

SESSION 1-A-1

Demographic Assumption Setting Post-COVID

May 2, 4 and 6, 2022

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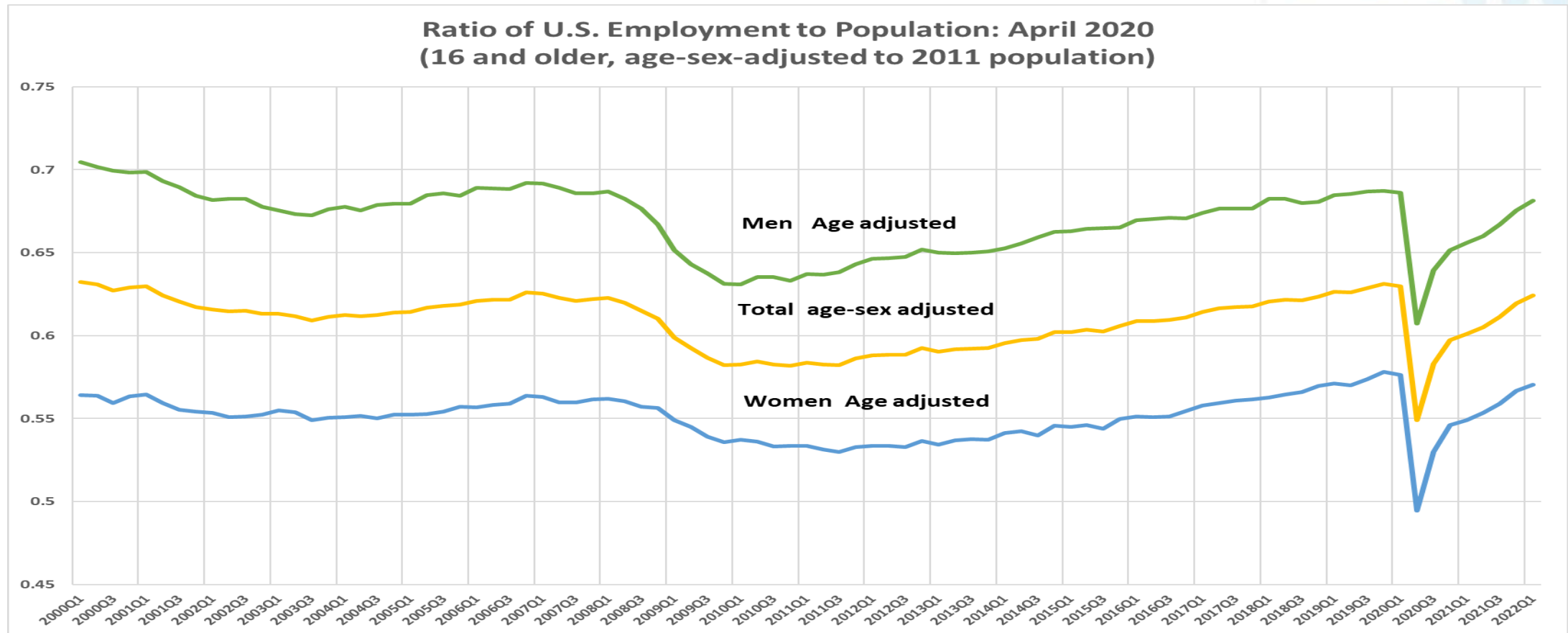
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Retirement & Termination

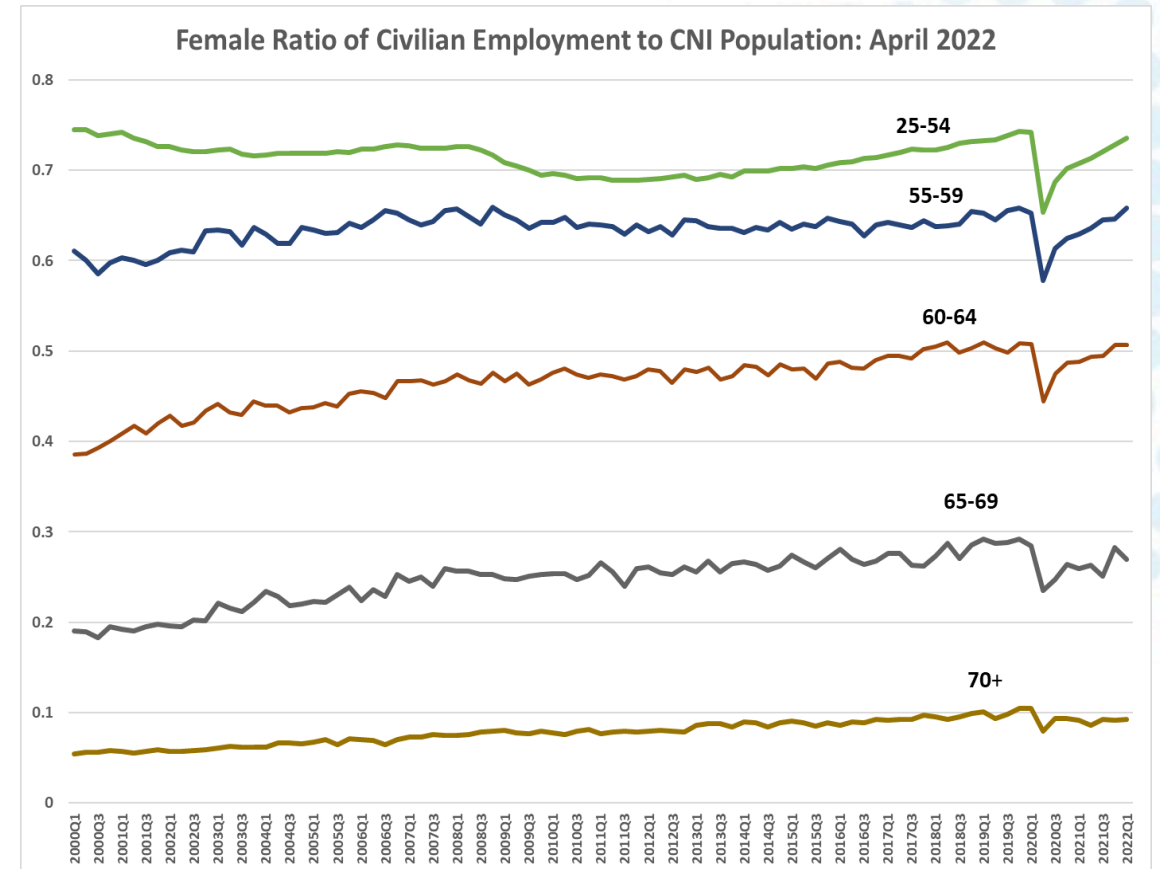
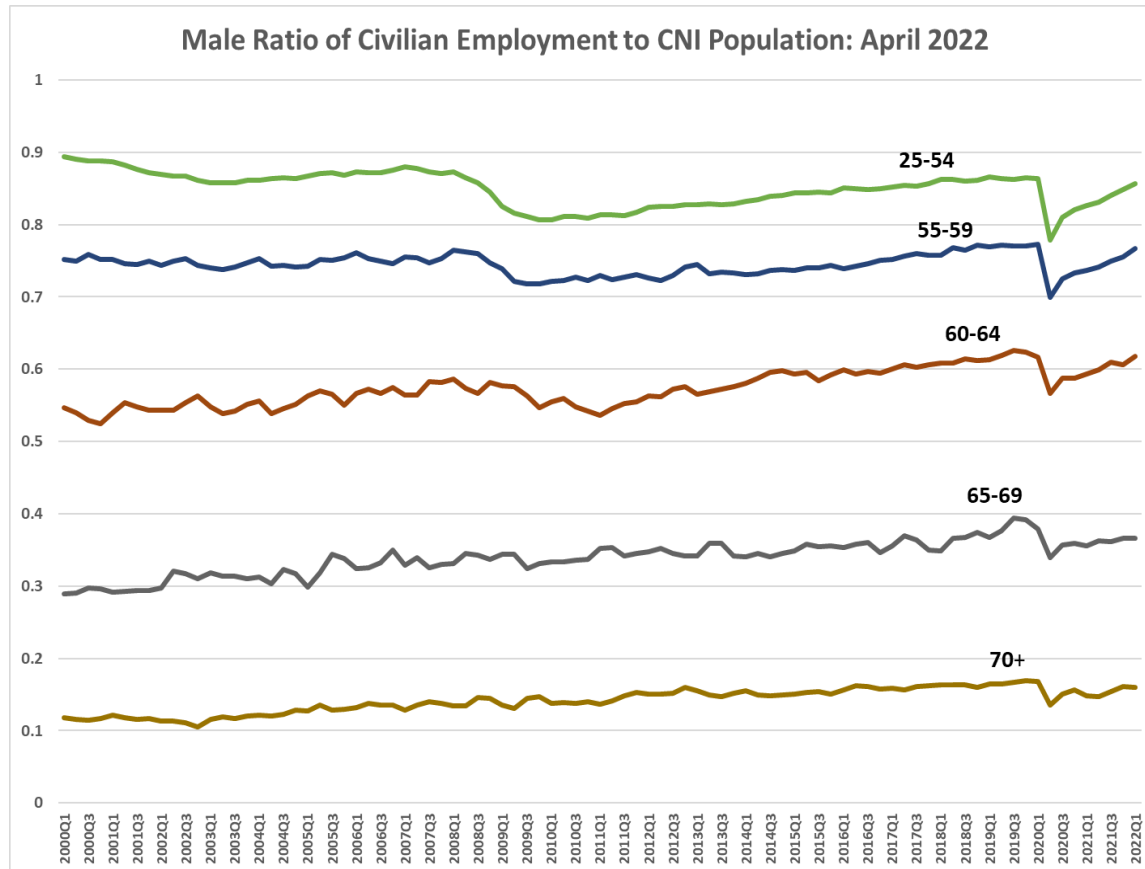
US Population: Employment Trends

- Employment has recovered MUCH faster after the 2020 recession, than after the 2008-9 recession
- Great Resignation? Or, increased job change in the pandemic period? BLS-CPS data



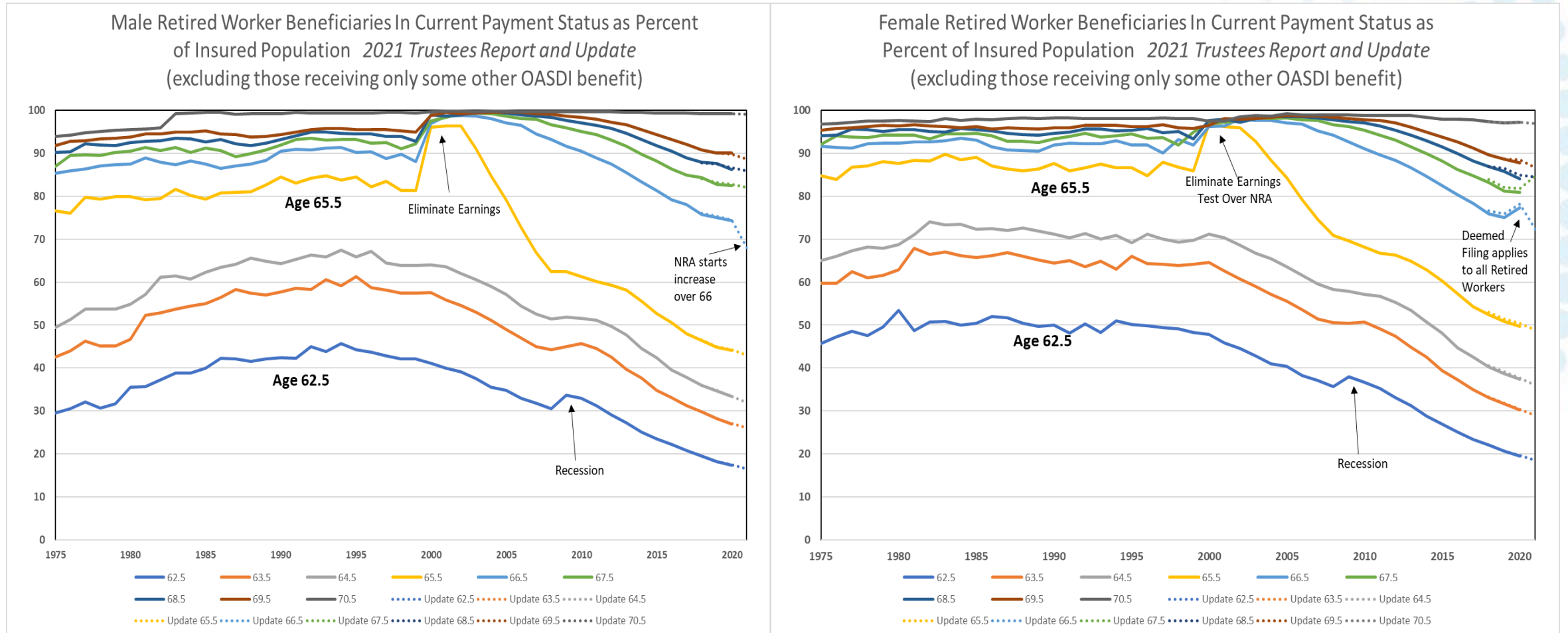
US Population: Employment Trends by Age Group

- Employment over age 60 has been rising: Little effect from 2008-9 recession. BLS-CPS data
- *Is the best retirement approach a job (Paul Samuelson)?*



Social Security Insured Population: Retirement Trends

- Age of Starting Social Security Retirement Benefits – Trend unchanged in 2020 and 2021

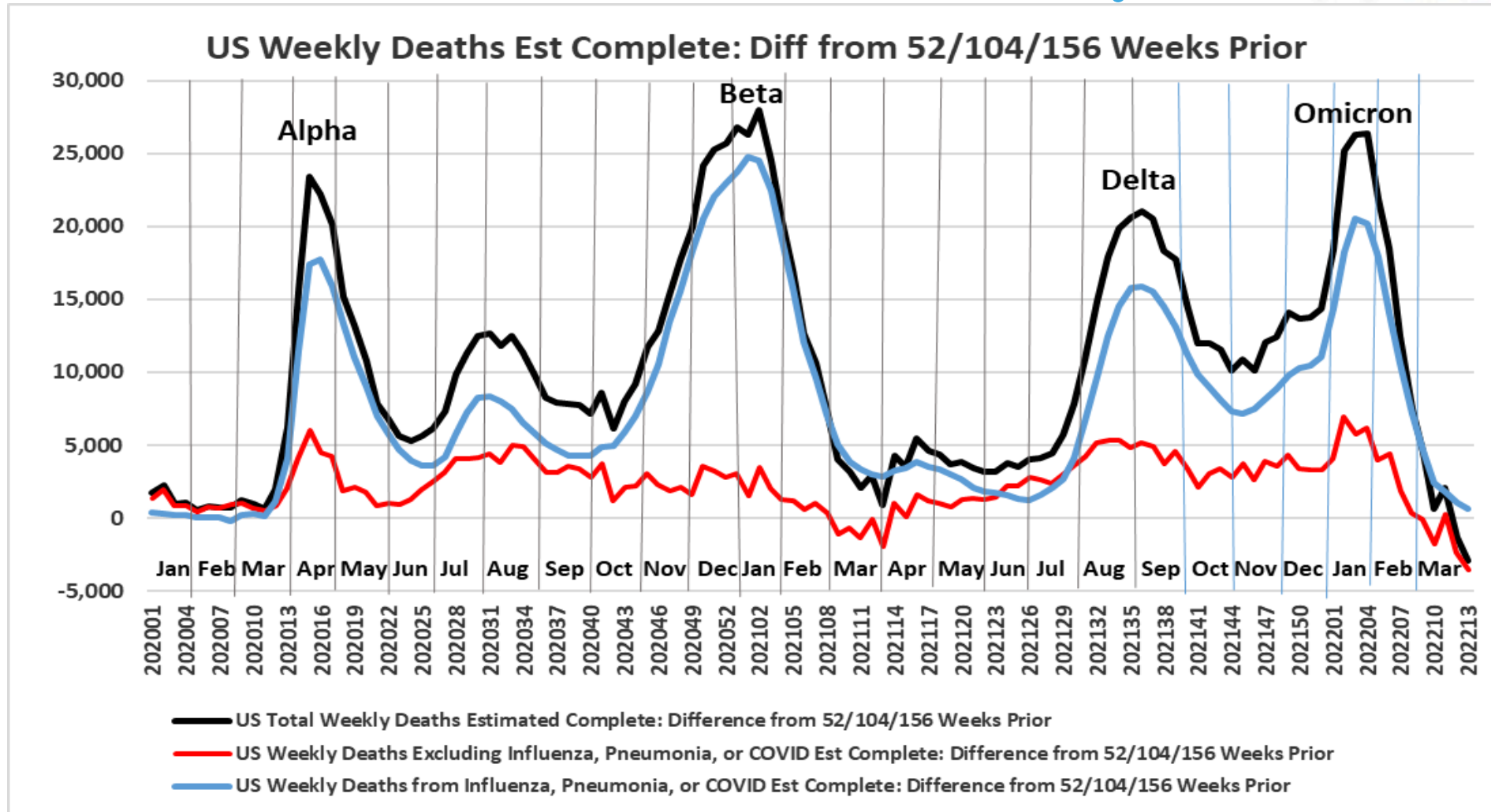


Base Mortality

COVID-19 Current and Long-Term Implications

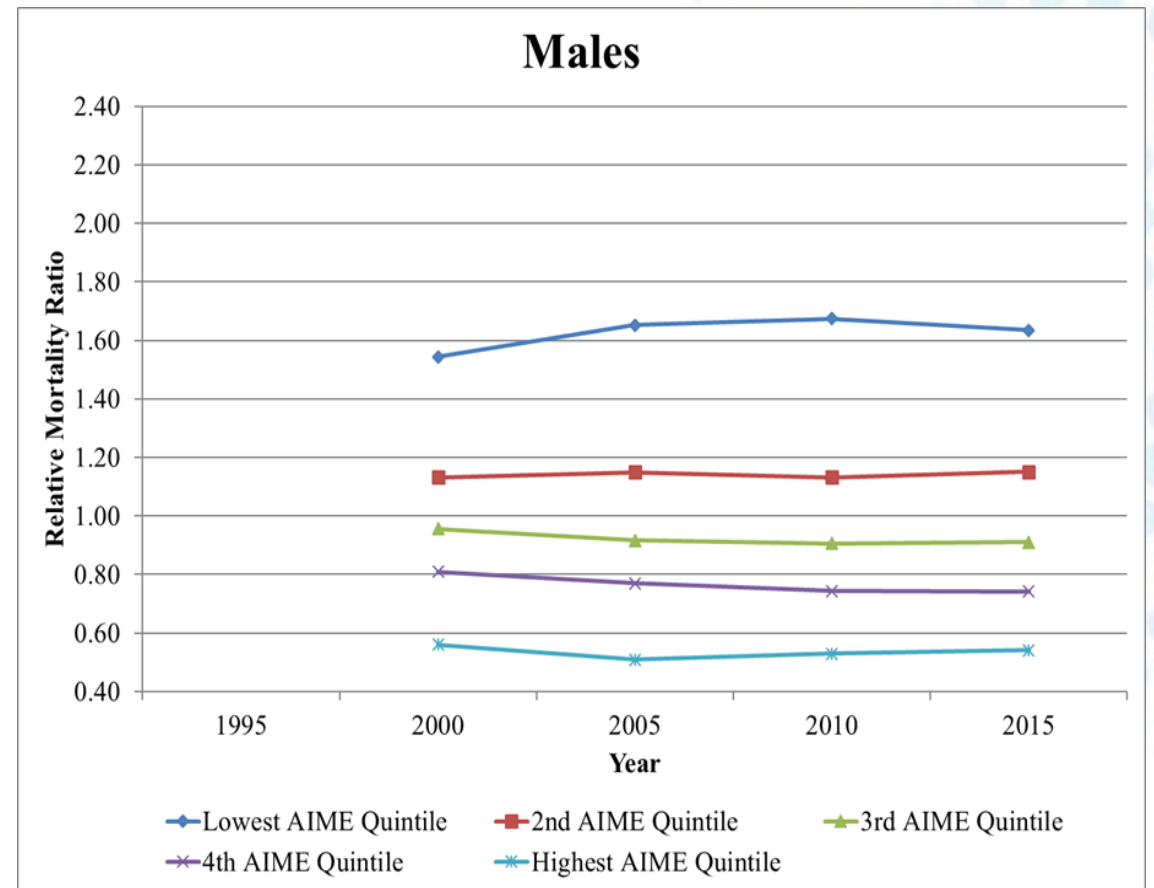
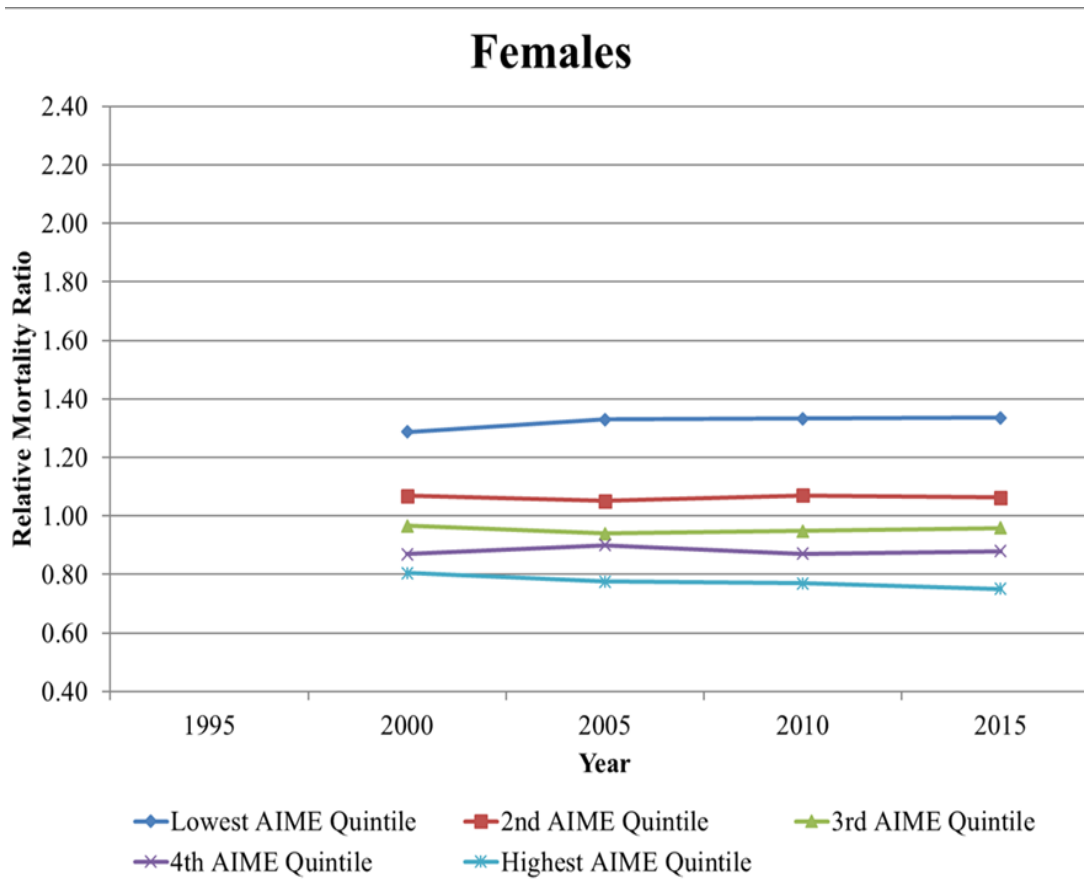
- Raised death rates in US roughly 16% in 2020 and 18% in 2021
- Reduced life expectancy for affected cohorts
 - Many died earlier, disproportionately those with other conditions
 - Most survived infection, but will carry some residual compromise
 - Thus, possibly no net implication for “trend rate” in mortality
- However, this is the second coronavirus in 20 years
 - Expect periodically in a now mobile world population?
- If deaths are raised by 16% in 2 of every 20 years:
 - Average *level* of mortality will be 1.6% above “trend”

Excess Deaths for U.S. CDC — by week



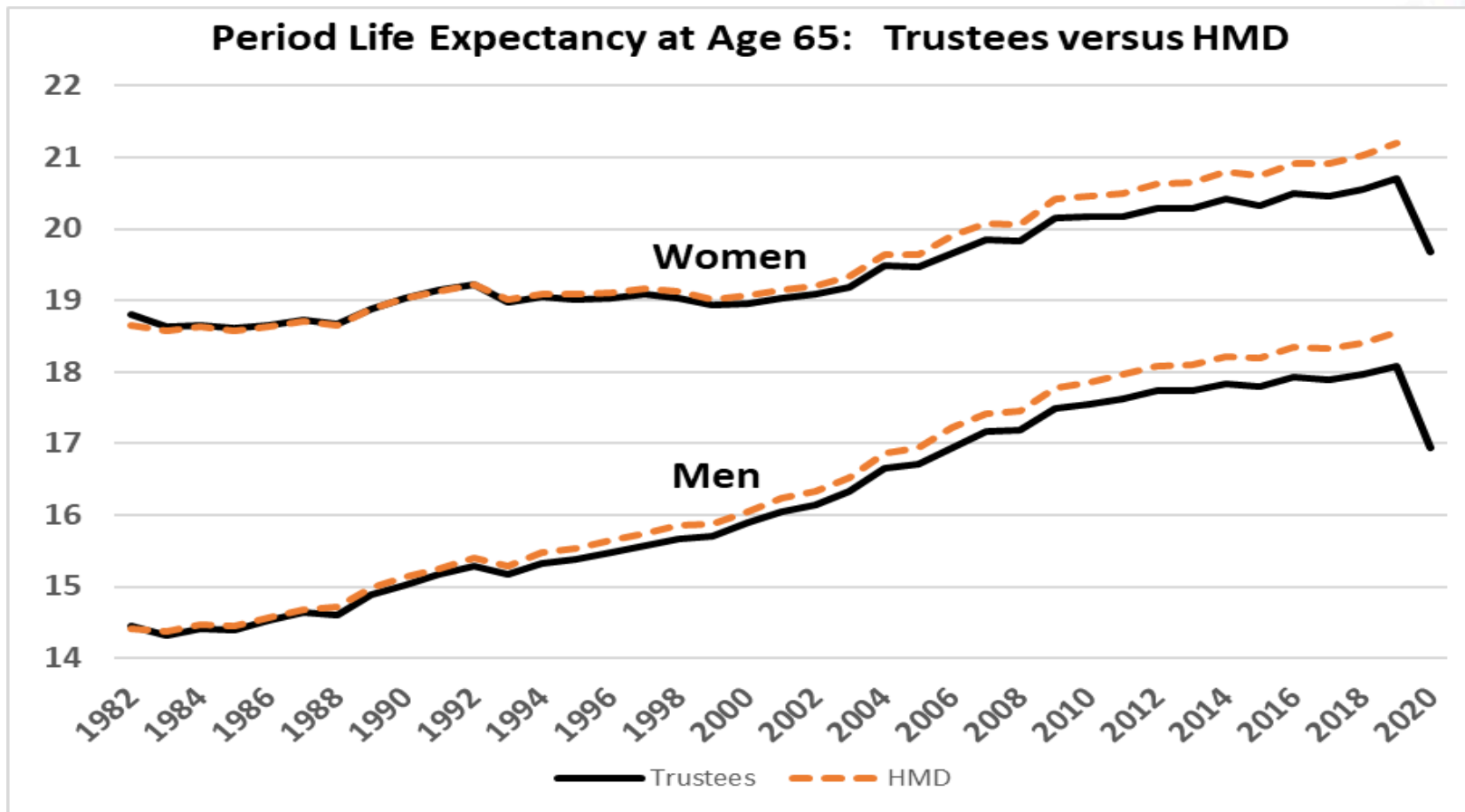
Level of Mortality Depends on Exposed Population

- Example: U.S. Death Rates Vary by Career Average Earnings Quintile –Lifetime consistent measure
Bosley, Morris, Glenn (2018): have the spreads roughly stabilized? At ages 65-69:



Level of Mortality also Depends on Data Source

- Trustees use consistent SSA/Medicare data, Human Mortality Database (HMD) uses National Center for Health Statistics (NCHS) deaths/Census exposure



Projected Mortality

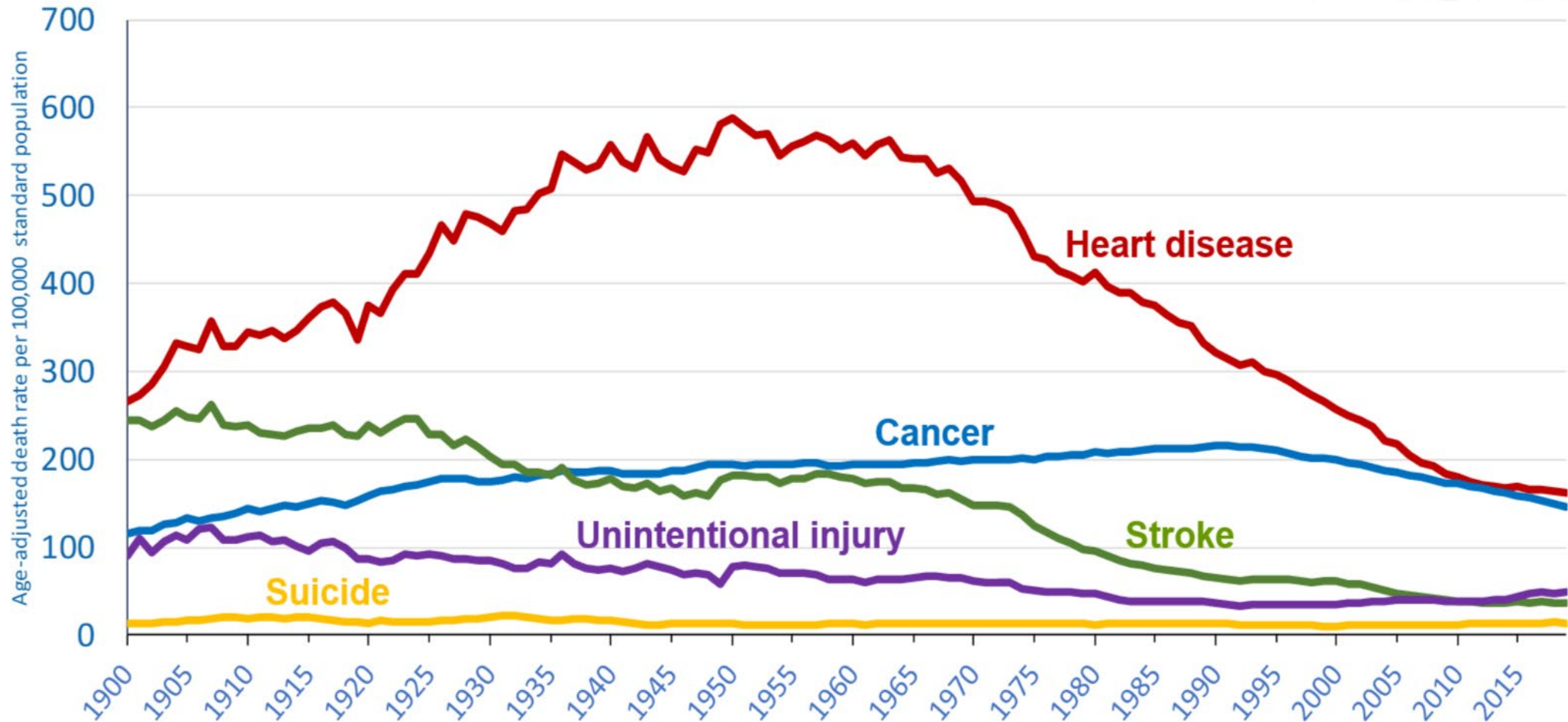
Approaches that can be used for Projecting

- Age setback (early method)
- Age-sex rate of decline matching a past period (Lee and Carter)
- Linear increase in life expectancy (Vaupel and Oeppen)
 - *Requires accelerating declines in mortality*
- Rate of decline same at all ages, (2011 Technical Panel, CBO 2013-15)
 - *Ignores age gradient in mortality improvement*
- Improvement by cohort (UK CMI, SOA)
 - *Does not differentiate health improvement from death deferral*
- Rate of decline by age, sex, and cause of death (SSA OCACT/Trustees)
 - *Understanding conditions of the past, and how they will change in the future*
 - *Note in 1982, Trustees projected 2015 Period LE at 65 to be 19.03; Actual 19.05*

How Future Conditions Will Differ from the Past

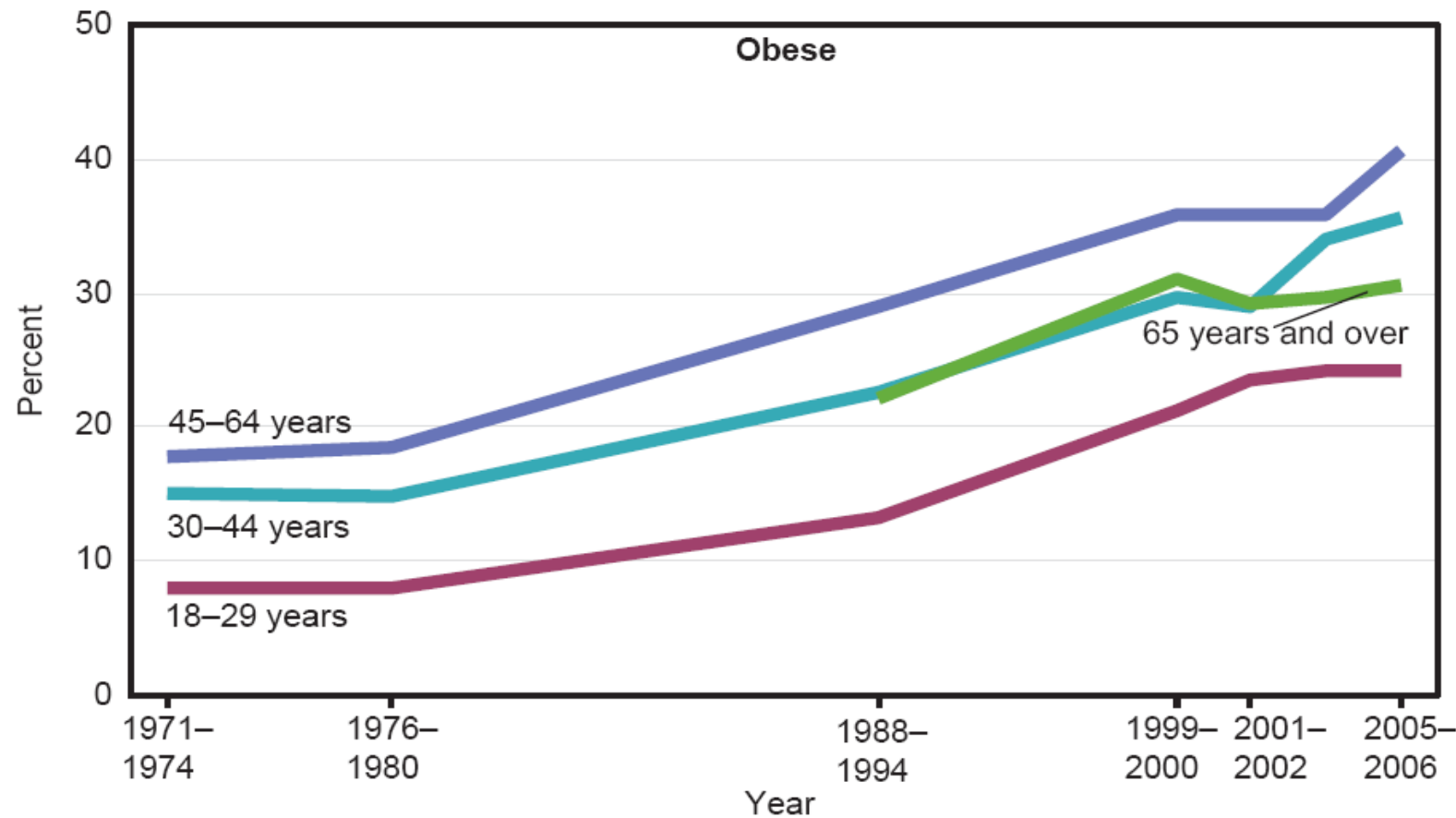
- Heart disease past success
- Cancer and dementia will be harder
- Obesity increase from sedentary lifestyle
- Difference by income/earnings
- Health spending—must decelerate
 - Advances only help if they apply to all
- Human limits
 - Increasing recognition of deceleration

Age-Adjusted Death Rates Due to Selected Leading Causes of Death: United States, 1900-2019



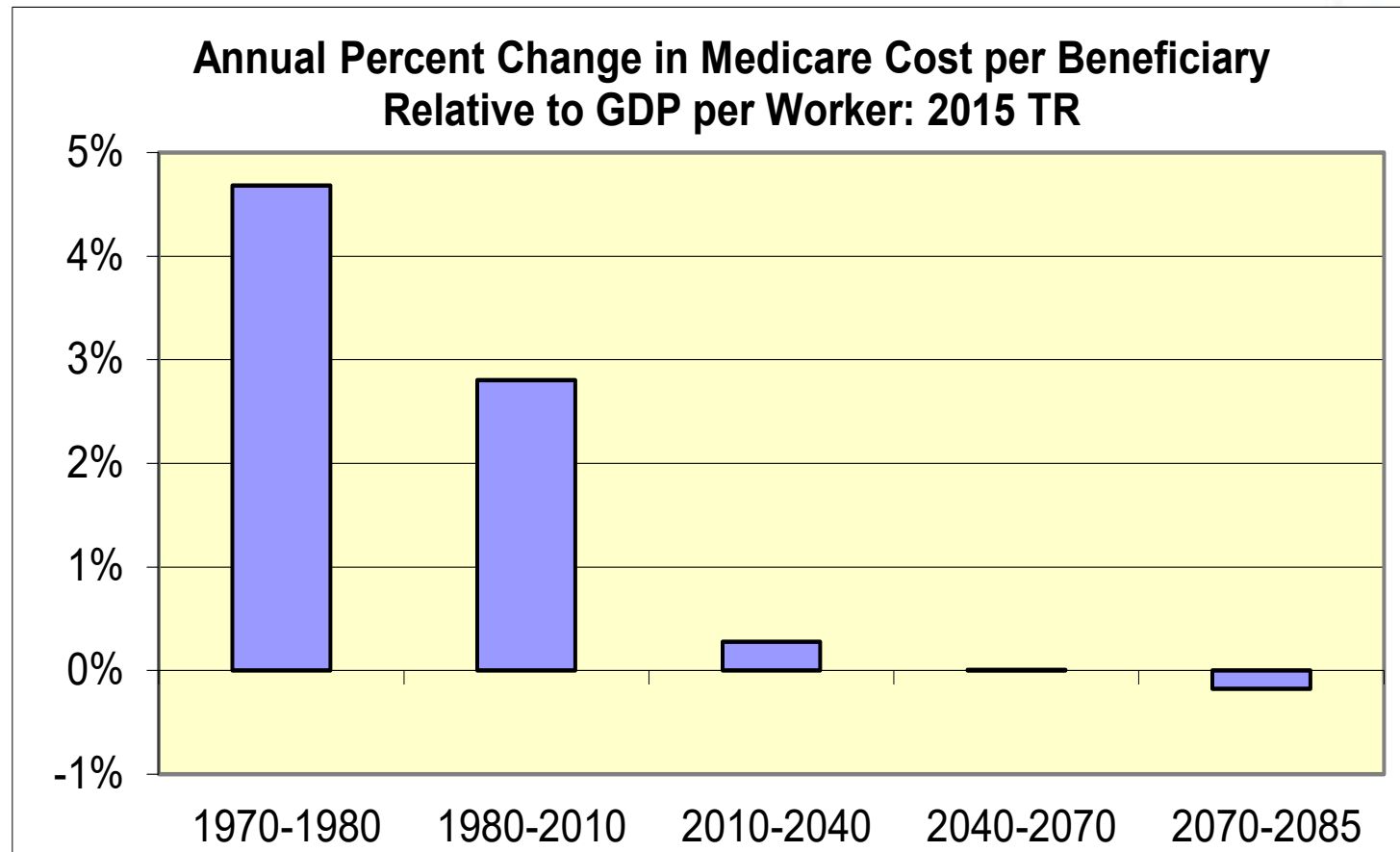
Trends in Obesity: US 1971 - 2006

- *Sam Preston 2010—must consider **cumulative** effects increasing duration of obesity for aged in future*



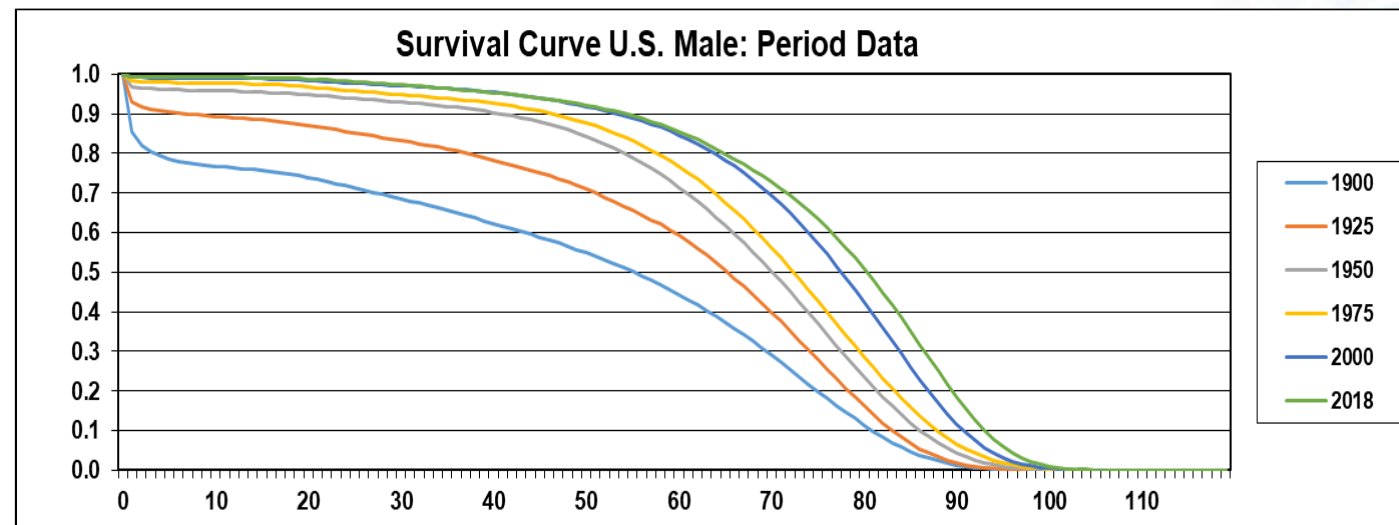
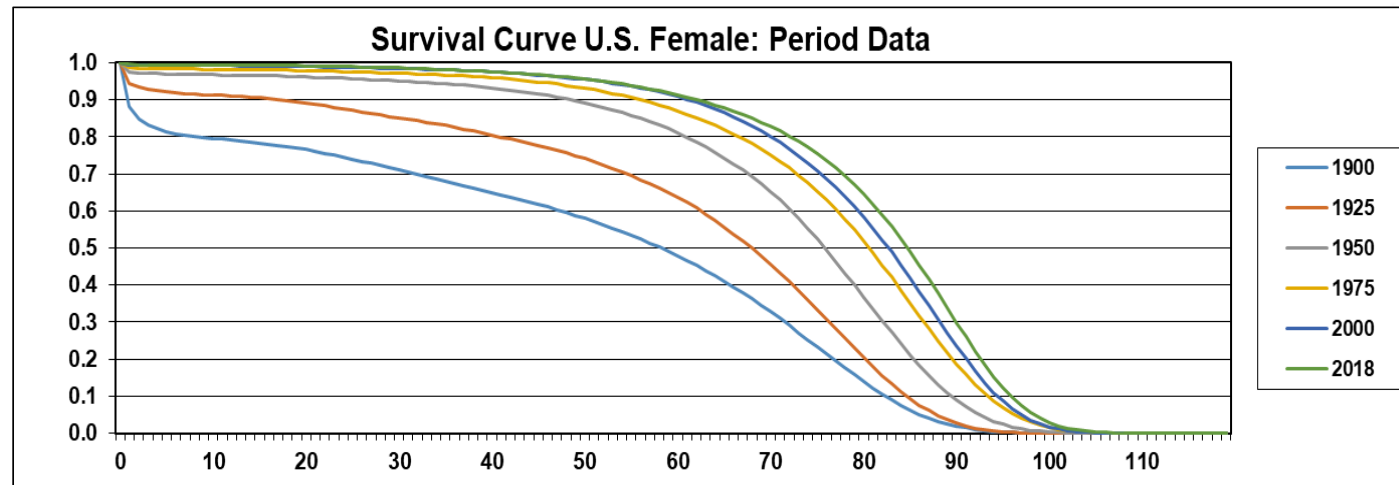
Health Spending Cannot Continue to Rise as Historical Rates Effects on Mortality?

Note Trustees' deceleration



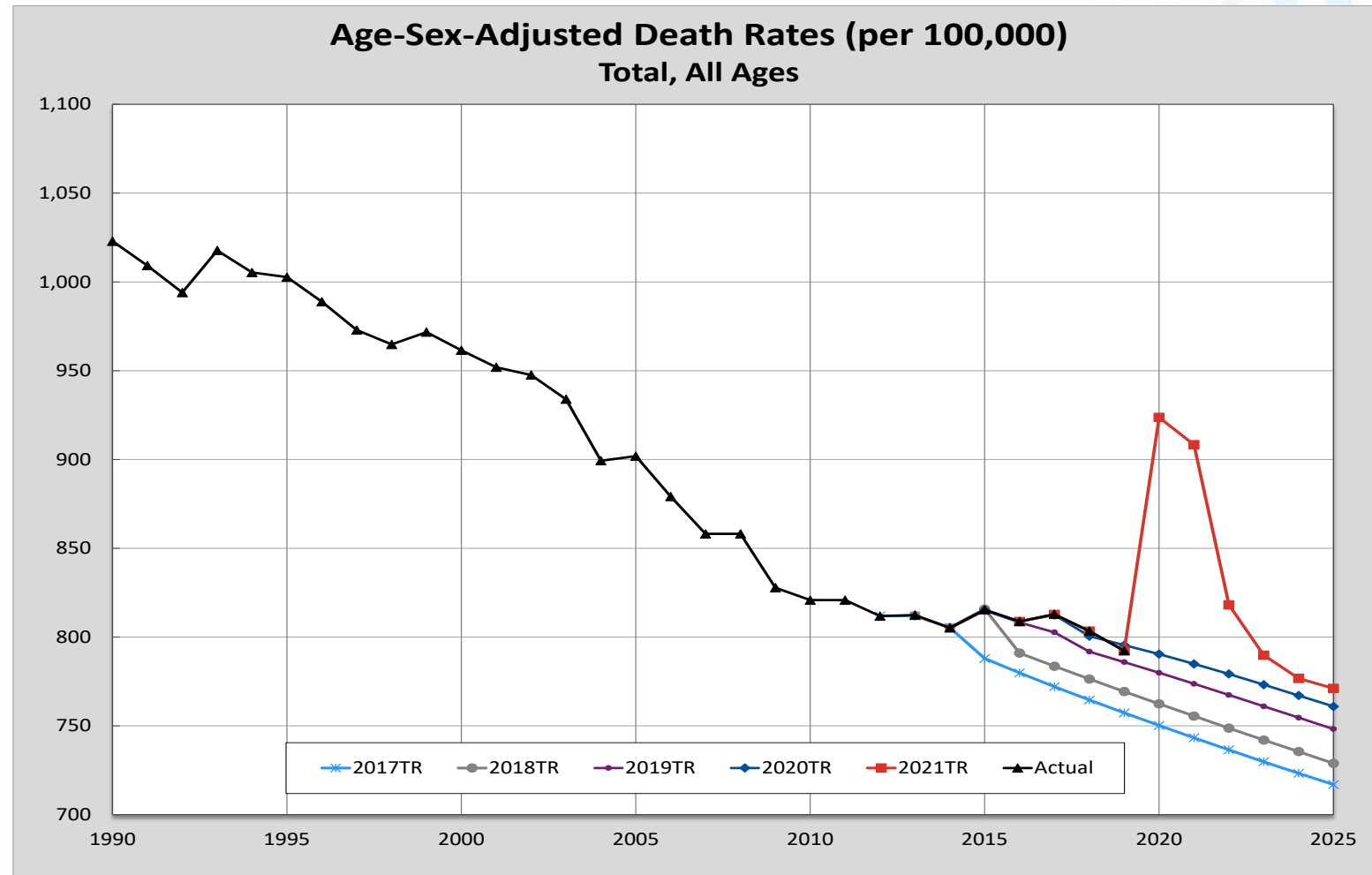
Is there an Omega?

Highest attained age has changed little; it appears we are rectangularizing the survival curve



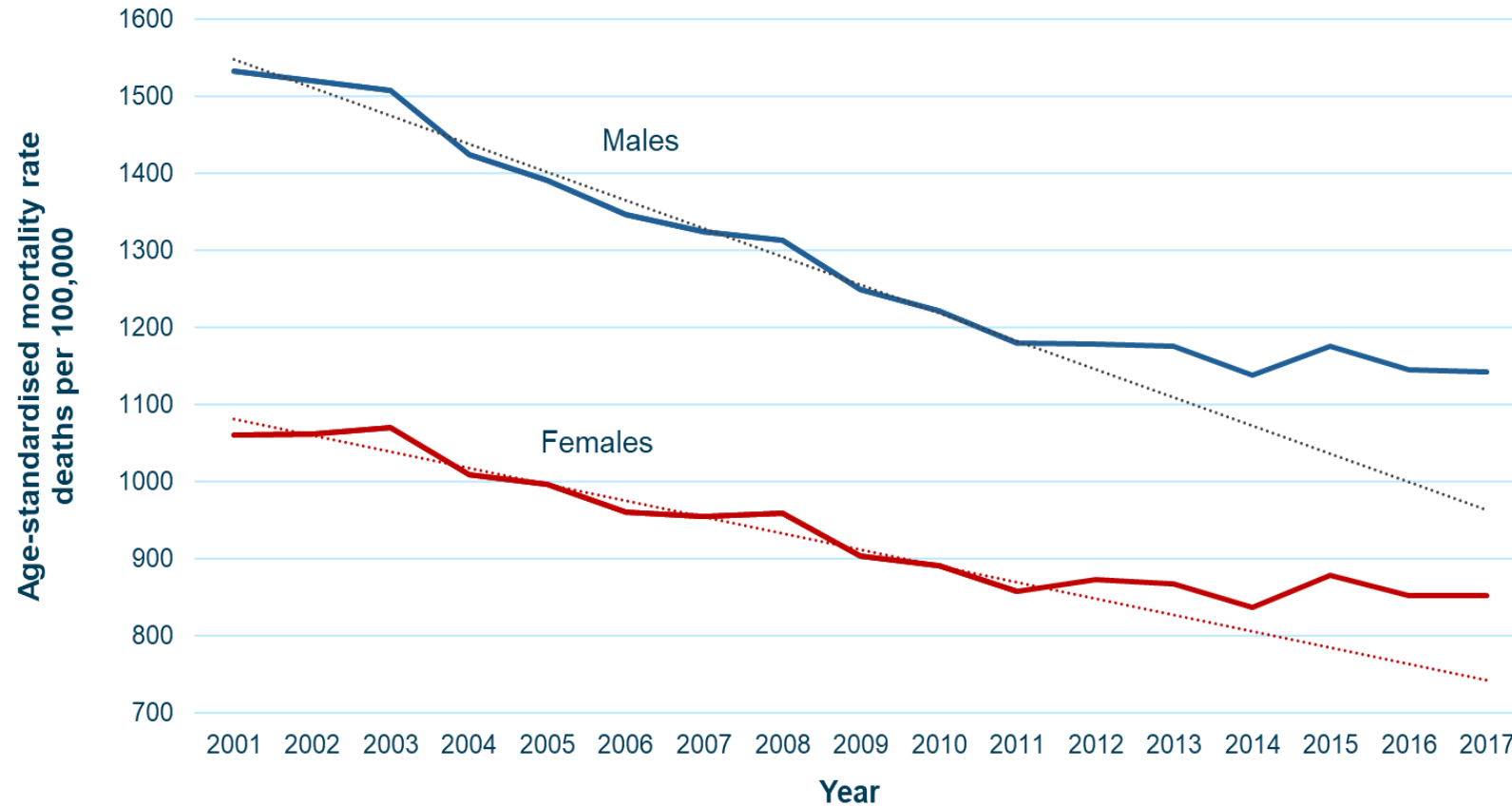
Mortality Experience All Ages SSA

Reductions slow after 2009, and continue to fall short of past trend



US is Not Alone - UK Deceleration Since 2011

January 2020 Living to 100 Conference: Adrian Gallop, UK Government Actuary's Office



Appendix

Cohort Considerations

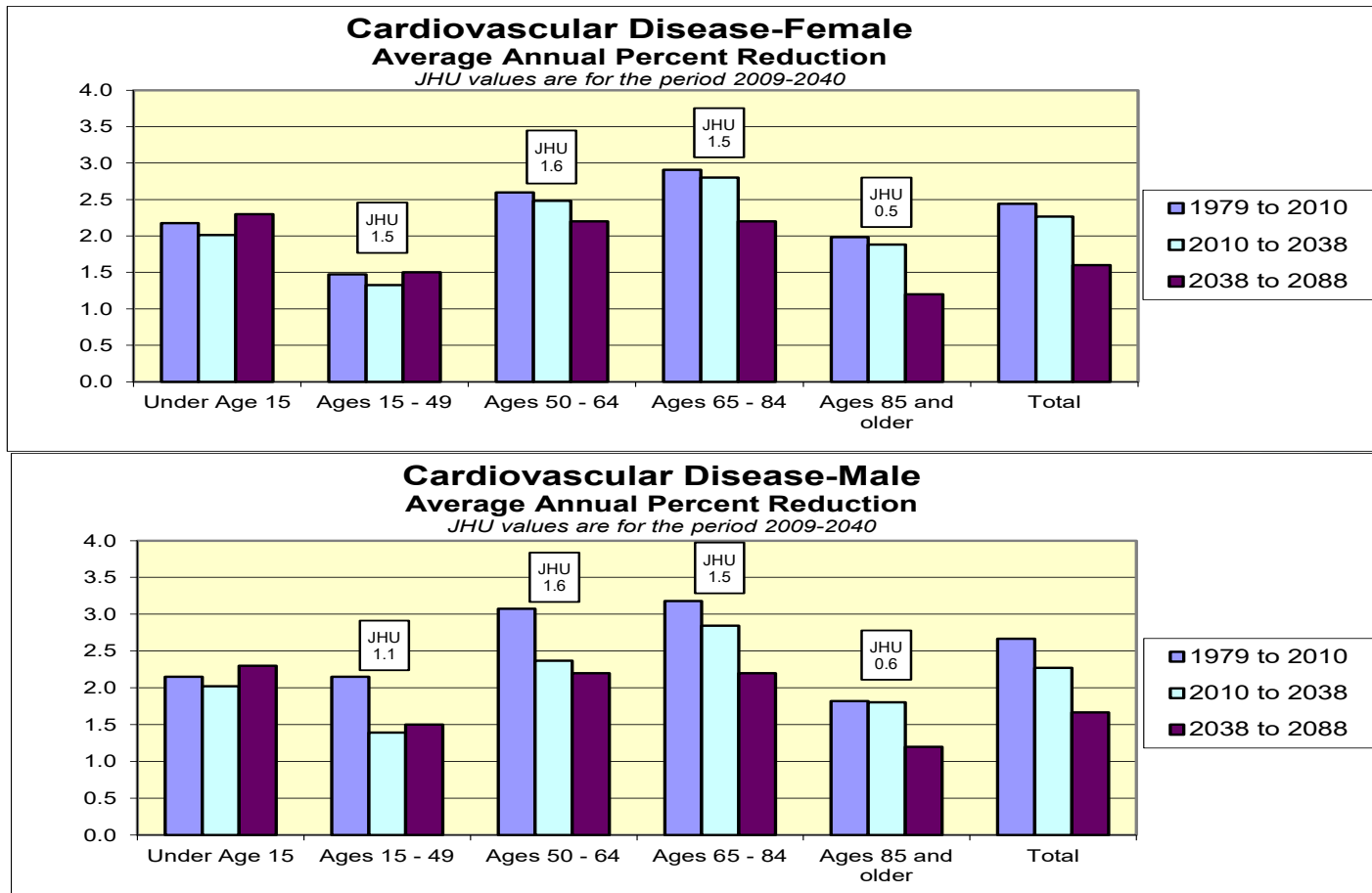
- Post-World War 2 births—special conditions:
 - Antibiotics when young; statins, etc. later
- What does change up to age x say above age x ?
 - If cohort is fundamentally healthier at age x ...
Then expect lower mortality over age x
 - But if medical interventions have just reduced deaths...
Then cohort mortality over age x could be worse, with increased numbers of impaired survivors
 - What does one cohort imply for the next cohort?
Further changes depend on conditions, not trend

Developing Assumptions by Cause

- Scientific approach reflecting biology
- Trustees and SSA OCACT develop in consultation with other experts
- Johns Hopkins recent survey of medical researchers and clinicians came to very similar medium-term expectations—independently
 - Trustees' medium-term rates by cause had not been published

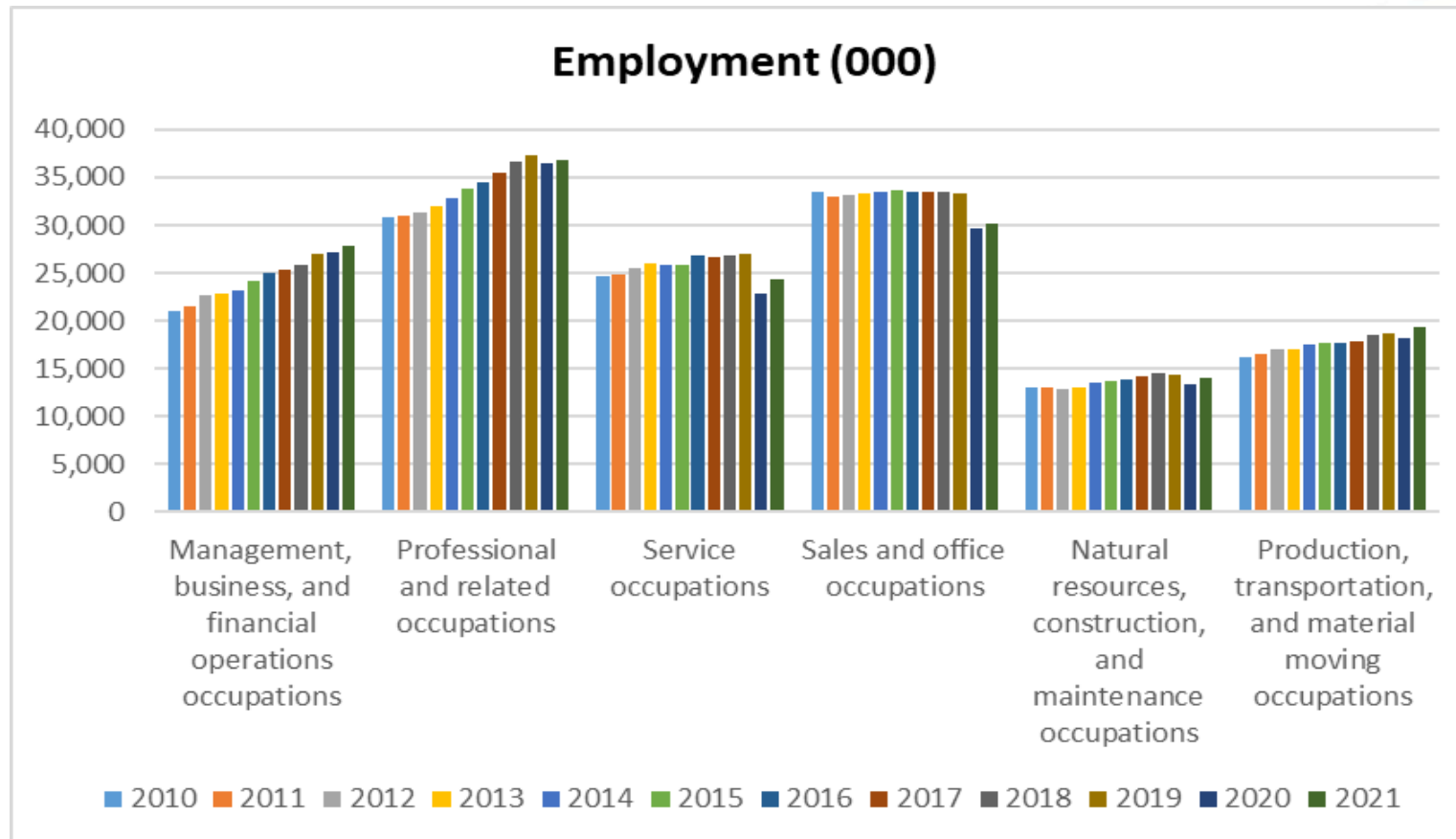
Demographic Assumptions by Cause

Cardiovascular Example: JHU was less optimistic than trustees over age 50 for next 30 years



US Population: Employment and Retirement Trends

- Employment by occupation--- changing distribution toward employment to higher ages



COVID-19 BA2 Variant: Reported Cases and Hospitalizations Starting in April

Daily Trends in Number of Cases and 7-day Average of New Patients Admitted to Hospital with Confirmed COVID-19 in The United States Reported to CDC

