

2023

SESSION 3-B-1

Demographics Assumptions Setting Post-COVID

MAY 1, 3 & 5

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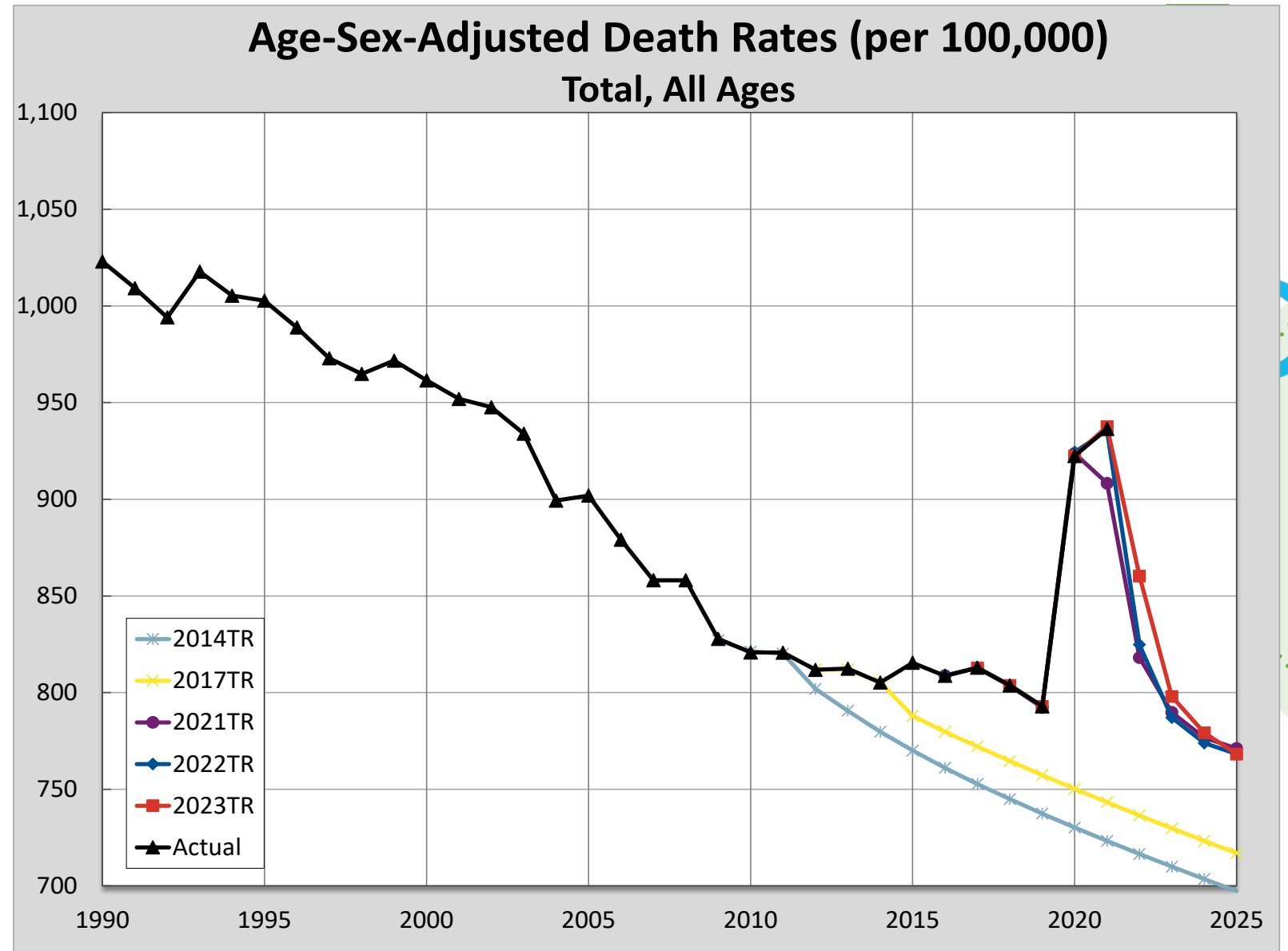
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Section 2: Base Mortality

Social Security Area Mortality Experience: All Ages

Deceleration in 2009 to 2019.
Increased mortality in the
COVID-19 pandemic.

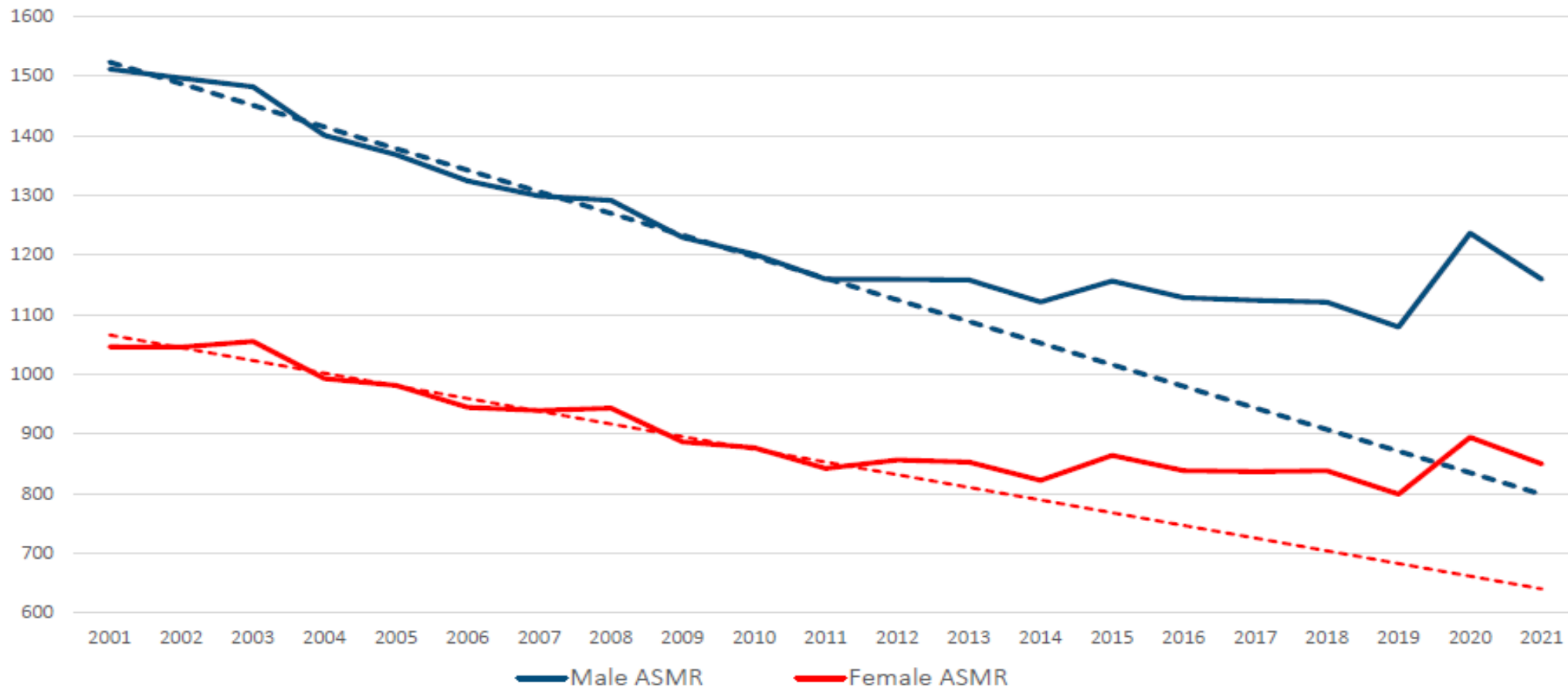
*We assume return to pre-COVID
trendline : balance selective
mortality in pandemic and post-
COVID conditions for survivors*



US is Not Alone—United Kingdom Deceleration Since 2011

January 2023 Living to 100 Conference: Adrian Gallop, UK Government Actuary's Office

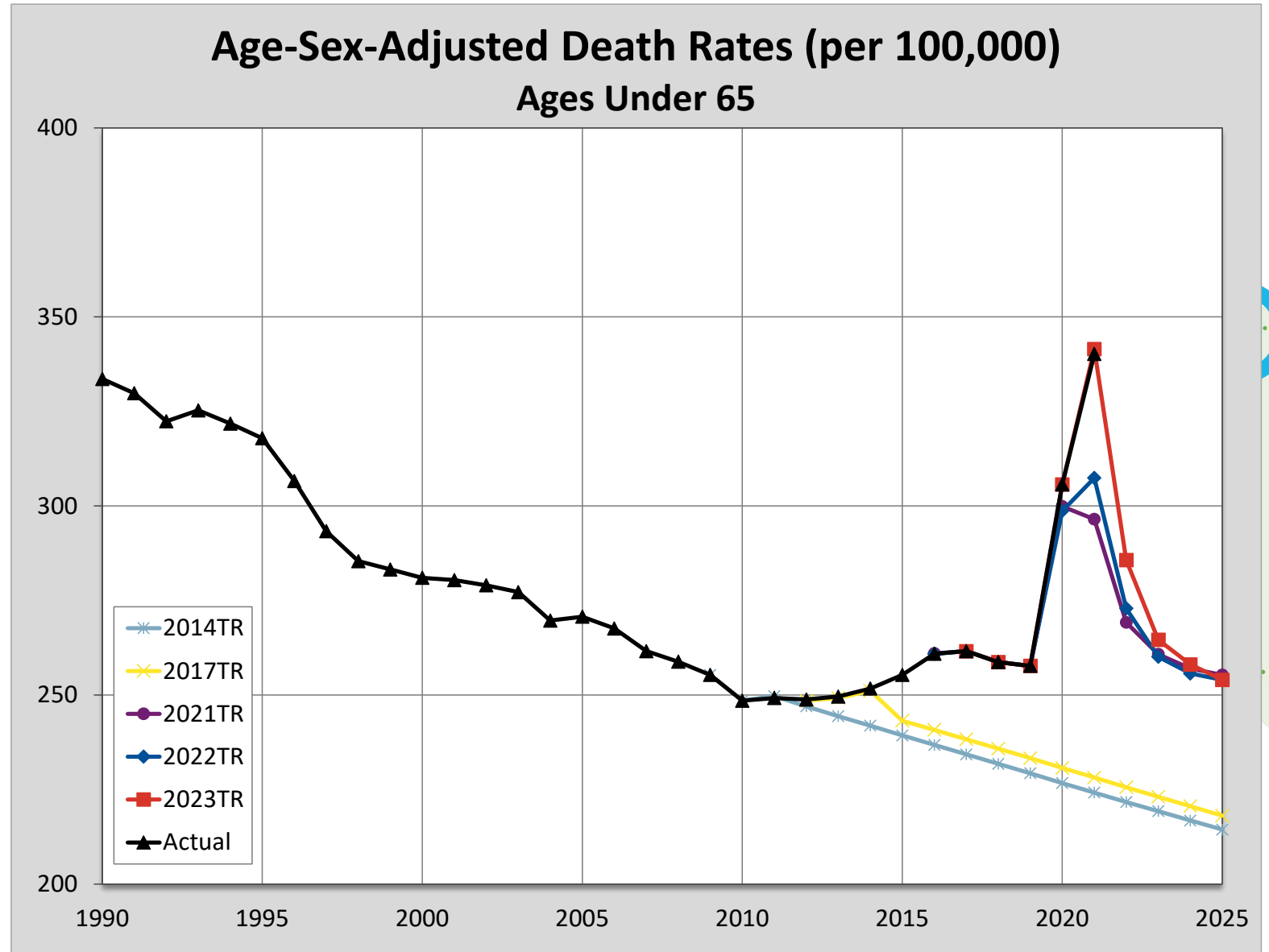
Age standardised mortality rates, Male & Females, E&W



Social Security Area Mortality Experience: Ages Under 65

Reversal of trend after 2009--
despair. Increased mortality in
2020-2022 in the COVID-19
pandemic.

*Note spike in 2021 when
COVID vaccine was not
available at younger ages*

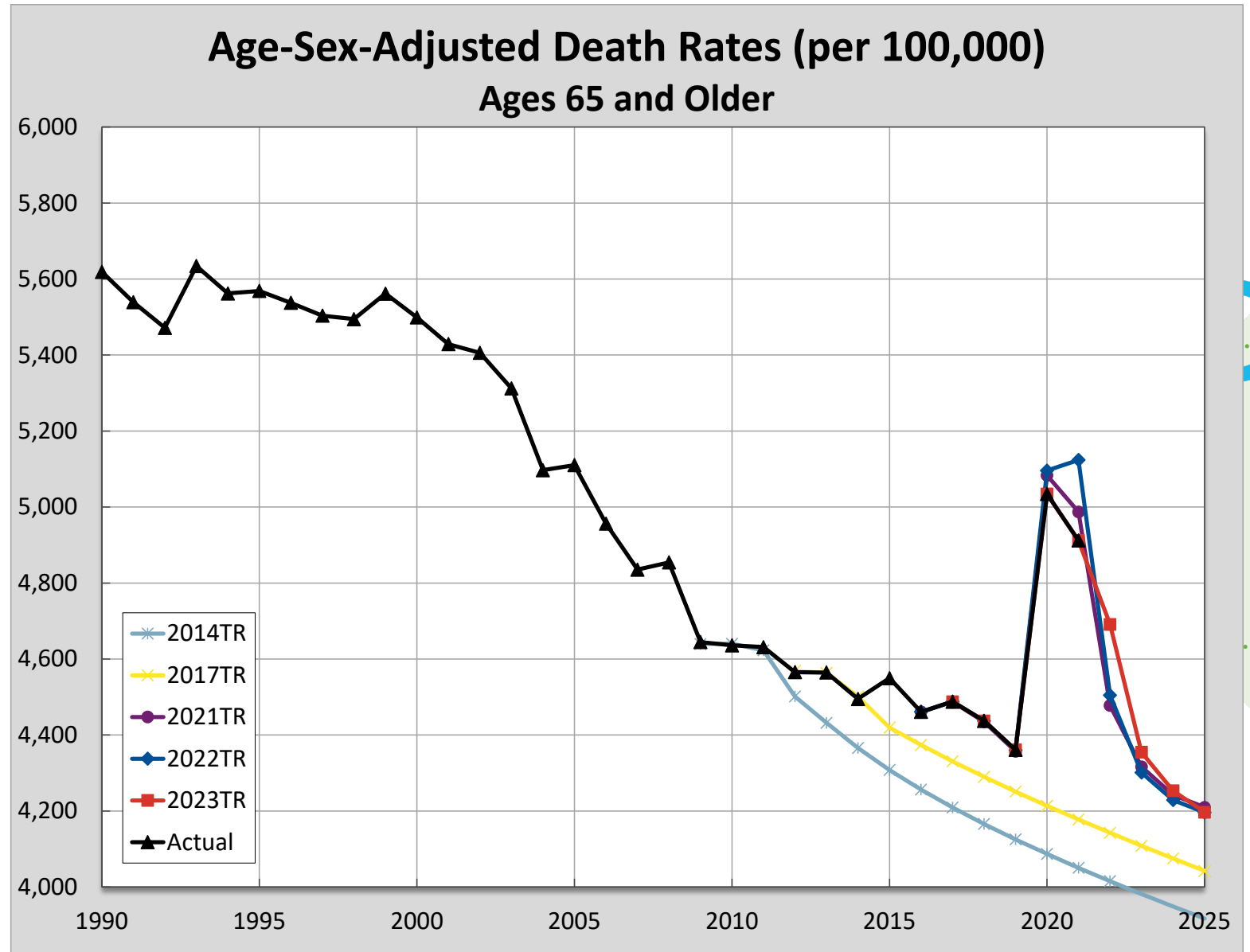


Social Security Area Mortality Experience: Ages 65 and Older

Deceleration since 2009.
Increased spike mortality in
the COVID-19 pandemic.

*What will the net effect of the
pandemic be on mortality in
the future?*

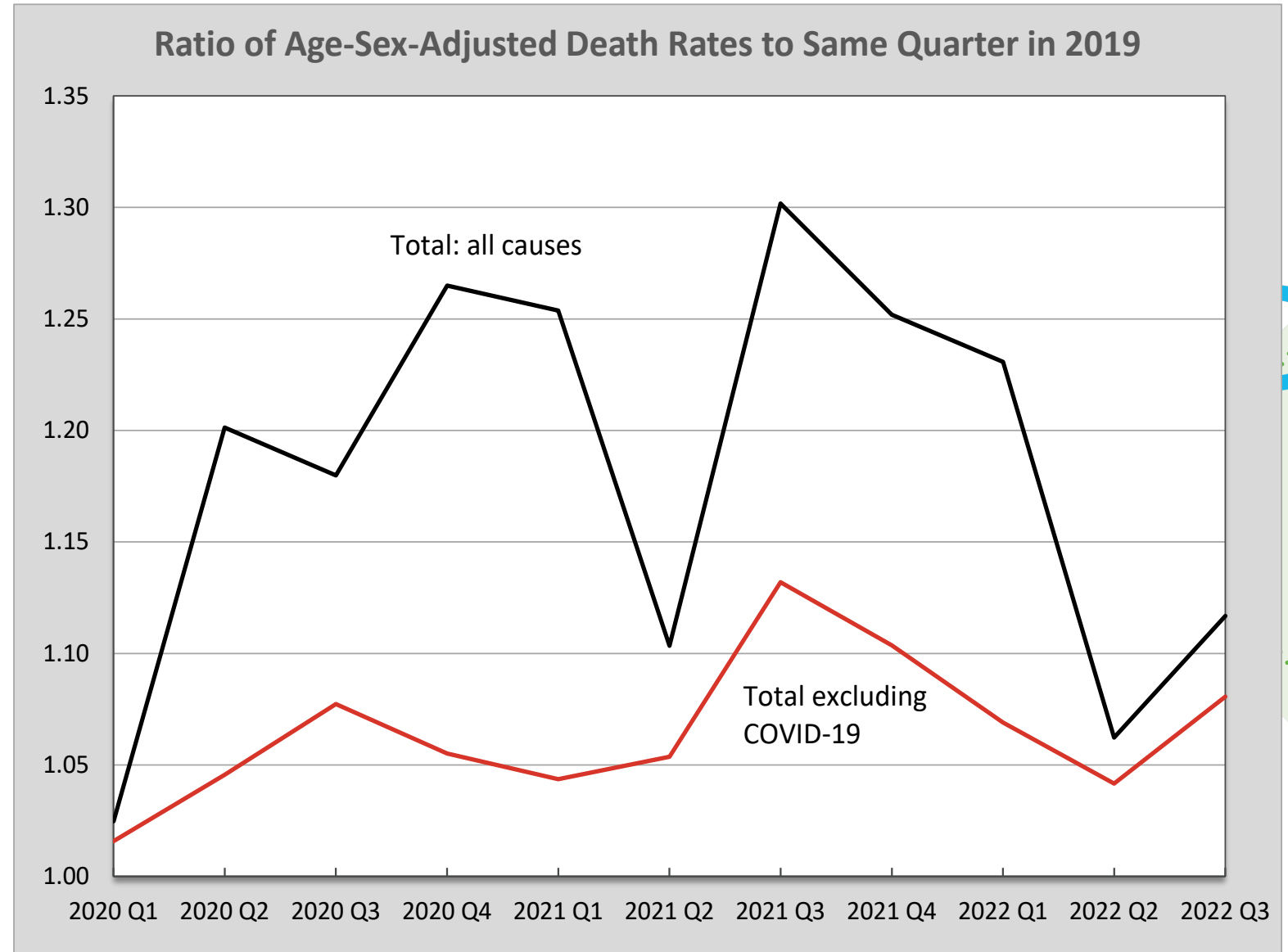
*Will offsetting effects balance
for the residual population
after the pandemic?*



Ratio of Age-Sex Adjusted Death Rates to Same Quarter in 2019

Through 2022 death rates for causes other than COVID have been about 5% higher in the pandemic period than they were in 2019.

Post-COVID conditions will continue to affect those surviving the pandemic.



Change in Age-Sex-Adjusted Death Rates

Change in Age-Adjusted Death Rates from the Same Quarter in 2019, by Cause of Death											
Cause of Death	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2022 Q1	2022 Q2	2022 Q3
Alzheimer disease	1.013	1.119	1.134	1.082	1.076	0.979	1.076	1.003	1.054	0.965	1.007
COVID-19	--	--	--	--	--	--	--	--	--	--	--
Cancer	0.995	0.965	0.994	0.986	0.975	1.000	1.021	1.009	0.970	0.975	0.988
Chronic liver disease and cirrhosis	1.063	1.116	1.252	1.256	1.286	1.241	1.315	1.282	1.277	1.179	1.198
Chronic lower respiratory diseases	0.991	0.909	0.970	0.935	0.793	0.850	1.030	0.989	0.846	0.858	0.935
Diabetes	1.013	1.170	1.222	1.200	1.149	1.108	1.253	1.186	1.157	1.057	1.116
Drug overdose	1.212	1.495	1.330	1.197	1.542	1.605	1.496	1.355	1.562	--	--
Falls, ages 65 and over	1.007	1.013	1.069	1.084	1.123	1.167	1.184	1.215	1.183	1.159	--
Firearm-related injury	1.071	1.101	1.202	1.212	1.204	1.244	1.250	1.246	1.221	1.235	--
Heart disease	0.992	1.048	1.070	1.054	1.039	1.033	1.128	1.102	1.064	1.015	1.055
HIV disease	1.000	1.000	1.000	1.077	0.933	0.857	1.000	1.077	0.933	0.929	1.000
Homicide	1.109	1.267	1.359	1.387	1.327	1.417	1.359	1.306	1.309	1.317	--
Hypertension	1.021	1.149	1.171	1.165	1.175	1.115	1.256	1.242	1.175	1.138	1.183
Influenza and pneumonia	1.143	1.052	1.045	0.939	0.629	0.774	1.135	1.053	0.674	0.835	0.966
Kidney disease	1.007	0.984	1.034	0.977	1.044	1.024	1.120	1.076	1.140	1.073	1.120
Parkinson disease	1.032	1.157	1.157	1.128	1.097	1.084	1.157	1.117	1.129	1.084	1.120
Pneumonitis due to solids and liquids	0.943	0.870	1.000	0.957	0.925	1.022	1.195	1.170	1.000	1.043	1.049
Septicemia	1.000	1.011	1.057	1.020	1.000	1.000	1.172	1.122	1.019	1.043	1.103
Stroke	1.018	1.042	1.080	1.060	1.098	1.095	1.144	1.112	1.127	1.073	1.103
Suicide	1.000	0.923	0.966	0.977	0.985	0.979	1.007	1.060	1.022	1.021	--
Unintentional injuries	1.086	1.216	1.216	1.146	1.307	1.355	1.318	1.269	1.341	1.255	--
Total	1.025	1.201	1.180	1.265	1.254	1.103	1.302	1.252	1.231	1.062	1.117
Total w/o COVID	1.016	1.046	1.077	1.055	1.044	1.054	1.132	1.104	1.069	1.042	1.081

Source: NCHS Quarterly Provisional Estimates as of March 20, 2023

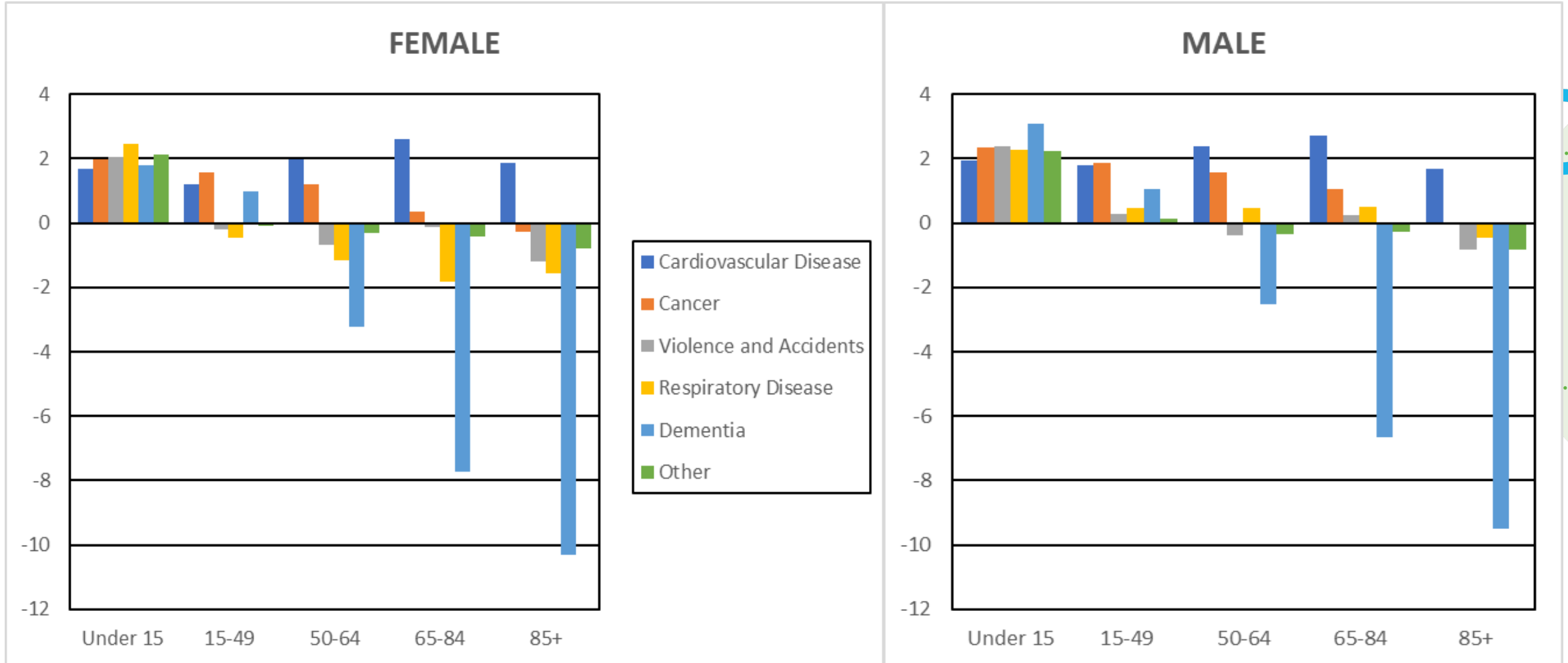
Section 3: Projected Mortality

Death Rates Will Continue to Decline: But How Fast?

- Must understand past and likely future conditions
 - Avoid simple extrapolation of past periods
 - Latter half of 20th century was extraordinary Cardio and health advances
 - So deceleration seems likely
 - Cause-specific rates and human behavior
 - Persistent historical “age gradient”, slower improvement at high ages
 - Trustees Accuracy:
 - in the 1982 TR, we projected period LE65 for 2015 to be 19.1;
 - actual for 2015 turned out to be 19.1

US Mortality Decline from 1979-2019 by Cause of Death:

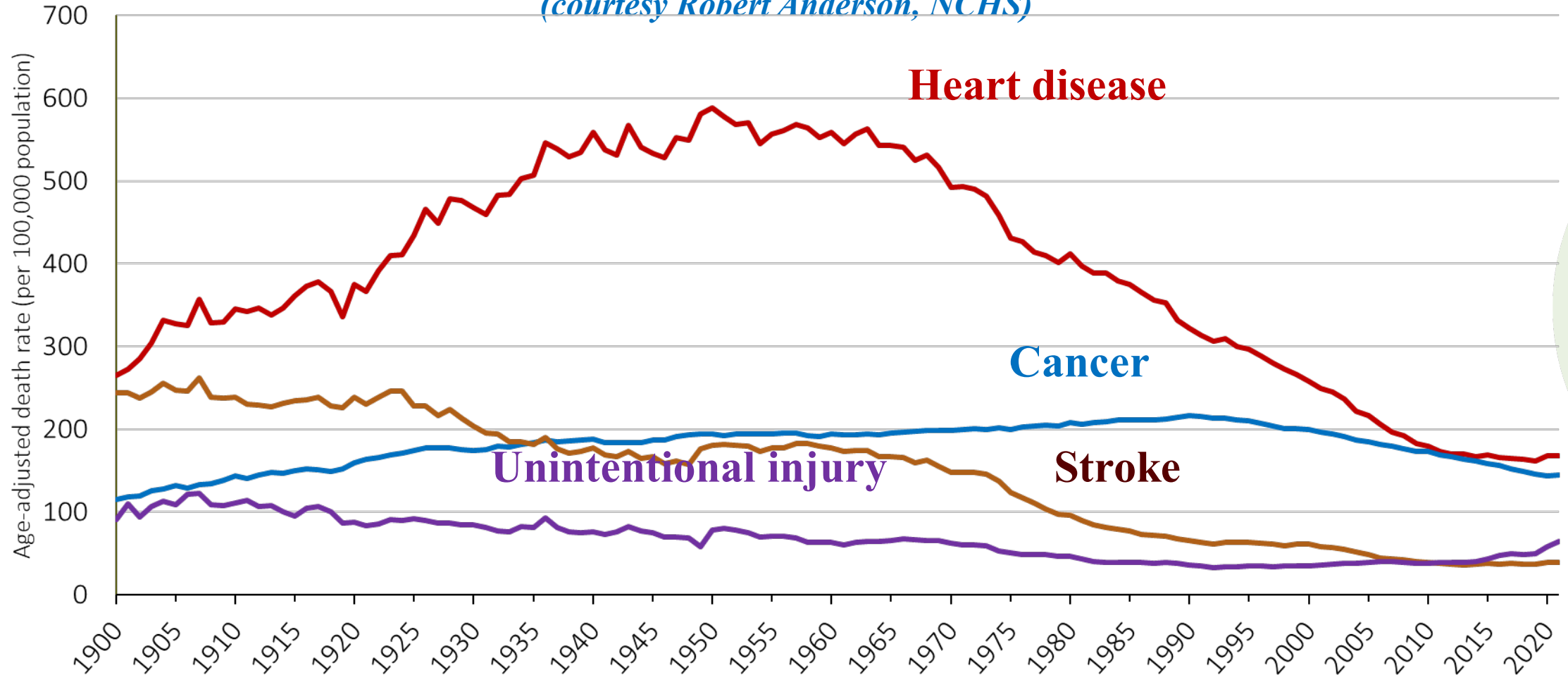
Over age 50 several negatives, will Cardio Sustain Improvement



Age-Adjusted Death Rates for Heart Disease, Cancer, Stroke and Unintentional Injuries: United States, 1900-2021

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(courtesy Robert Anderson, NCHS)



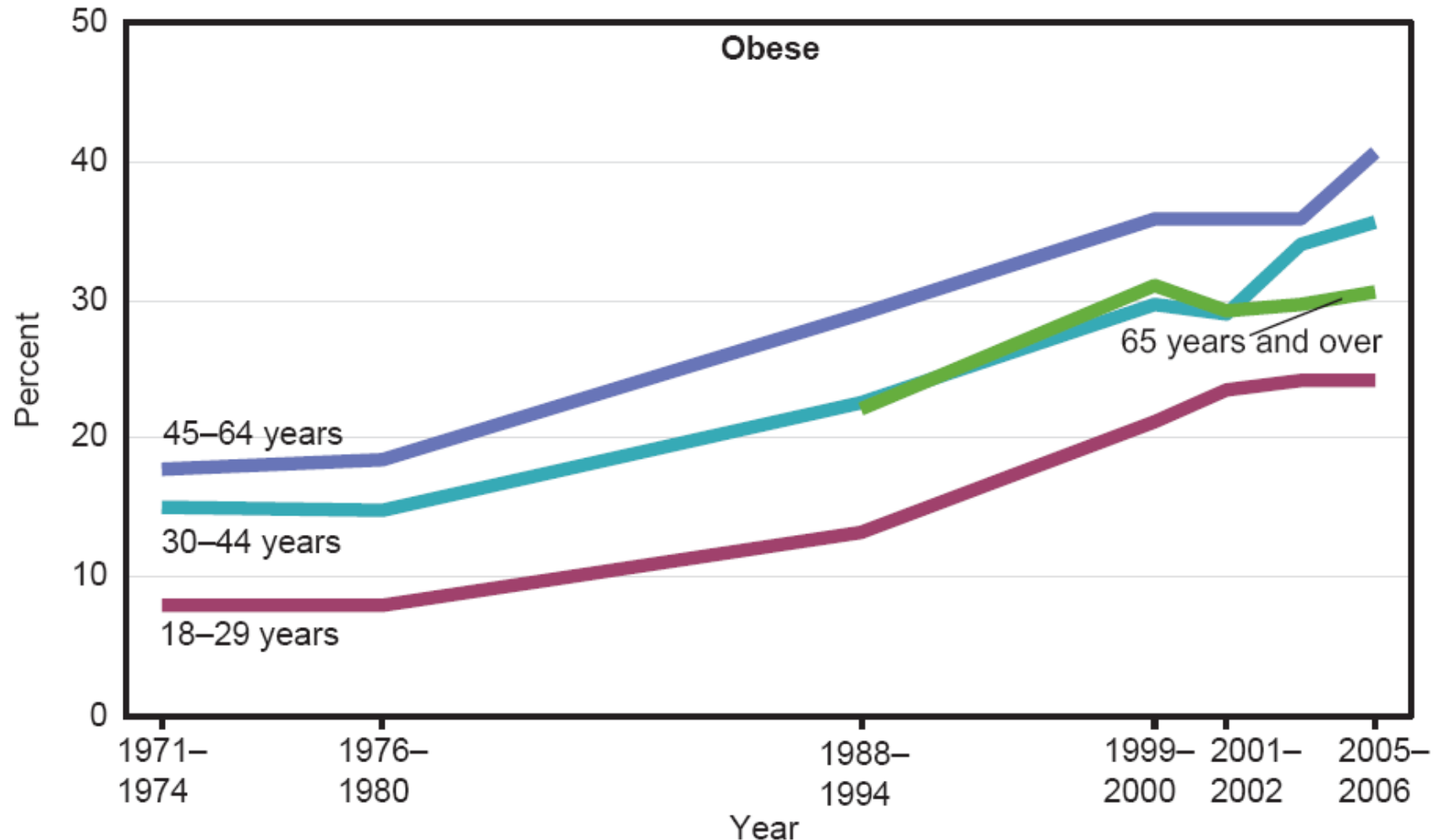
Notes: Data are from the National Vital Statistics System. Prior to 1933, data are for death-registration States only. Data for 2021 are provisional.

Future Conditions, *Including Behavior*

- Smoking decline but “deaths of despair” continue
- Obesity—sedentary lifestyle
- Health spending—will decelerate
 - An ageing population, and Climate Change will strain resources
- Periodic pandemics will elevate the average *level* of mortality in the future----*diminishing life expectancy*

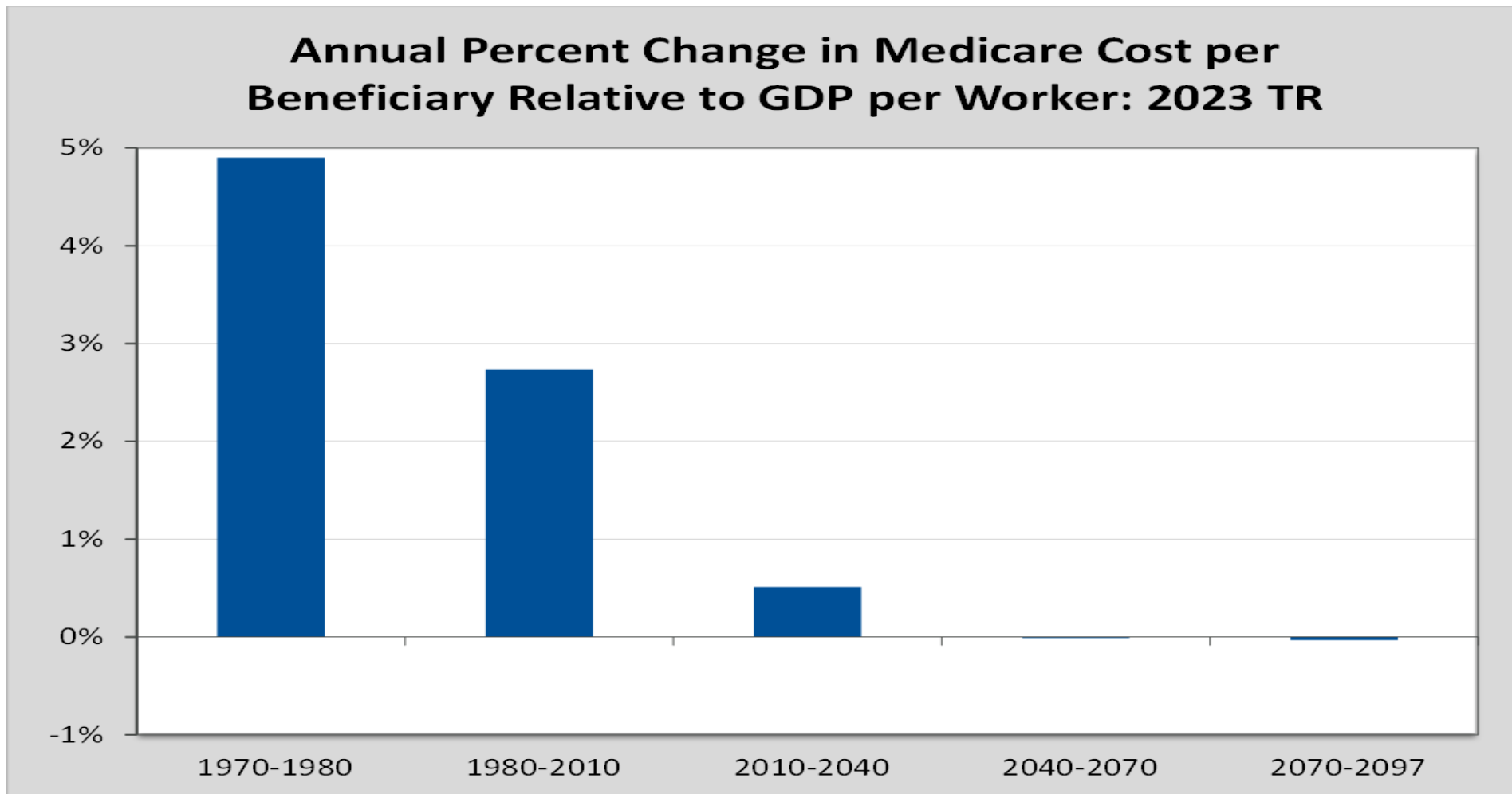
Trends in Obesity: US 1971-2006

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



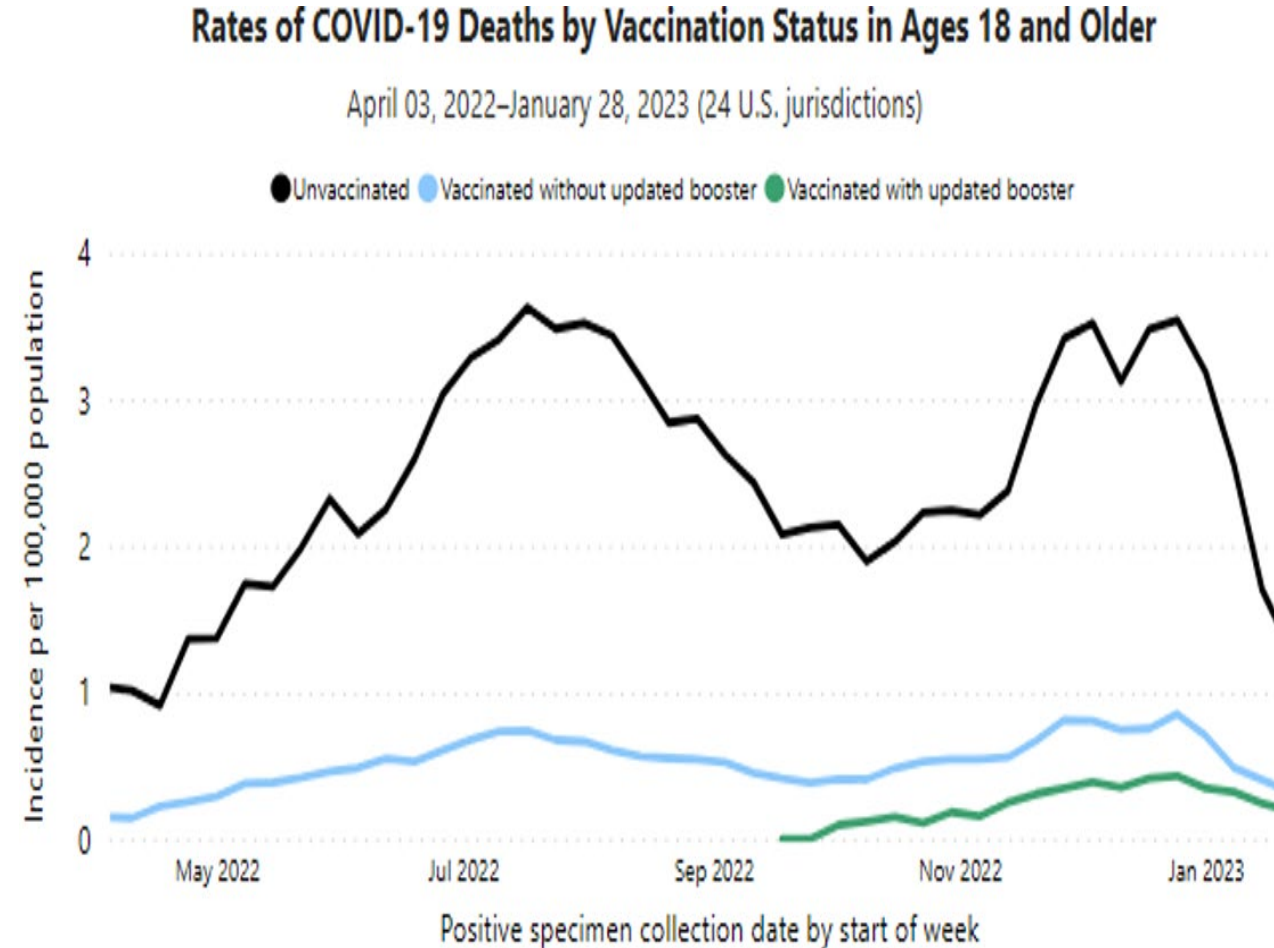
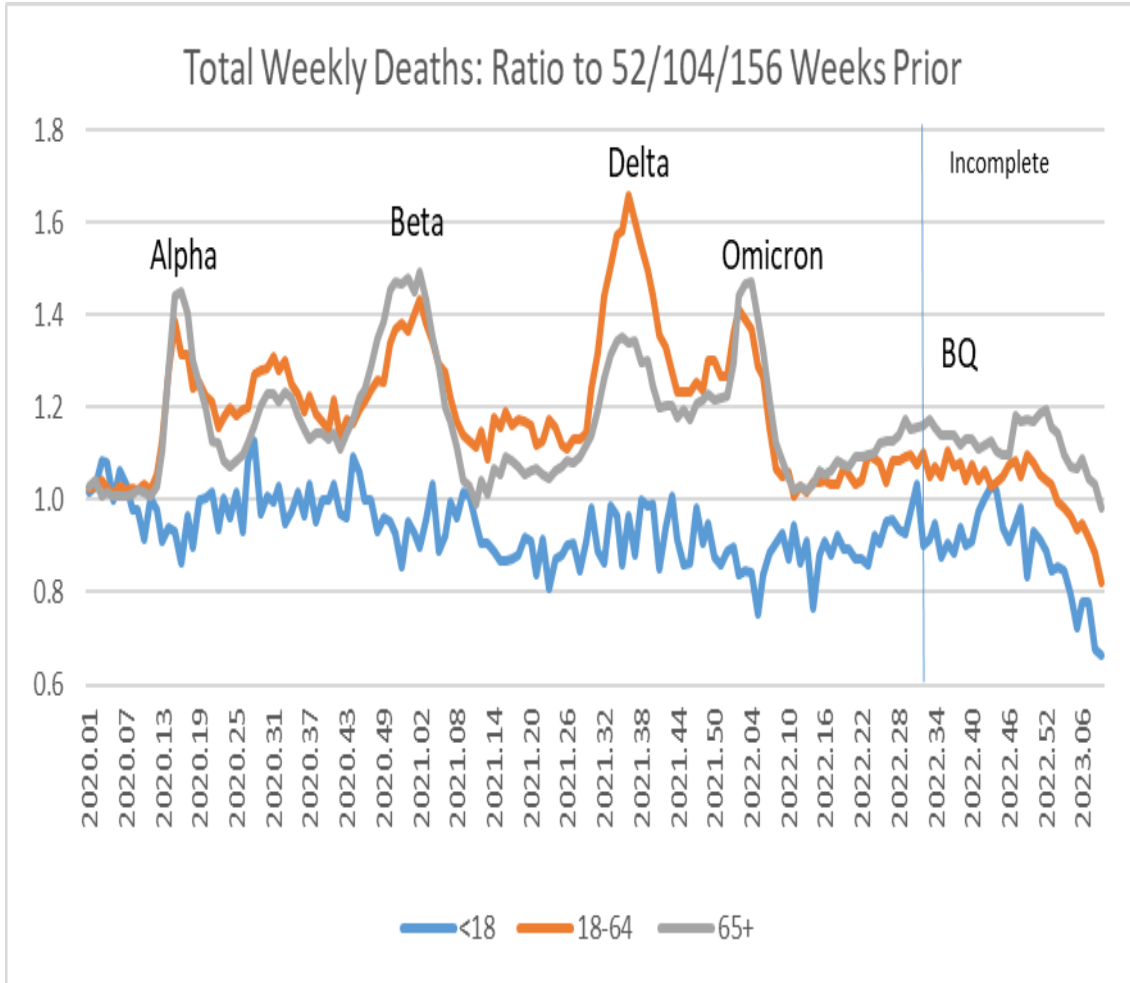
Health Spending Cannot Continue to Rise at Historical Rates

Trustees project deceleration, but beneficiaries rising faster than workers

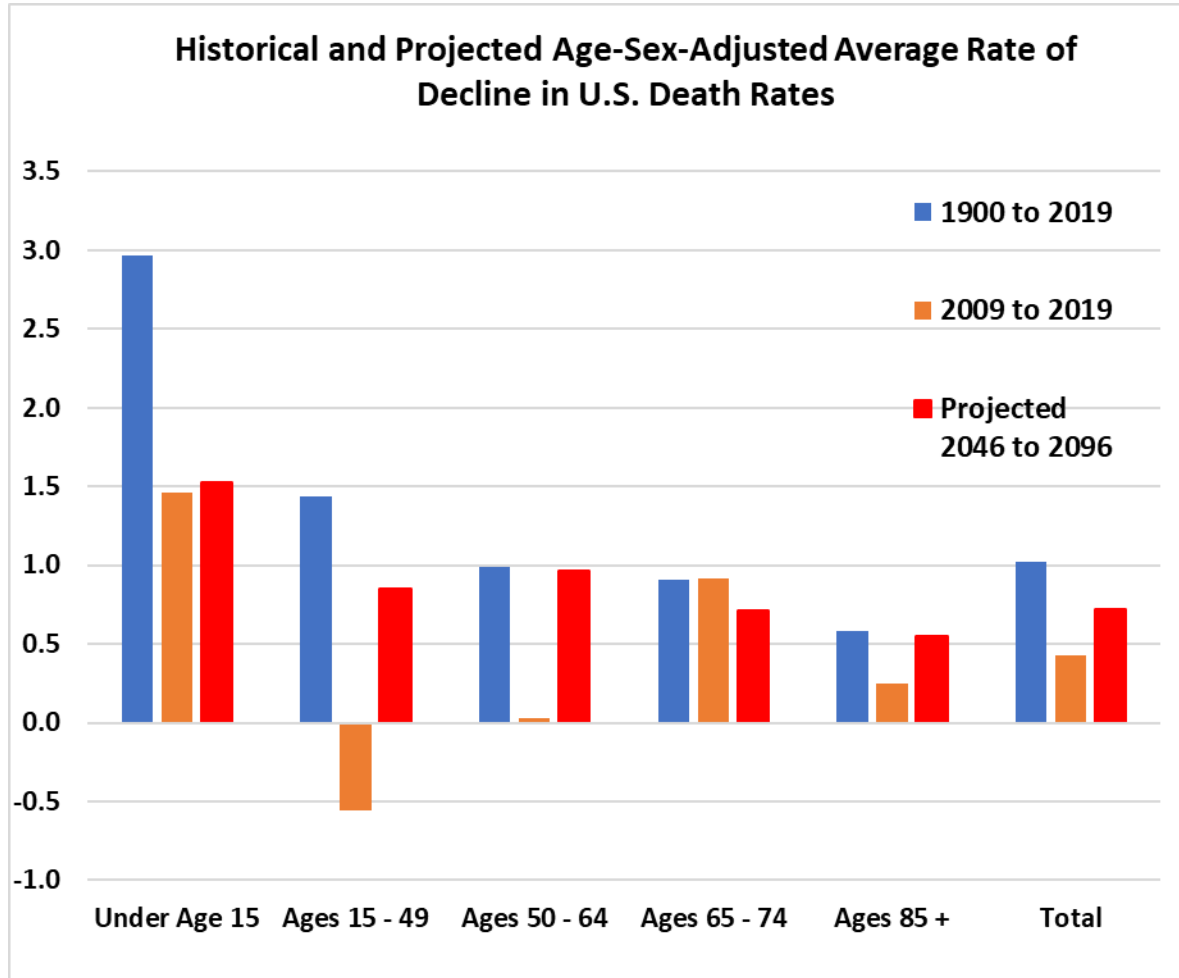


COVID-19 is Not Over. More Waves and Pandemics to Come ^{May 1, 3 & 5}

Vaccination in US age 18+ to date: primary series 79%, bivalent booster only 20%



Our Ultimate (2046 to 2096) Projected Rates of Decline: Less than 0.78% for ages 65 and over

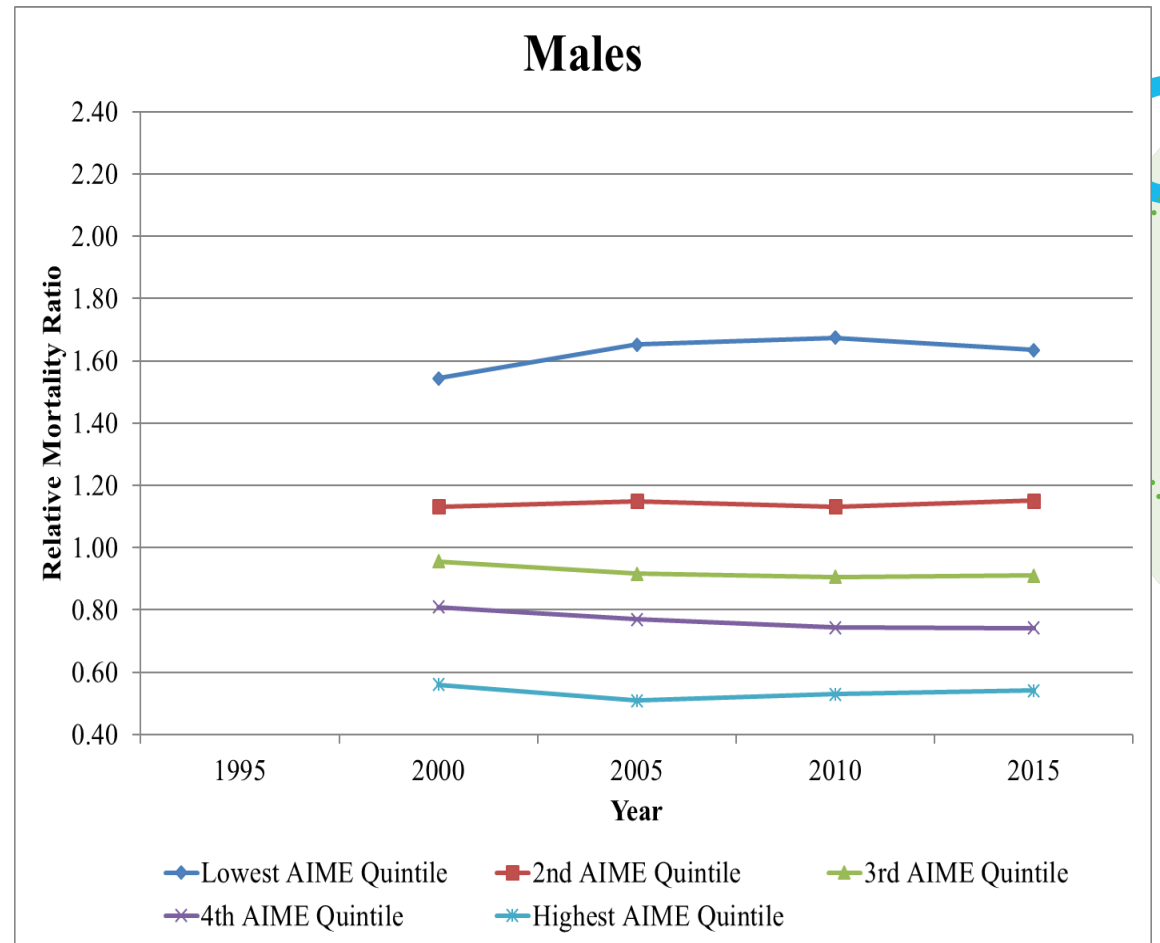
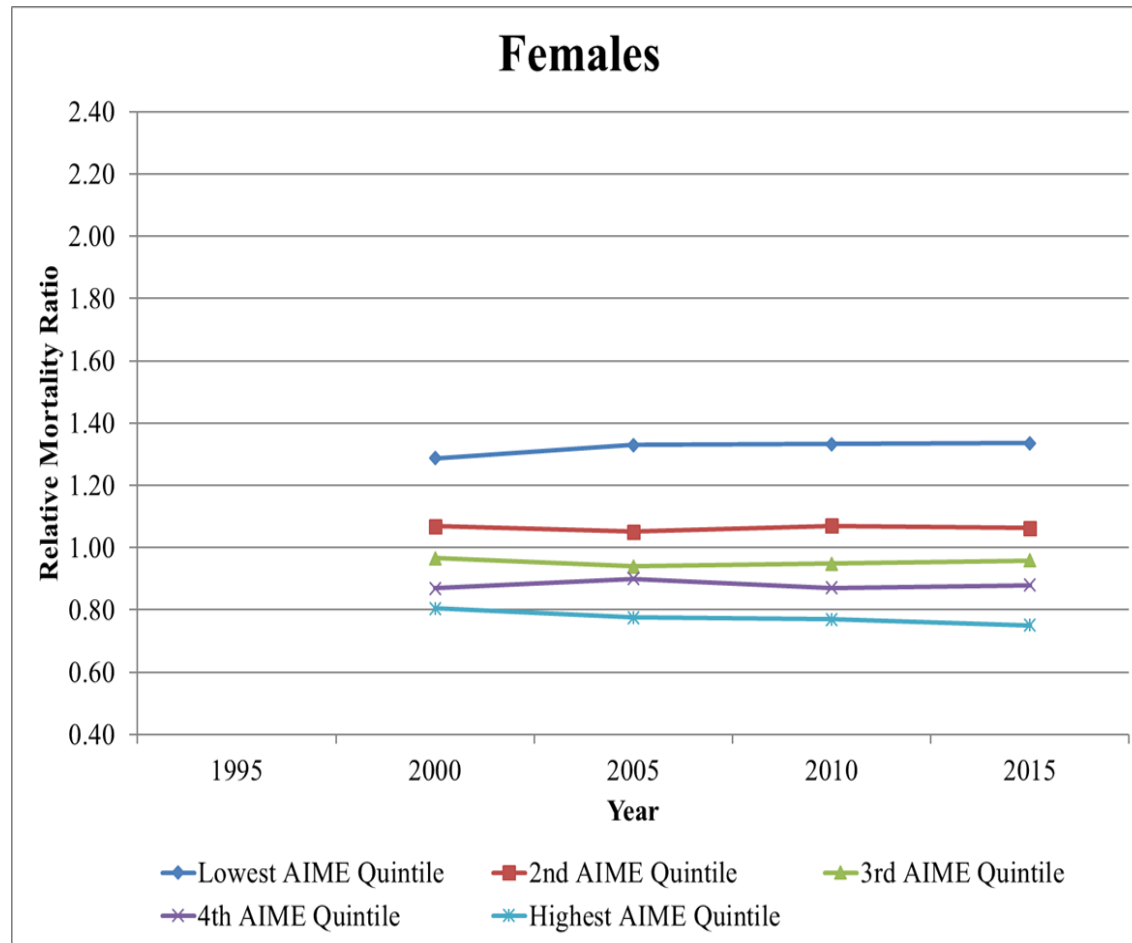


	1900 to <u>2019</u>	2009 to <u>2019</u>	Projected 2046 to <u>2096</u>
Under Age 15	2.97	1.46	1.52
Ages 15 - 49	1.43	-0.55	0.85
Ages 50 - 64	0.99	0.03	0.96
Ages 65 - 74	0.91	0.92	0.71
<u>Ages 85 +</u>	<u>0.58</u>	<u>0.24</u>	<u>0.55</u>
Total	1.02	0.43	0.72

Mortality By Career-Average Earnings Level: Actuarial Study 124

Crucial to scale to your exposed population, but rate of change may be similar

Age group 65-69 relative mortality ratios—not diverging

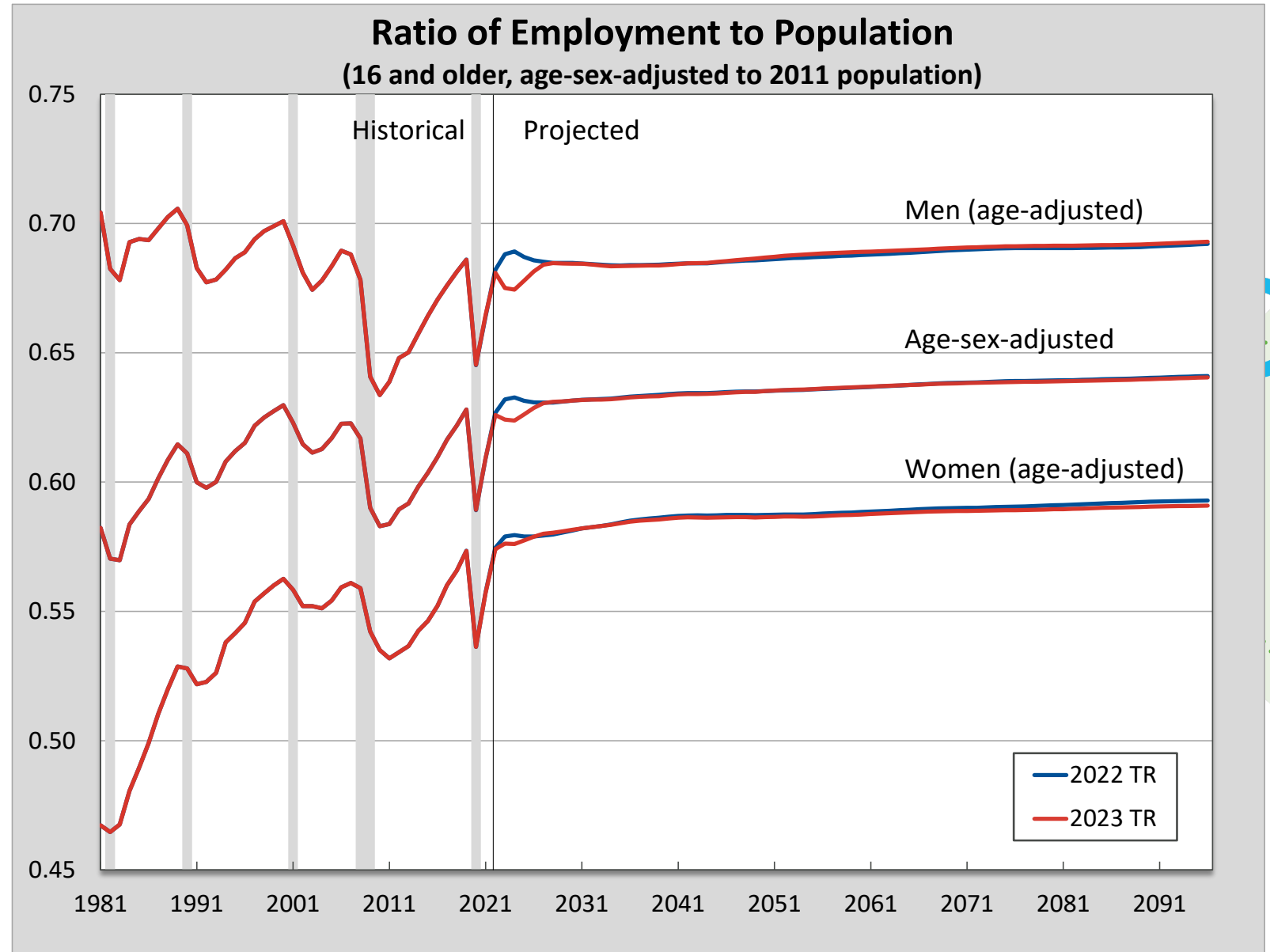


Section 4: Retirement and Termination

Ratio of Employment to Population

Recovered more strongly from the brief but steep recession than did LFPRs.

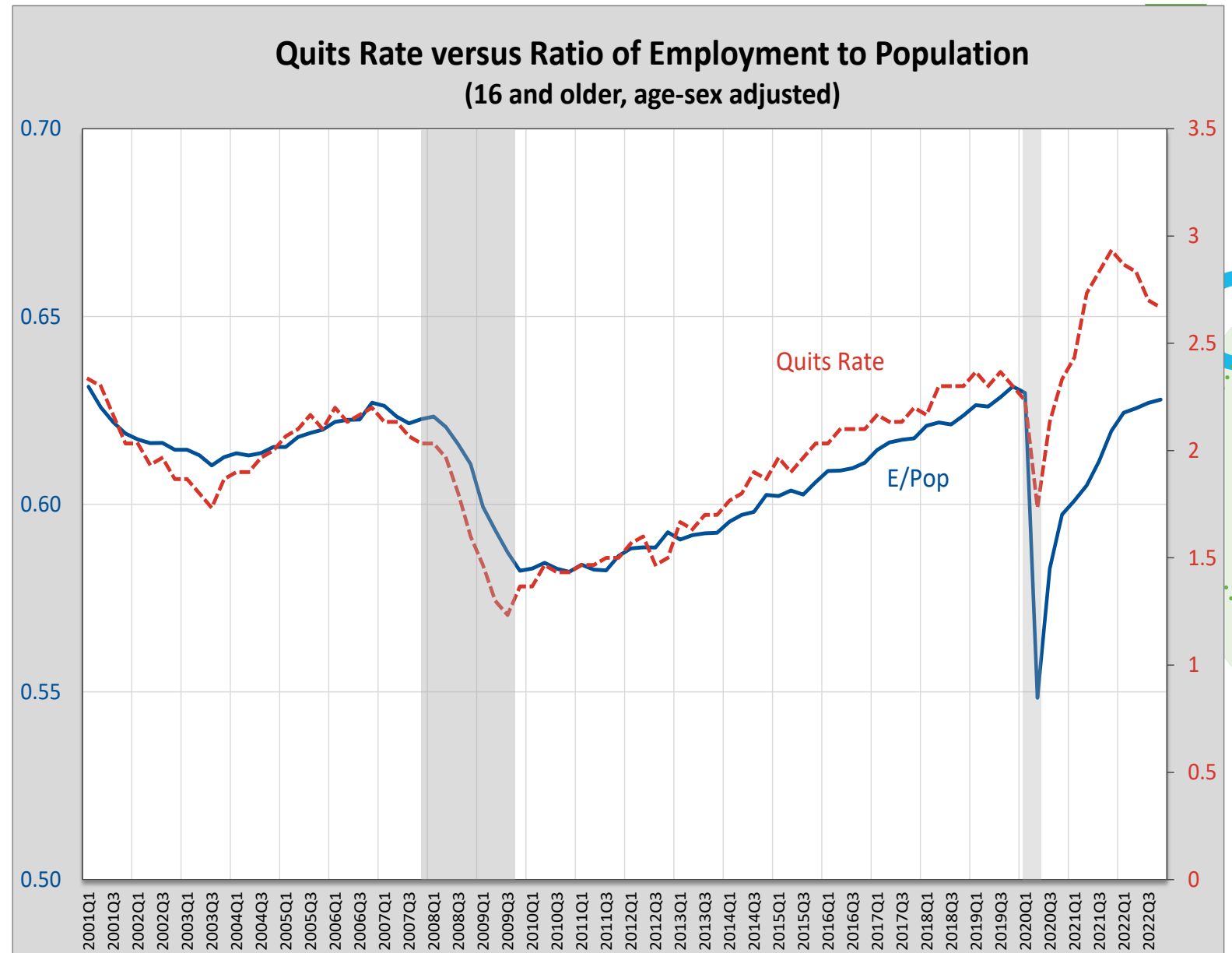
Recovered to pre-recession levels for women by 2022, but not for men. Projected to fall for men in 2023 and 2024, due to the assumed slowdown in economic growth, before recovering to its long-term trend.



Ratio of Employment to Population vs. Quits Rate

The quits rate represents the number of voluntary separations (when an employee voluntarily leaves a job, regardless of whether it is followed by taking a job with a different employer) as a percentage of total employment.

Elevated quits rates suggest a tight labor market, in which workers are able to switch jobs easily, and usually correspond to periods of a high (or rising) ratio of employment to population.



Age of Starting Social Security Retirement Benefits

