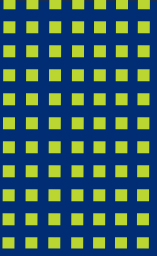# Riverside University HEALTH SYSTEM
Public Health

HEALTH MATTERS BRIEF

Leading Causes of Death in Riverside County, CA

INTRODUCTION

This brief examines the leading causes of death in Riverside County by exploring data from California Integrated Vital Records Registration System. We rank cause of death data in multiple ways, including by total number of deaths, age-adjusted death rates, and years of potential life lost. We also examine changing trends over time and explore differences across age, sex, racial and ethnic groups.

Understanding leading causes of death can help in identifying emerging health concerns and support public health decisions for improving population health. In the United States, cause-of-death trends have shifted since the onset of the COVID-19 pandemic. This shift is due to the mortality burden from COVID-19 and to the increases in drug overdose and alcohol use–related diseases (Ahmad and Anderson, 2021).

RIVERSIDE COUNTY KEY FINDINGS

Heart disease was the leading cause of death between 2018 and 2022 in Riverside County

Other top causes of death vary over time and across sexes and racial/ethnic groups

Deaths from external injuries are more common among younger age groups
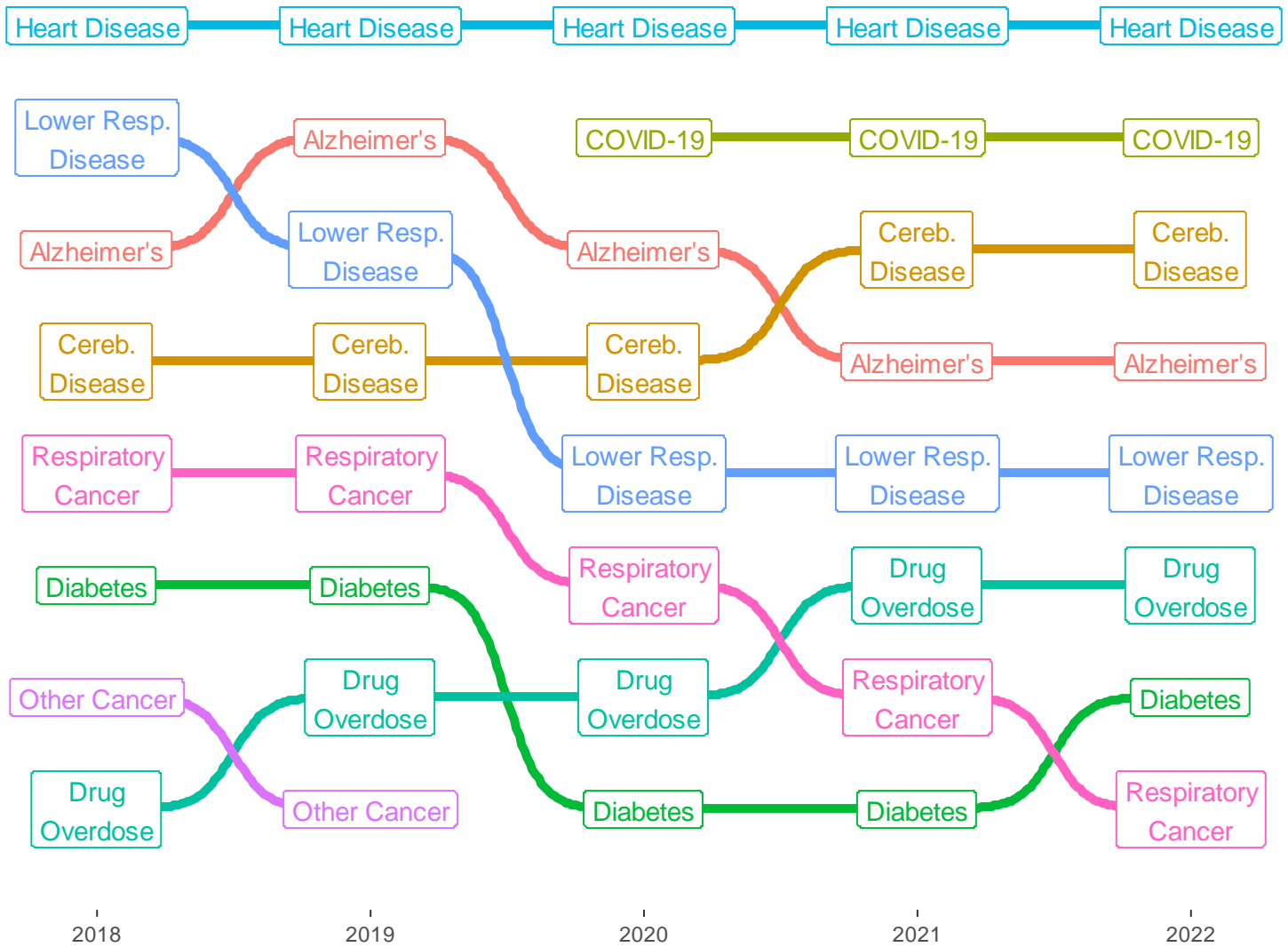
Drug overdose deaths have increased since the onset of the COVID-19 pandemic and are a leading cause of premature death

Trends of Leading Causes of Death

Figure 1. Top 8 Causes of Death by Year, Ranked by Count, 2018-2022

Data Sources: California Integrated Vital Records System (Cal-IVRS), California Comprehensive Death File (CCDF), Riverside County, 2018-2022. Note: Some of the abbreviations are in place to give the visualization more ability to convey the message. Explanations for these abbreviations can be found in the notes section at the end of this brief.
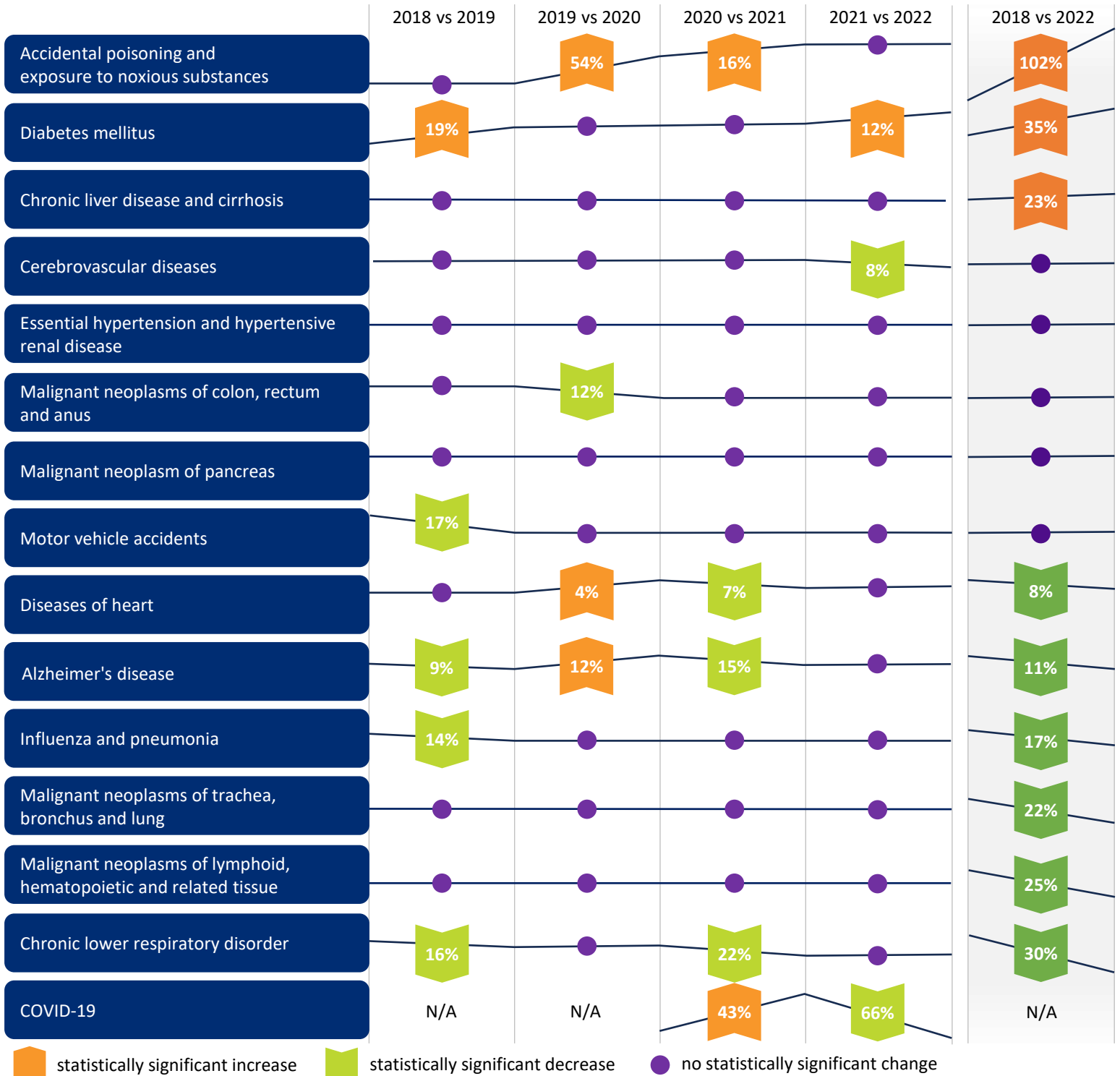
Shown above, in Figure 1, are the leading causes of death ranked by count between 2018 and 2022 among Riverside County residents. While some of the changes in ranks over time are due to a change in the number of deaths over time, some causes have maintained their numbers over time and have only shifted in rank due to the increase or decrease in deaths over time from other causes. Alzheimer's, for instance, is an example of a cause of death that has had similar numbers over the observed years but has shifted in rank due to the decrease in Lower Respiratory Diseases and the onset of the COVID-19 pandemic in 2020. Alternatively, Lower Respiratory Diseases and Respiratory Cancers are examples of causes of death that have decreased in rank as a leading cause of death both because the death counts have decreased over time and because of the increase in deaths from other causes of death, such as COVID-19. Drug Overdose (more specifically unintentional drug overdose) is a cause of death that has increasingly become a higher ranking cause of death in recent years, more than doubling the number of deaths from 2018 (407) to 2022 (874). Finally, the leading cause of death in every year shown above, Heart Disease, has had the highest count of death among Riverside County residents.
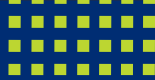
Time trends in mortality rates for the leading causes of death

We calculated standardized mortality ratios (SMRs) to assess changes in cause-specific mortality over time. SMRs were calculated as the ratio of the observed number of cause-specific deaths for a given year relative to the expected number of cause-specific deaths, assuming it had the same age- and cause-specific deaths rates as the previous year of interest. We employed a Poisson regression method to conduct significance tests regarding the differences between the observed and expected cause-specific death counts. Among the fifteen leading causes of death, nine causes exhibited statistically significant differences between 2018 and 2022, with accidental poisoning (including drug overdoses) showing the largest increase.

Figure 2. Comparing observed death counts to expected death counts based on rates from the previous year

Cause of death	2018 vs 2019	2019 vs 2020	2020 vs 2021	2021 vs 2022	2018 vs 2022
Accidental poisoning and exposure to noxious substances	no change	54% increase	16% increase	no change	102% increase
Diabetes mellitus	19% increase	no change	no change	12% increase	35% increase
Chronic liver disease and cirrhosis	no change	no change	no change	no change	23% increase
Cerebrovascular diseases	no change	no change	no change	8% decrease	no change
Essential hypertension and hypertensive renal disease	no change	no change	no change	no change	no change
Malignant neoplasms of colon, rectum and anus	no change	12% decrease	no change	no change	no change
Malignant neoplasm of pancreas	no change	no change	no change	no change	no change
Motor vehicle accidents	17% decrease	no change	no change	no change	no change
Diseases of heart	no change	4% increase	7% decrease	no change	8% decrease
Alzheimer's disease	9% decrease	12% increase	15% decrease	no change	11% decrease
Influenza and pneumonia	14% decrease	no change	no change	no change	17% decrease
Malignant neoplasms of trachea, bronchus and lung	no change	no change	no change	no change	22% decrease
Malignant neoplasms of lymphoid, hematopoietic and related tissue	no change	no change	no change	no change	25% decrease
Chronic lower respiratory disorder	16% decrease	no change	22% decrease	no change	30% decrease
COVID-19	N/A	N/A	43% decrease	66% decrease	N/A

Legend: statistically significant increase (orange) ● statistically significant decrease (green) ● no statistically significant change (purple)

Leading Causes of Death by Sex and by Race/Ethnicity

In 2022, the top five leading causes of death accounted for 62.2% of all female deaths and 64.5% of all male deaths occurring in Riverside County (Figure 3). Males and females shared four of the five leading causes of death, with similarities in the ranking of certain causes of death. For both populations, heart disease (diseases of heart) and cancer (malignant neoplasms) ranked as the first and second leading causes of death. Heart disease accounted for 22.9% of all deaths in females and 24.8% of all deaths in males. Cancer accounted for 19.3% of all female deaths and 17.8% of all male deaths. The third leading cause of death was unique to either population. Alzheimer's disease ranked third with 7.8% of female deaths while unintentional injuries ranked third with 10.2% of male deaths.

Figure 3. Top 5 Leading Causes of Death by Sex in 2022

|	Female	Male
1st	Heart disease	Heart disease
2nd	Cancer	Cancer
3rd	Alzheimer's disease	Unintentional Injury
4th	Stroke	COVID-19
5th	COVID-19	Stroke

Data Source: California Integrated Vital Records System (Cal-IVRS), California Comprehensive Death File (CCDF), Riverside County, 2022.

Figure 4. Top 5 Leading Causes of Death by Race/Ethnicity in 2022

	American Indian/ Alaska Native	Asian	Black/ African American	Hispanic	Multirace	Native Hawaiian/ Pacific Islander	White
1st	Heart disease	Cancer	Heart disease	Heart disease	Heart disease	Heart disease	Heart disease
2nd	Cancer	Heart Disease	Cancer	Cancer	Unintentional injury/ Cancer	Unintentional injury/ COVID-19	Cancer
3rd	Unintentional Injury	COVID-19	Unintentional Injury	Unintentional Injury	COVID-19	Cancer	Alzheimer's disease
4th	COVID-19	Stroke	COVID-19	COVID-19	Stroke	Diabetes mellitus	Unintentional injury
5th	Stroke	Alzheimer's disease	Stroke	Stroke	Alzheimer's disease	Stroke	Chronic lower respiratory diseases

Data Source: California Integrated Vital Records System (Cal-IVRS), California Comprehensive Death File (CCDF), Riverside County, 2022.

Heart disease is the leading cause of death among all race/ethnic groups except Asians whose leading cause of death was cancer (Figure 4). The White population had the highest burden of mortality from heart disease, accounting for 26.6% of all deaths in this population. The Asian population had the highest burden of mortality from cancer among all groups, accounting for 22.2% of total deaths within this group. The burden of mortality from unintentional injuries was relatively similar for both the Native Hawaiian or Other Pacific Islander (NHPI) population and the Multirace population, with 17% in the NHPI population and 16% in the Multirace population, making it the second leading cause of death. COVID-19 consistently ranked as one of the top 5 leading causes of death for nearly all race/ethnicity groups except for the White population.
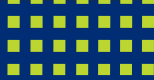
Leading Causes of Death by Age Group

Generally, for younger age groups external causes (unintentional injuries including drug overdose, suicide, and homicide) accounted for more deaths than other causes, while chronic diseases were more prevalent among older age groups (NVSR, 2024). In 2022, the first leading cause of death for the population ages 1-4 and 15-44 was unintentional injuries (Figure 5). The relative burden of mortality from unintentional injuries – which includes drug overdose - was the highest for the age group 25-34 accounting for 54.2% of all deaths in this age group, 52% for the age group 15-24, 40% for the age group 1-4, and 35.3 % for the age group 35-44. Cancer was the first leading cause of death for several age groups. Among individuals aged 65-74, cancer accounted for 26% of all deaths in this group. In the age group 55-64, cancer accounted for 24%, 23% for the age group 5-14, and 19.3% for the age group 45-54. Chronic liver disease and cirrhosis ranked in the top 5 leading causes of death for the population ages 35-64, with its highest rank of fourth for the age group 35-44 (7.6%).

Among individuals aged 25 to 34, unintentional injuries accounted for 54% of deaths in 2022.

Figure 5. Top 5 Leading Causes of Death by Age Group in 2022

	Less than 1	1-4	5-14	15-24	25-34
1st	Perinatal conditions	Unintentional injury	Cancer	Unintentional injury	Unintentional injury
2nd	Congenital anomalies	Cancer/Congenital anomalies	Unintentional injury	Suicide/ Assault (homicide)	Suicide
3rd	Sudden infant death syndrome	COVID-19/ Assault (homicide)	Congenital anomalies	Cancer	Cancer
4th	Assault (homicide)/Septicemia	**	*	Congenital anomalies	Assault (homicide)
5th	*	**	*	Pregnancy	Heart disease

|	35-44	45-54	55-64	65-74	75-84	85+
1st	Unintentional injury	Cancer	Cancer	Cancer	Heart disease	Heart disease
2nd	Cancer	Unintentional injury	Heart disease	Heart disease	Cancer	Alzheimer's disease
3rd	Heart disease	Heart disease	Unintentional injury	COVID-19	Chronic lower respiratory diseases	Cancer
4th	Chronic liver disease and cirrhosis	COVID-19	COVID-19	Diabetes mellitus	COVID-19	Stroke
5th	COVID-19	Chronic liver disease and cirrhosis	Chronic liver disease and cirrhosis	Stroke	Alzheimer's disease	COVID-19

*: Multiple causes of death in the same order. **: No ranking due to low counts.

Data Source: California Integrated Vital Records System (Cal-IVRS), California Comprehensive Death File (CCDF), Riverside County, 2022.

Years of Potential Life Lost

Figure 6. Age-Adjusted Years of Potential Life Lost (YPLL)
by Cause for Riverside County, 2014 to 2023
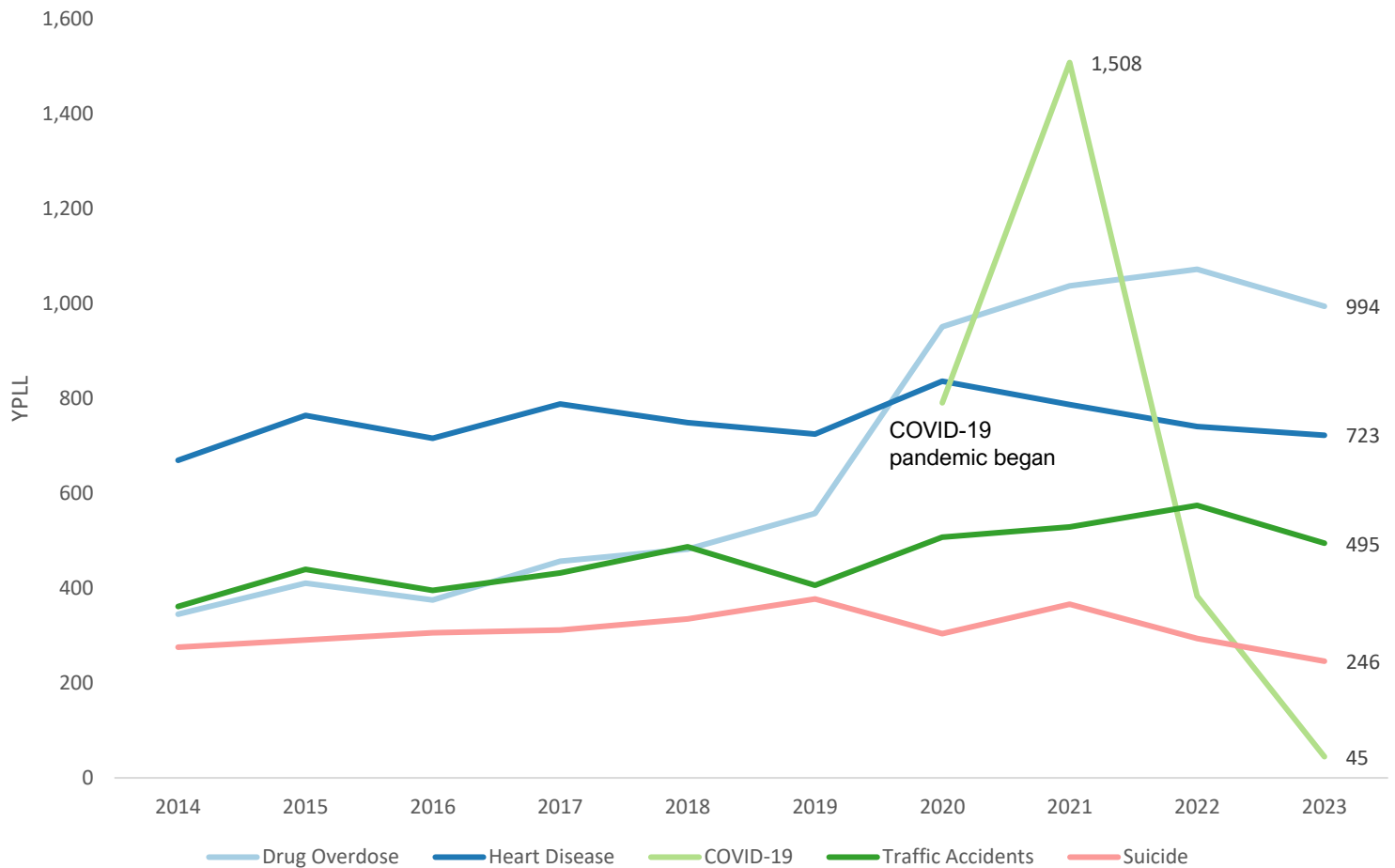
Data Sources: California Integrated Vital Records System (Cal-IVRS), California Comprehensive Death File (CCDF), Riverside County, 2014-2023.
Death Statistical Master File (DSMF), 2014-2019.
U.S. Census Bureau, Vintage Population Estimates, 2010–2019 and 2020–2023.

Years of Potential Life Lost (YPLL): Why do we use this?

Years of potential life lost (YPLL) is used to measure the number of years of the final age at death before age 75. It can be used to better understand the underlying drivers of overall life expectancy. Unlike using measures that focus on counts or count rates, this measure puts a focus on causes of death that have a pronounced effect on younger age groups. For example, while suicide and traffic accidents might not be leading causes of death when viewed through the lens of counts or count rates, they are highlighted above as leading causes of YPLL due to the younger age distribution of decedents. Additionally, heart disease is both a leading cause of death and a leading cause of YPLL; it also does not appear to have major changes in YPLL over time.

Similar to other causes of death measured by counts or count rates, as shown in previous sections of this brief, YPLL also saw a lot of rapid shifting trends since the onset of the COVID-19 pandemic. COVID-19, for instance, started in 2020 as one of the top contributors to YPLL, but has more recently been remediated due to vaccination efforts. Drug overdose, historically a leading cause of YPLL, has more recently reached a new level and has become the leading cause of YPLL. Policymakers looking to improve life expectancy might seek to target efforts to reduce these kinds of deaths, especially those related to the opioid epidemic that was officially declared a public health emergency in 2017 (Hargan, 2017).

CONCLUSIONS

This brief shows that heart disease was the leading cause of death in Riverside County throughout the period from 2018 to 2022. This brief also shows that cause of death rankings in Riverside County have varied over time and across sexes and racial/ethnic groups, demonstrating potential disparities. In addition to the shifts brought about by the onset of the COVID-19 pandemic, Riverside County saw notable increases in the number of deaths associated with 'accidental poisoning and exposure to noxious substances', where most of these deaths were caused by drug-related overdoses. Similarly, the YPLL findings show that accidental poisoning and exposure to noxious substances represent a persistent burden on our community's health and well-being, especially for our younger age groups.

NOTES

List of abbreviations for the causes of death used on Page 3:
- Lower Resp. Diseases - Short for lower respiratory diseases, includes bronchitis, emphysema, asthma, etc.
- Cereb. Diseases - Short for cerebrovascular diseases, includes stroke, brain hemorrhage, and cerebral infarction.
- Drug Overdose - Includes any deaths due to accidental poisoning. Any intentional poisonings to another person are included under homicide, and any intentional self-inflicted poisonings are in the suicide category.
- Heart Disease - Includes conditions of the heart such as heart attack, hypertension of the heart, heart failure, or other conditions affecting the heart.

REFERENCES

Ahmad, F. B., & Anderson, R. N. (2021). *The leading causes of death in the US for 2020*. Jama, 325(18), 1829-1830. National Center for Health Statistics. (2024). *Deaths: Leading Causes for 2021* (National Vital Statistic Reports Vol .73 No.4). U.S. Department of Health and Human Services. https://www.cdc.gov/nchs/data/nvsr/nvsr73/nvsr73-04.pdf

Hargan, Eric. Determination That A Public Health Emergency Exists. Administration for Strategic Preparedness & Response. U.S. Health & Human Services. Enacted October 26th, 2017. Retrieved from https://aspr.hhs.gov/legal/PHE/Pages/opioids.aspx

SUGGESTED CITATION

ACKNOWLEDGEMENTS