Differential Mortality and Retirement Benefits in the Health and Retirement Study

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Life Expectancy and Social Security

- Life expectancy has changed substantially since the initial years of the Social Security system.
  - Life expectancy at age 65 has increased for men and women by 50 and 35 percent respectively since 1940.
  - Steady rise in potential benefit years in the face of a constant or declining number of work years.
- Policy response of raising retirement age to maintain constant ratio of retirement years to potential work years.
- Would stabilize long-term cost ratio.

Life Expectancy

Year Cohort Turned 65	Percentage Surviving From Age 21 to 65		Life Expectancy At Age 65	
	Male	Female	Male	Female
1940	54	61	12.7	14.7
1960	60	71	13.2	17.4
1980	68	81	14.7	18.7
2000	76	85	16.9	19.5
2010	79	87	18.9	20.0

Differential Mortality

- Recent research has demonstrated a strong link between mortality and measures of socio-economic status, including income and education.

  - Life expectancy is rising more rapidly for individuals in the upper portions of the earnings or education distribution.

  - Waldron (2007) using SSA earnings records for men

  - Similar results using educational attainment - Meara, Richards, and Cutler (2008).

Life Expectancy at Age 65, By Career Earnings

Top half of earnings distribution

Bottom half of earnings distribution

Year of birth

Life Expectancy Age 65
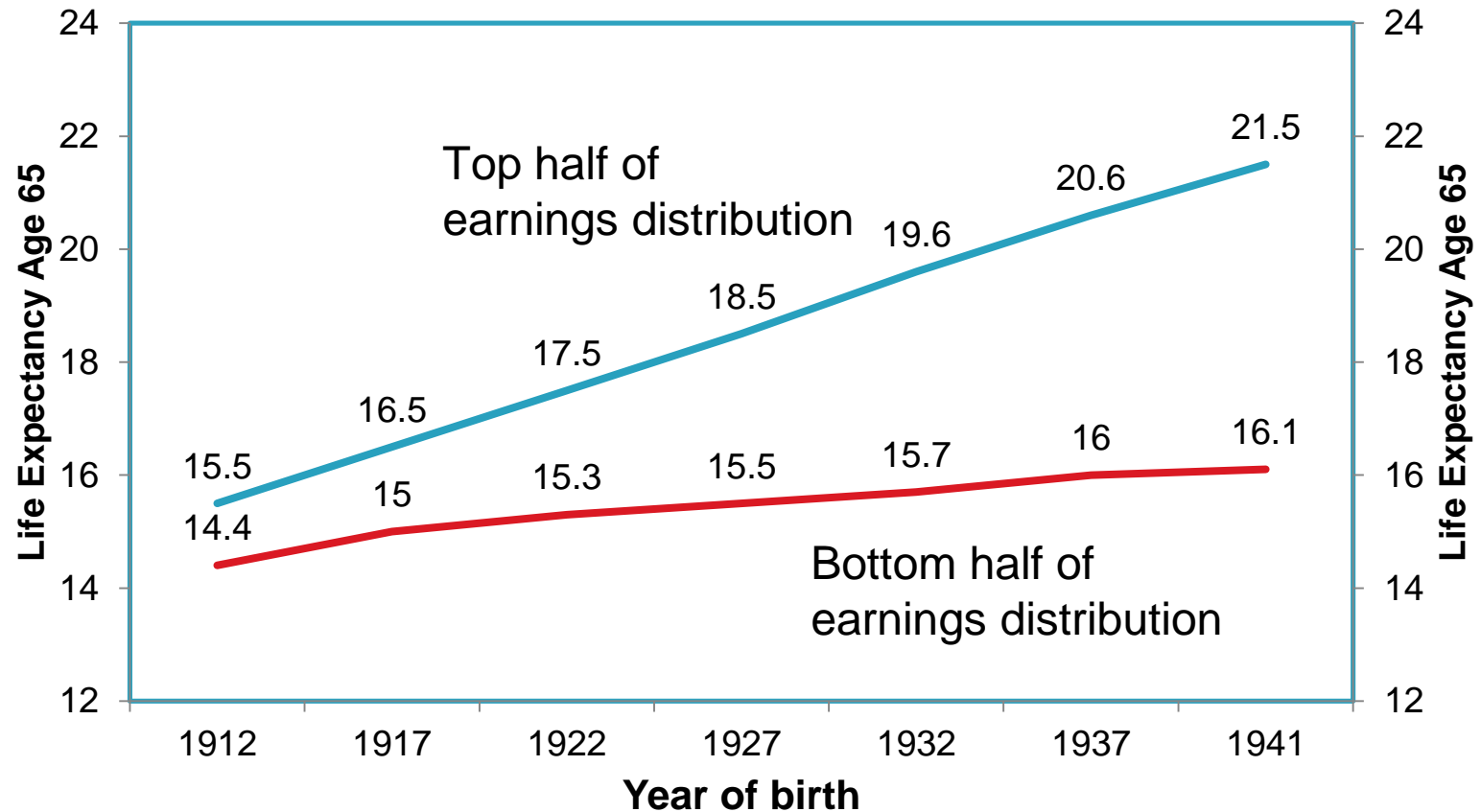
Source: Waldron (2007).

Social Security Progressivity

- If gains in expected life spans are increasingly concentrated among the well-to-do, it seems unfair to ask the less affluent to bear the main burden of adjustment.

- Disagreement about the impact of differential mortality on the progressivity of lifetime benefits.
  - Goda, Shoven, and Slavov (2009) suggest a near complete offset (retirement only).
  - CBO (2006) suggests system remains progressive

Differential Mortality in the HRS

- Measure magnitude of mortality differences and trends.
  - Ability to use both income and education as measures of socio-economic status (SES)
  - Access to SSA earnings records allows computation of career earnings (average of nonzero values for ages 41-50)
  - Educational attainment reported by survey respondents.
- Effects on distribution of lifetime benefits
  - Information from both SSA benefit records and survey respondents

HRS Data Set

- First five age cohorts(AHEAD, Coda, HRS, WB, and EBB) spanning birth years 1900-1953.

- 30,671 respondents and 9,914 deaths through 2011.

- About 65% permitted use of earnings and benefit records

- Constructed measures of career earnings and educational attainment.

Mortality

- Proportional hazard model of mortality risk:

$$Mortality(x) = \exp\left(\beta_i X_i\right)$$

  - $X_{i\text{'s}}$ include
    - Career earnings, educational attainment, age, race, and birth year.
    - Separate equations for men and women
    - *Equivalized* measure of career earnings for those with a spouse—Sum of two earnings divided by $\sqrt{2}$
  - Use an earning regression to expand to full sample with predicted career earnings

Mortality

- **Results**
  - Both career income and education are significant correlates of mortality
  - Mortality is lower for college educated, and
  - A declining function of career earnings
  - Mortality is falling for later cohorts of men, but no significant trend for women.
  - Interaction of birth year and SES indicator implies that *differential mortality is increasing over time*.
    - Life expectancy-SES relationship becoming more pronounced

# Male Life Expectancy-Age 55
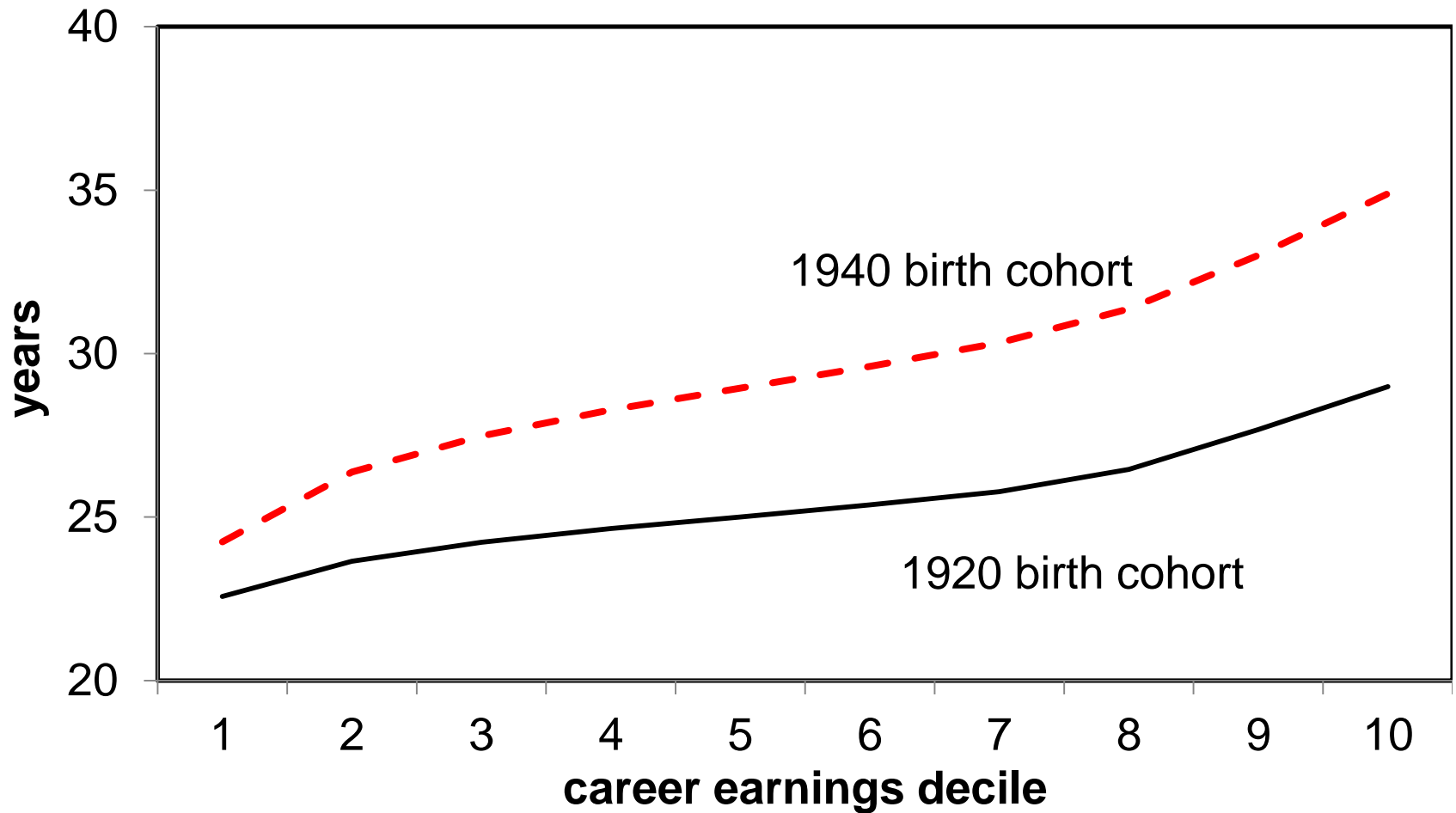
Female Life Expectancy-Age 55
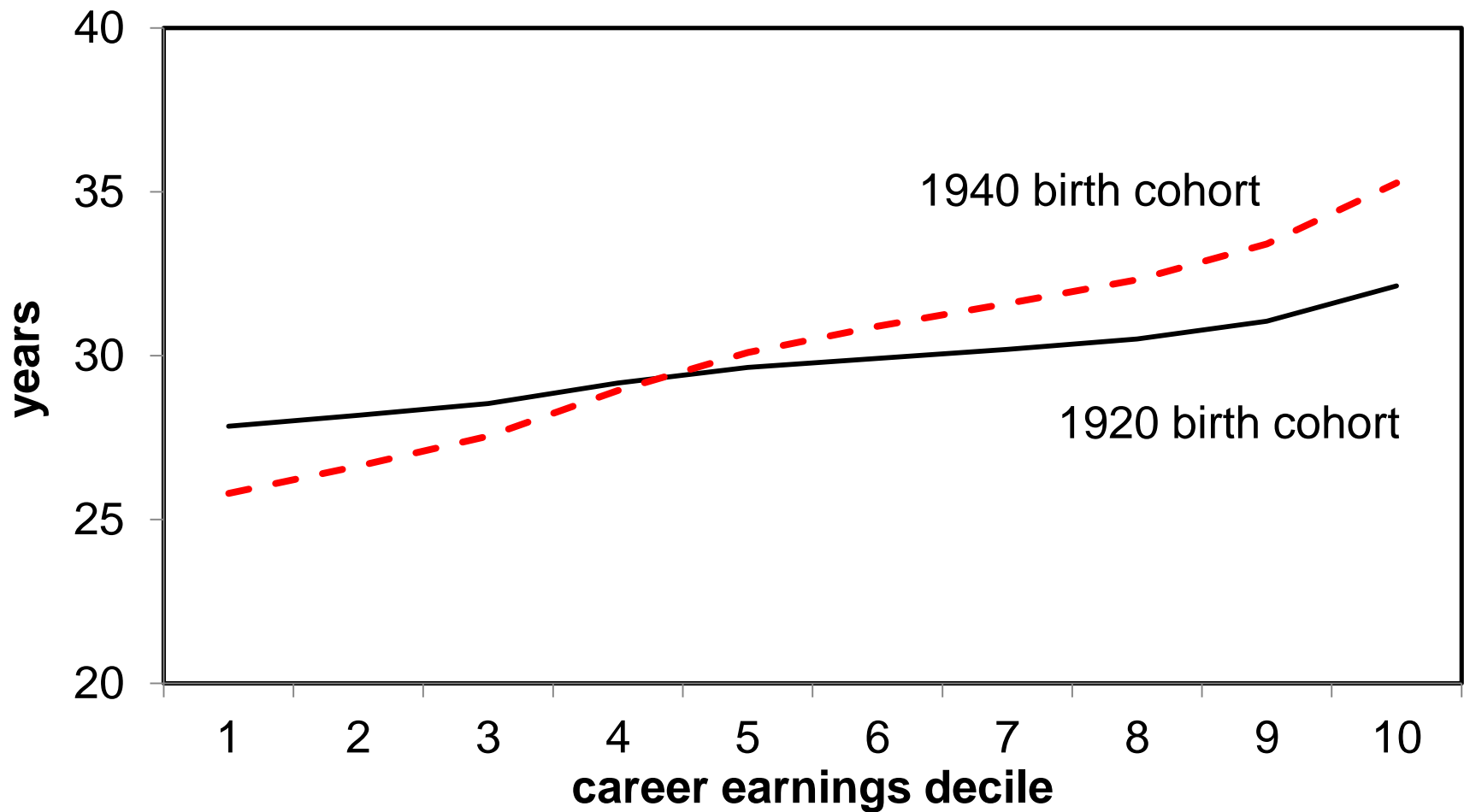
Benefits

- three-fourths of the respondents (23,142) reported receiving OASDI benefits at some time over the 10 survey waves from 1992 to 2010.

  - Annual benefits = Self-reported disability, retirement, and spousal income (2005$) averaged over all waves.
  - Equivalized benefits for couples – sum of two divided by $\sqrt{2}$

- Compute probability of survival from mortality equation for ages 55 to 100.
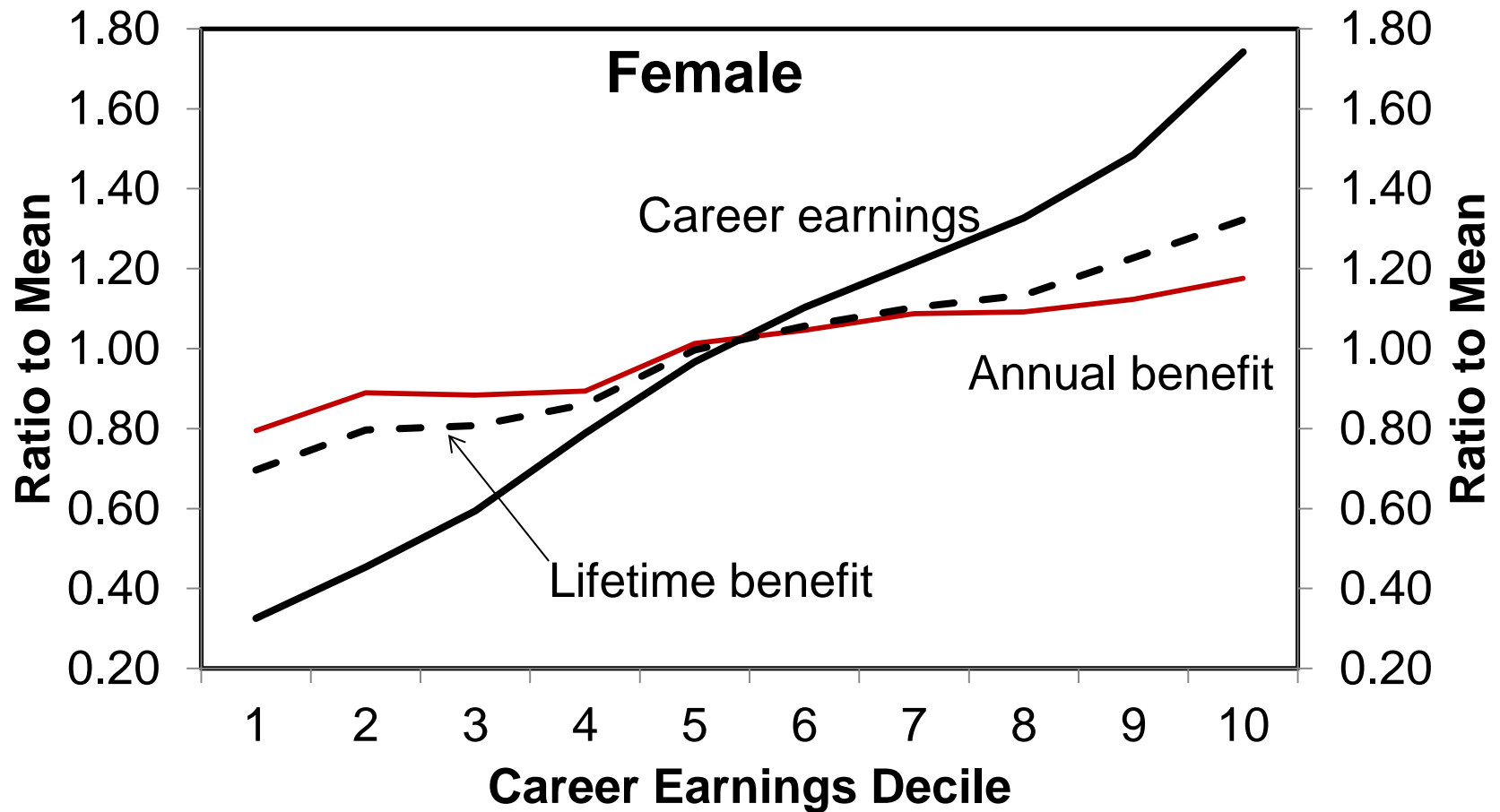
Benefits

- Lifetime benefits computed as the sum over the interval of 55-100 of the probability of survival at a given age times the individual's fixed benefit—no discounting.

- Compute decile distribution of career earnings, annual benefits, and lifetime benefits as percent of own mean.

Distribution of Career Earnings, Annual Benefits, Lifetime Benefits
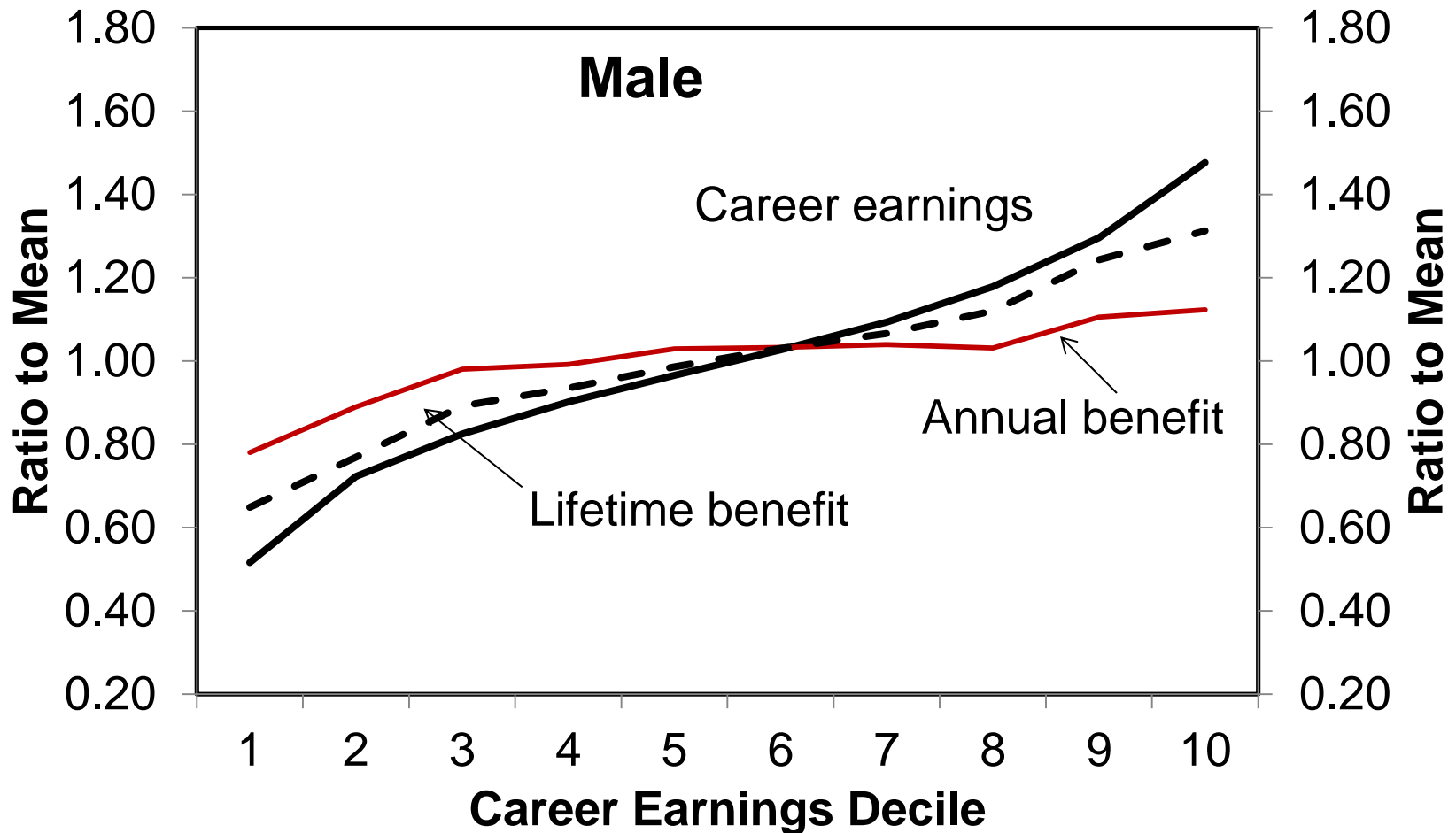
Distribution of Career Earnings, Annual Benefits, Lifetime Benefits

Progressivity

- **Men**
  - Point-in-time benefits have much more uniform distribution than career earnings
  - Large portion of progressivity offset on a lifetime basis by effects of differential mortality
- **Women**
  - Wider distribution of earnings than for men
  - Distribution of benefits similar to men
  - Less effect of differential mortality on lifetime benefits