



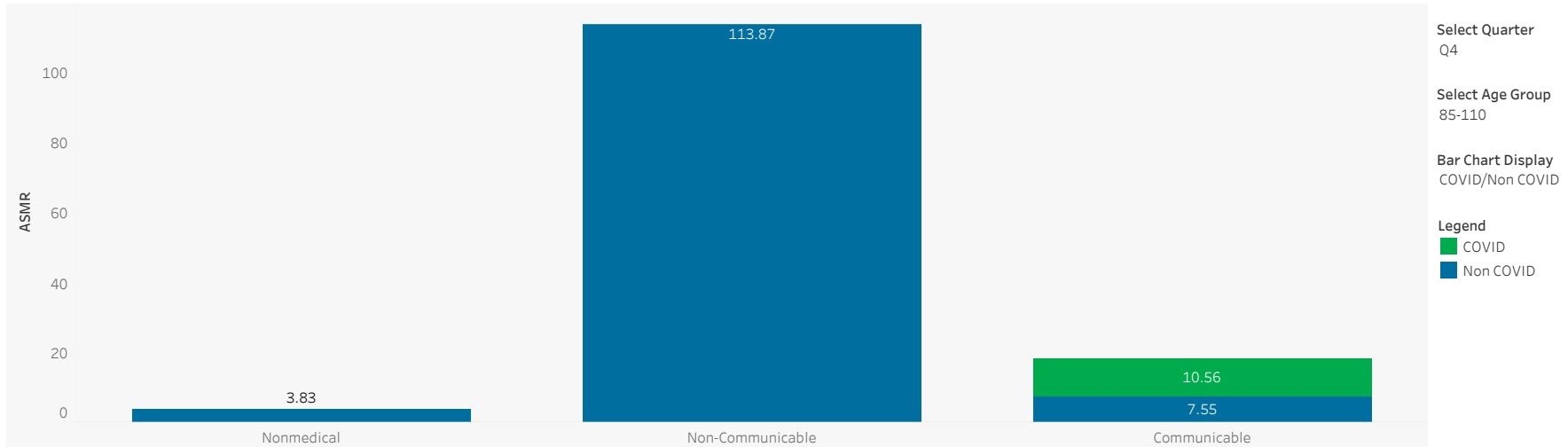
LIMRA, Reinsurance Group of America (RGA), the Society of Actuaries (SOA) Research Institute, and TAI have collaborated on an ongoing effort to analyze the impact of COVID-19 on the individual life insurance industry's mortality experience and share the emerging results with the insurance industry and the public. The Individual Life COVID-19 Project Work Group (Work Group) was formed as a collaboration of LIMRA, RGA, the SOA, and TAI to design, implement, and create the study and to produce and distribute a variety of analyses.

This dashboard contains the results of a cause of death (COD) analysis focused on how the rates of death for various causes were impacted throughout the pandemic period for the insured population. We examine the relationship between COVID deaths and overall excess deaths. Data from 28 companies representing approximately 69% of the industry face amount in force have been included in the analysis in this report. A total of 3.4 million death claims from individual life policies from January 1, 2015 through December 31, 2021 make up the basis of the analysis.

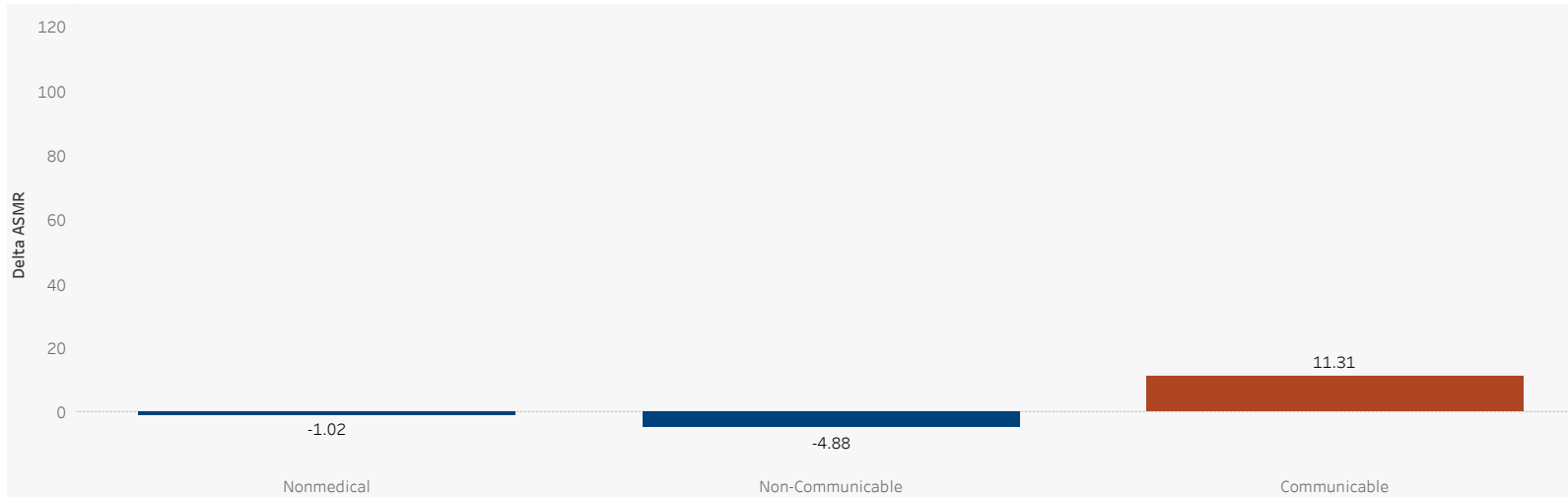
Highlights of 4th quarter 2021 Cause of Death analysis:

1. COVID experience by age group in the 4th quarter followed a similar pattern to the 3rd quarter.
  - a. Younger ages (under 40, weighted average age 27.7 years) continued a reversal in how overall excess age-standardized mortality rates (ASMR) developed in relation to COVID deaths
    - i. Prior to 3rd quarter 2021, excess deaths were well beyond COVID deaths for insured lives; in the 3rd quarter of 2021, COVID deaths accounted for more than the overall excess deaths for this cohort, and in the 4th quarter of 2021, COVID deaths accounted for almost all of the overall excess deaths.
  - b. Excess ASMR in middle and older ages (40+) were largely driven by just COVID deaths.
    - i. As in the 3rd quarter, ages 40-59 experienced the largest impact from COVID (overall excess of 30% despite COVID excess of 36%).
    - ii. Excess deaths in ages 60-84 were nearly all due to COVID.
    - iii. Excess deaths for ages 85+ were roughly half of the COVID excess (overall excess of 4% with 8% COVID excess).
2. Regional differences in ASMR results remained extreme in the 4th quarter of 2021.
3. Results by face amount in the 4th quarter of 2021 were tied to the results by age.
  - a. Excess deaths by face amount were largely consistent across the 40-74 year old cohort.
  - b. Much of the excess deaths variation for ages 75+ is likely due to having fewer deaths and less reliable trends on which to base the results.

Total Age-and-Sex-Specific Mortality Rate (ASMR) by Category



Total ASMR - Expected ASMR



# X Significance Level Pivot Table

Cause of Death Categories ..	Year	Quarter	Age Groups					P-Value
			0-39	40-59	60-74	75-84	85-110	0.1
Communicable (Excluding COVID)	2020	Q1	0.0	0.1	0.5	2.8	9.8	
		Q2	0.0	0.1	0.4	2.3	8.7	
		Q3	0.0	0.0	0.3	1.9	6.8	
		Q4	0.0	0.1	0.5	2.5	9.1	
	2021	Q1	0.0	0.1	0.5	2.3	8.5	
		Q2	0.0	0.1	0.3	1.8	6.7	
		Q3	0.0	0.1	0.5	2.1	6.4	
		Q4	0.0	0.1	0.5	2.2	7.6	
COVID-19	2020	Q1	0.0	0.0	0.2	0.4	0.8	
		Q2	0.0	0.3	1.3	4.9	19.6	
		Q3	0.0	0.2	0.7	3.0	7.6	
		Q4	0.0	0.4	2.1	9.4	31.0	
	2021	Q1	0.1	0.5	2.3	8.4	23.7	
		Q2	0.0	0.2	0.6	1.3	3.2	
		Q3	0.2	0.8	1.6	3.6	7.1	
		Q4	0.2	0.6	1.7	4.0	10.6	
Non-Communicable	2020	Q1	0.3	1.5	8.0	35.2	122.6	
		Q2	0.3	1.5	7.2	32.6	113.9	
		Q3	0.2	1.4	7.3	32.5	111.9	
		Q4	0.3	1.4	7.2	33.0	116.0	
	2021	Q1	0.3	1.4	7.5	33.1	115.6	
		Q2	0.3	1.4	7.1	31.1	105.1	
		Q3	0.2	1.3	7.1	31.8	108.1	
		Q4	0.2	1.3	7.2	32.4	113.9	
Nonmedical	2020	Q1	0.3	0.3	0.4	1.2	4.2	
		Q2	0.3	0.3	0.4	1.2	4.0	
		Q3	0.4	0.3	0.5	1.2	4.0	
		Q4	0.3	0.3	0.4	1.3	3.7	
	2021	Q1	0.3	0.3	0.4	1.2	3.8	
		Q2	0.4	0.3	0.4	1.1	3.8	
		Q3	0.3	0.3	0.4	1.1	3.6	
		Q4	0.3	0.3	0.4	1.2	3.8	

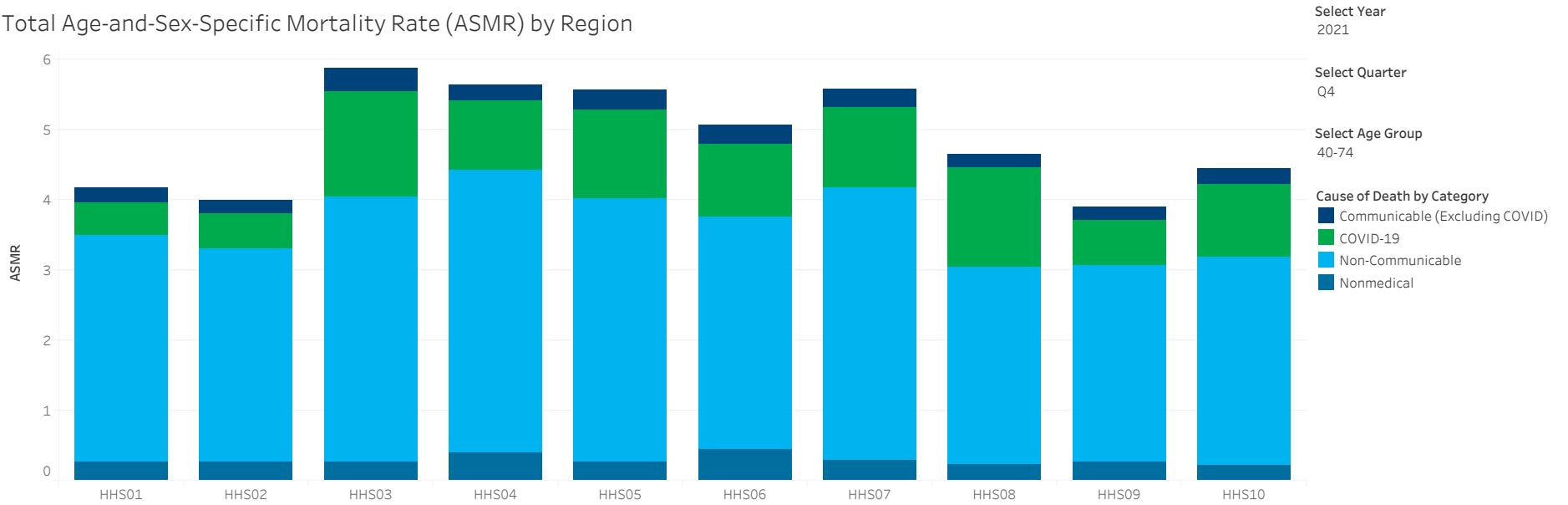
**Significance Level**

- Above Expected
- Expected
- Lower Than Expected

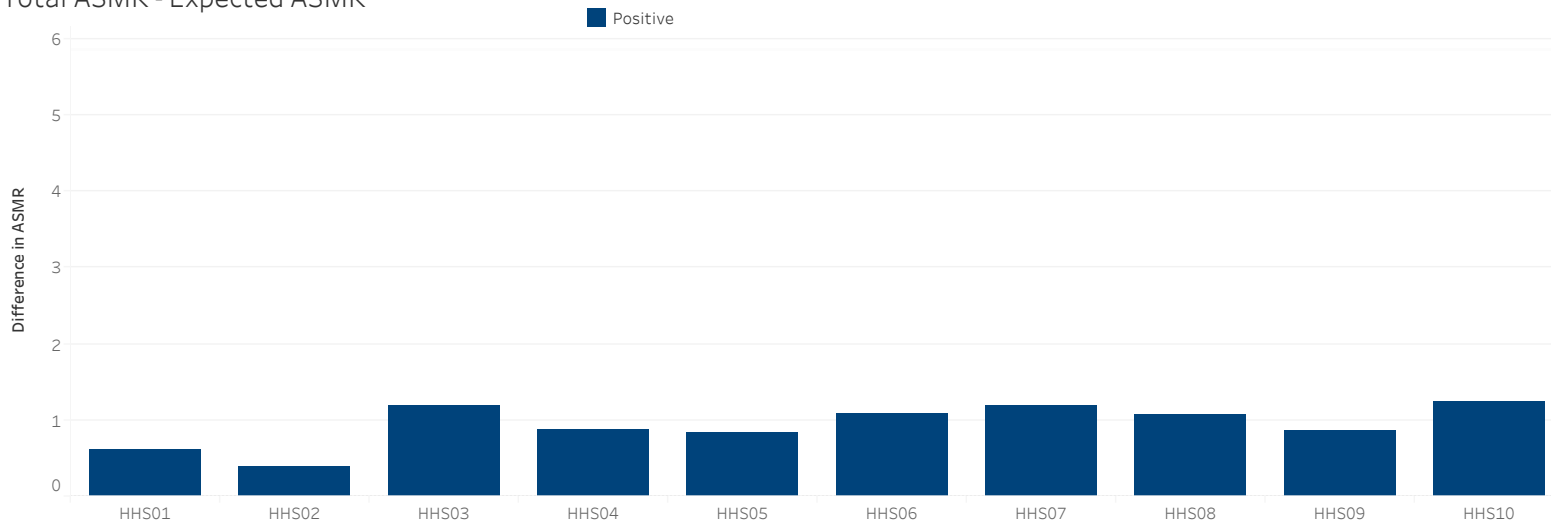
## Summary of Claims by Cause and Age Group

Main Cause Category	Cause Subcategory	0-39	40-74	75+
Communicable	Influenza/Pneumonia	279	14,356	61,546
	Other Communicable	205	10,466	27,107
	Covid-19	841	30,695	43,230
Non-Communicable	Cancer	2,918	172,804	201,598
	Cvd Other Than Hypertension	2,388	137,457	442,250
	Diabetes	184	7,071	11,125
	Digestive	487	15,868	18,521
	Hypertension	189	10,814	34,719
	Kidney Diseases	97	6,843	20,539
	Nervous System	531	23,532	139,633
	Other Non-Communicable	1,484	27,302	105,119
	Respiratory Diseases	497	36,603	104,008
Non-Medical	Auto Transport Accidents	2,261	6,819	2,736
	Other Accidents	5,722	17,248	26,247
	Other Non-Medical	317	2,553	5,410
	Suicide	3,169	11,788	2,775
Unknown	Unknown	28,263	604,149	925,978
<b>Age Group Grand Total</b>		<b>49,832</b>	<b>1,136,368</b>	<b>2,172,541</b>

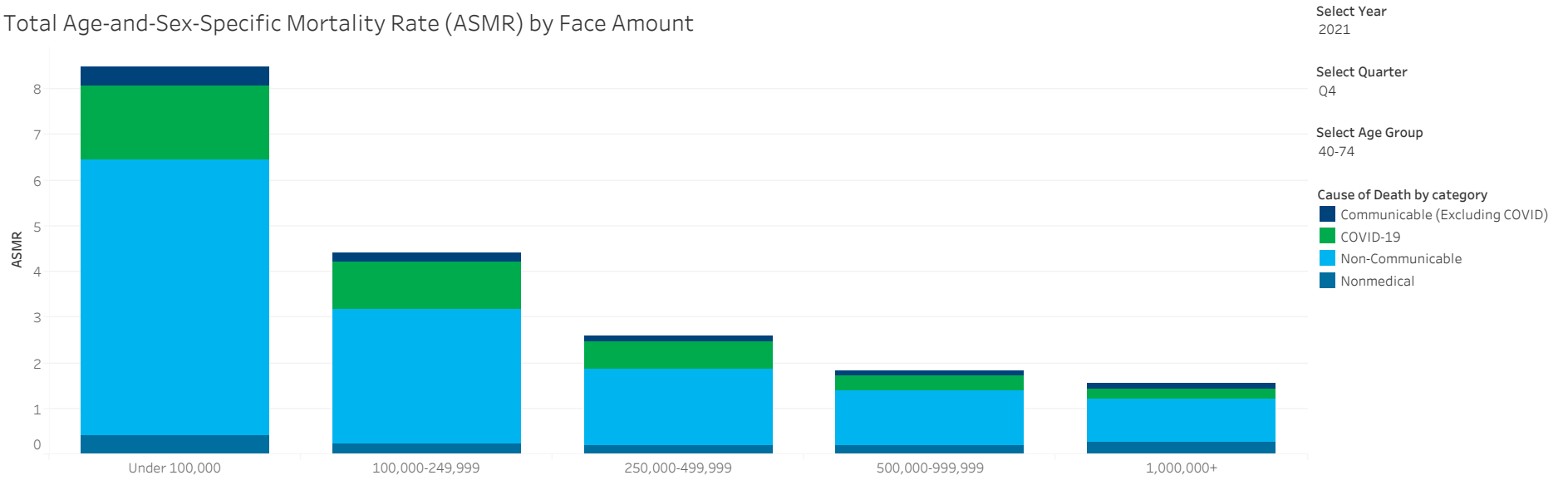
Total Age-and-Sex-Specific Mortality Rate (ASMR) by Region



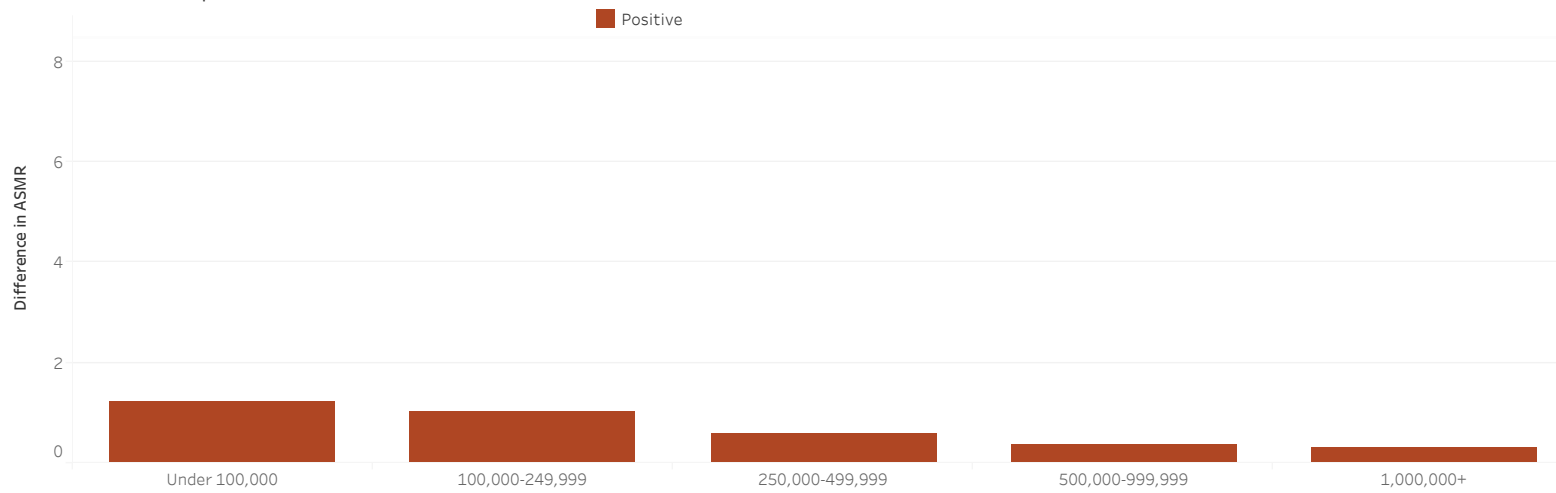
Total ASMR - Expected ASMR



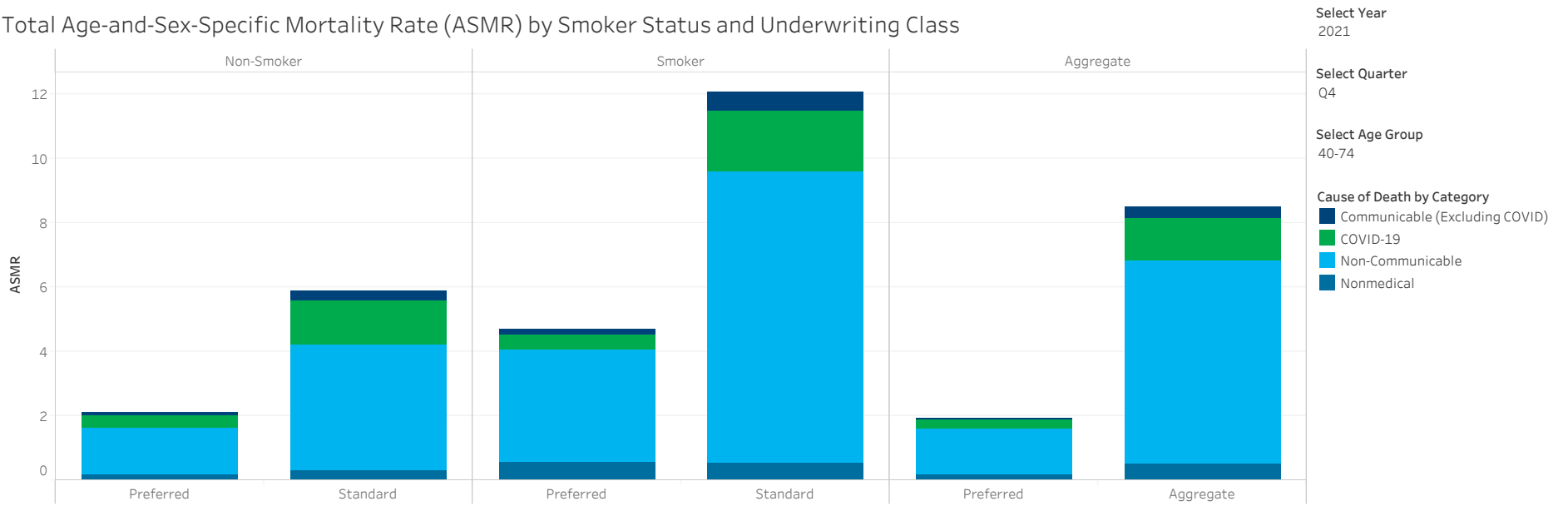
Total Age-and-Sex-Specific Mortality Rate (ASMR) by Face Amount



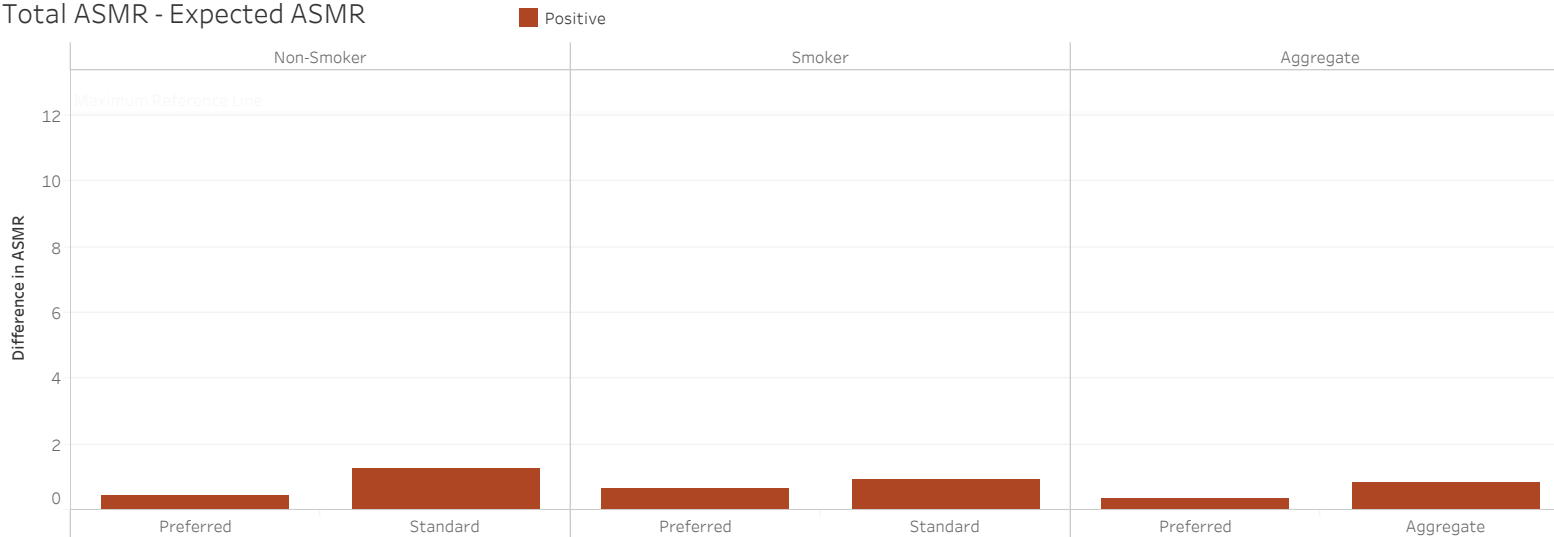
Total ASMR - Expected ASMR



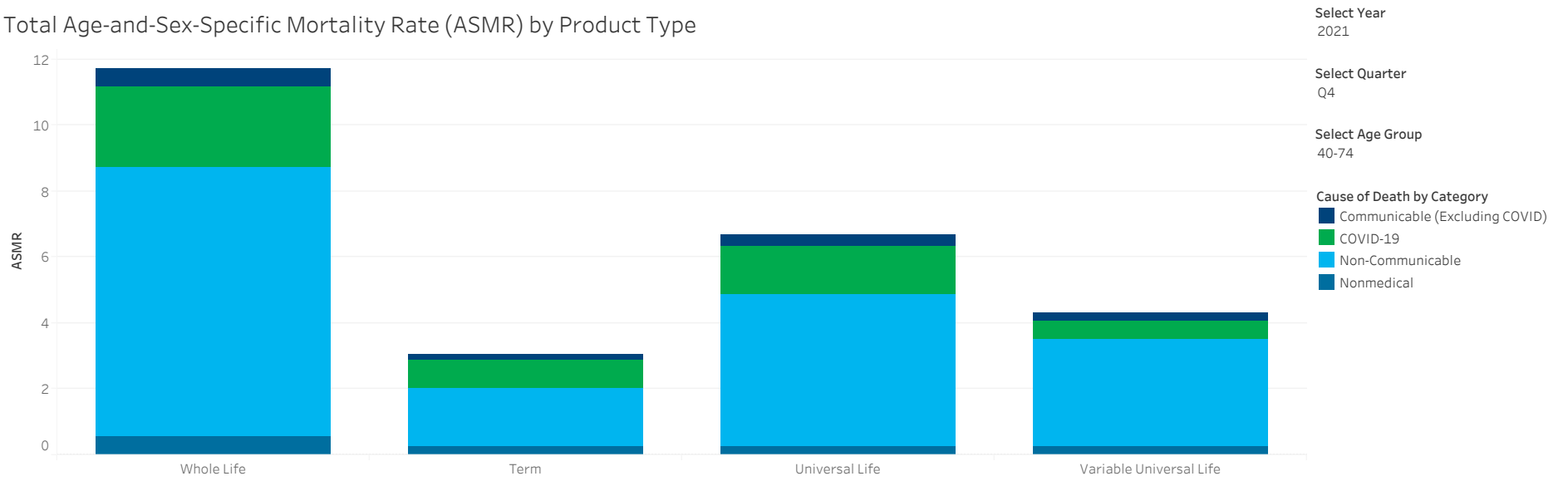
# Total Age-and-Sex-Specific Mortality Rate (ASMR) by Smoker Status and Underwriting Class



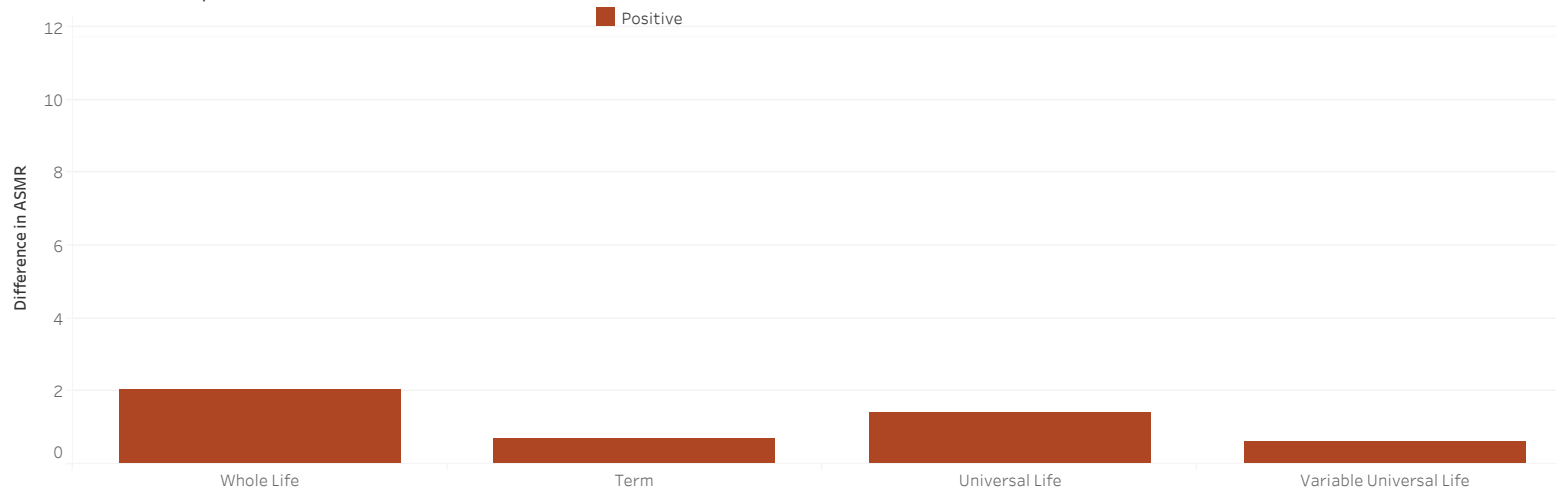
## Total ASMR - Expected ASMR



Total Age-and-Sex-Specific Mortality Rate (ASMR) by Product Type

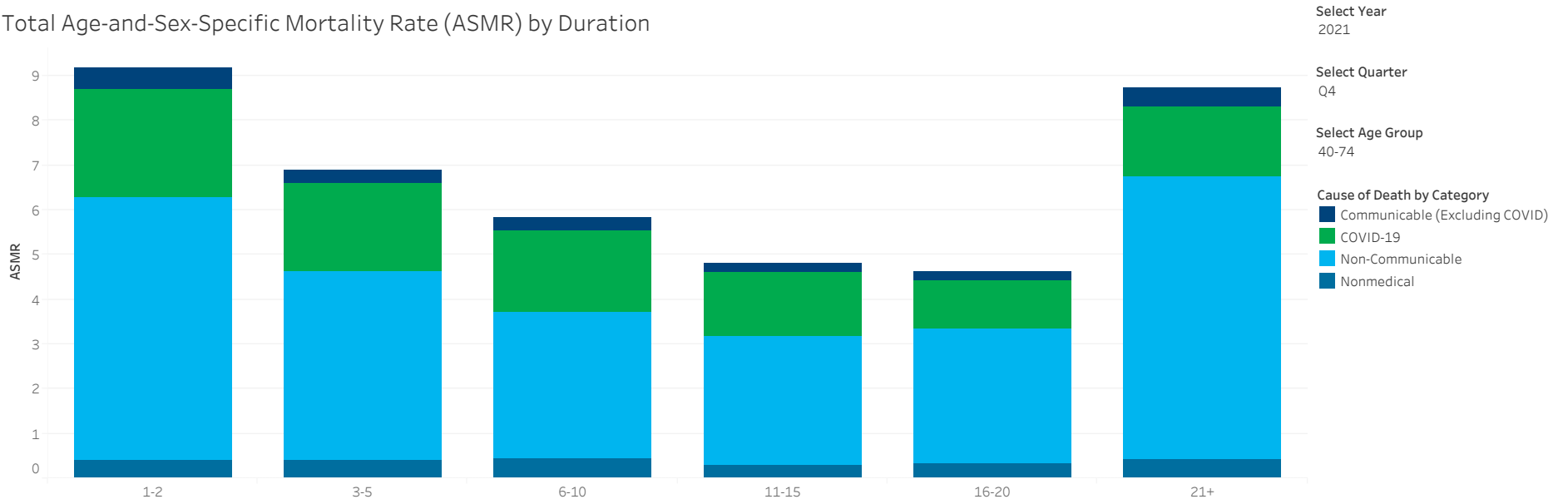


Total ASMR - Expected ASMR

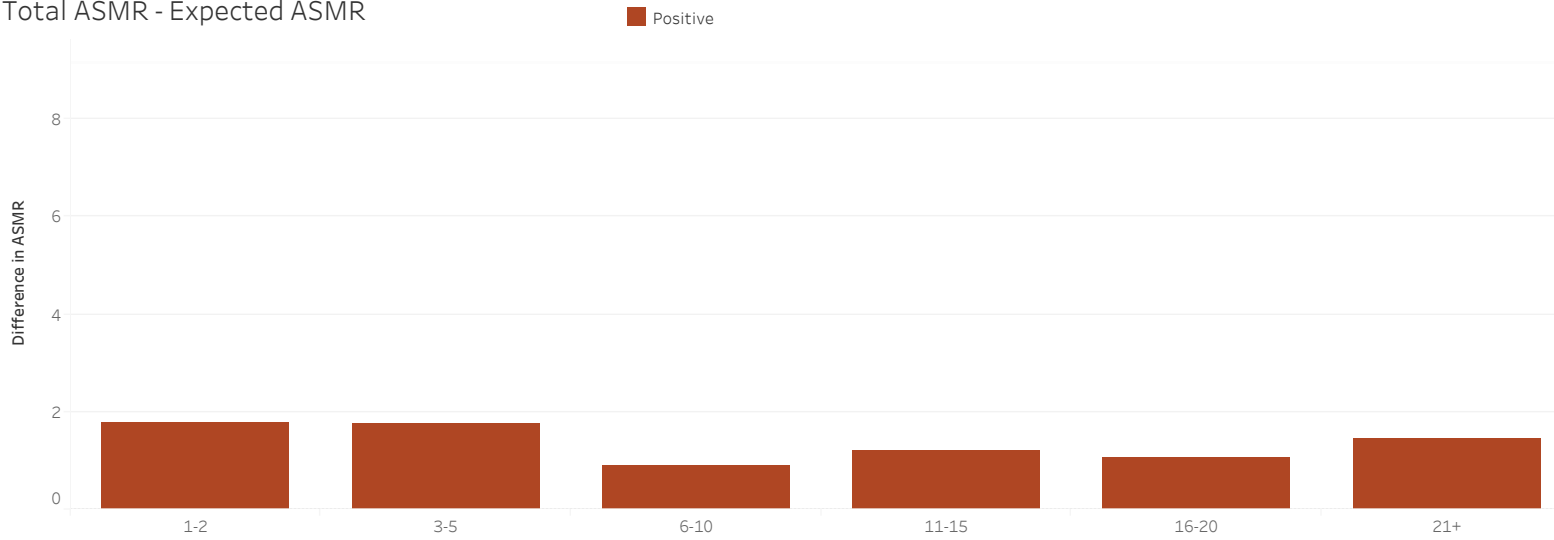




Total Age-and-Sex-Specific Mortality Rate (ASMR) by Duration



Total ASMR - Expected ASMR



## Methodology

Many of the analyses in this dashboard focus on age-and-sex standardized rates of death per 1000, usually split into more specific causes of death. Raw totals of deaths and proportions of causes of death lack sufficient context to provide much useful information for several reasons:

- The cause mix changes by age, sex and over time;
- Exposures and, therefore, deaths have higher variance in a multi-company, multi-product line study such as this one; and
- Trends in cause of death counts can be masked or distorted by exposure inconsistencies. We address these issues by developing age-and-sex-standardized mortality rates per 1000 (ASMR) for the various age groups.

Each subgroup shown in this dashboard, such as non-smoker or smoker, has a unique age/sex mix for standardization that is developed from the ages and time periods discussed. If looking at the fourth quarters for non-smokers aged 40-74, then exposures and deaths are taken from only non-smokers in the fourth quarters from 2015-2020, ages 40-74. Those distributions by age and sex become the standard for that subset. This is necessary to allow consistency across time periods for causes to develop a meaningful trend.

This means that, while rates of death by cause shown within any subgroup are meaningful, they are not directly comparable in the report to rates within a different subgroup.

For many of the dashboard charts, the actual rates of death by a cause group for one age mix in a quarter are shown in the upper chart columns, and the increase or decrease versus expected is presented in the bars directly beneath. This provides a fast visual representation of how the causes shown were impacted in that quarter, both in magnitude and direction.

In the Total ASMR By Region tab, the names of each region correspond with the CDC Health and Human Services regions. To view the states included, hover over the chart or view the map here. <https://www.hhs.gov/about/agencies/iea/regional-offices/index.html> ..

## Participating Companies

AIG Life
Allstate
Ameritas Life Insurance Corp.
Amica Life
Baltimore Life
CNO Financial Group
Equitable
Global Atlantic Financial Group
Government Personnel Mutual Life
Kansas City Life
Lincoln Financial