



Utah Department of
Health & Human
Services

Occupational trends and risk factors in suicide mortality: Utah, 2001-2022

Yanling Shi

Office of Vital Records and Statistics
Utah Department of Health and Human Services

What we will cover:

- **Introduction**
- **Methods**
- **Results**
- **Conclusion**

Introduction

1. The Role of Work in Well-Being- Our jobs impact more than just income—they significantly shape our physical and psychological well-being, with most of the U.S. population(62.5%) is engaged in the workforce.

2. A Growing Concern- Rising suicide rates among the working-age population highlight an urgent issue: the evolving relationship between occupation and suicide risk.

The study by Sussell and colleagues(1) reported about a 33% increase in suicide rates among the U.S. working-age population over the past two decades. To put that into context, this rise is slightly higher than the 32% increase seen in the general U.S. population during the same time period, according to the CDC.

3. Our Objective

To identify specific occupations that are linked to a higher risk of suicide and gain a deeper understanding of these patterns within the state.

4. Why It Matters

By pinpointing those high-risk groups, we can tailor our intervention strategies.

- (1) Sussell A, Peterson C, Li J, Miniño A, Scott KA, Stone DM. *Suicide Rates by Industry and Occupation — National Vital Statistics System, United States, 2021*. *MMWR Morb Mortal Wkly Rep* 2023;72:1346–1350. DOI: <http://dx.doi.org/10.15585/mmwr.mm7250a2>.

Methods

- For this investigation, we used Utah death certificate data spanning from 2001 to 2022.
- We focused on deaths among Utah residents who were 18 years or older, had died within the state, and had occupation data available on the death certificate.
- To ensure the accuracy of occupational information, we first corrected any military coding errors. Then, we used John B's method(2) to cross-walk the occupation codes to the 2018 Census occupation groups.
- For the purposes of analysis—and to make the results easier to interpret—we grouped these Census occupation categories into 25 broader groups.
- We used joinpoint regression models to analyze trends, by obtaining the annual percentage change (APC) of line segments from the model estimates (3).
- All statistical analyses, except the trend analyses, were performed with SAS, V.9.4, for Windows (4).
- We considered a p value smaller than 0.05 to be statistically significant.

(2) Crosswalks to convert U.S. Census Bureau industry and occupation codes, 1980–2018

- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10280701/>

(3) National Cancer Institute. Joinpoint regression program, version 5.3.0 n.d. Available: <http://surveillance.cancer.gov/joinpoint/>

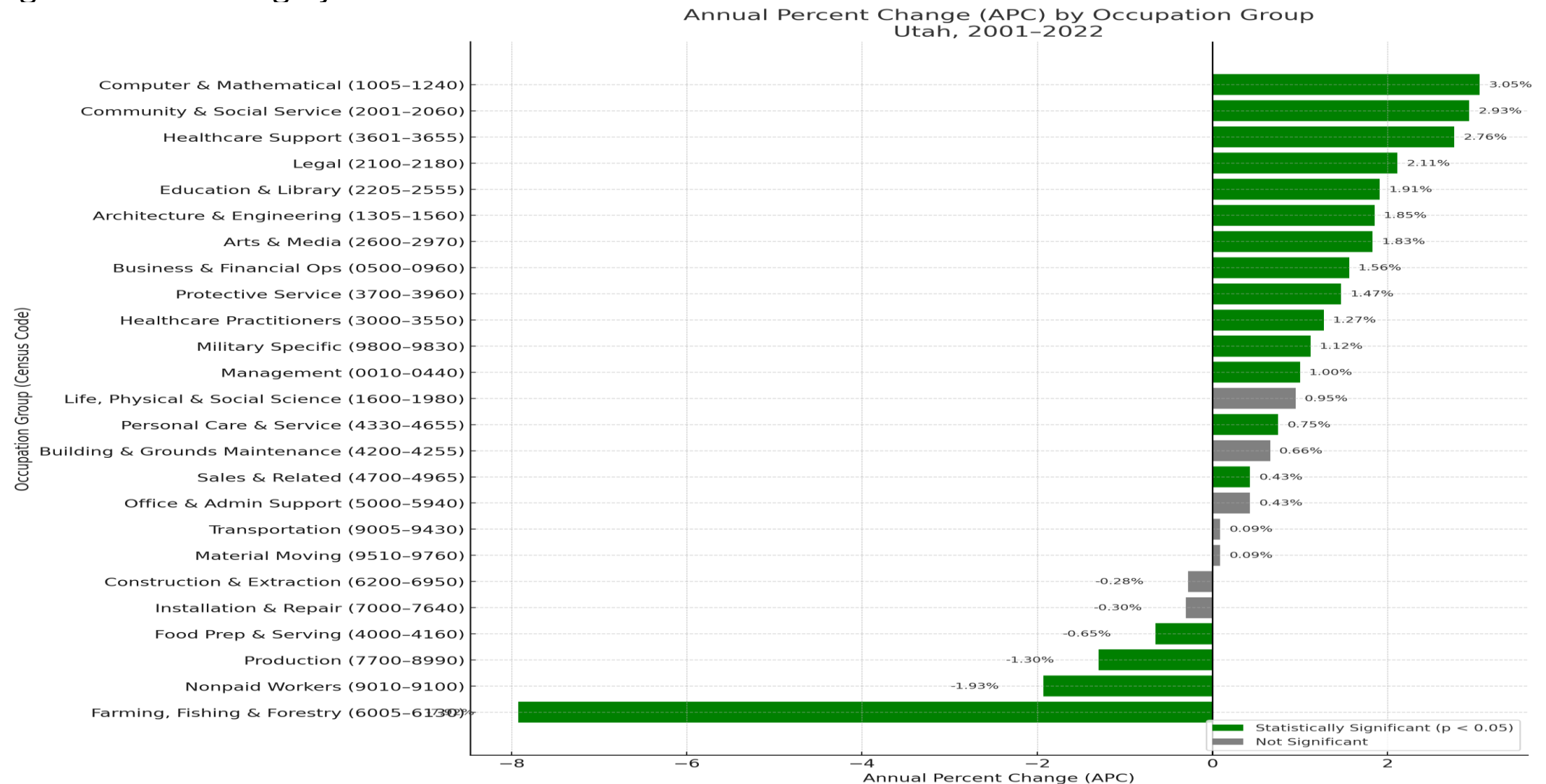
(4) SAS Institute Inc. SAS® 9.4 Statements: Reference. Cary, NC: SAS Institute Inc, 2013.

Results

- Changes in occupations
- Changes in suicides
- Suicides and occupations
- Risk factors in suicide mortality

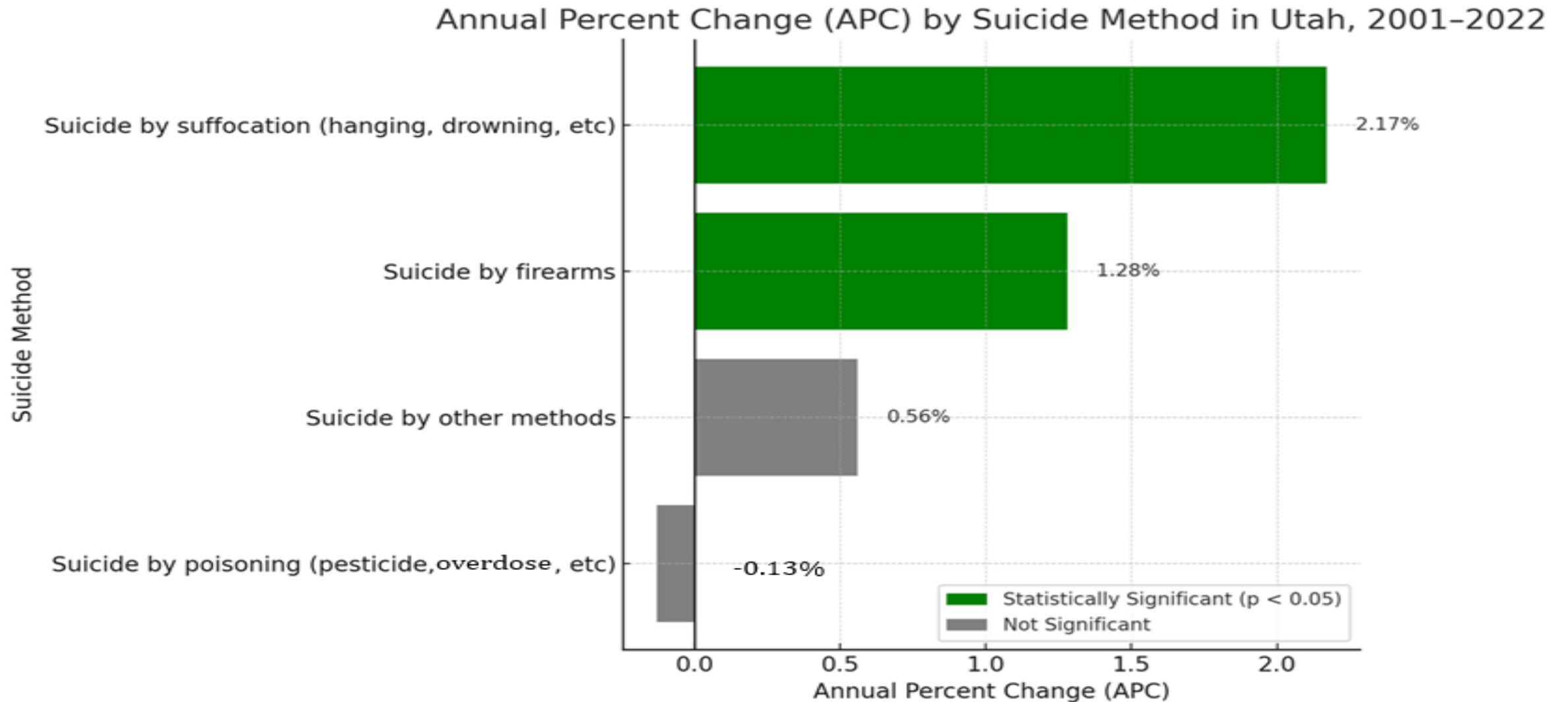
Results-Changes in occupations

Here's the updated chart showing **Annual Percent Change (APC)** by **Occupation Group**, now including **Census codes** in the labels and highlighting **statistically significant changes** in green. Non-significant changes are shown in gray.

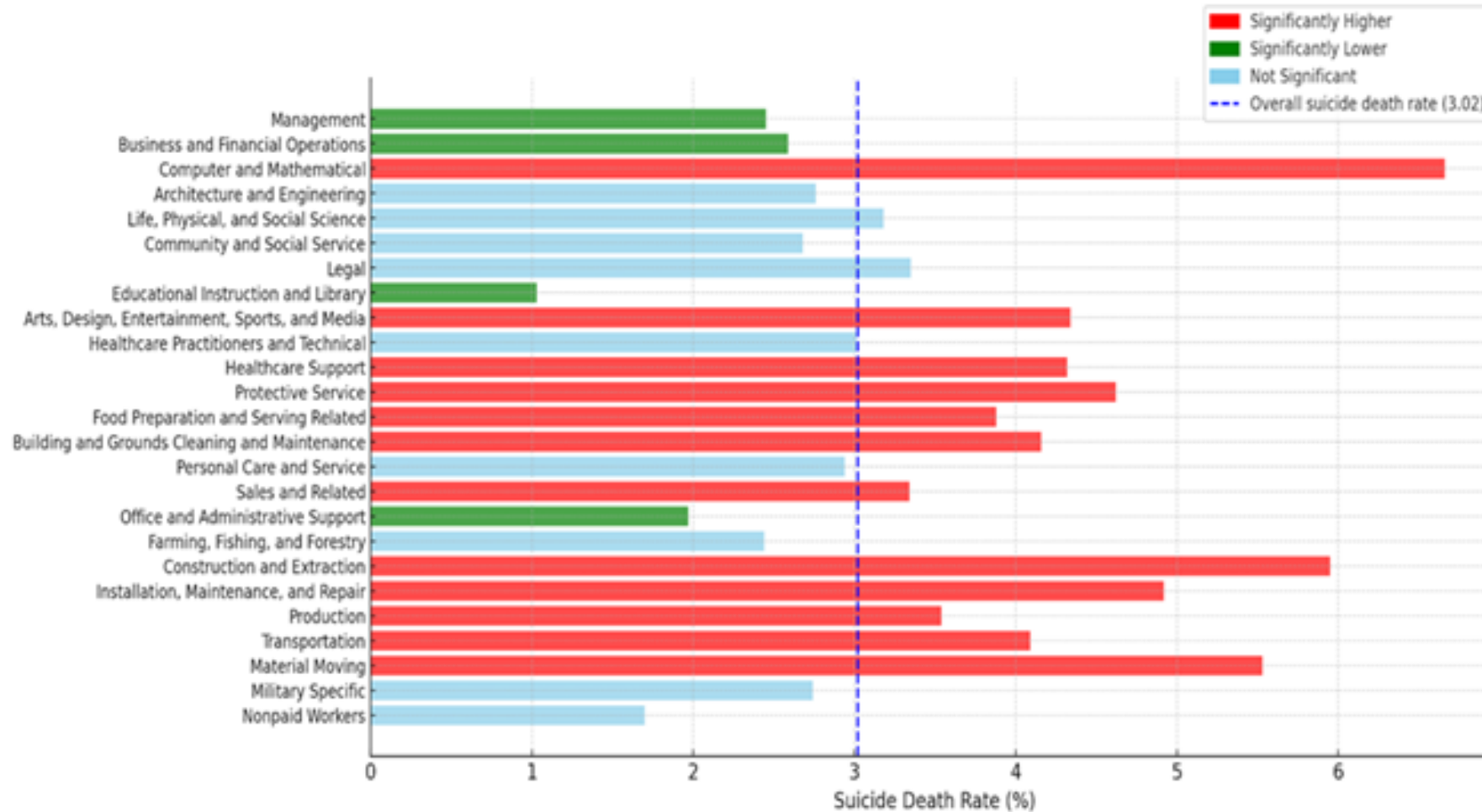


Results-Changes in suicides

Here's the focused chart displaying **Annual Percent Change (APC)** by **specific suicide methods** in Utah from 2001–2022. Statistically significant trends are shown in green, while non-significant ones are in gray.



Results-Suicides and occupations



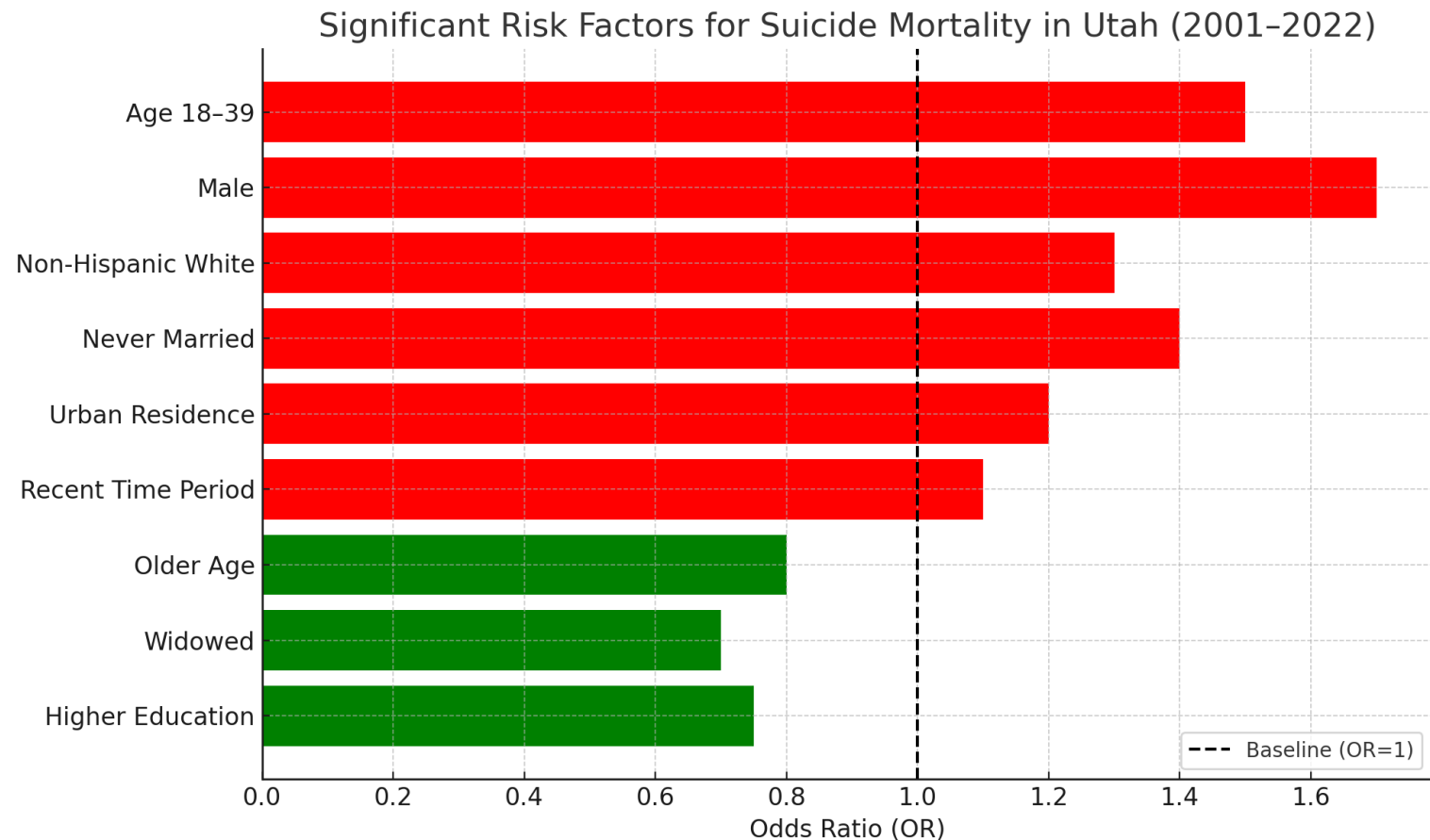
Red bars = Significantly higher than 3.02

Green bars = Significantly lower than 3.02

Sky blue bars = Not significantly different from 3.02

Dashed blue line = Overall suicide death rate (3.02)

Results-Risk factors in suicide mortality



Here is a visualization showing the significant risk factors for suicide mortality in Utah between 2001 and 2022, based on your logistic regression analysis.

- **Red bars** indicate increased risk (odds ratio > 1).
- **Green bars** indicate protective factors (odds ratio < 1).
- The **dashed line** at OR = 1 represents the baseline (no increased or decreased risk).

Conclusion

Our research shows important shifts in suicide mortality across both job types and demographic groups.

- Suicide deaths have gone up among highly skilled technical workers—especially in the fast-growing computer and mathematical fields, which now have the **highest** suicide rates.
- Suicide deaths involving suffocation and firearms have been rising significantly.
- Younger individuals, males, and people who have never been married are at significantly higher risk of suicide.

These rising trends point to an urgent need for targeted prevention strategies. Moving forward, future research should focus on uncovering the underlying causes behind these disparities and developing tailored interventions to support those most at risk.

What we have covered:

- **Introduction**
- **Methods**
- **Results**
- **Conclusion**



Utah Department of
Health & Human
Services

Q&A

Contact information:

Yanling Shi

Data Management and Reporting Manager

O: 801-538-9339

- yshi@utah.gov