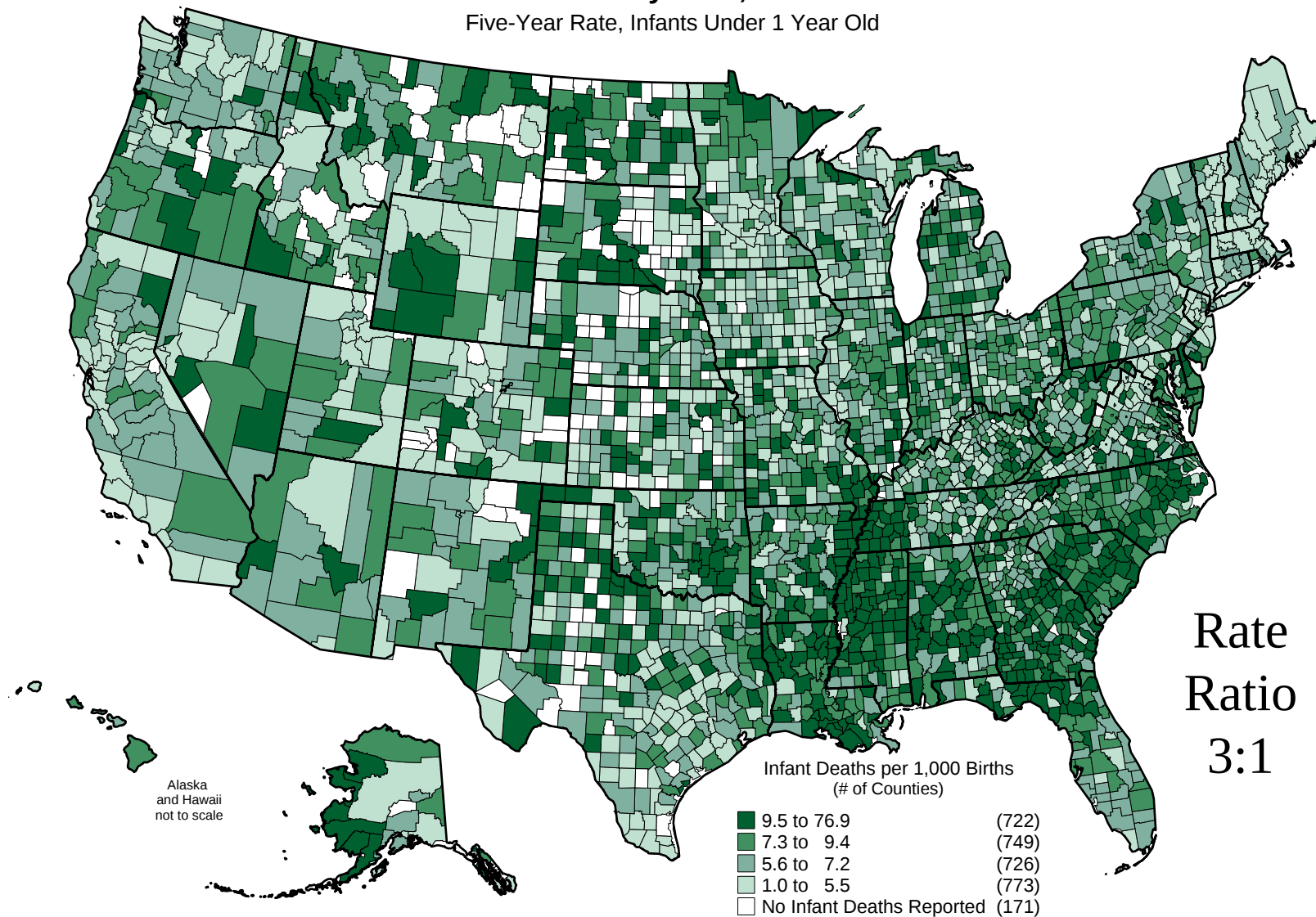
Typical Rate Ratio 10:1, but small numbers¹⁷

Regional Geography of the United States

- ▶ **Recognizable “super” metropolitan regions**
 - ▷ BosWash
 - ▷ San-San
- ▶ **Similar rural regions**
 - ▷ Appalachia
 - ▷ The Delta
 - ▷ The Border
- ▶ **Murray’s “Eight Americas”**

Infant Mortality Rate, 1999-2003

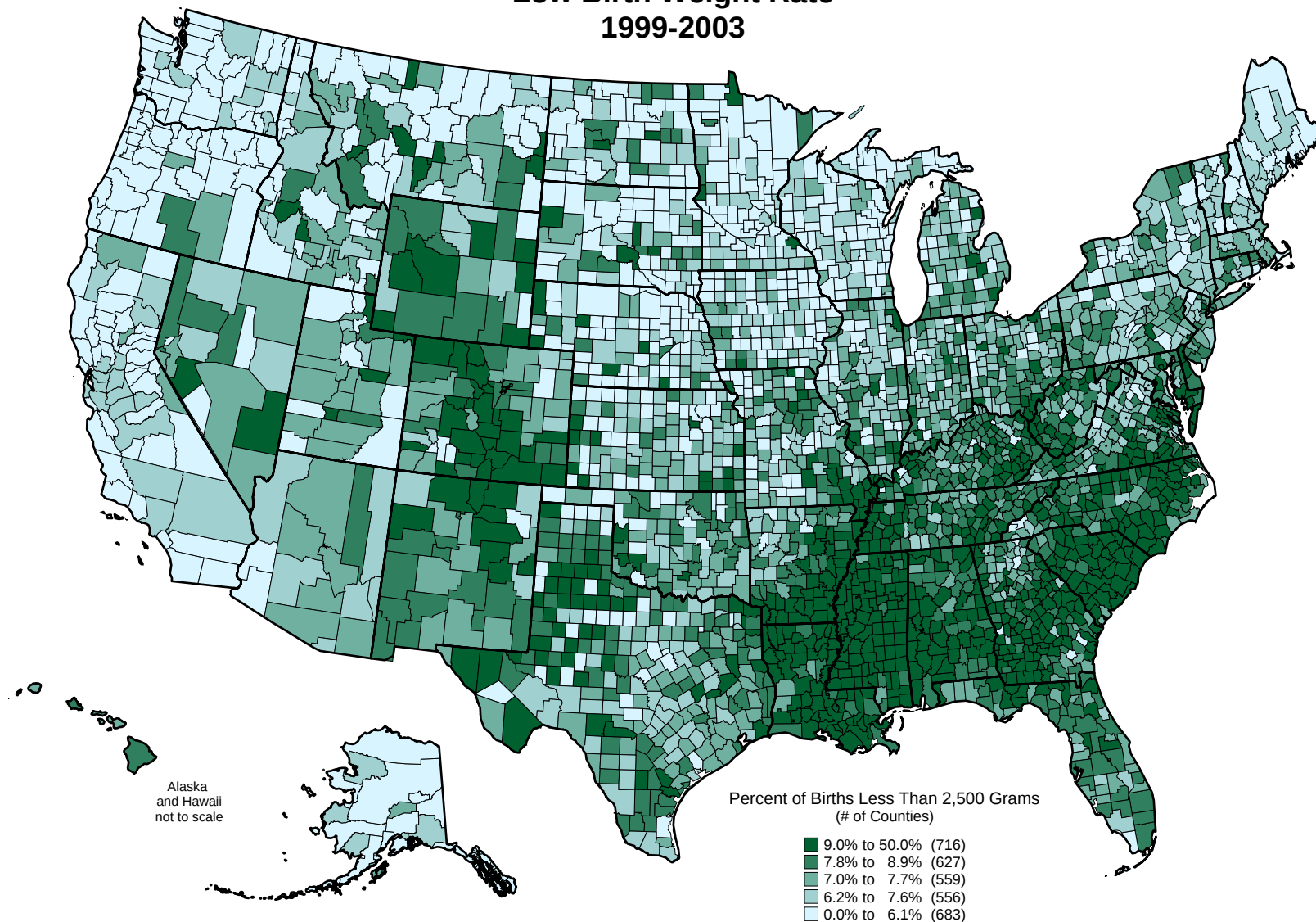
Five-Year Rate, Infants Under 1 Year Old



Source: United States Department of Health and Human Services (US DHHS), Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS), Office of Analysis and Epidemiology(OAE), Compressed Mortality File (CMF).

Produced By: North Carolina Rural Health Research and Policy Analysis Center, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.

Low Birth Weight Rate 1999-2003

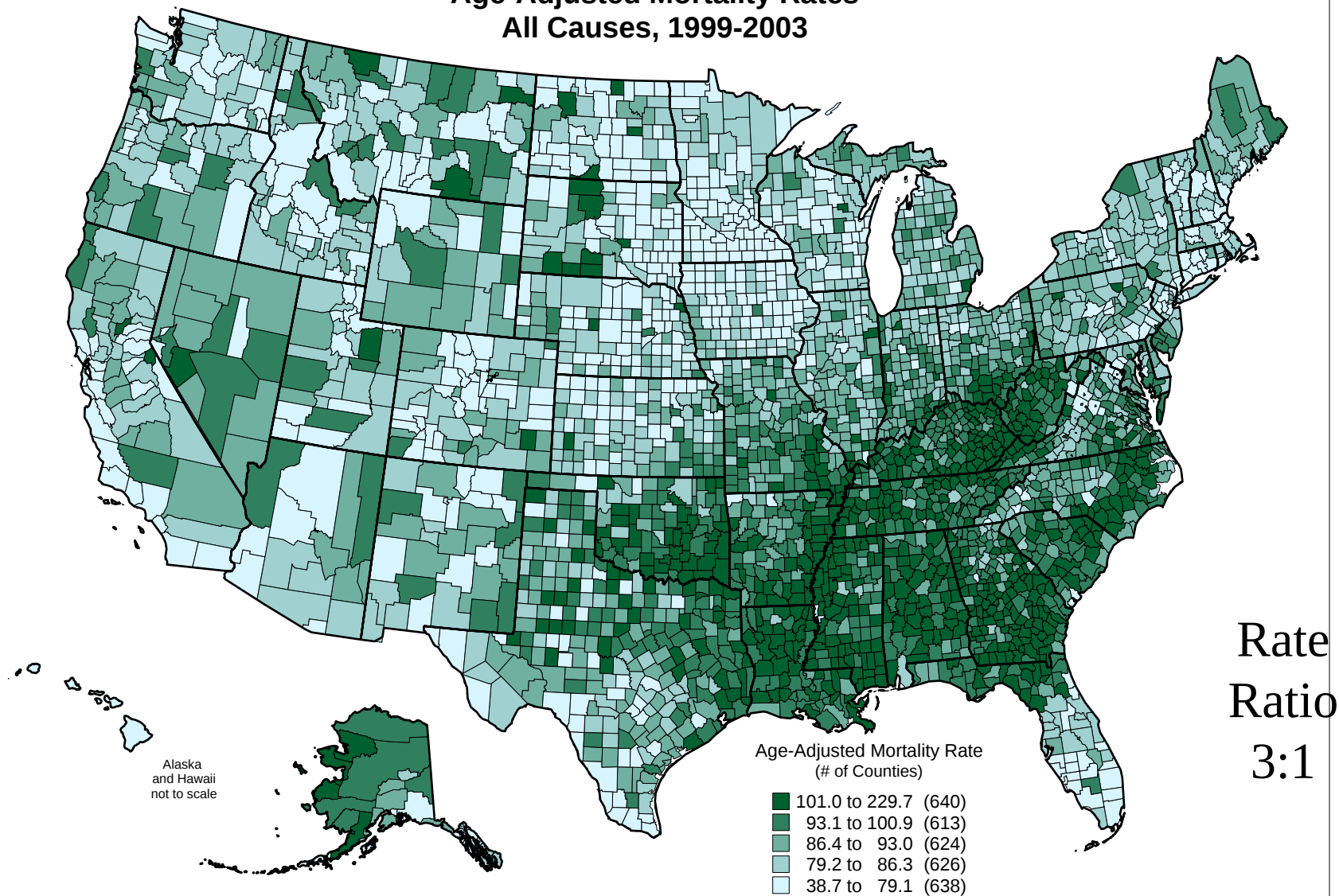


Source: HRSA Geospatial Data Warehouse, <http://datawarehouse.hrsa.gov>.

*Note: Low birth weight indicates the percent of all births that were less than 2,500 grams (5.5 pounds).

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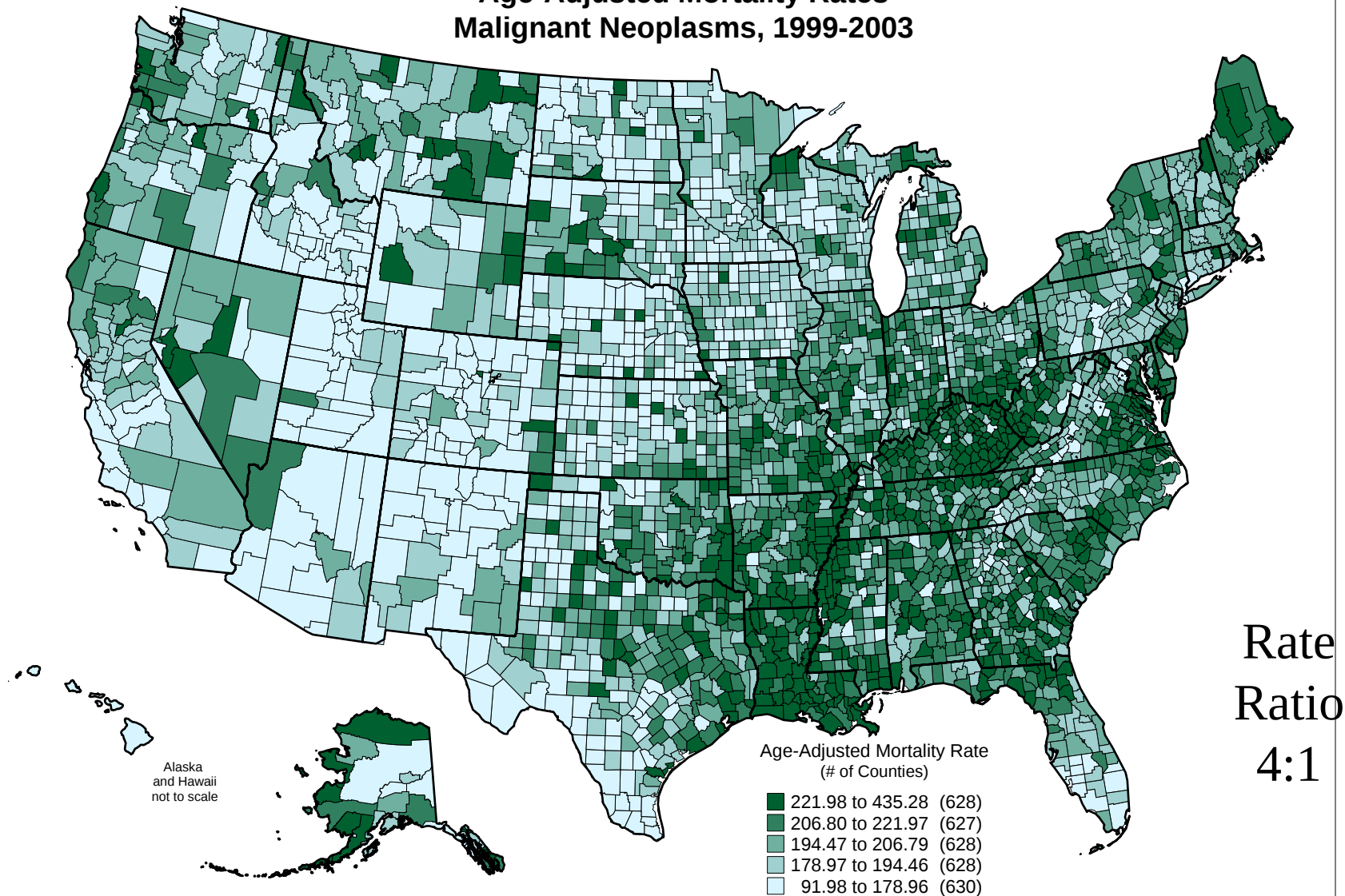
Age-Adjusted Mortality Rates All Causes, 1999-2003



Suggested Citation: United States Department of Health and Human Services (US DHHS), Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS), Office of Analysis and Epidemiology(OAE), Compressed Mortality File (CMF)

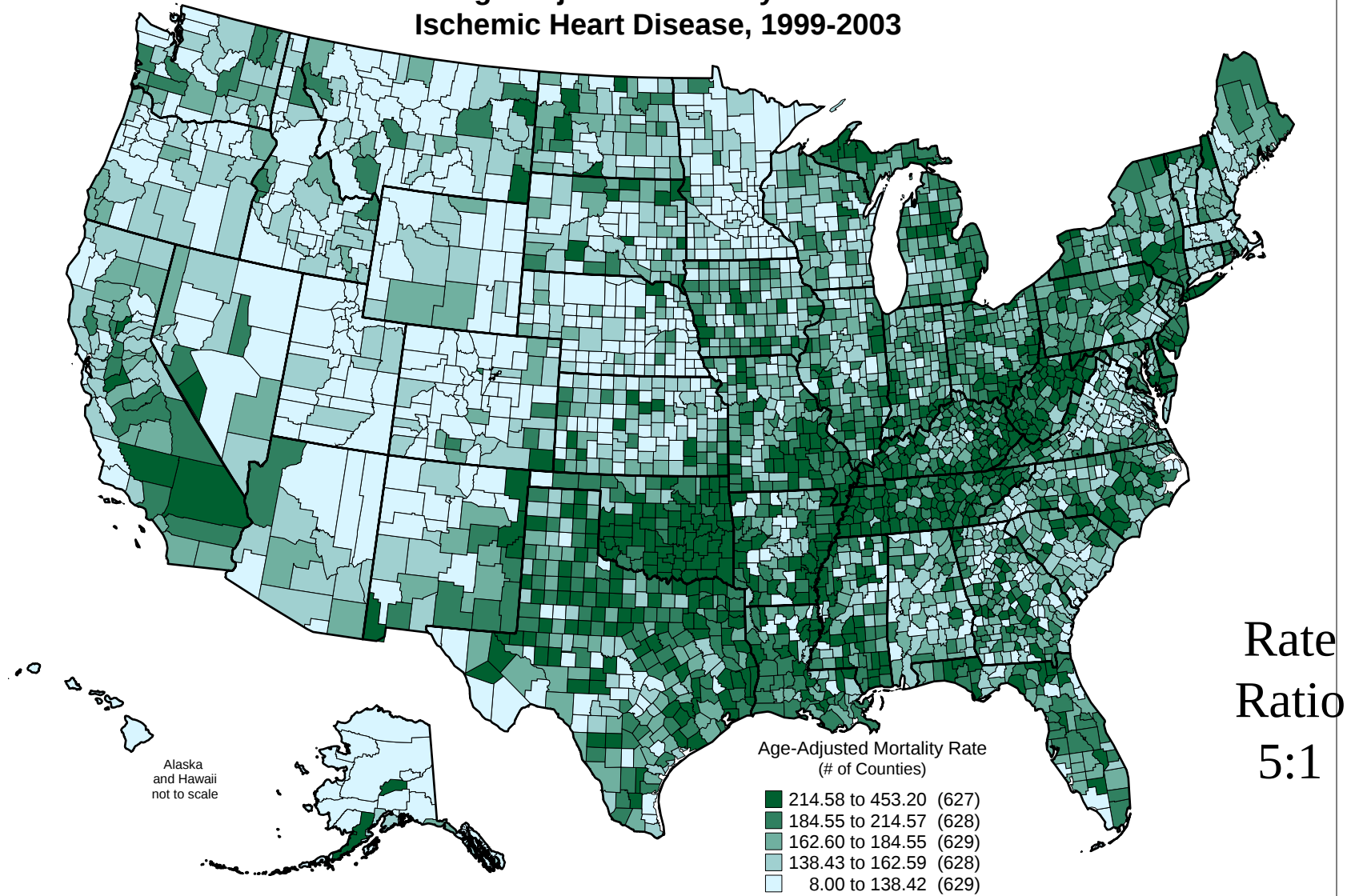
Produced By: North Carolina Rural Health Research and Policy Analysis Center, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.

Age-Adjusted Mortality Rates Malignant Neoplasms, 1999-2003



Source: United States Department of Health and Human Services (US DHHS), Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS), Office of Analysis and Epidemiology(OAE), Compressed Mortality File (CMF)
Produced By: North Carolina Rural Health Research and Policy Analysis Center, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.

Age-Adjusted Mortality Rates Ischemic Heart Disease, 1999-2003



Source: United States Department of Health and Human Services (US DHHS), Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS), Office of Analysis and Epidemiology(OAE), Compressed Mortality File (CMF)
Produced By: North Carolina Rural Health Research and Policy Analysis Center, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.

Age-adjusted stroke mortality rates per 100 000 by in the United States, 1988 to 1992 HAS

**White men (A) Geographic Rate
Ratio 3:1**

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

**White women (B) Geographic Rate
Ratio 4:1**

**Age-adjusted cancer mortality
rates per 100 000 in the
United States,
1990 to 2001 by *Congressional
Districts***

Men Rate, Geographic Ratio 2:1

QuickTime™ and a
TIFF (Uncompressed) decompressor
are needed to see this picture.

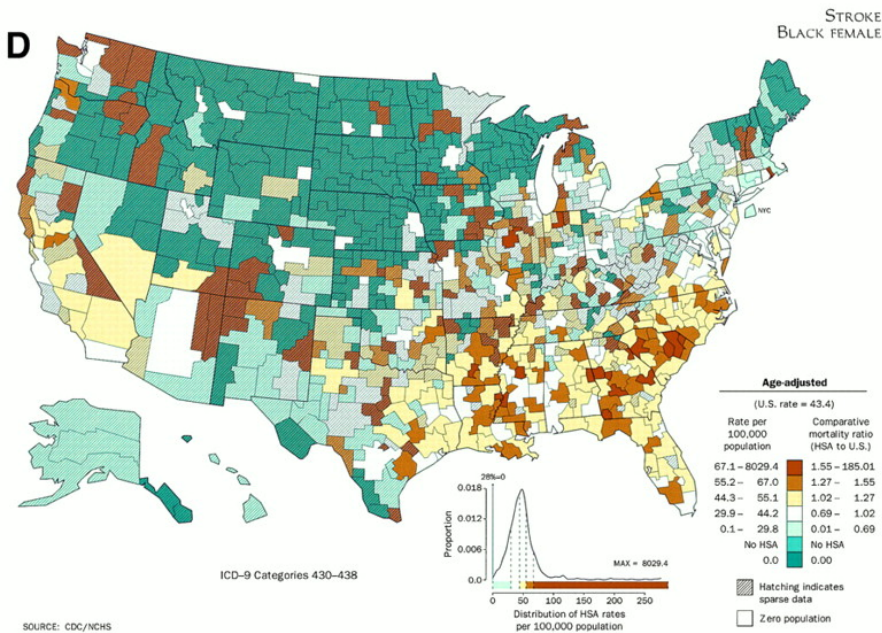
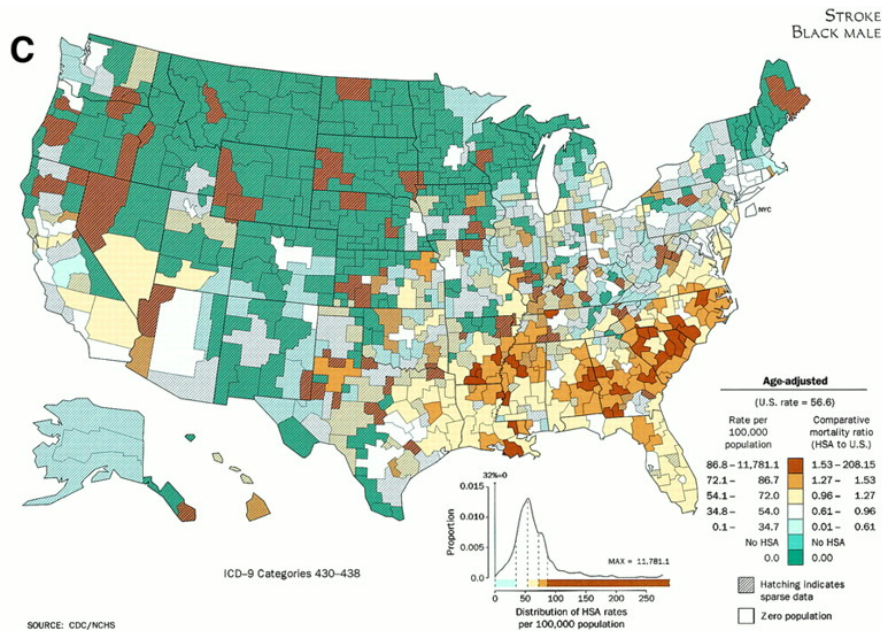
Women, Geographic Rate Ratio 1.9:1

(from Hao et al. IJHG v.5 no 28 2006)²⁵

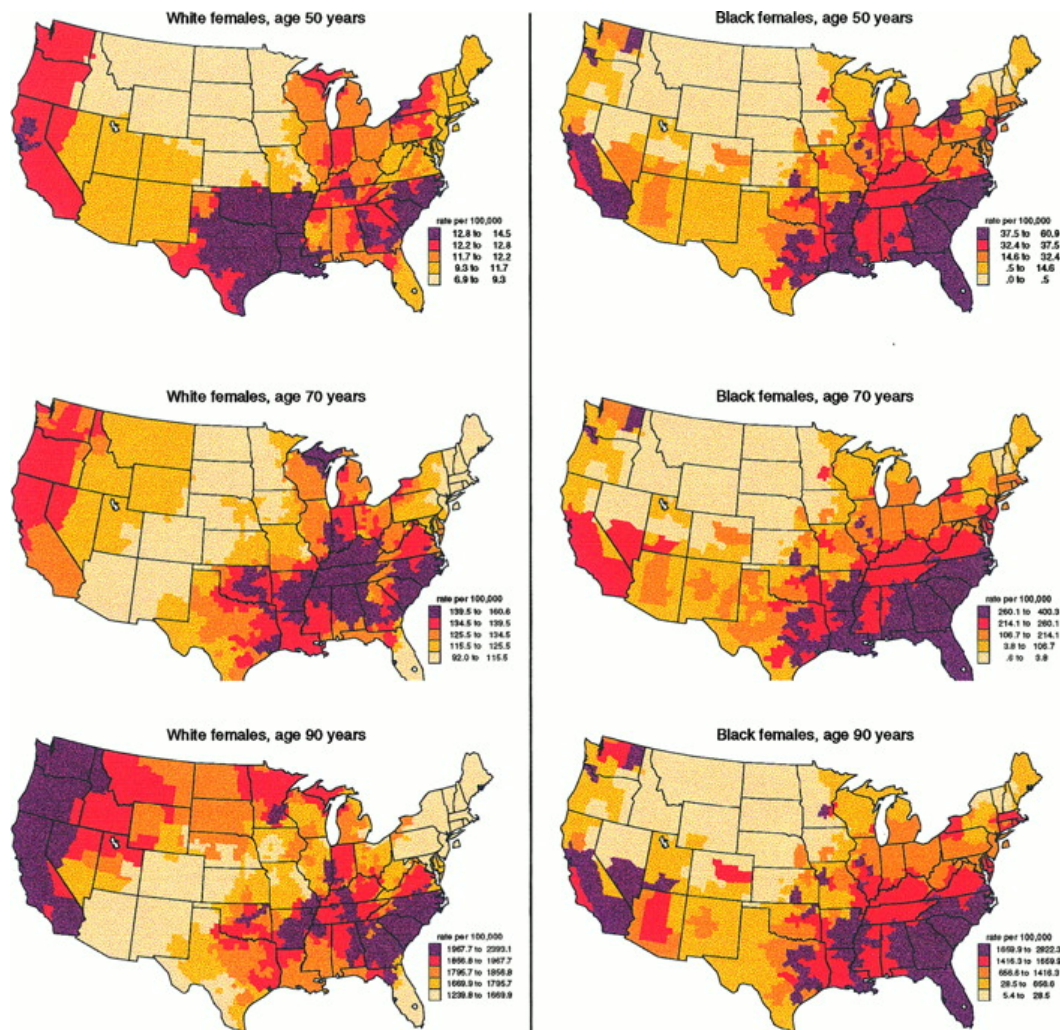
Age-adjusted stroke mortality rates per 100 000 by in the United States, 1988 to 1992 HAS

Black men (C), Geographic Rate Ratio 10:1, Race Rate Ratio 3:1

Black women (D) Geographic Rate Ratio 3:1, Race Rate Ratio 2.5:1



Smoothed stroke mortality rates per 100 000 by HSA in white and black women aged 50 (top), 70 (middle), and 90 years (bottom) in the United States, 1988 to 1992

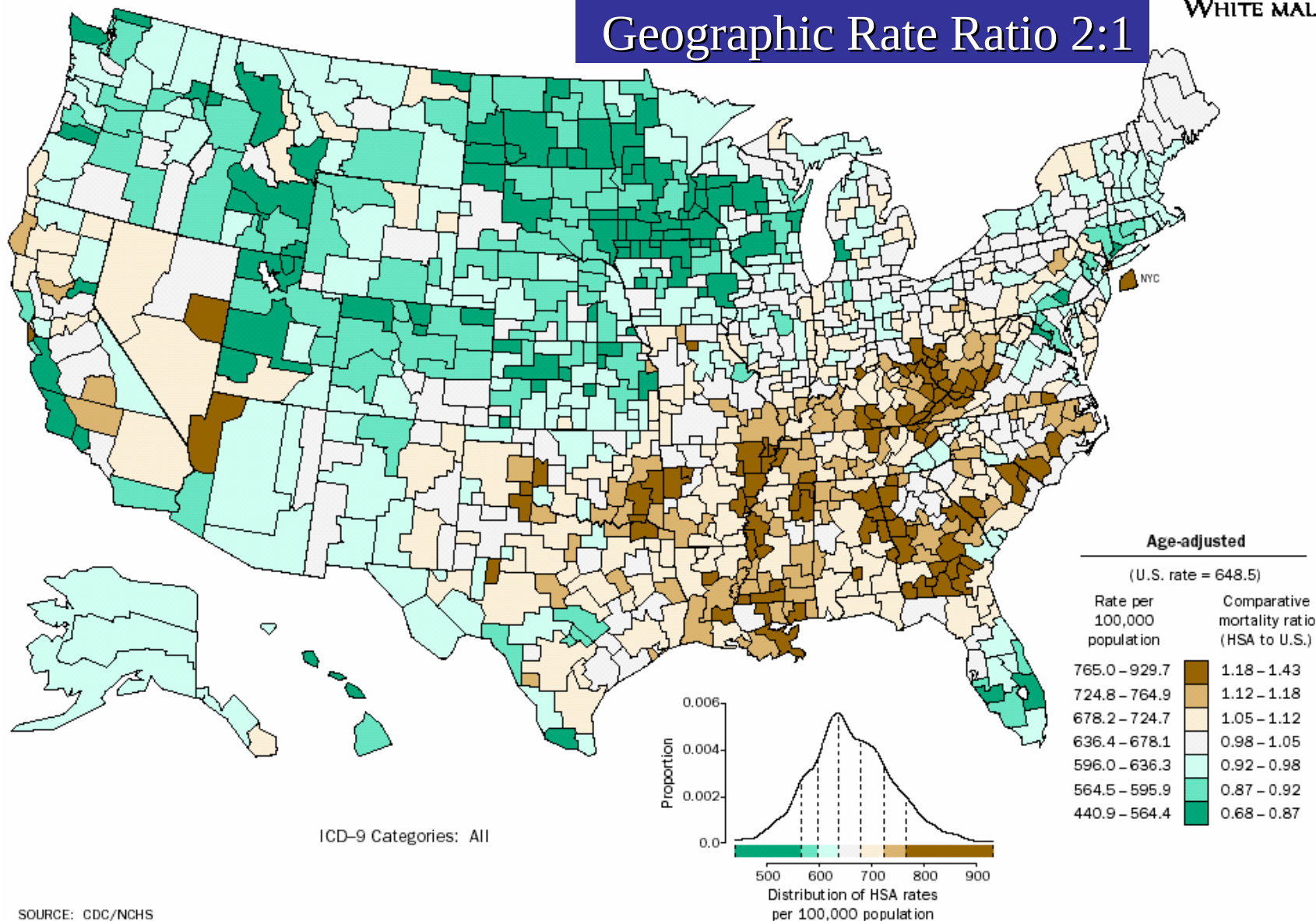


Pickle, L. W. et al. Stroke 1997;28:1639-1647

AGE-ADJUSTED DEATH RATES BY HSA, 1988-92

ALL CAUSES
WHITE MALE

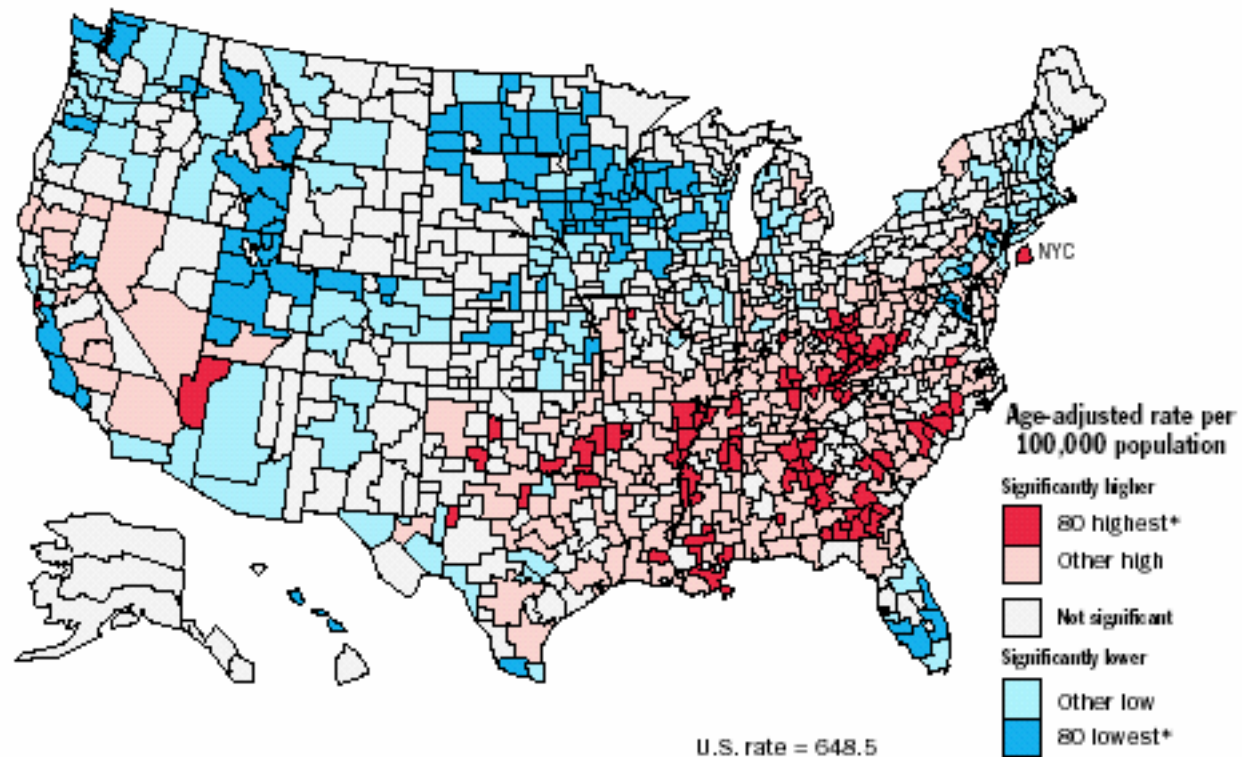
Geographic Rate Ratio 2:1



HSA Rates, all causes, white males

DEATH RATES OF EACH HSA
COMPARED WITH U.S. RATE

ALL CAUSES
WHITE MALE



SOURCE: CDC/NCHS

* See text

Regional Rates, all causes, white males

PREDICTED REGIONAL RATES
FOR SMOOTHED RATE MAPS

ALL CAUSES
WHITE MALE



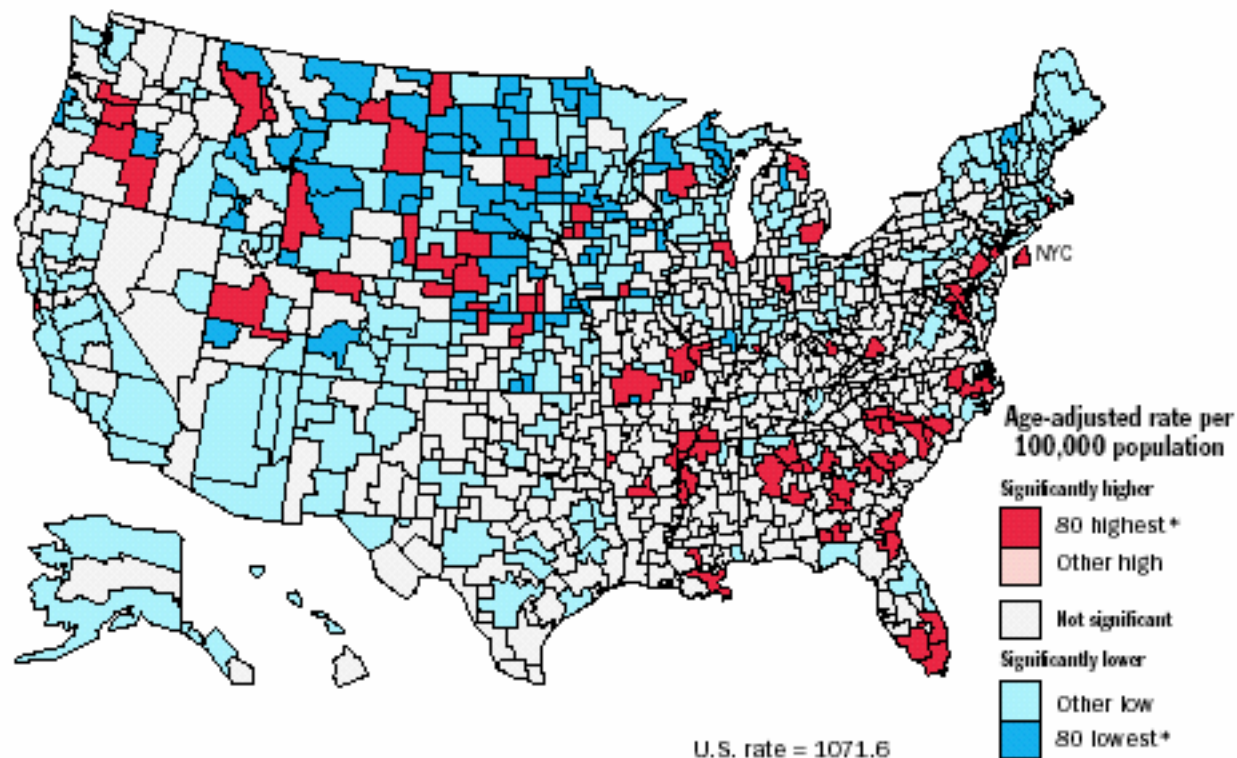
NOTE: Brackets indicate 95% confidence limits.

SOURCE: CDC/NCHS

HSA Relative Rates, all causes, black males

DEATH RATES OF EACH HSA
COMPARED WITH U.S. RATE

ALL CAUSES
BLACK MALE



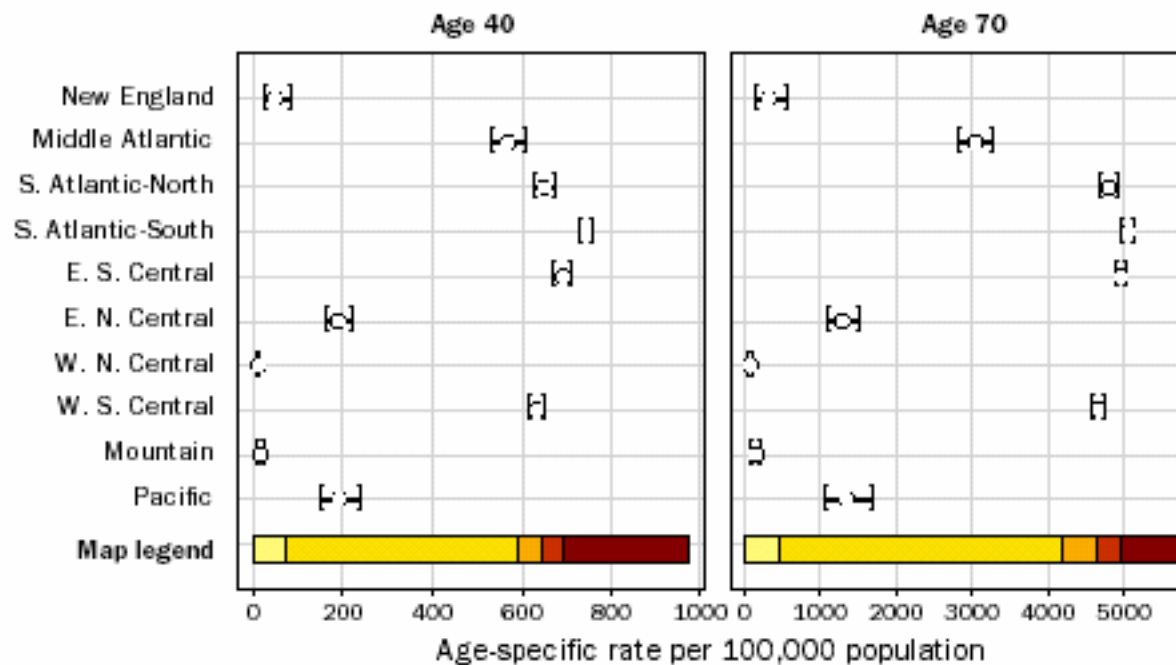
SOURCE: CDC/NCHS

* See text

Regional Rates, all causes, black males

**PREDICTED REGIONAL RATES
FOR SMOOTHED RATE MAPS**

**ALL CAUSES
BLACK MALE**

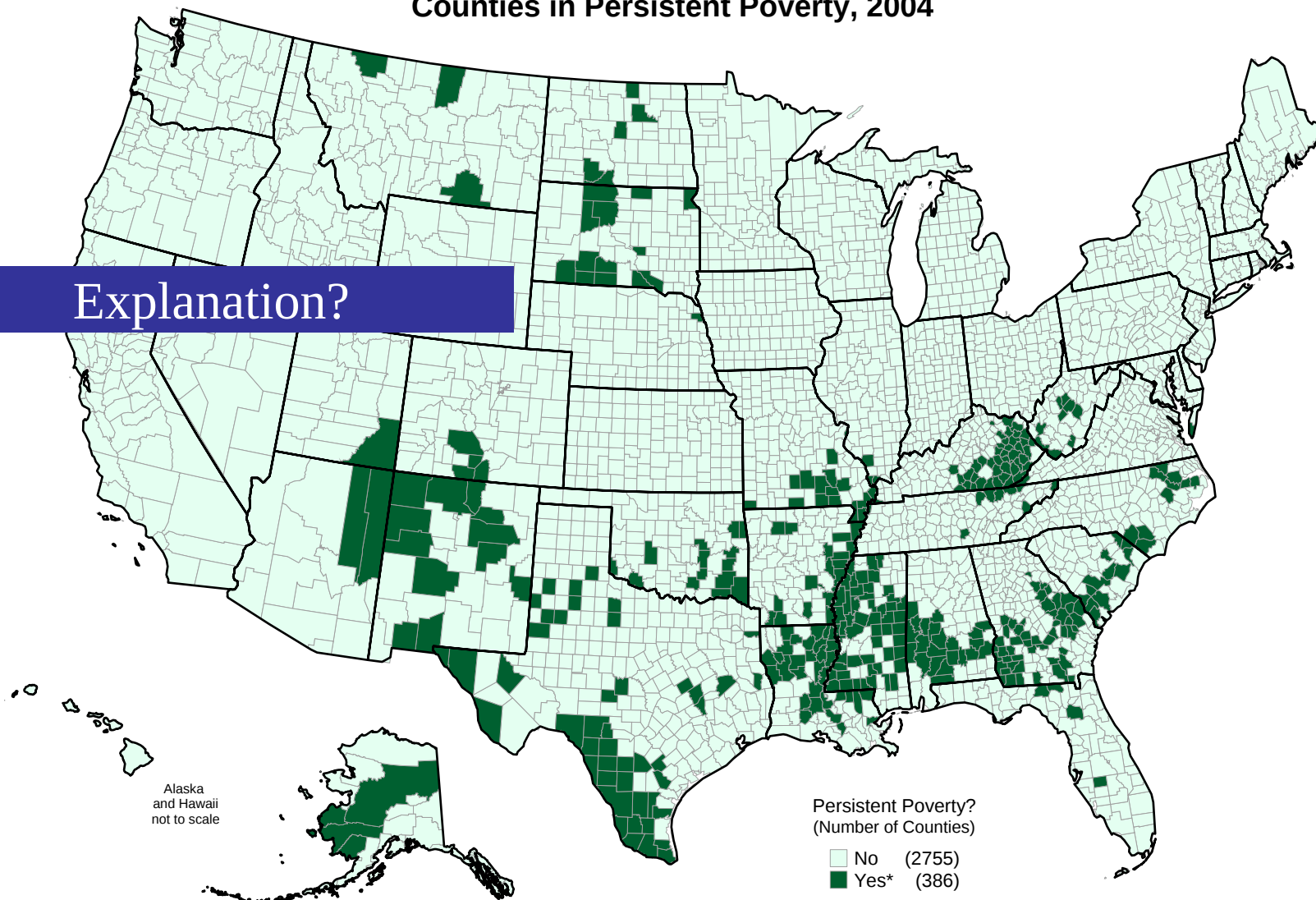


NOTE: Brackets indicate 95% confidence limits.
SOURCE: CDC/NCHS

Geographic Rate Ratio 4:1

Counties in Persistent Poverty, 2004

Explanation?



Source: USDA, Economic Research Service, 2004.

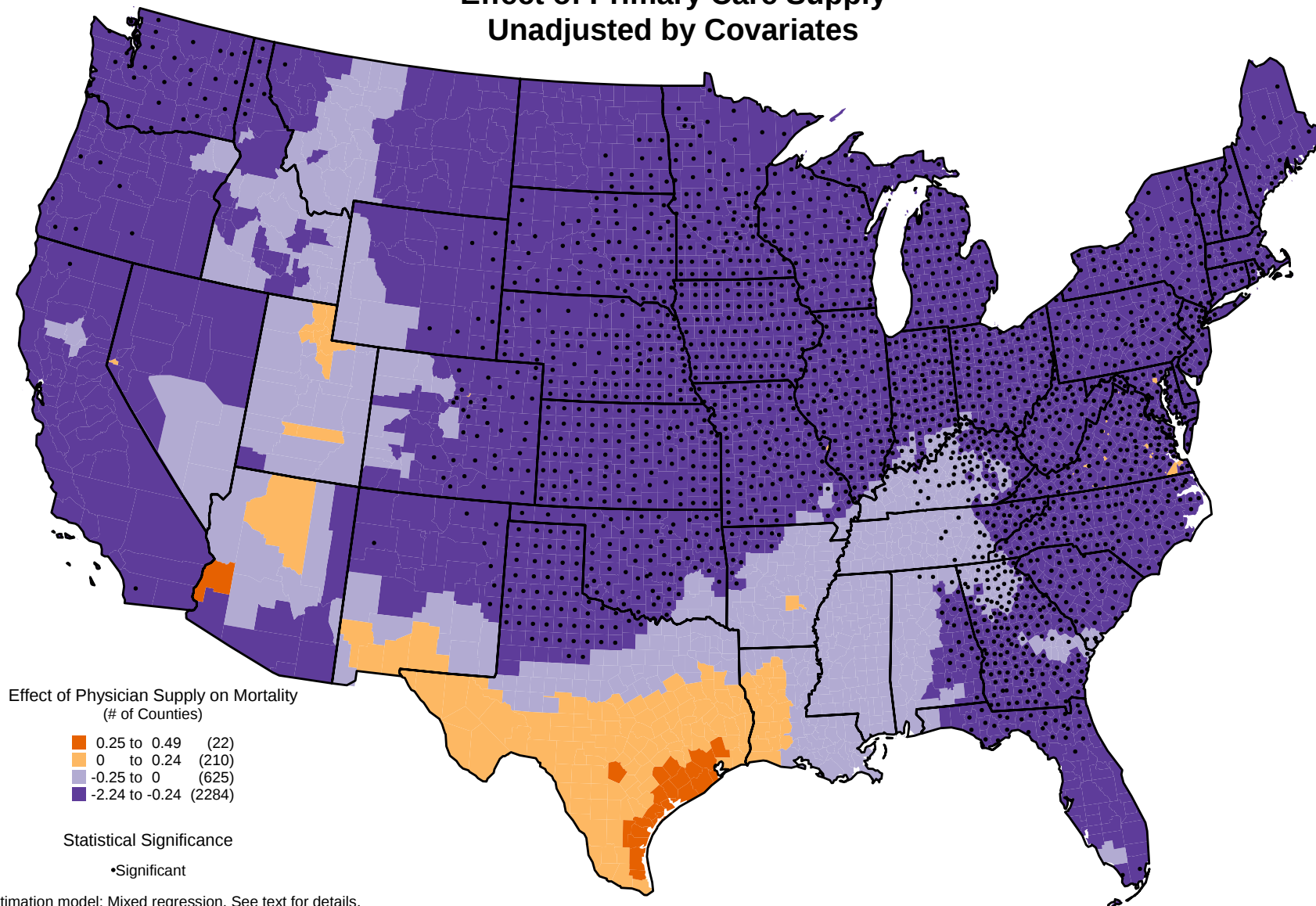
*Note: Counties include those in which 20% or more of the population were below the poverty level in each of the years 1970, 1980, 1990 and 2000.

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All Cause Age-Adjusted Mortality, 1996-2000

Effect of Primary Care Supply

Unadjusted by Covariates



Estimation model: Mixed regression. See text for details.

Values are estimates of the local effect of the physician supply on mortality (i.e. the regression coefficient on physician supply).

Positive (orange) means greater physician supply is associated with increased mortality.

Negative (purple) means greater physician supply is associated with decreased mortality.

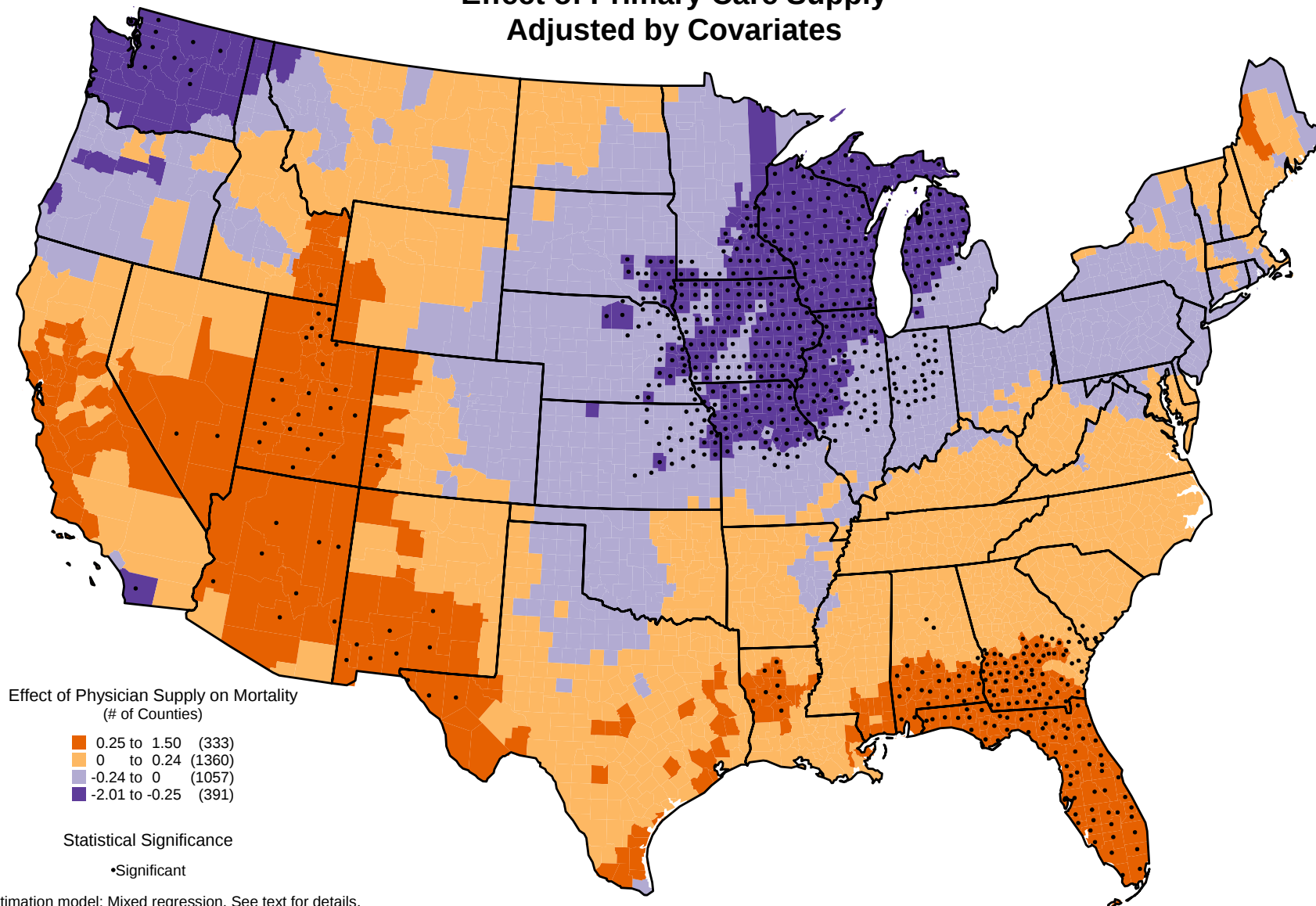
Source: Area Resource File, Various Years.

Produced By: Southeast Regional Center for Health Workforce Studies, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.

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