Measuring Disparities in Life Span and Disease-Specific Mortality

Slides accompanying testimony presented to National Committee on Vital and Health Statistics Work Group on National Health Information Infrastructure and Health Statistics for the 21st Century

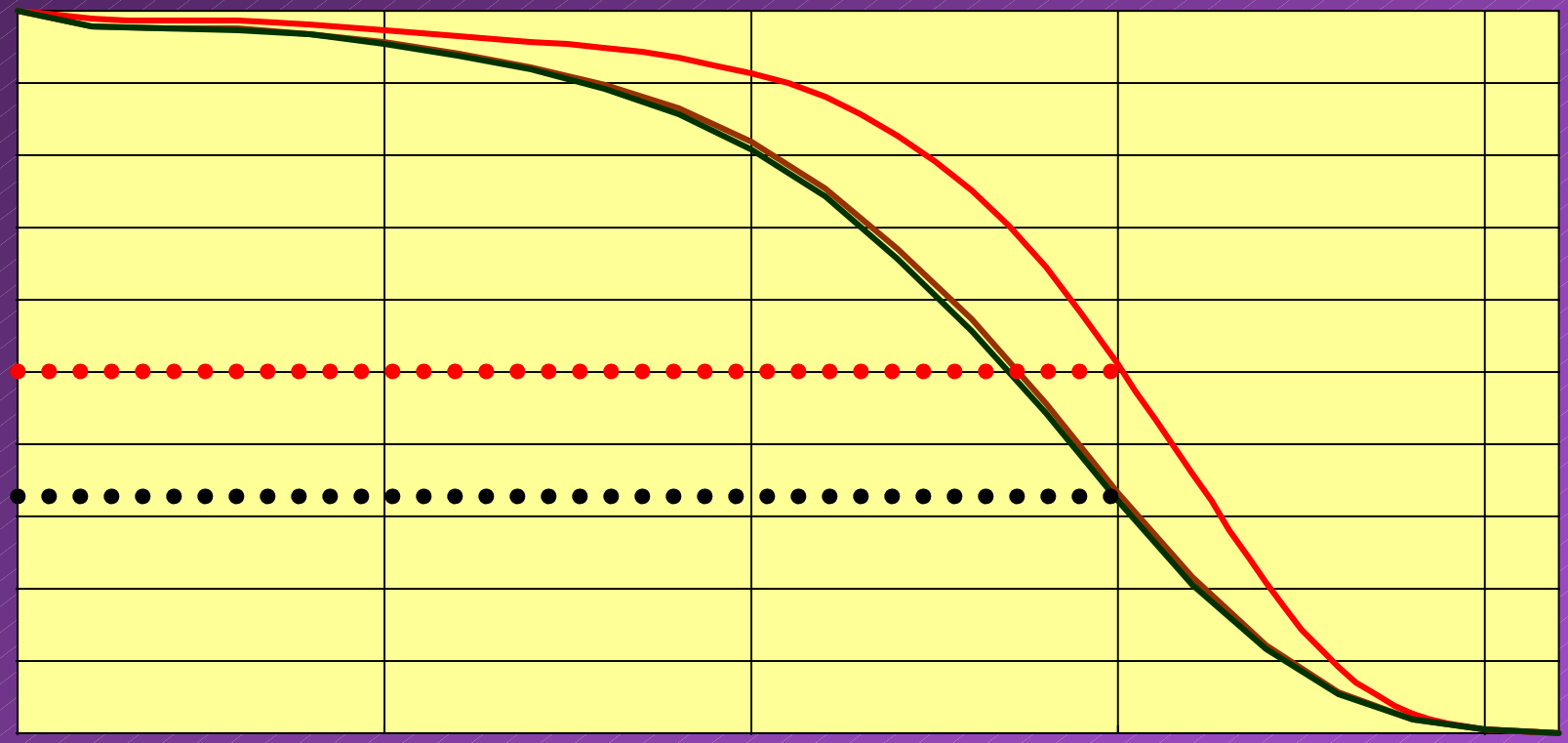
November 20, 2000
Research Triangle Park, NC

Please do not duplicate or further distribute without permission

Chris Mansfield
Center for Health Services Research and Development
East Carolina University

CHSR&D

EAST CAROLINA UNIVERSITY



CHSR&D

EAST CAROLINA UNIVERSITY

Premature Mortality

Years of potential life lost before age 75 (YPLL-75)

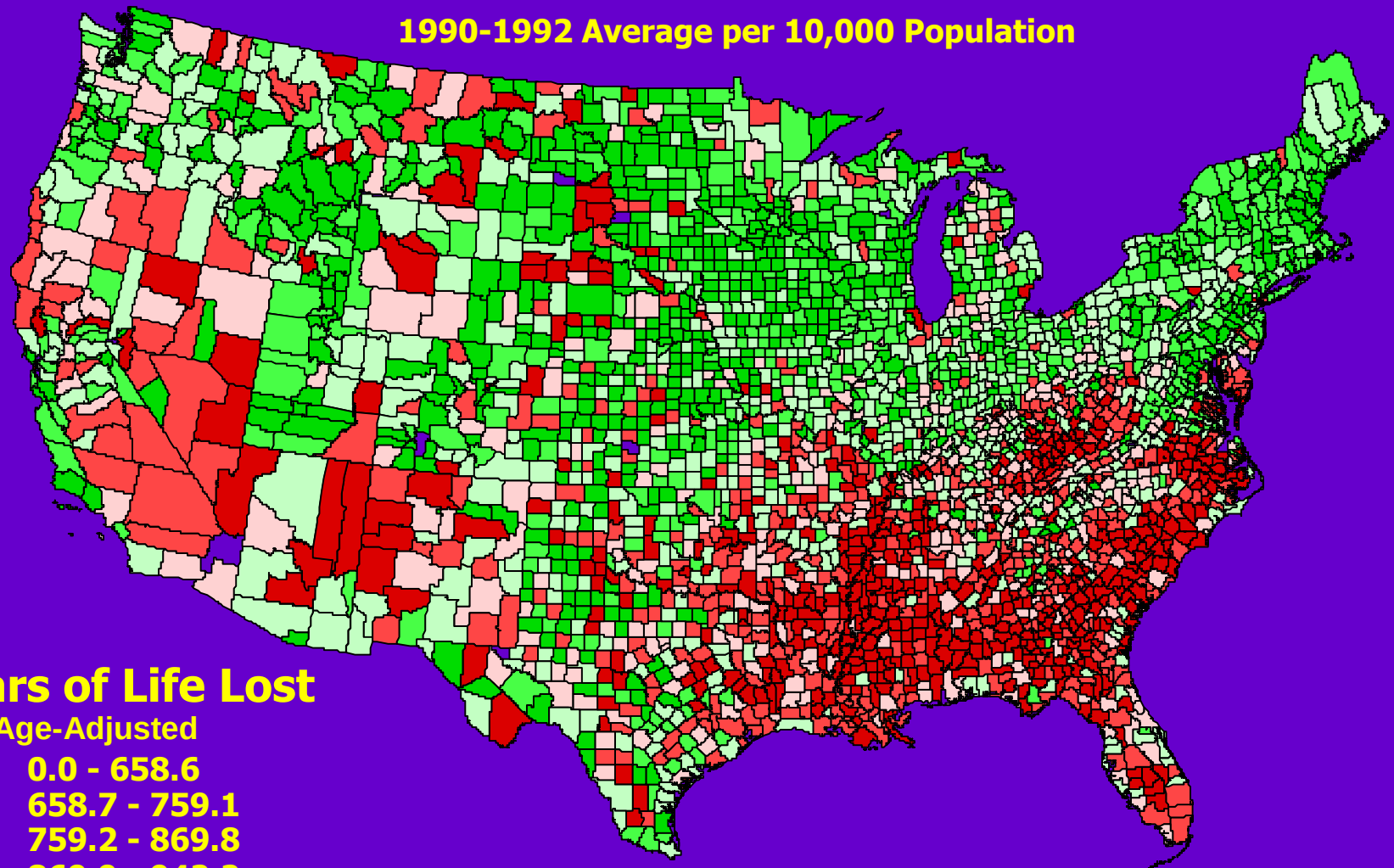
- For each county, calculate 3-yr. avg. deaths (1990-92) in each age group (Area Resource File)
- Multiply deaths in age group by 75 minus the mid-point of age group
- Divide by age-adjustment factor (US Standard Million)
- Sum adjusted YLL in each age group to get total YPLL-75 for county

CHSR&D

EAST CAROLINA UNIVERSITY

Years of Potential Life Lost before Age 75

1990-1992 Average per 10,000 Population



Years of Life Lost

Age-Adjusted

- **0.0 - 658.6**
- **658.7 - 759.1**
- **759.2 - 869.8**
- **869.9 - 942.2**
- **942.3 - 1086.5**
- **1086.6 - 2792.9**

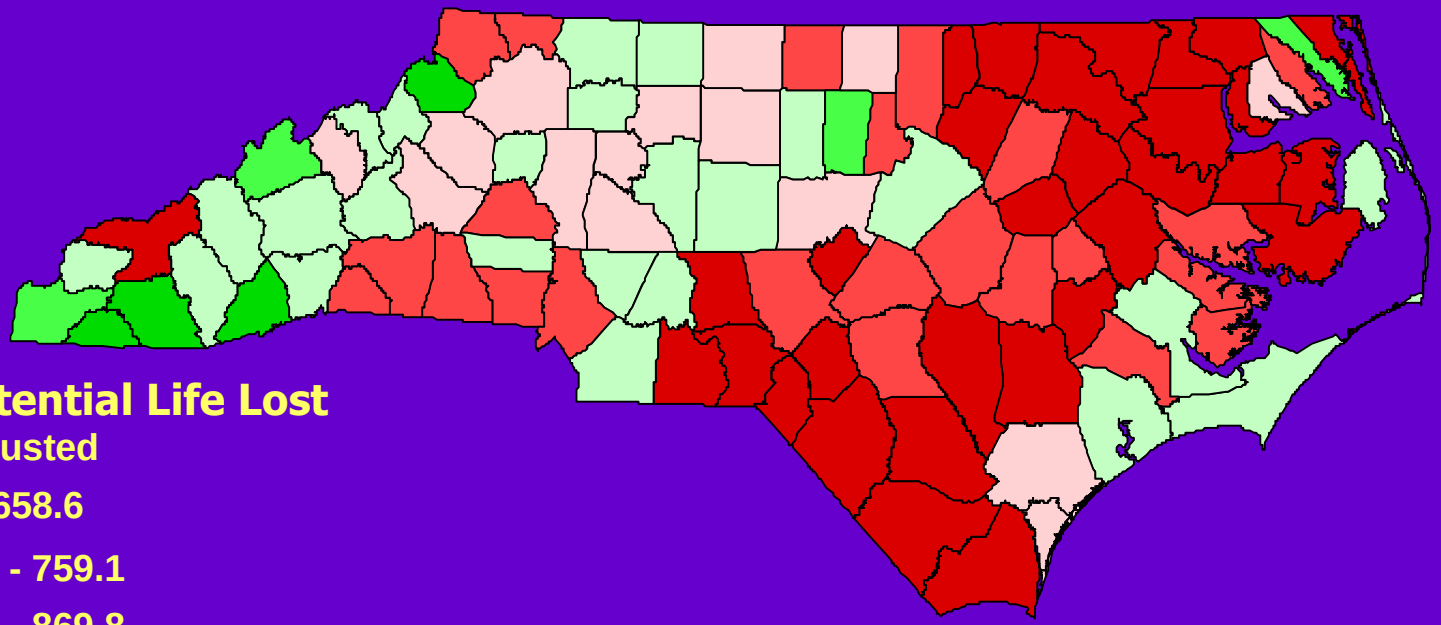
Age-adjusted to U.S. 1940 Standard Million Population. U.S. YPLL mean = 869.8.
Counties categorized according to their value relative to this mean.
Data: Area Resource File 1996

Center for Health Services Research and Development
East Carolina University

Years of Potential Life Lost before Age 75

U. S. 1990-1992 Average per 10,000 Population

NC ranks 40th



Years of Potential Life Lost
Age-Adjusted

- 0.0 - 658.6
- 658.7 - 759.1
- 759.2 - 869.8
- 869.9 - 942.2
- 942.3 - 1086.5
- 1086.6 - 2792.9

Center for Health Services Research and Development
East Carolina University

Data source: Area Resource File 1996

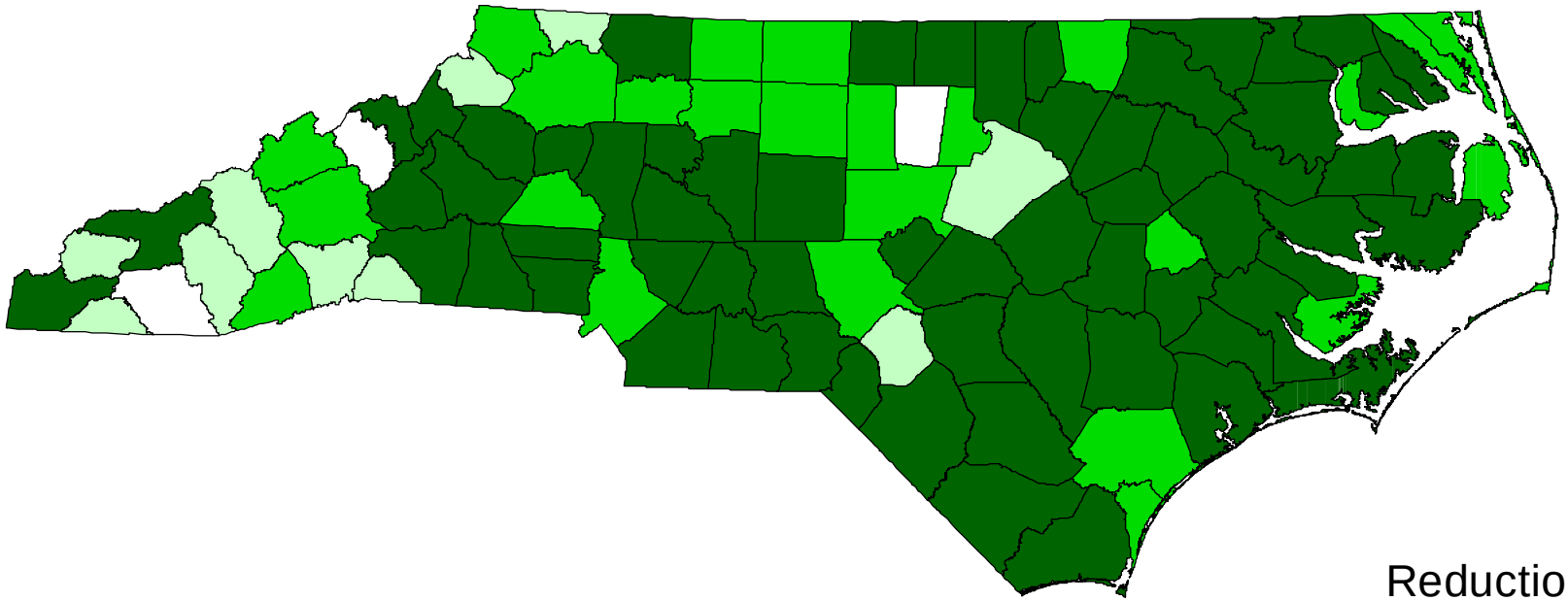
Utility of YPLL-75

- **Summary measure of the first overarching goal but objective for YPLL-75 was dropped from the draft *HP2010***
- **Has not been calculated for race but could be**
- **Calculation of YPLL-75 for all US counties available at our website**

CHSR&D

EAST CAROLINA UNIVERSITY

Coronary Heart Disease Mortality Objective



Reduction Necessary to meet Objective

- meets objective
- 0 to 10.0%
- 10.1 to 20.0%
- 20.1% or more

HEALTHY PEOPLE 2010

Reduce coronary heart disease deaths to no more than 166.0 per 100,000 population

Center for Health Services Research and Development
Data Source: State Center for Health Statistics

Coronary Heart Disease ICD-9 Codes: 402, 410-414, 429.2
Five Year Average, Age-Adjusted Rates Standardized to US 2000 SM

PNC

ENC

NC

WNC

CHSR&D

EAST CAROLINA UNIVERSITY

Gender

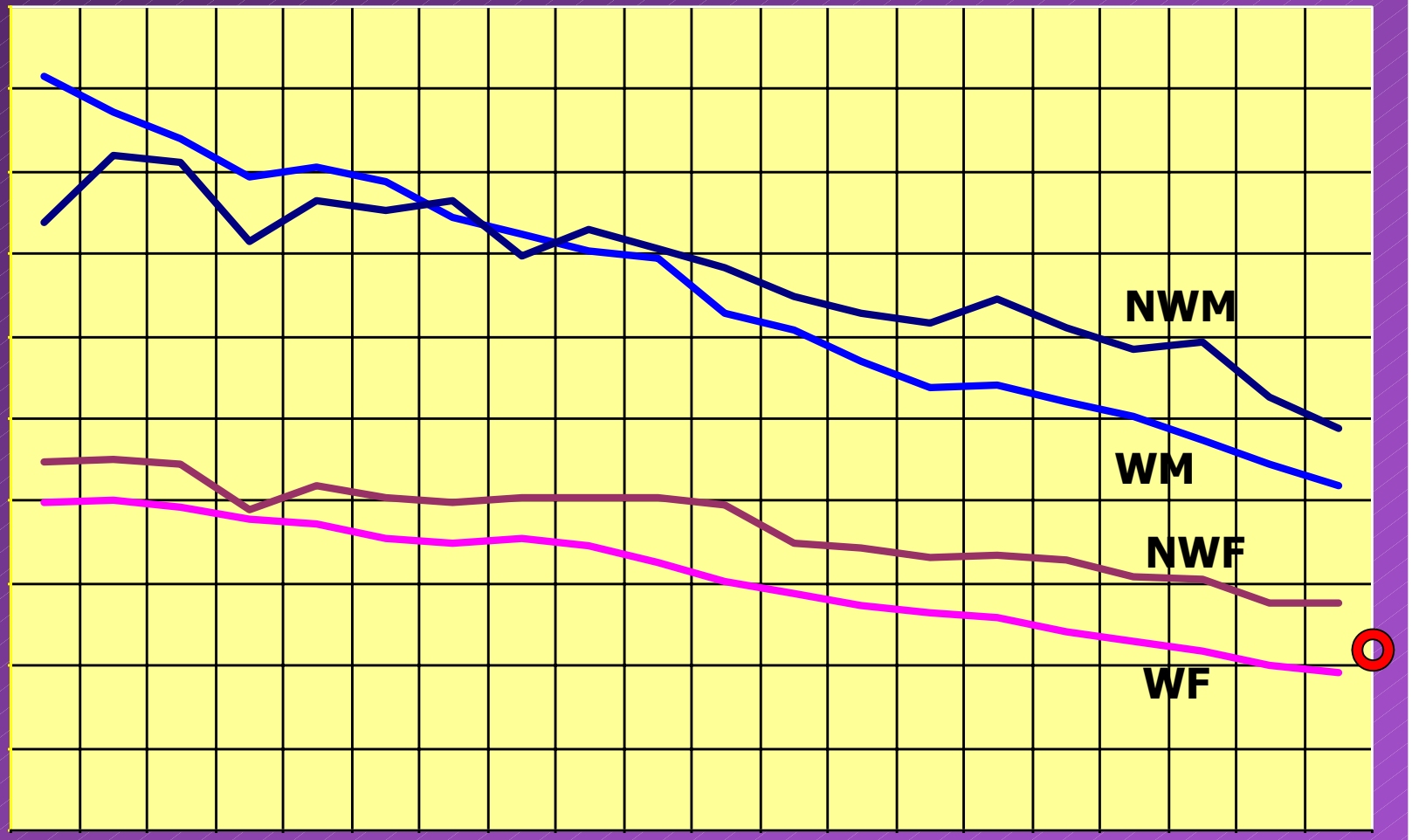
Region

Race

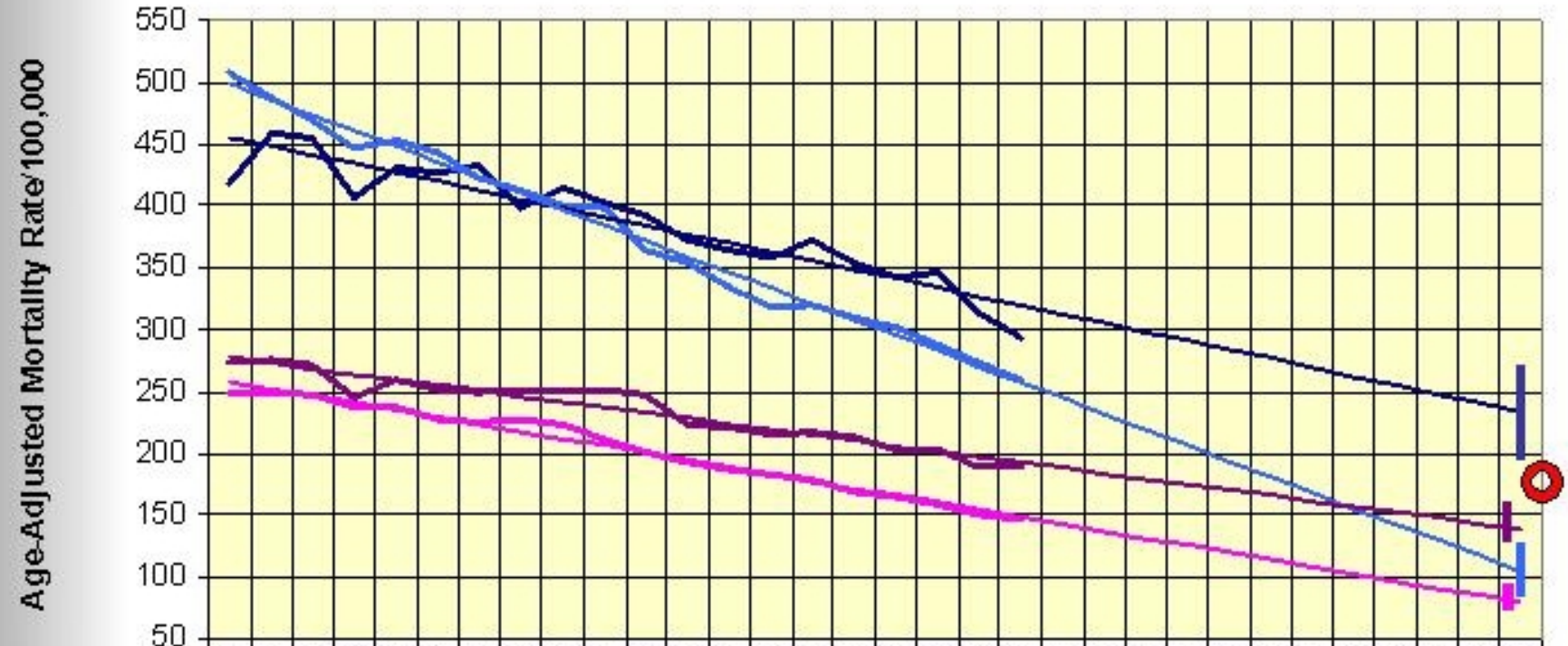
CHSR&D

EAST CAROLINA UNIVERSITY

Coronary Heart Disease Mortality in North Carolina: 1979-1998 by Race and Gender



Coronary Heart Disease Mortality in North Carolina: 1979-1998 by Race and Gender with Projection to 2010

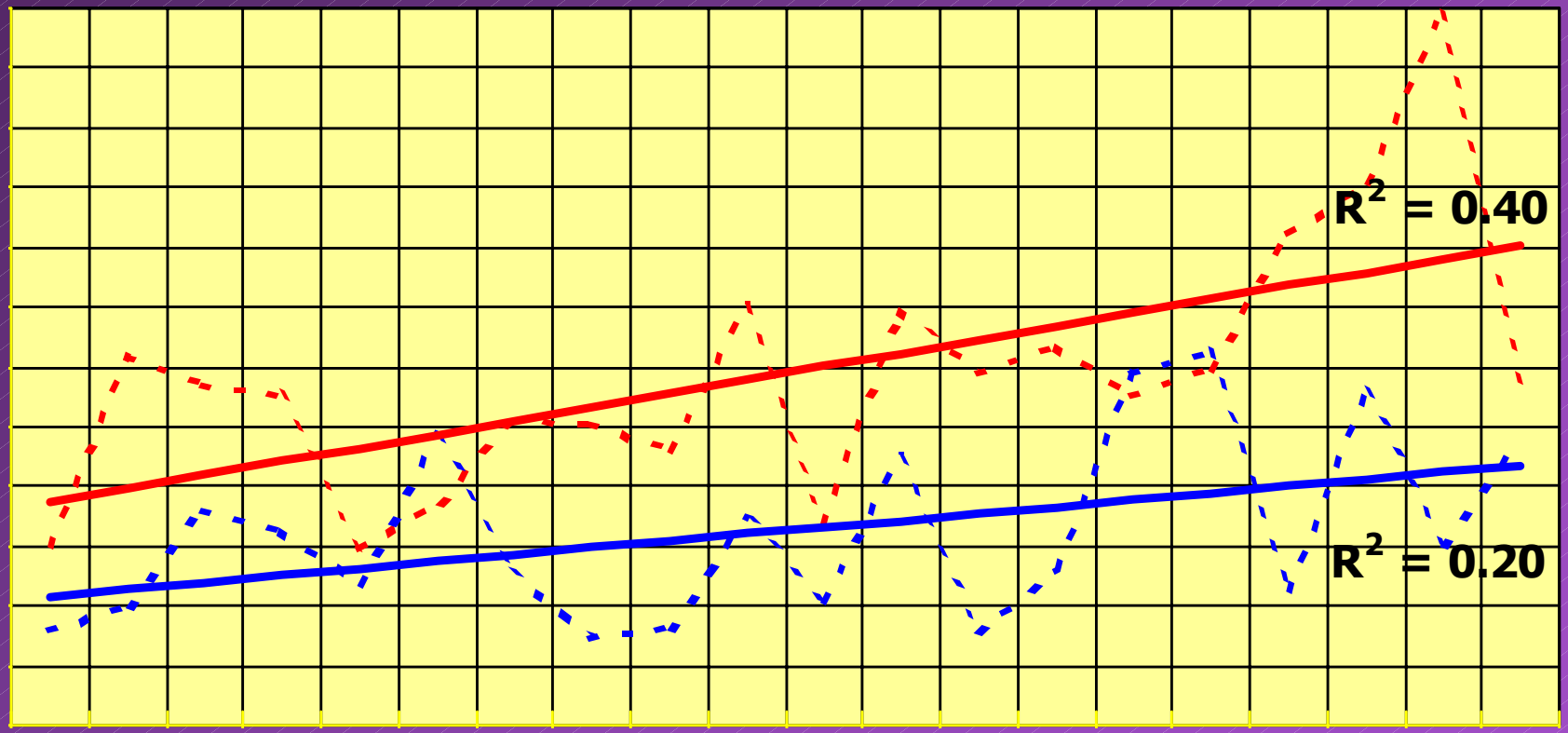


	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10
NWM	420	459	456	408	432	426	432	399	414	403	392	374	364	357	372	355	341	347	318	294												
WM	507	487	470	447	453	444	422	418	401	398	364	353	335	319	321	311	302	287	273	260												
NWF	273	275	272	245	260	252	249	252	252	253	247	224	222	216	217	214	204	203	189	188												
WF	249	250	247	238	237	227	225	227	223	212	201	193	187	183	179	170	165	159	150	147												

Projections are by linear regression with a 2-standard error estimate at 2010 (90% confidence interval)

ICD-9 Codes: 402, 410-414, 429.2

Age-Adjusted to US 2000 Standard Million



CHSR&D

EAST CAROLINA UNIVERSITY

Stroke Mortality and Racial Disparity, Eastern North Carolina

Mortality

As compared to the U.S. crude rate (60.3)

- less than 25% higher; small numbers
- 26% to 50% higher
- more than 50% higher

Disparity

25 percent or greater racial disparity in elevated counties

Center for Health Services Research and Development
Data Source: State Center for Health Statistics

CHSR&D

Race

Region

Gender

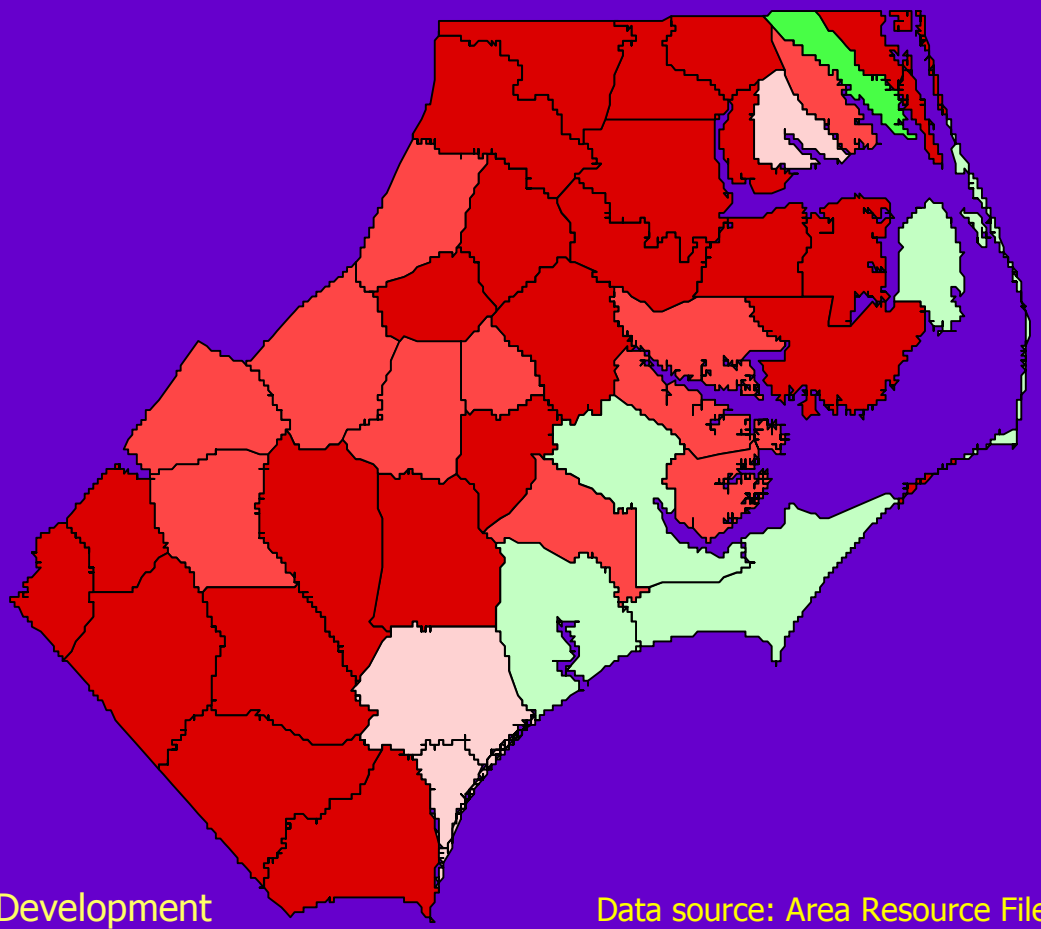
CHSR&D

EAST CAROLINA UNIVERSITY

Years of Potential Life Lost before Age 75

U. S. 1990-1992 Average per 10,000 Population

ENC would rank 51st



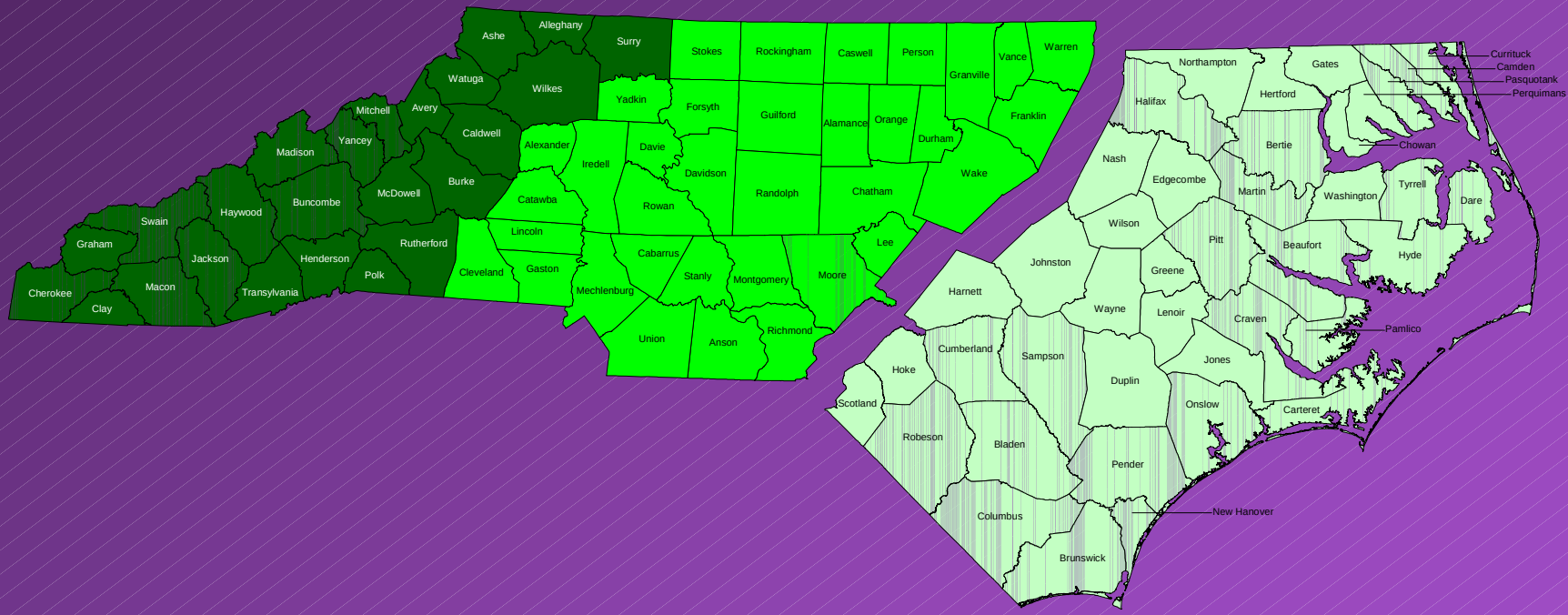
Years of Potential Life Lost
Age-Adjusted

- 0.0 - 658.6
- 658.7 - 759.1
- 759.2 - 869.8
- 869.9 - 942.2
- 942.3 - 1086.5
- 1086.6 - 2792.9

Center for Health Services Research and Development
East Carolina University

Data source: Area Resource File 1996

"Excess" mortality in Eastern North Carolina



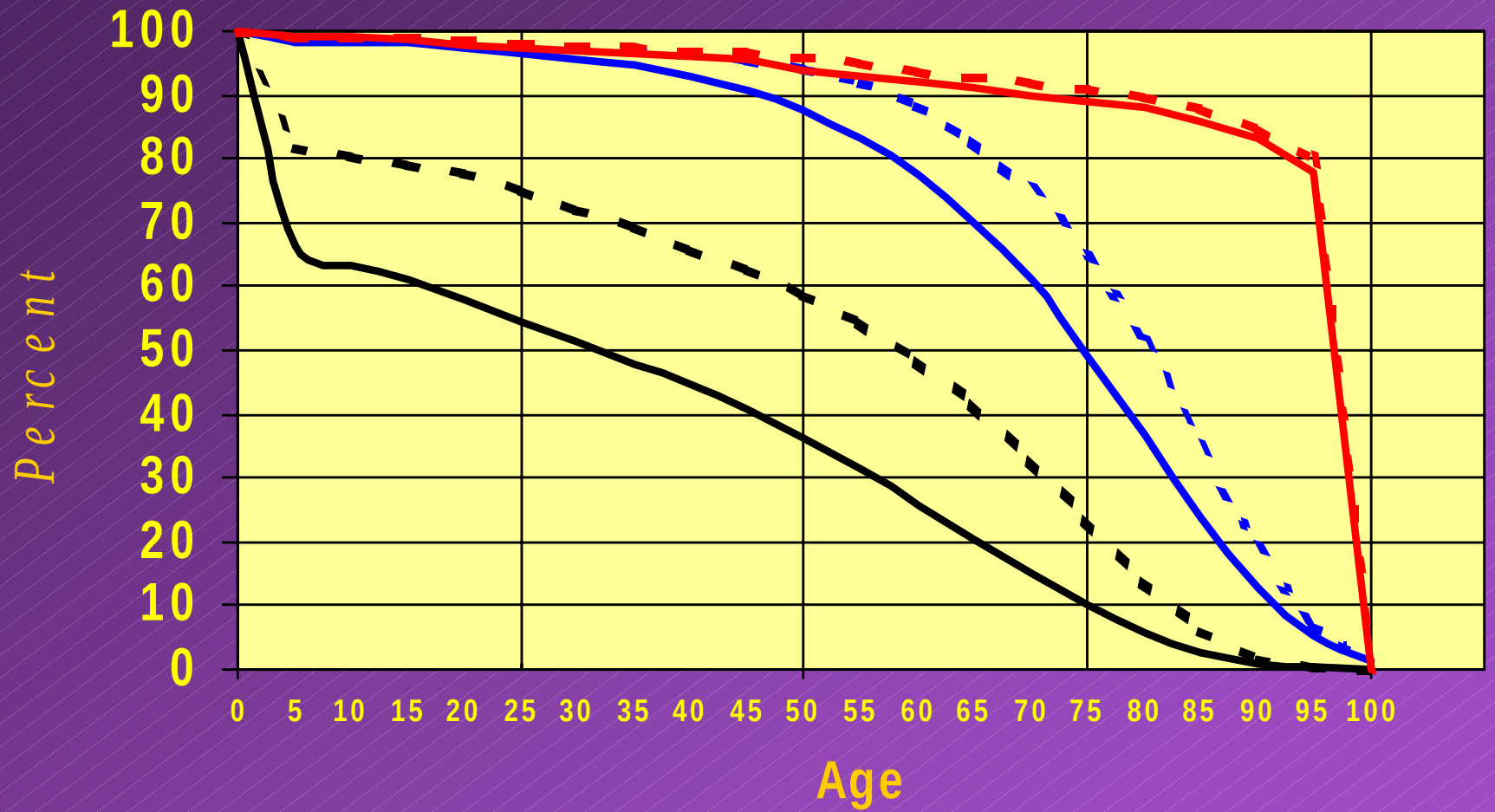
1,656 excess deaths annually

WNC 1998 age-adjusted rate as standard for calculation of regional disparity burden

CHSR&D

EAST CAROLINA UNIVERSITY

Percent Surviving by Age by Race



CHSR&D

EAST CAROLINA UNIVERSITY

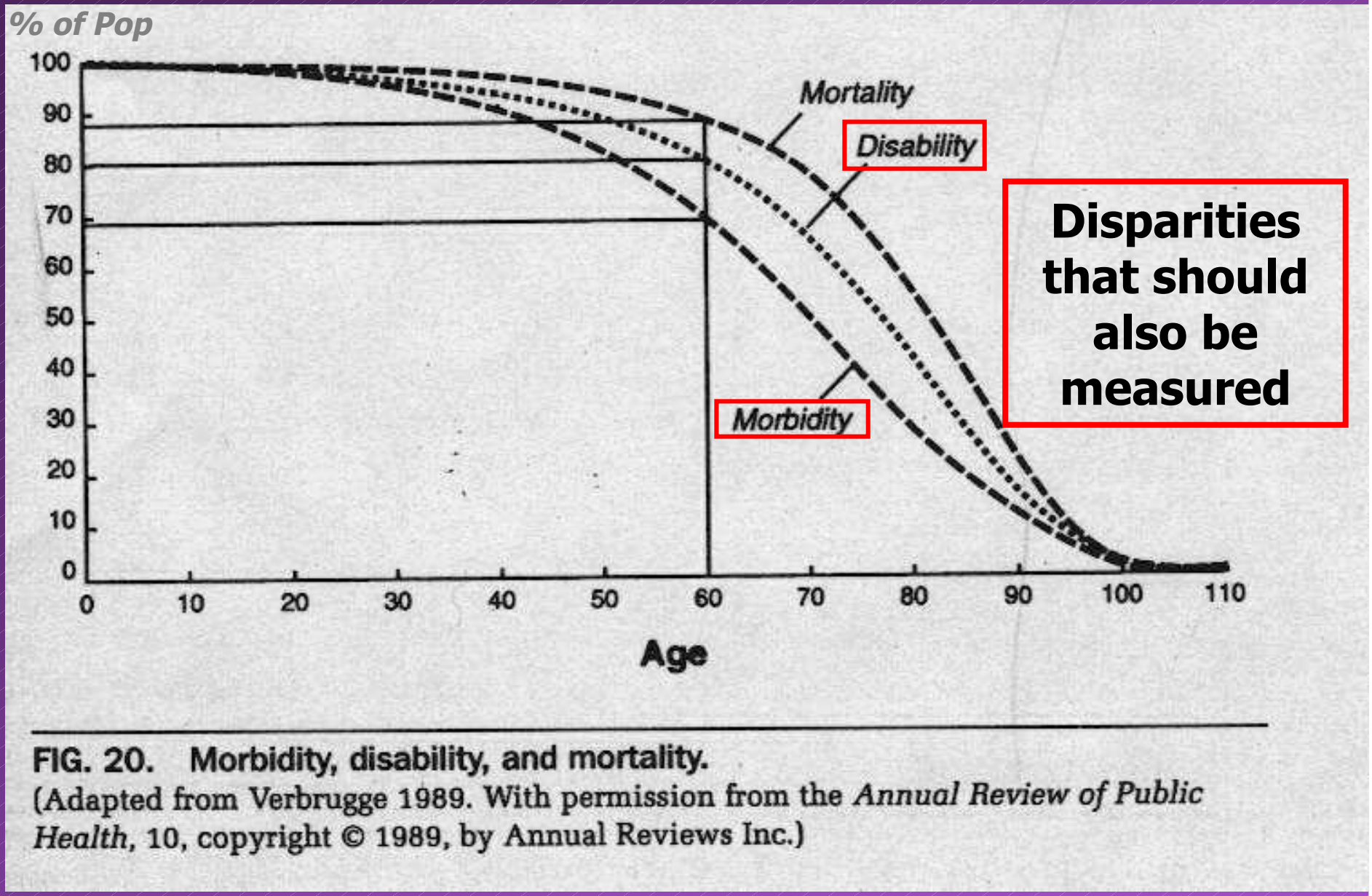


FIG. 20. Morbidity, disability, and mortality.
(Adapted from Verbrugge 1989. With permission from the *Annual Review of Public Health*, 10, copyright © 1989, by Annual Reviews Inc.)

Purchasing population health requires a quantifiable measure;

"Population health is defined as the aggregate health outcome of health adjusted life expectancy (quantity and quality) of a group of individuals, in an economic framework that balances the relative marginal return from the multiple determinants of health." Kindig 1997

CHSR&D

EAST CAROLINA UNIVERSITY

Existing measures

- Mortality rates
  - Crude
  - Age-adjusted (race & sex-adjusted too?)
  - Cause- and age-specific
- Life expectancy
- Premature death (YPLL)
- Morbidity
- Disability (ADLs, IADLs)
- Functional Status (SF-36)
- Self-reported health status
- Provider report cards (HEDIS, JCAHO)

CHSR&D

EAST CAROLINA UNIVERSITY

Potential measures

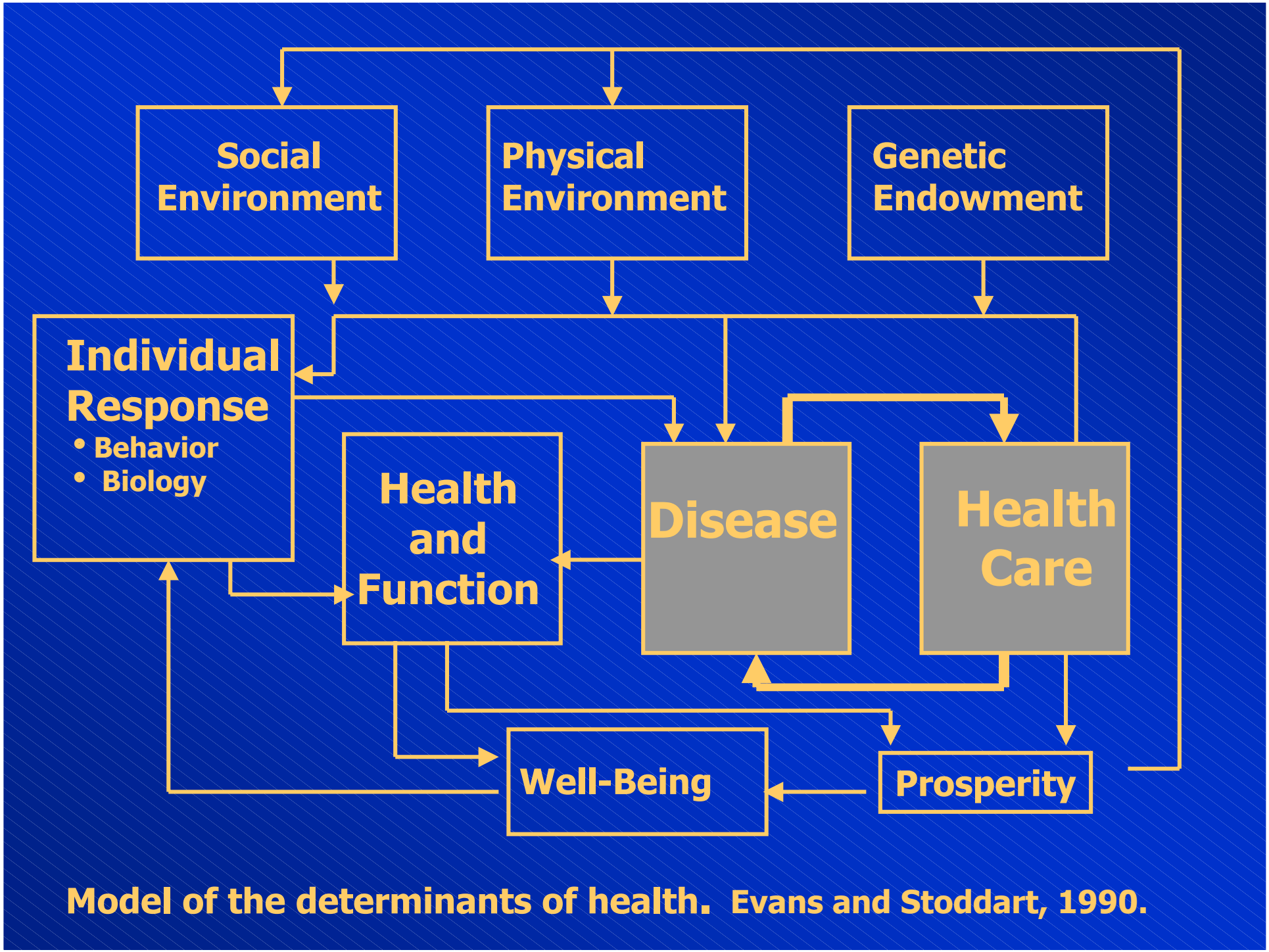
- Gross National Health Product ?
- Health Adjusted Life Years
  - Quality Adjusted Life Years (QALYs)
  - Disability Adjusted Life Years (DALYs)
  - Years of Healthy Life (YHL) - combines ypls with self-reported health status by age cohorts

CHSR&D

EAST CAROLINA UNIVERSITY

Necessary conditions for perfect competition:

- No seller has any influence over market price
- Homogenous products (substitutability)
- Large number of buyers and sellers
- **Each has complete knowledge of the market**
- No restraints on market entry



Model of the determinants of health. Evans and Stoddart, 1990.