

Trends in U.S. Population and Insured Mortality

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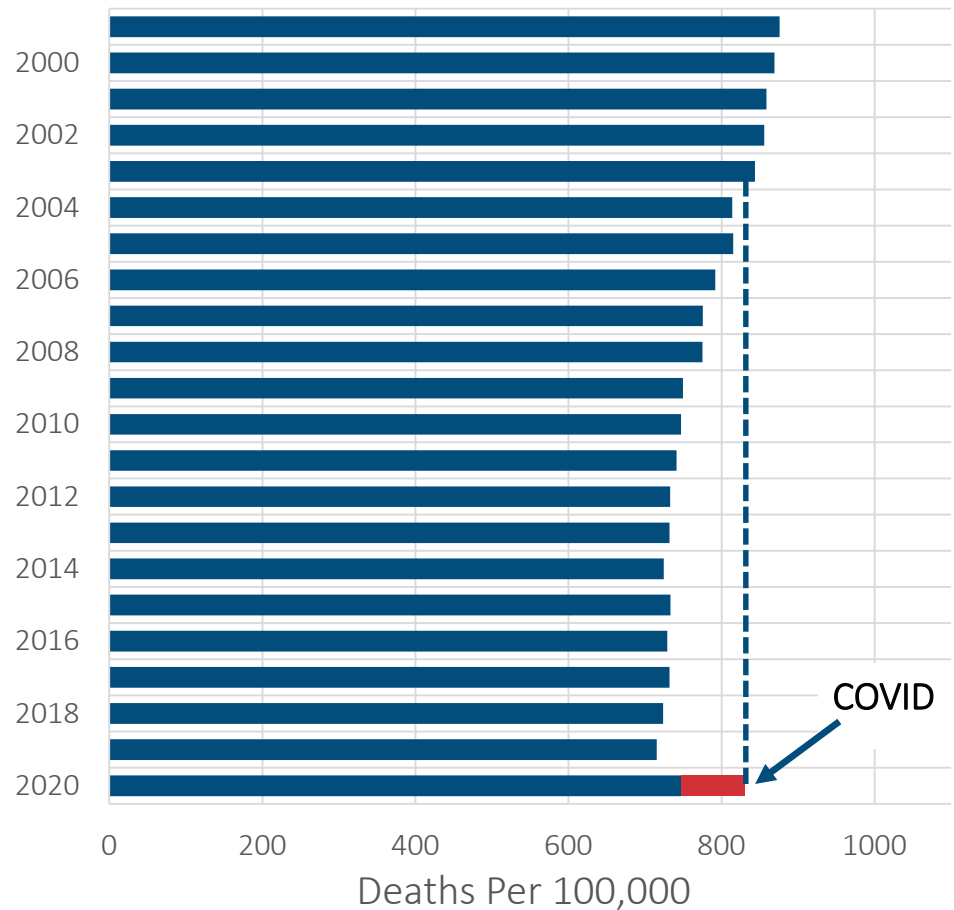


2020 U.S. Population Mortality



2020 Overall U.S. Population Historical Mortality Rates

- 2020 Mortality Rate = 830.5/100,000 (0.8%)
- 83.6 deaths/100,000 due to COVID
- ★ 16.1% increase over 2019
- ★ 2020 highest rate since 2003
- ★ Without COVID, increase over 2019 = 4.4%



CDC WONDER; CDC Rapid Release.

Actual/Expected (A/E) in 2020 U.S. Population

- Compares actual deaths to an expected baseline >>> Actual/Expected or A/E's
- Differs from CDC analysis – by sex and age group
- ★ Ages <5 had lower mortality than expected
- ★ Ages 35-54 highest A/E's for all CODs
- ★ Ages 15-24 had highest A/E's if COVID excluded

Age	Female		Male	
	Total	Excl. COVID	Total	Excl. COVID
< 1	96.2%	96.0%	93.8%	93.4%
1-4	91.5%	90.6%	96.9%	96.1%
5-14	95.8%	94.3%	107.1%	105.7%
15-24	119.0%	115.4%	125.3%	123.2%
25-34	118.7%	112.4%	122.5%	117.9%
35-44	124.0%	114.6%	128.9%	118.8%
45-54	122.8%	110.2%	128.7%	112.9%
55-64	116.4%	102.6%	121.2%	105.3%
65-74	120.4%	103.9%	122.8%	103.7%
75-84	121.2%	103.5%	123.5%	102.7%
> 84	119.5%	102.5%	119.4%	100.4%
All Ages	119.7%	103.7%	122.3%	104.8%

2020 U.S. Population Mortality Rates by Cause of Death

- ★ Heart COD – largest increase in 20 years. Only other increase was in 2015 = 0.9%.
- ★ Cancer continued its steady improvement.
- ★ Diabetes, liver, hypertension, Parkinson's had large increases
- 'Other' includes accidents, drug overdoses (O.D.), suicides, and assaults

COD	12-month rate ending in quarter	Change over 2019
Accidents	55.3 – Q3	12.1%
Drug O.D.	25.1 – Q2	16.2%
Suicides	13.5 – Q3	(2.9)%
Assaults	7.1 – Q3	18.3%

Cause of Death	2019 Age-Adjusted Mortality Rate	2020 Age-Adjusted Mortality Rate	2019 to 2020 Change in Mortality
Heart	161.5	167.0	3.4%
Cancer	146.2	143.7	-1.7%
COVID	0.0	83.6	∞
Stroke	37.0	38.6	4.3%
Pulmonary	38.2	36.2	-5.2%
Alzheimer's	29.8	32.2	8.1%
Diabetes	21.6	24.6	13.9%
Liver	11.3	13.2	16.8%
Influenza/ pneumonia	12.3	13.0	5.7%
Kidney	12.7	12.7	0.0%
Hypertension	8.9	10.0	12.4%
Parkinson's	8.8	9.8	11.4%
Septicemia	9.5	9.7	2.1%
Pneumonitis	4.7	4.4	-6.4%
HIV	1.4	1.4	0.0%
Other	372.8	397.4	6.6%
Total	715.2	830.5	16.1%

Group Life COVID-19 Mortality Survey

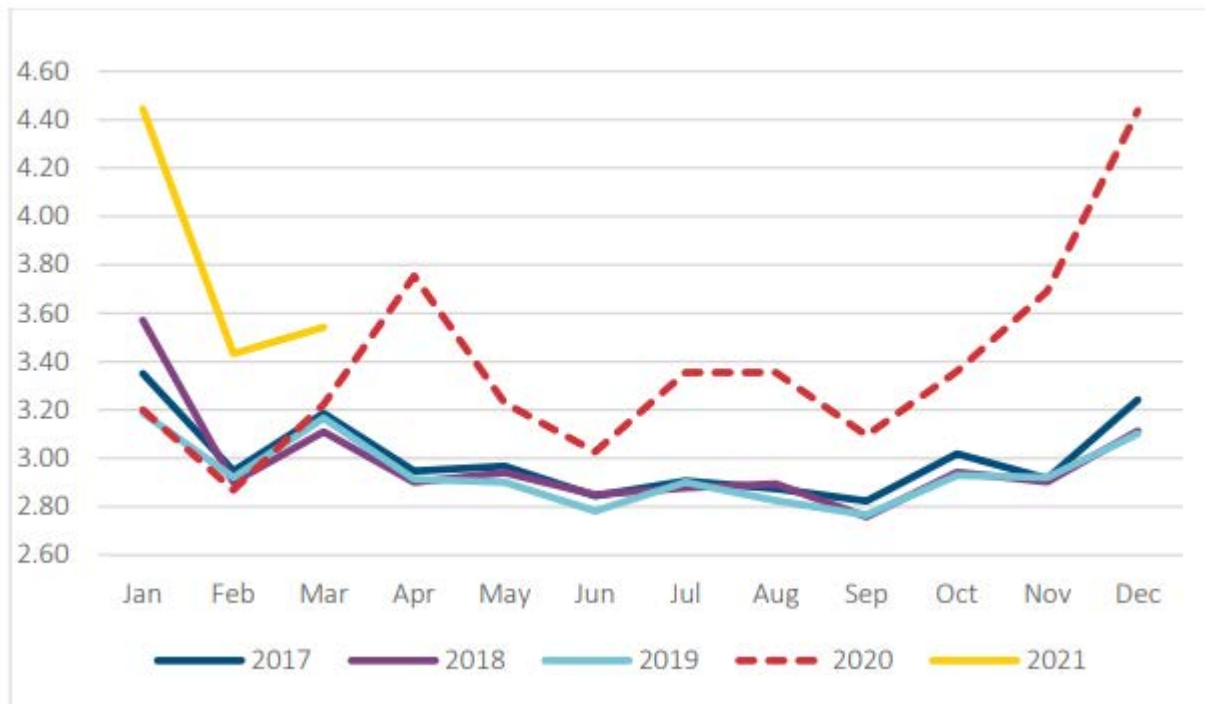


Survey Overview

- Purpose is to gather high-level view of U.S. Group Term Life Insurance mortality results during the COVID-19 pandemic
- 20 of the top 21 U.S. Group Term Life insurers focused on employer groups participated in the survey (about 90% of industry)
 - Includes over 1.8 million claims and over \$83 billion in earned premium
- Survey compares mortality results during pandemic to 2017-2019 baseline period
- July report contains data through Q1 2021 and is an update to the December 2020 report, which included data through August 2020

Survey Overview

AGGREGATE INCURRED³ CLAIM INCIDENCE PER 1000 LIVES BY CALENDAR YEAR AND MONTH



Survey Highlights

- Group Life claim incidence were higher for the April 2020 – March 2021 period:
 - 17.3% on Reported basis
 - 19.6% on Incurred basis
- 13% of reported claims from April 2020 – March 2021 had a cause of death of COVID-19
- Blue Collar group experienced the smallest excess mortality of the collar groups studied
 - Spread between Blue and White/Grey has narrowed since the previous update

EXCESS MORTALITY FOR TOP TEN INDUSTRIES BY NUMBER OF COVID CLAIMS

Industry	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	4/20- 3/21	% COVID	% Count	# COVID
W-Public Administration	109%	123%	124%	139%	134%	130%	15.2%	14%	8,936
B-Transport; Comms.; Utilities	99%	114%	112%	127%	112%	116%	15.7%	13%	8,341
B-Manufacturing - Auto, Planes, ...	96%	110%	106%	126%	145%	122%	16.1%	9%	5,933
B-Manufacturing - Heavy; Steel;	96%	108%	104%	124%	105%	110%	14.5%	9%	5,059
W-Doctors Offices	98%	124%	123%	126%	124%	124%	19.3%	6%	4,385
W-Educational Services	100%	117%	122%	126%	129%	124%	15.9%	6%	4,152
G-Manufacturing - Paper; Drugs	92%	105%	111%	125%	119%	115%	14.4%	6%	3,408
G-Wholesale Trade	108%	129%	124%	144%	118%	129%	16.0%	5%	2,998
G-Retail - Trade	89%	107%	106%	115%	126%	113%	15.1%	4%	2,658
W-Insurance; Other Finance	103%	131%	123%	130%	122%	126%	15.5%	3%	2,221
All Segments⁵	98%	115%	115%	127%	123%	120%	15.6%	100%	63,650

Survey Highlights

- Mortality patterns by region changed over the course of the pandemic.
Regions with highest excess mortality by quarter:
 - Q2 2020: Northeast (42.6%)
 - Q3 2020: Southeast (25.3%)
 - Q4 2020: Midwest (33.8%)
 - Q1 2021: Southeast (32.3%)

Survey Highlights

- Group Life survey data excess mortality was generally 80% - 110% of U.S. population data
 - December report indicated a 50% - 70% range
 - West region showed the largest spread between Group Life and U.S. population data

SPREAD BETWEEN U.S. POPULATION AND GROUP LIFE EXCESS DEATH PERCENTAGES

Report	Date Range of Data	U.S. Population Excess Death Percentage	Group Life Excess Death Percentage	Difference
December 2020	April 2020 – August 2020	21.9%	12.9%	9.0%
July 2021	April 2020 – March 2021	23.6%	19.7%	3.9%

Individual Life COVID-19 Claims Analysis



Overview and Data

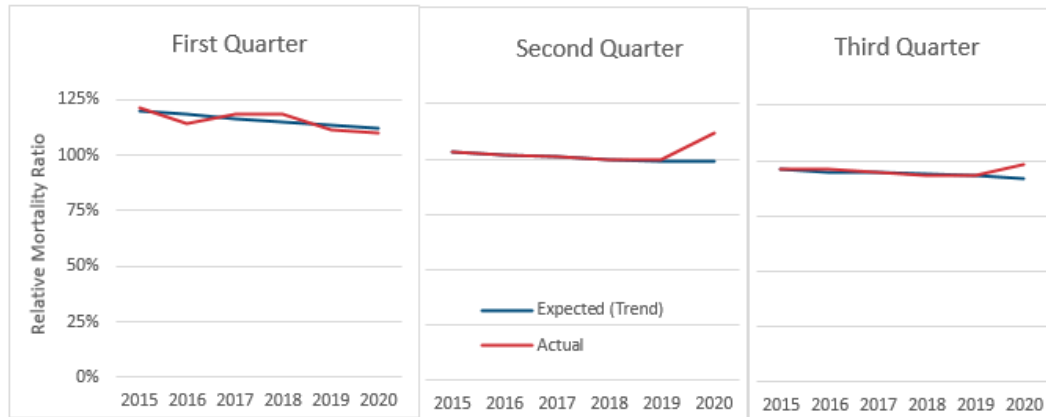
- The previous report published in March included data from 2015 – June, 2020
 - Analysis was by cause of death, but not a true experience study
- This experience study included data from 2015 – September, 2020
 - 2020 deaths compared with 2015 – 2019, by quarter
 - The data included exposures: this is similar to a more traditional experience study than the March study
 - Results largely in line with COVID-19 experience from other studies, with some interesting observations
 - 31 Contributing companies with 2.8 million deaths

Methodology

- Generally follows a standard Actual to Expected study, but:
 - The baseline is based on VBT-2015, which is an amount-based table
 - When analyzed based on amount, even with 2.8 million deaths, ratios were very volatile
 - Numerators based on counts, which gave stable, solid results
 - Report discusses “relative mortality ratios” instead of “Actual to Expected” because of this technical disconnect

Methodology Contd.

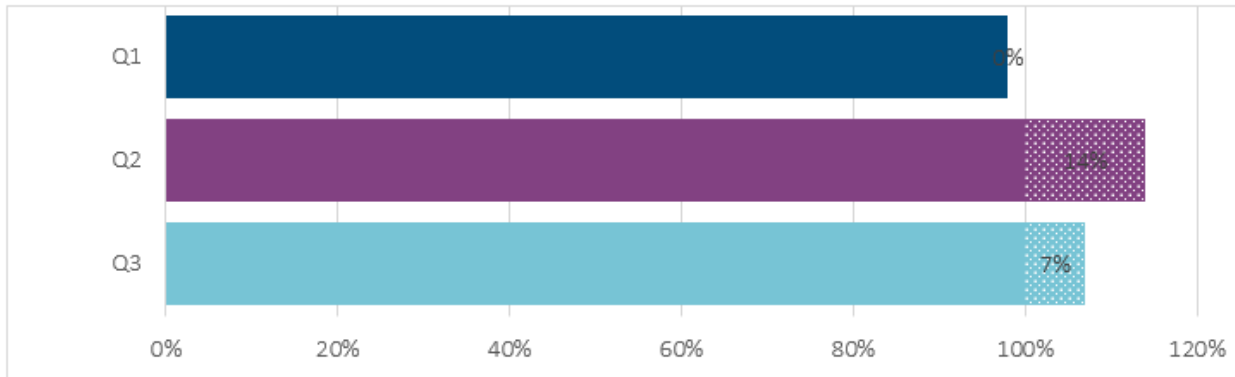
- 2015 – 2019 experience was extrapolated to 2020 by quarter, and compared against 2020 actuals
- Overall 5-year trends were clearly identifiable



All fully underwritten business, by quarter

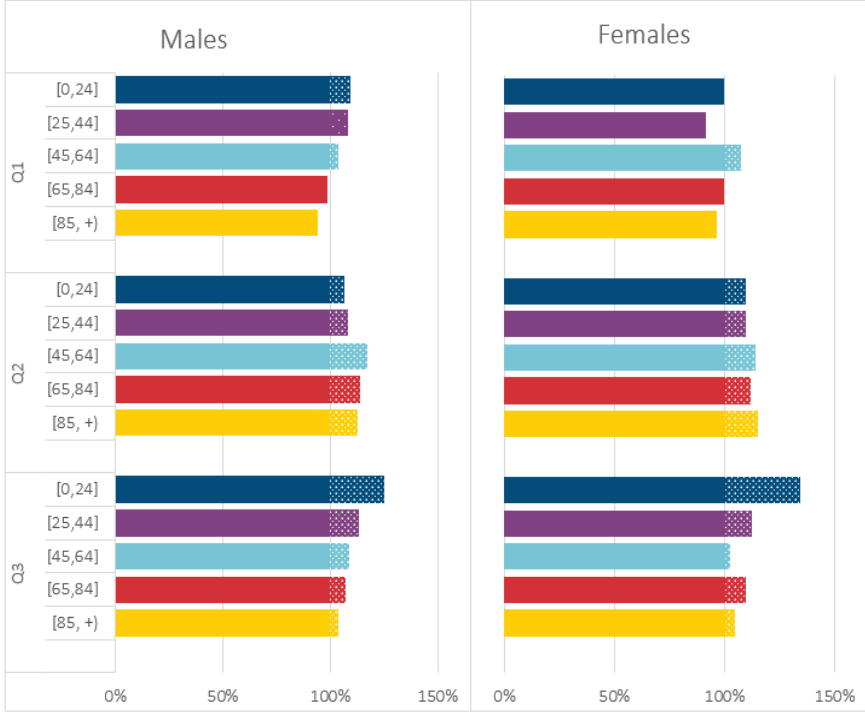
Methodology Contd.

- The results were also shown as excess mortality charts, by quarter:

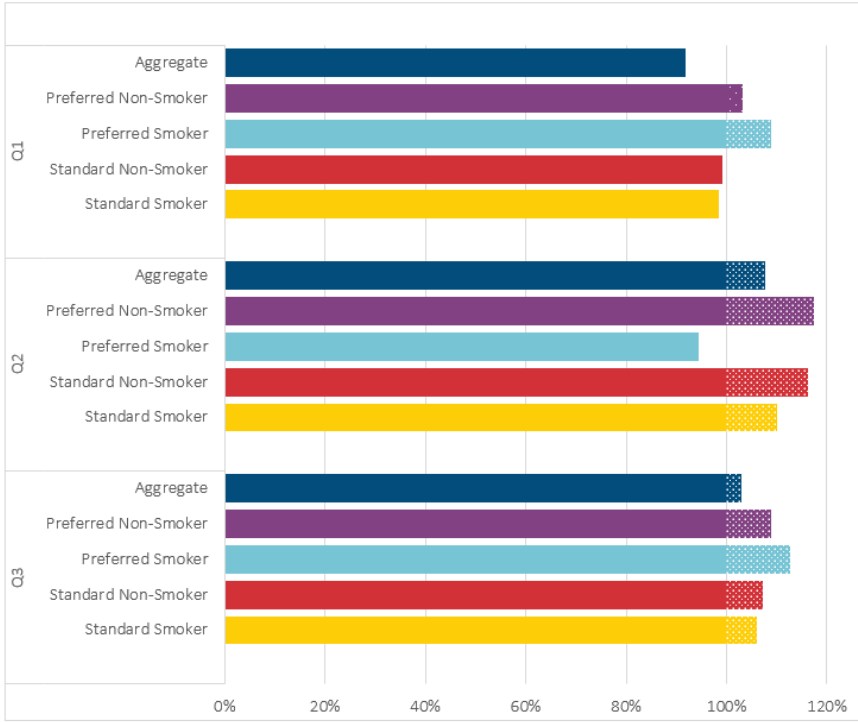


All fully underwritten
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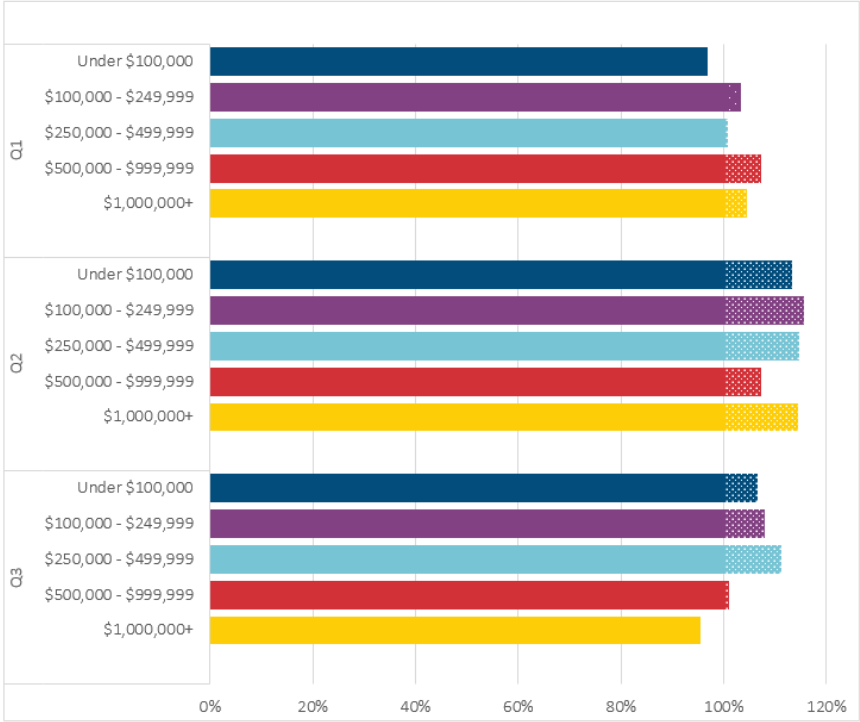
Actual to Expected Relative Mortality Ratios: By Sex and Attained Age



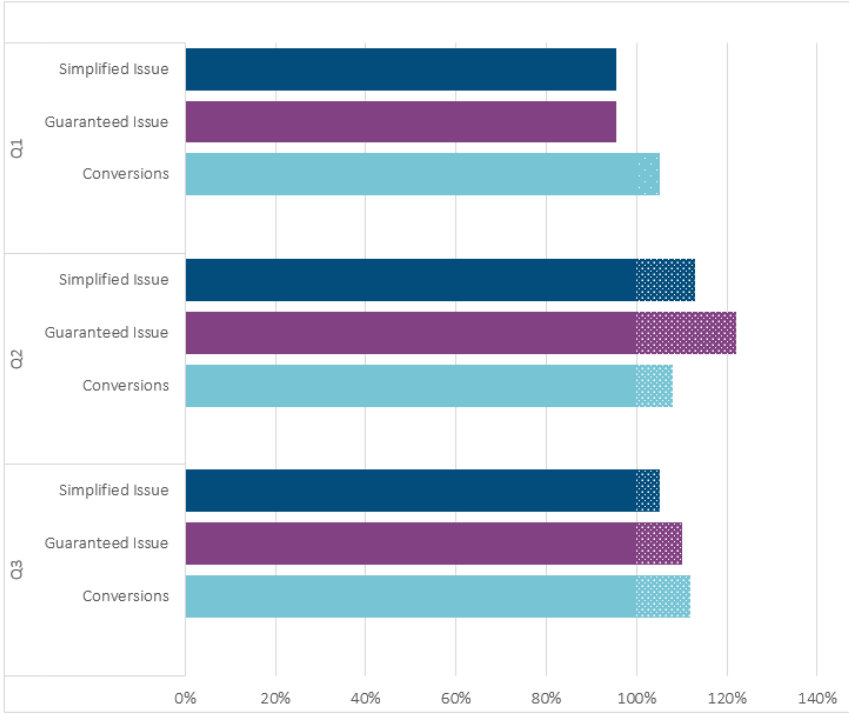
Actual to Expected Relative Mortality Ratios: By Preferred Class



Actual to Expected Relative Mortality Ratios: By Face Amount



Actual to Expected Relative Mortality Ratios: By Underwriting Type



Actual to Expected Relative Mortality Ratios: By Geographic Region

Code	Name	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Region 1	Northeast	96%	103%	94%	153%	137%	100%	99%	95%	105%
Region 2	NY-NJ	98%	98%	112%	244%	126%	102%	96%	96%	93%
Region 3	Mid-Atlantic	98%	98%	103%	123%	115%	99%	106%	99%	102%
Region 4	Southeast	95%	99%	103%	107%	103%	102%	118%	119%	110%
Region 5	North Central	96%	94%	99%	118%	105%	106%	103%	106%	106%
Region 6	Texas and surrounding states	93%	94%	101%	108%	102%	103%	121%	113%	110%
Region 7	Plains	100%	90%	95%	99%	103%	104%	108%	108%	101%
Region 8	Northern Plains	104%	96%	95%	114%	103%	100%	95%	96%	110%
Region 9	California+	94%	98%	96%	108%	102%	102%	118%	114%	105%
Region 10	Washington+	98%	100%	101%	99%	92%	106%	106%	101%	109%

Questions



References

<https://www.soa.org/resources/research-reports/2021/us-pop-mort-rates-2000-2019/>

<https://www.soa.org/resources/experience-studies/2021/group-life-covid-19-mortality/>

<https://www.soa.org/resources/experience-studies/2021/covid-19-life-mortality-study/>





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