

COVID Endemic, What Does it Mean for Insurers?

Actuarial Club of Hartford and Springfield

November 2, 2023



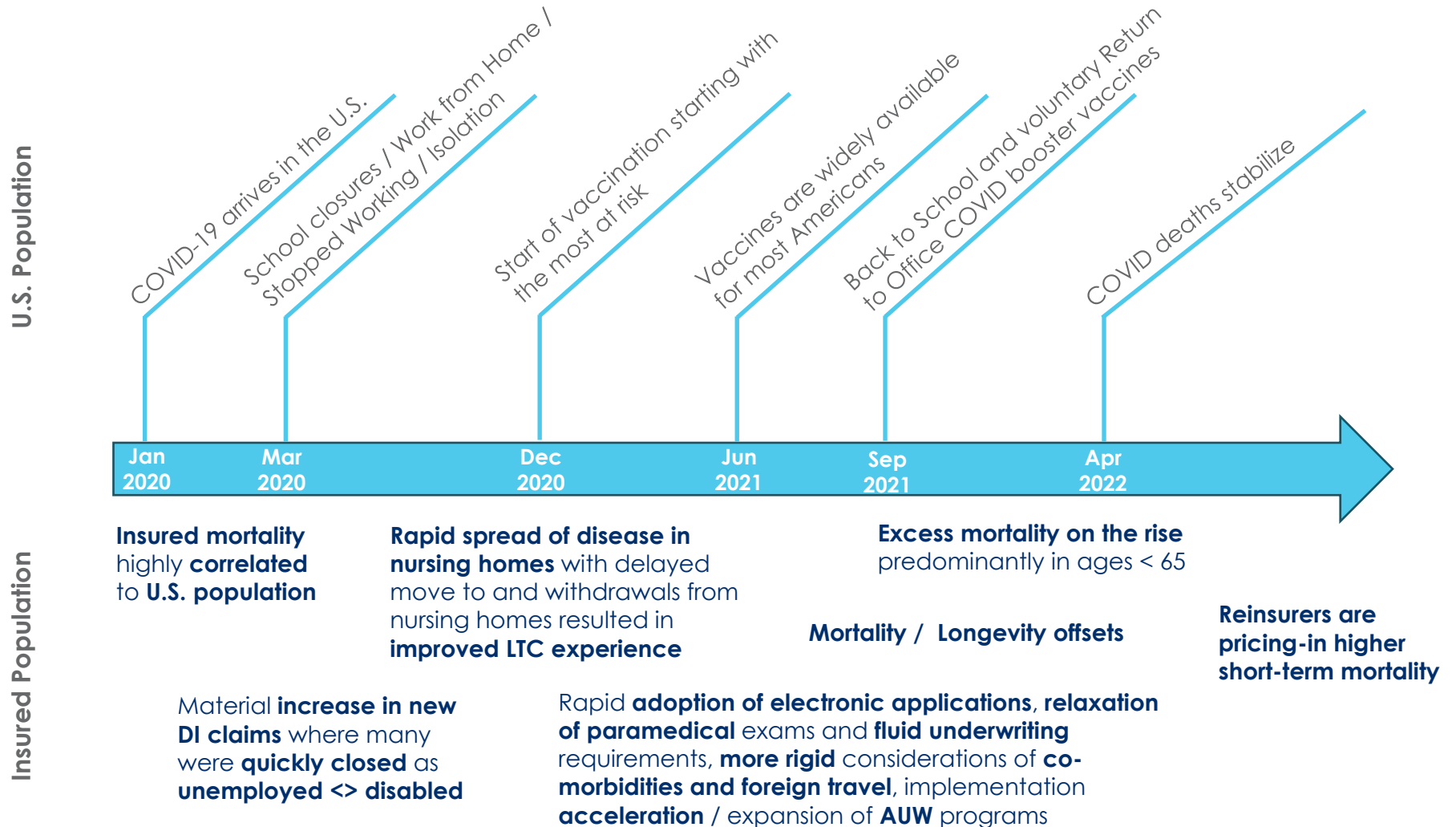
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Agenda

1. COVID Pandemic Overview
2. Shift from Pandemic to Endemic
3. Excess Mortality
4. Pre-pandemic Historical Mortality Improvement
5. Impact of 2020 – 2021 Excess Mortality on Historical Mortality Improvement
6. Element Impacting Future Mortality Improvements
7. Concluding Thoughts

COVID Pandemic Overview

It's important to understand where we have been and what we learned, which helps to make assumptions on where we are going

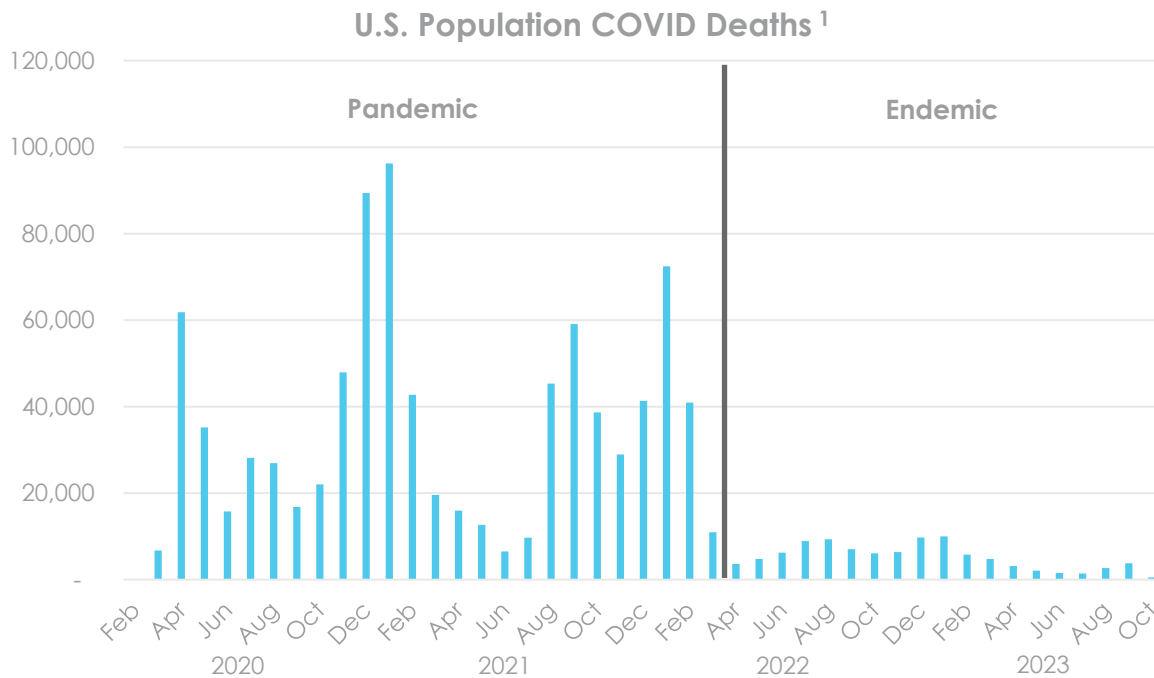


Shifted from Pandemic to Endemic

With vaccines and broadly available medical treatments, we **have shifted from pandemic to endemic**

Within the endemic portion, **COVID deaths and distribution of those deaths, has stabilized with the most at risk population being the older ages with co-morbidities**

- Over 85% deaths affecting ages 65+ since April 2022



Age Distribution of COVID Deaths ¹

	2020	2021	2022	2023
< 45	2.5%	5.7%	3.4%	1.9%
45 – 54	4.8%	8.8%	5.2%	2.3%
55 – 64	12.0%	17.7%	13.0%	7.6%
65 – 74	21.7%	24.6%	22.5%	17.9%
75 – 84	27.7%	23.7%	27.4%	30.7%
85 +	31.2%	19.4%	28.5%	39.6%

Source: www.wonder.cdc.gov ¹As of October 18, 2023

Excess Mortality

2020-2021 non-COVID excess mortality was very elevated representing an **extra ~ 97,000 deaths per year on average**

- Hypertension & heart diseases (~ 32,000)
- Drug or alcohol (~ 25,000)
- Diabetes or obesity (~ 12,000)
- Homicides or motor-vehicle (~ 10,000)
- All other causes (~ 18,000)

Within the insured population, this **widely affected group carriers** where **mortality is more correlated to U.S. population** than individual life business, and **bears no medical underwriting**

Non-COVID excess mortality results in smaller impacts on annuities, pension risk transfer, LTC, and more affluent segments serviced by Life insurers given their focus on older issue ages (on average)

While non-COVID excess mortality has receded since its peak in 2020/2021, **underlying trends in obesity and increased drug and alcohol use are concerning for future mortality trends pertaining to heart diseases and diabetes** in particular

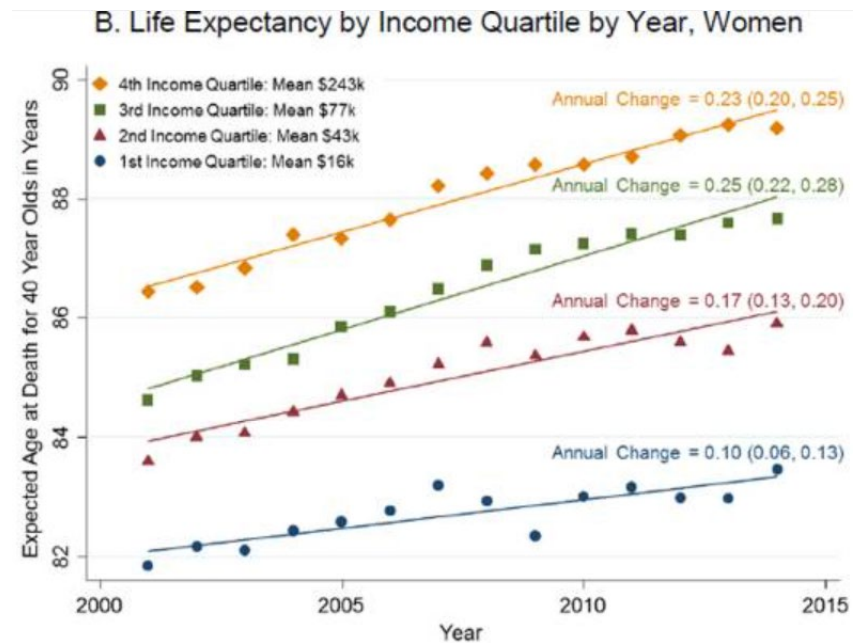
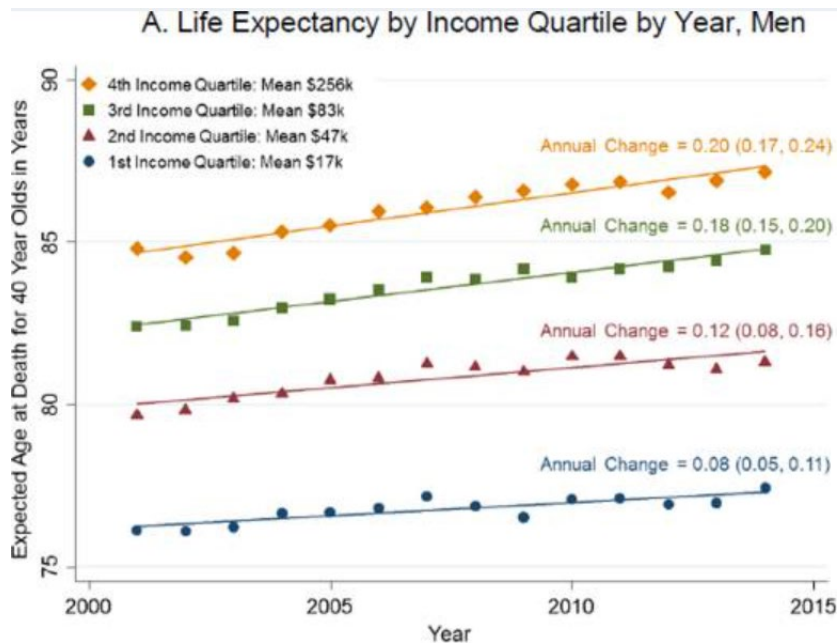
Apr. 2020	Average Annual Deaths (in 1,000)			Excess as % Baseline		
Dec. 2021	Non-COVID Excess	COVID	Baseline	Non-COVID Excess	COVID	Total Excess
< 18	~0	~0	35	~0%	~0%	~0%
18 – 44	29	20	183	16%	11%	26%
45 – 64	33	105	545	6%	19%	25%
65 +	35	350	2,167	2%	16%	18%
Total	97	474	2,930	3%	16%	20%

Source: Non-COVID Excess Deaths, 2020-21: Collateral Damage of Policy Choices?
https://www.nber.org/system/files/working_papers/w30104/w30104.pdf

Pre-Pandemic Historical Mortality Improvement

Between 2000 and 2014, for age 40, we observe

- On-going mortality improvement for both Males and Females
- Greater improvements for Females vs. Males
- Materially **different levels of improvement by income demographics** and with an **increasing gap over time**
 - Differences persist after controlling for higher income growth rate for individuals in top vs. bottom quartiles



Source: The Association Between Income and Life Expectancy in the United States, 2001 - 2014

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4866586/#:~:text=Between%202001%20and%202014%2C%20life,the%20difference%20for%20both%20sexes>

Impact of 2020 – 2021 Excess Mortality on Historical Mortality Improvement

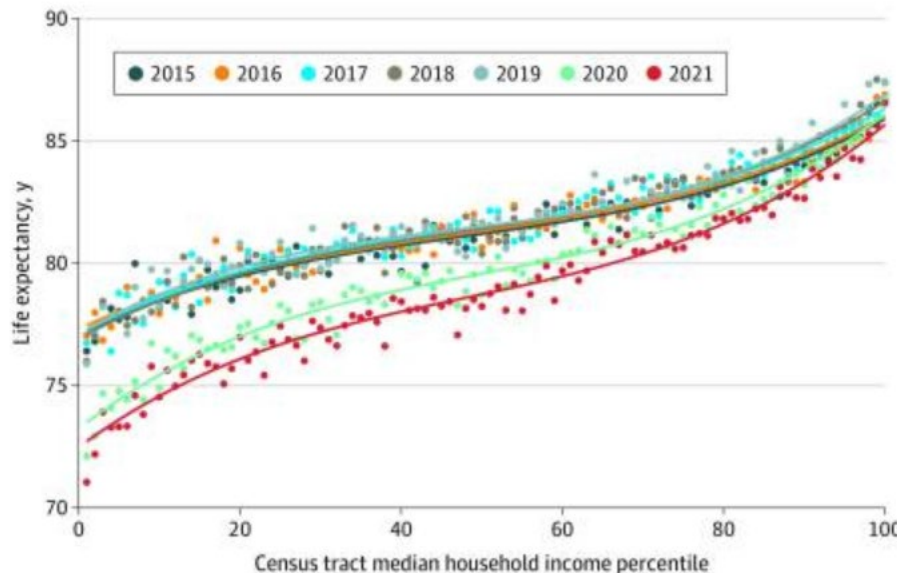
Over 2015 – 2019 (pre-pandemic), we continue to observe positive improvement in life expectancy across income levels but also continued increase in the income gap disparity

During the 1st year of the COVID pandemic, life expectancy decreased by 3.8 years (from 75.9 to 72.1) for lowest income percentile but only decreased 0.6 years (from 87.4 to 86.8) at the highest income percentile

In 2021, we continue to observe the loss of life expectancy which further decreased by 1.0 year (from 72.1 to 71.1) for lowest income percentile but only decreased 0.2 years (from 86.8 to 86.6) at the highest income percentile

- Shows how the impact of excess mortality was materially different across different income levels and inherently demographics, and continues to grow with a 15.5 year difference in life expectancy from lowest to highest income percentile

Life Expectancy in California by Census Tract Median Household Income Percentile, 2015 - 2021

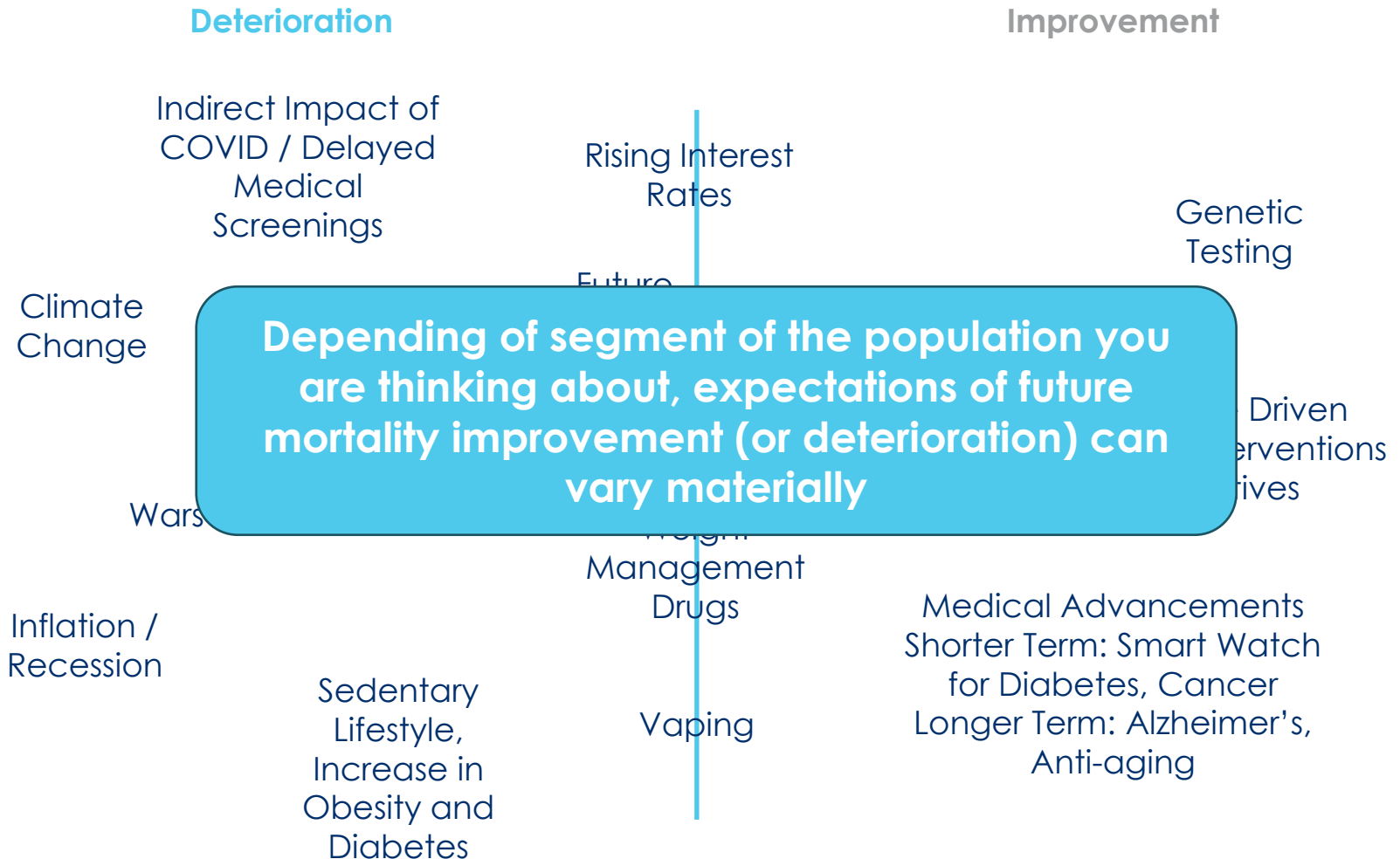


Year	Linear gradient (95% CI)
2015	0.072 (0.067-0.076)
2016	0.072 (0.068-0.076)
2017	0.074 (0.070-0.079)
2018	0.078 (0.073-0.082)
2019	0.075 (0.070-0.080)
2020	0.103 (0.098-0.108)
2021	0.107 (0.102-0.112)

Linear gradient is the estimated slope of the regression line through the census tract percentile groups

E.g. 2019 linear gradient indicates that moving from one group of census tract to the next highest one is associated with an increase of 0.075 years in life expectancy

Elements Impacting Future Mortality Improvement



Concluding Thoughts

Key is **knowing your market and its demographics** to be able to make appropriate assumptions as the **items discussed will not affect each market equally**

To the extent your can **medically underwrite** your business, **will also provide protective value** that will influence your expectations of future mortality improvement

As we continue to **modernize and accelerate the underwriting process**, this may also **influence those future expectations**

Depending on your confidence level in your assumptions, there are **mitigating solutions**:

- **Reinsurance**, including guarantees rates
- Acquiring / writing **offsetting blocks of mortality and longevity risk**
 - Be mindful of difference in demographics/hedge effectiveness
- Insurance carrier driven **health intervention programs / wellness** initiatives

My **expectations** for future mortality improvements are **slightly optimistic for the affluent segment** of the population but shifts to **pessimistic as we move down to lower income levels**



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