


Week 3 + 4 Presentation

# Low-Income Jobs Lost to COVID-19

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DAT 4500

# Recap & Progress Overview

- **Analysis of selected industries by demographics**
  - Proportion of Women Per Industry
  - Proportion of Demographics that have jobs in each Industry
- **Analysis of change in gross output (pre, post, and during COVID-19)**
- **Research of health and social assistance**
  - Why was there a large change in low-income employment?
  - What jobs in this category qualify as low-income?
- **Finalized research question**
- **New datasets to support research questions**

<u>Issues we encountered:</u>

- Narrowing down our research question
- Figuring out what Metrics to Use to measure covid-19 regulations

# Visual 1: 2019 Q1 – 2022 Q4 Gross Output by Industry (In Billions)

| | 2019 Q1 | 2019 Q2 | 2019 Q3 | 2019 Q4 | 2020 Q1 | 2020 Q2 | 2020 Q3 | 2020 Q4 | 2021 Q1 | 2021 Q2 | 2021 Q3 | 2021 Q4 | 2022 Q1 | 2022 Q2 | 2022 Q3 | 2022 Q4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Accommodation and food services | 1,167.80 | 1,186.40 | 1,207.20 | 1,205.80 | 1,135.70 | 682.3 | 976.3 | 984.3 | 1,085.30 | 1,286.60 | 1,391.10 | 1,421.90 | 1,441.60 | 1,526.40 | 1,561.20 | 1,615.90 |
| Health care and social assistance | 2,599.50 | 2,638.70 | 2,659.70 | 2,694.20 | 2,638.90 | 2,366.50 | 2,595.60 | 2,684.00 | 2,692.80 | 2,765.50 | 2,819.60 | 2,869.00 | 2,899.30 | 2,928.20 | 2,979.80 | 3,023.60 |
| Professional, scientific, and technical services (STEM) | 2,425.50 | 2,471.10 | 2,523.00 | 2,528.90 | 2,608.70 | 2,395.30 | 2,553.40 | 2,678.00 | 2,732.70 | 2,818.90 | 2,901.70 | 2,975.80 | 3,059.40 | 3,120.90 | 3,198.00 | 3,262.20 |
| Transportation and warehousing | 1,281.10 | 1,286.80 | 1,285.60 | 1,300.60 | 1,291.00 | 998.4 | 1,132.60 | 1,218.50 | 1,295.60 | 1,402.10 | 1,509.20 | 1,615.30 | 1,696.10 | 1,803.70 | 1,823.80 | 1,795.60 |

Huge decrease in Jobs
- Accommodation & Food Services
- Health Care & Social Assistance

Increase in Jobs
- STEM
- Transportation & Warehousing

- Shows the Gross Output amongst each industry from 2019 Q1 to 2022 Q4
- 2019 Q1 to 2020 Q2 shows the change in each industries Gross Output due to covid and how much impact there was
- 2020 Q2 to 2022 Q4 period shows the changes in recovery and how much they had gained before, during, and after covid

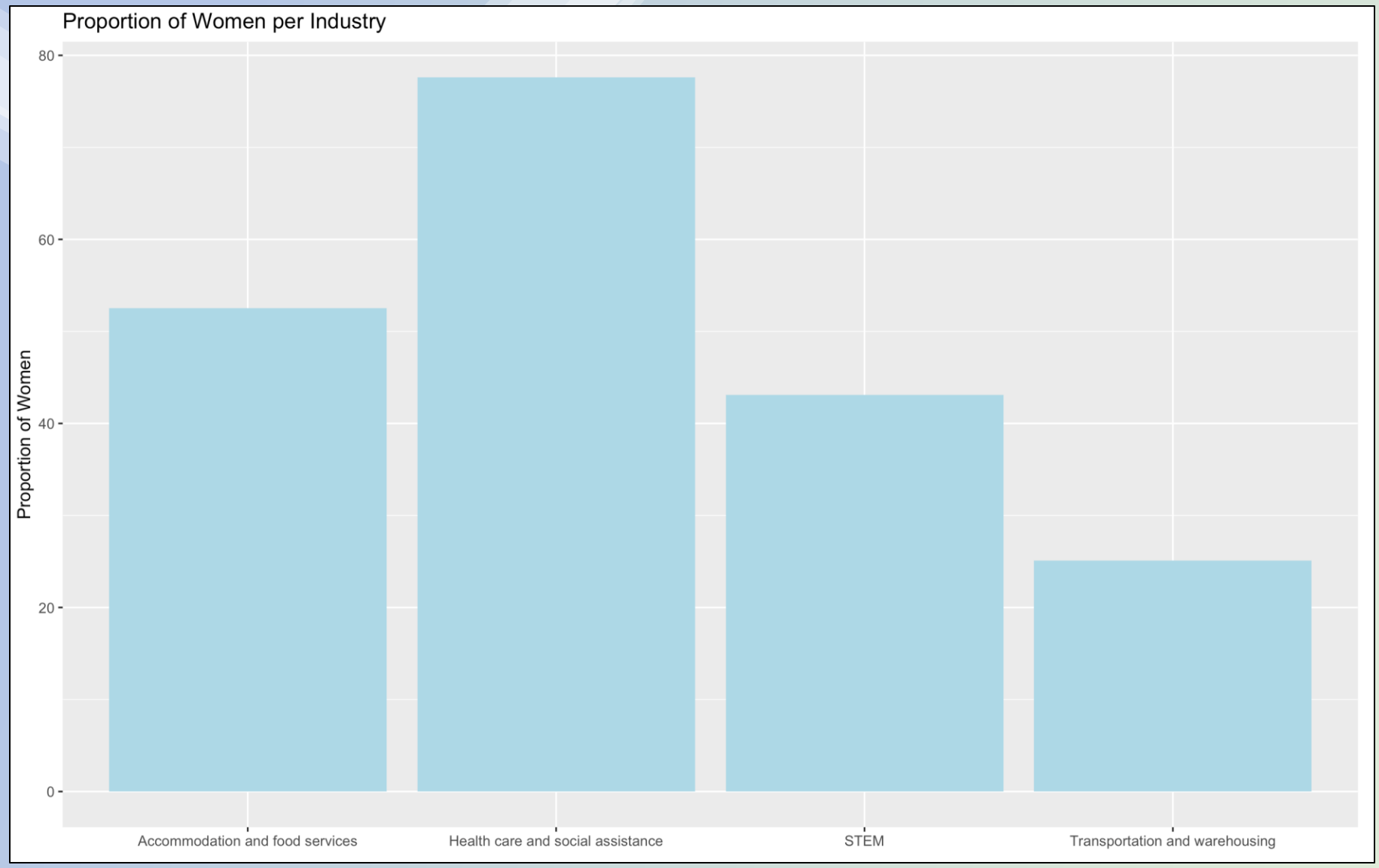
# Visualization 2: Gross Output of Industries (In Billions)

- **Impact** (2019 Q1 – 2020 Q2)
- **Recovery** (2020 Q2 – 2022 Q4 )

| | Covid Impact (loss in billions) | Recovery (gain in billions) | Gain-Loss Ratio |
|---|---|---|---|
| Accommodation & food services | 485.5 | 933.6 | 1.92 |
| Health care & social assistance | 233 | 657.1 | 2.82 |
| STEM | 30.2 | 866.9 | 28.71 |
| Transportation & warehousing | 282.7 | 797.2 | 2.82 |

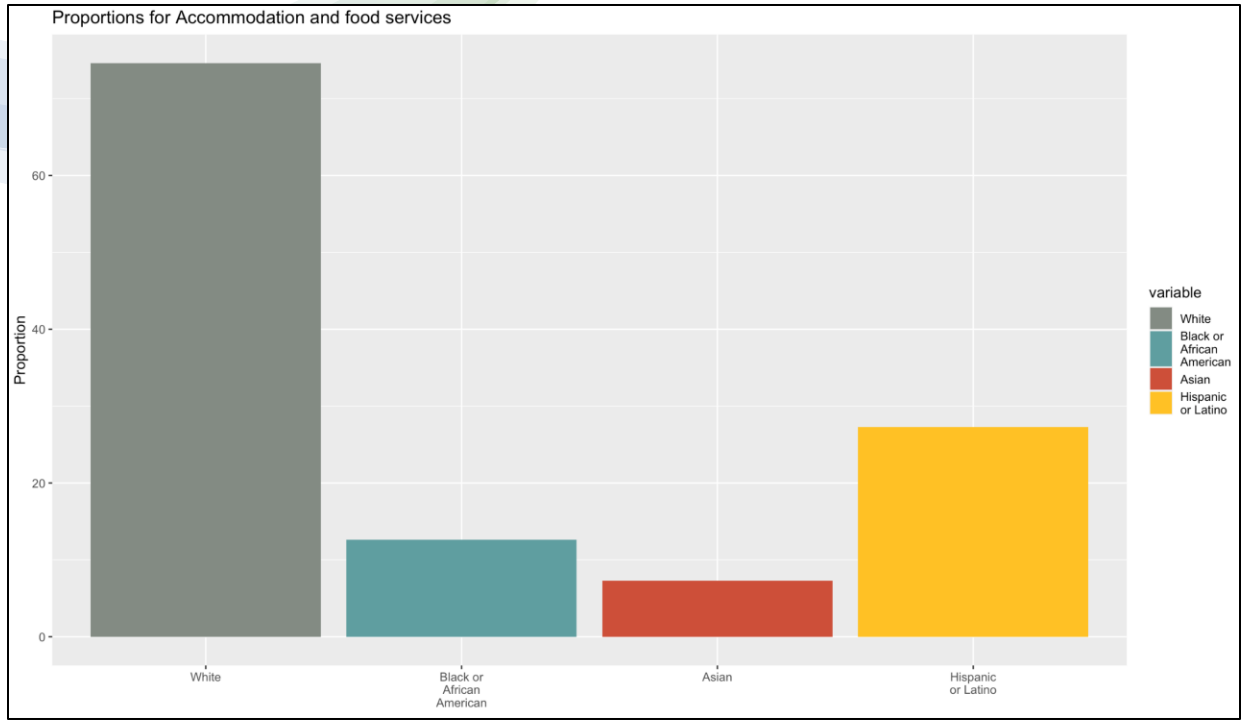
- Accommodation & food services loss the most and gained the most in terms of recovery
- Healthcare was impacted the least in terms of loss & gain
- The STEM industry had the highest ratio whereas Accommodation & food services had the lowest ratio

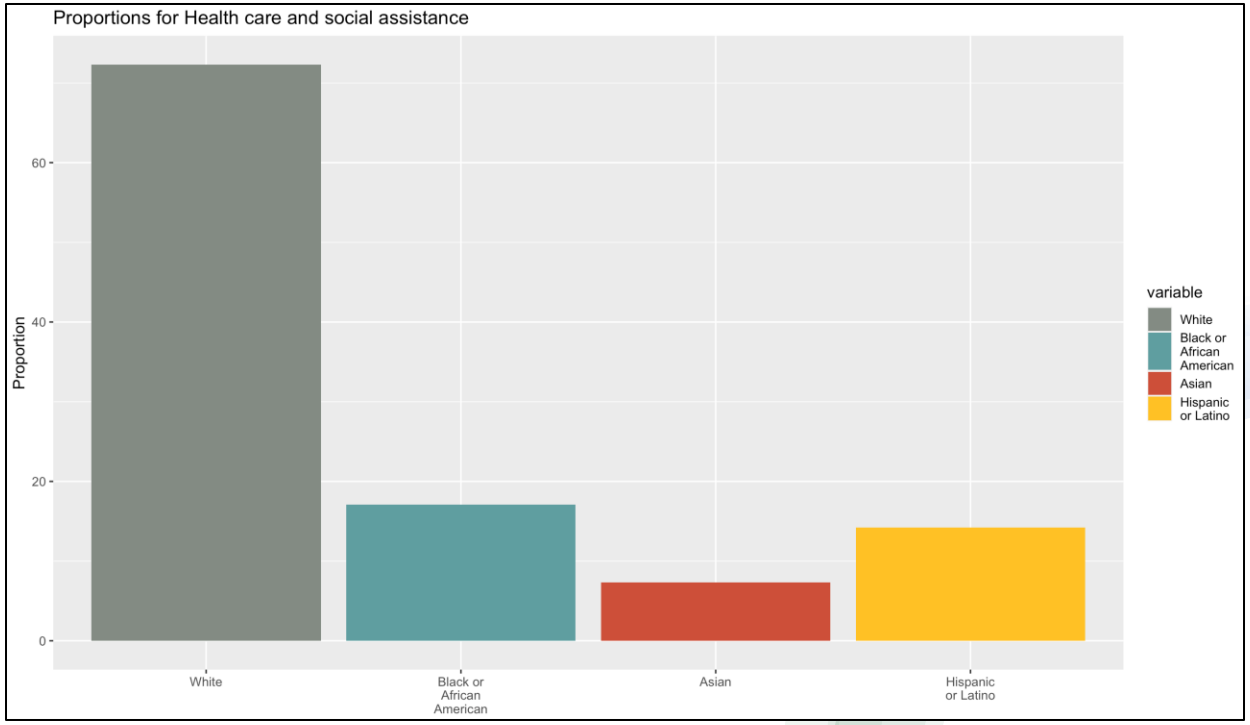
# Visualization 3: Proportion of Women per Industry




- Percent of women employed in 2021 amongst these 4 industries
- Health care had the highest & Accommodation & Food Services had the second highest
- STEM & Transportaion & Warehousing last

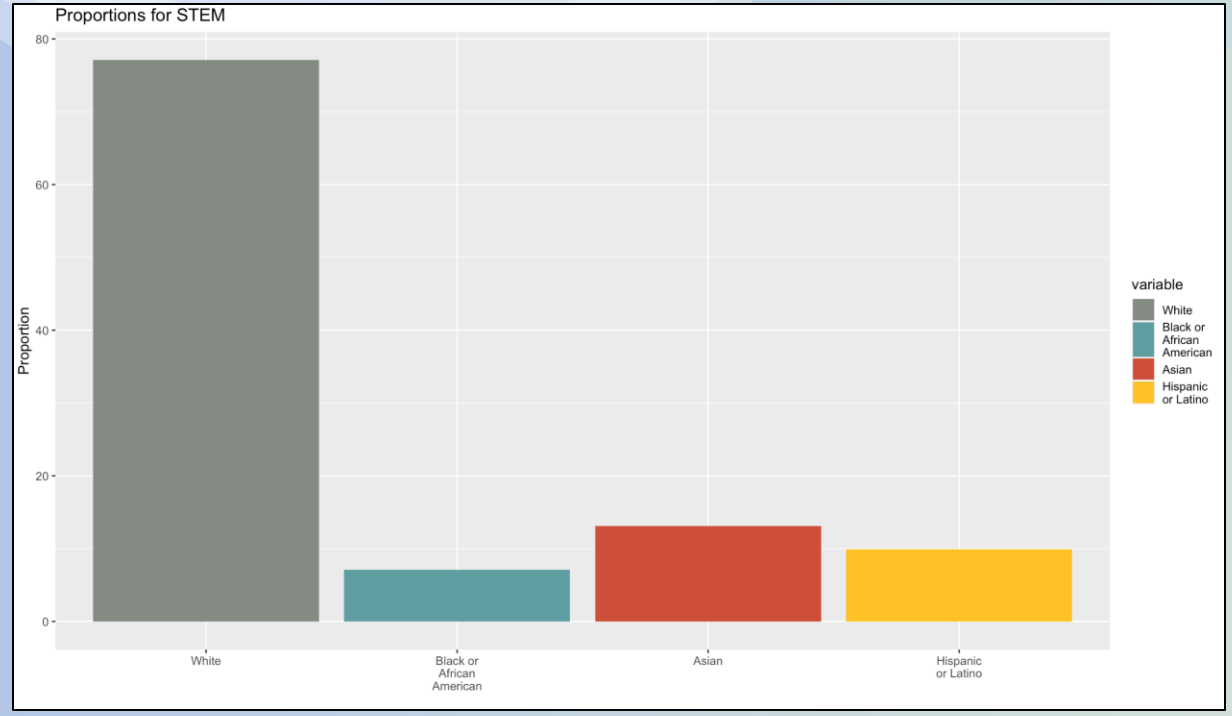
# Visual 4: Accommodation & Food Services and Health & Social Assistance

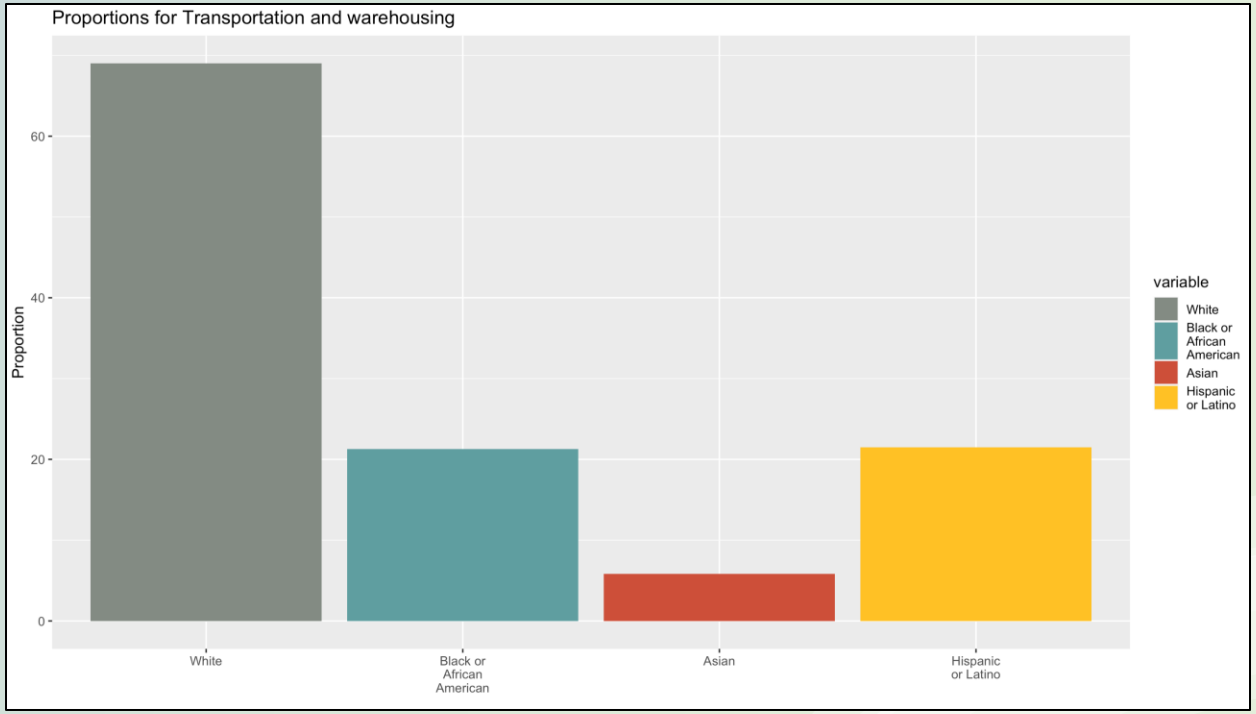



- Shows the proportion of demographics that have jobs in each industry as of 2021 (total employed)

# Visual 4 (cont'd): STEM and Transportation & Warehousing

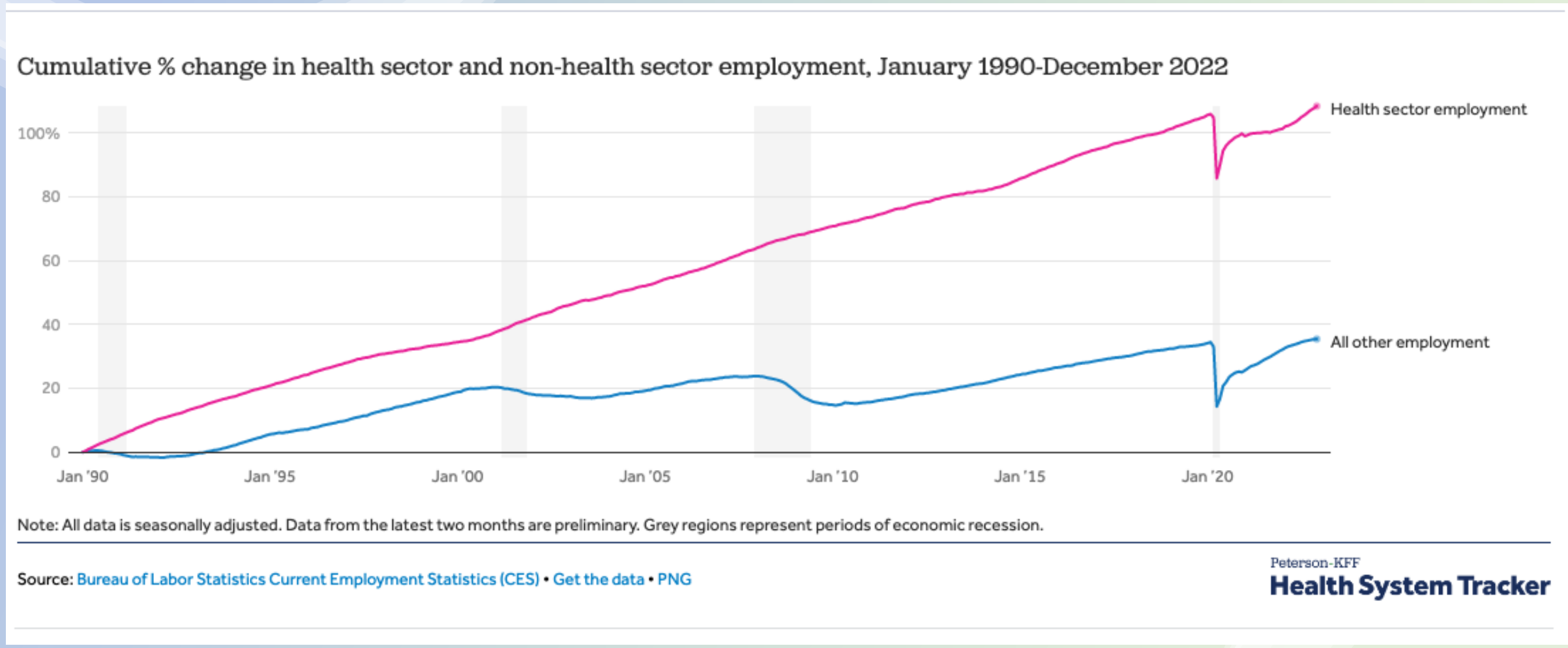


# Health & Social Assistance: A Closer Look

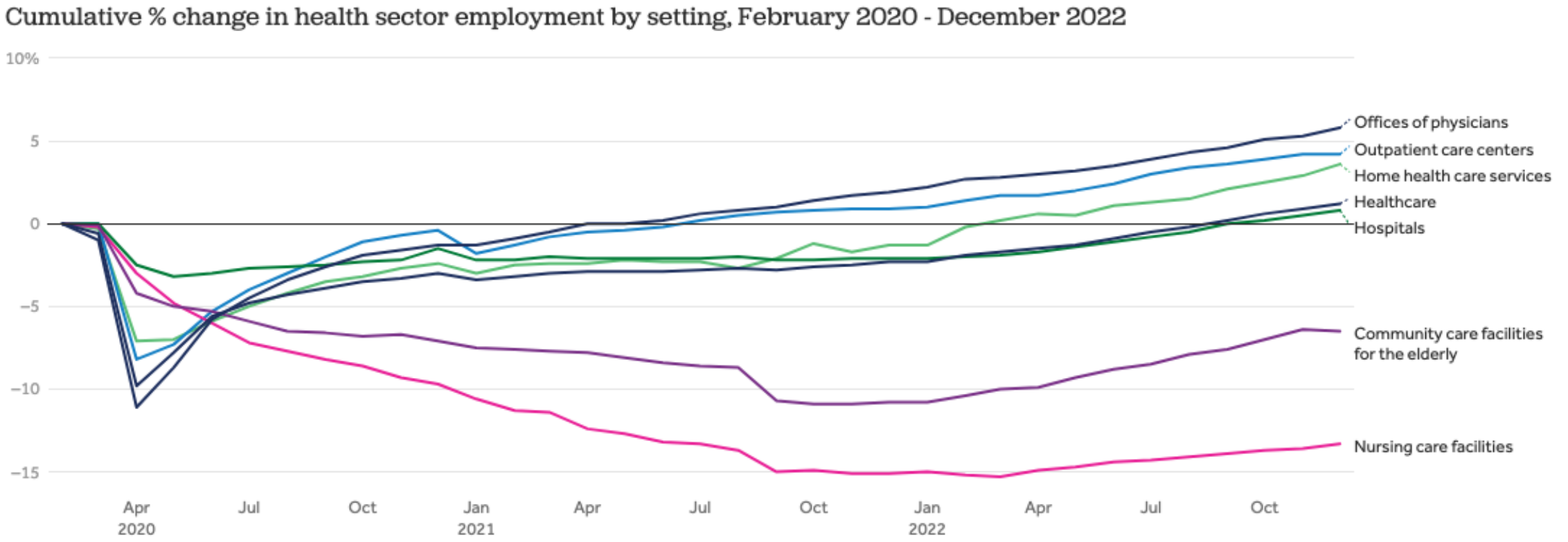
- Health employment drastically fell in 2020.
  - Healthcare providers cancelled elective care
  - Patients practicing social distancing, avoiding the health facilities.
  - Employees quitting (burnout from pandemic, fear of uncertainty, financial hardship)
  - Getting laid-off
- Health employment fell by -8.2% from April 2019 - April 2020.
- 16.2 to 14.9 million employees
- By May 2020, employment began to rise again (recovery process).
- By Dec. 2022, jobs including physicians, care centers, hospitals, and more employed more people than in Feb. 2020.
- Given trends of pre-pandemic, the employment in these industries is still below expected levels.

# Visual 5: Health & Social Assistance: A Closer Look (cont'd)




HealthSystemTracker (2023)

# Health & Social Assistance: A Closer Look (cont'd)




HealthSystemTracler (2023)

# Health & Social Assistance: A Closer Look (cont'd)

- Utilization of health services remained lower than expected based on the trends of the years before the pandemic.
- Patients ensuring own safety – not going out much
- Effects of the pandemic still linger (COVID-19. Still. Exists!)
- Much of the employee gain came from temporary layoffs due to the shutdown.
- Wanting less people in the work settings.

# Proposed Research Question

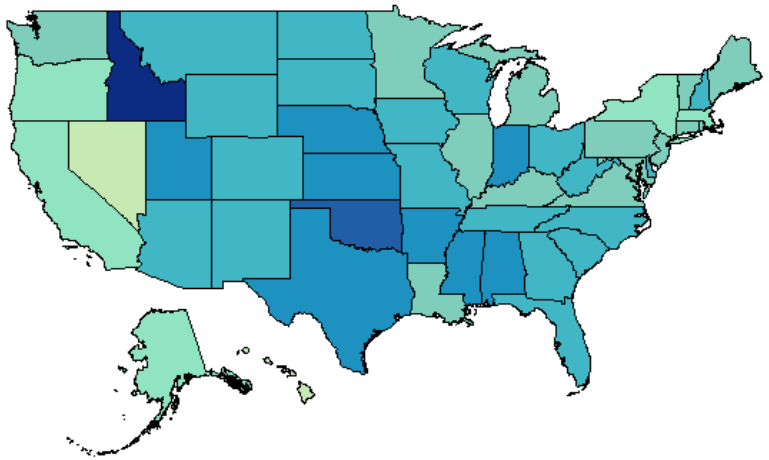
- **How do different states respond to the covid pandemic and how does that affect the workforce?**
- Approach to answering the question:
  - Analysis on the state level
  - Analyzing COVID and economic regulations that impact our four key industries
  - Analyzing work conditions on each of the four industries
  - *In our final report, we plan to incorporate demographic analysis to explore the hypothesized impacts on various demographics.*

# Metrics to Measure COVID-19 Regulations

- Rate of vaccinations (as a proportion)
- Mask Mandate (length, strictness)
- Social distancing (mandates around gatherings, distance)
- Income tax (y/n)
- Number of LIJs
- Number of jobs
- Average salary per state (change over time)
- Health ranking by state (from the QoL Metric)
- Political standing of the state
- Rate of jobs that went remote
- Proportion of vaccines by age and state compared to how many work

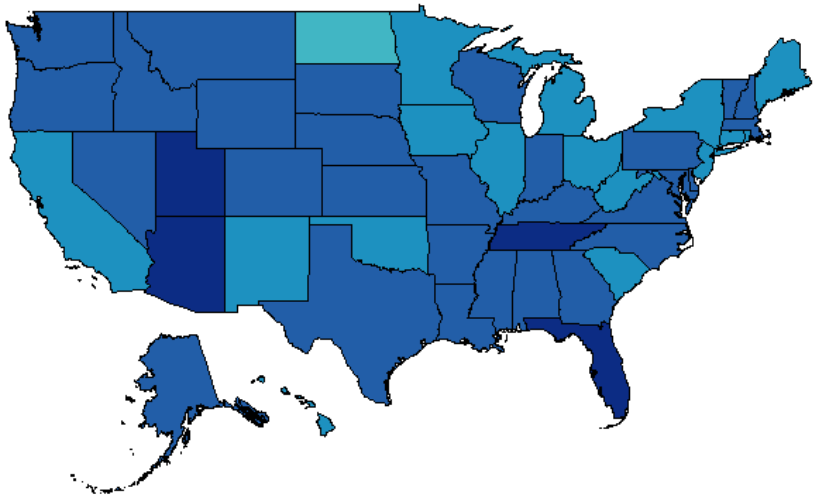
## Proportion of Accommodations and Food Services Jobs Lost to Covid-19

-0.5% - -0.25%
-0.25% - 0%
0.25% - 0.5%
0.5% - 1%
1% - 2%
2% - 3%
3% +



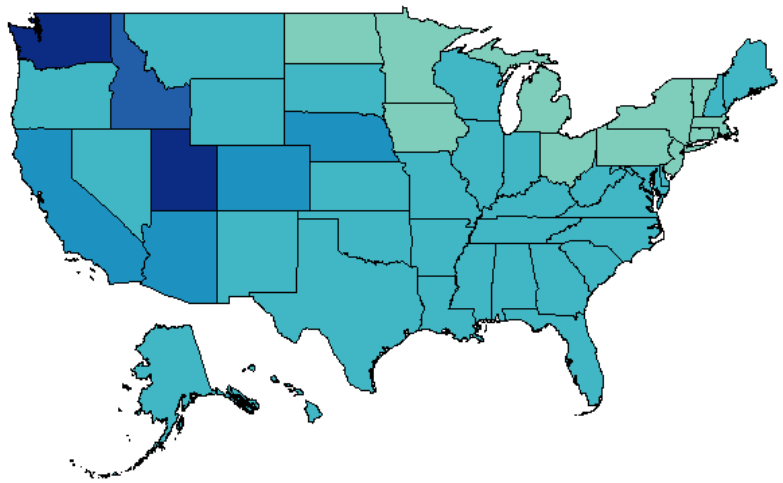
## Proportion of Stem Jobs Lost to Covid-19

-0.5% - -0.25%
-0.25% - 0%
0% - 0.25%
0.25% - 0.5%



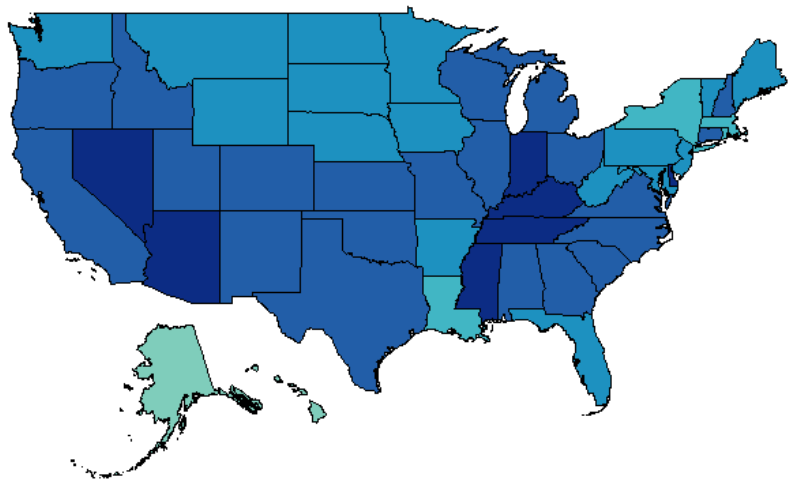
## Proportion of Health and Social Assistance Jobs Lost to Covid-19

-0.5% - -0.25%
-0.25% - 0%
0% - 0.25%
0.25% - 0.5%
0.5% - 1%



## Proportion of Transportation and Warehousing Jobs Lost to Covid-19

-0.5% - -0.25%
-0.25% - 0%
0% - 0.25%
0.25% - 0.5%
0.5% - 1%



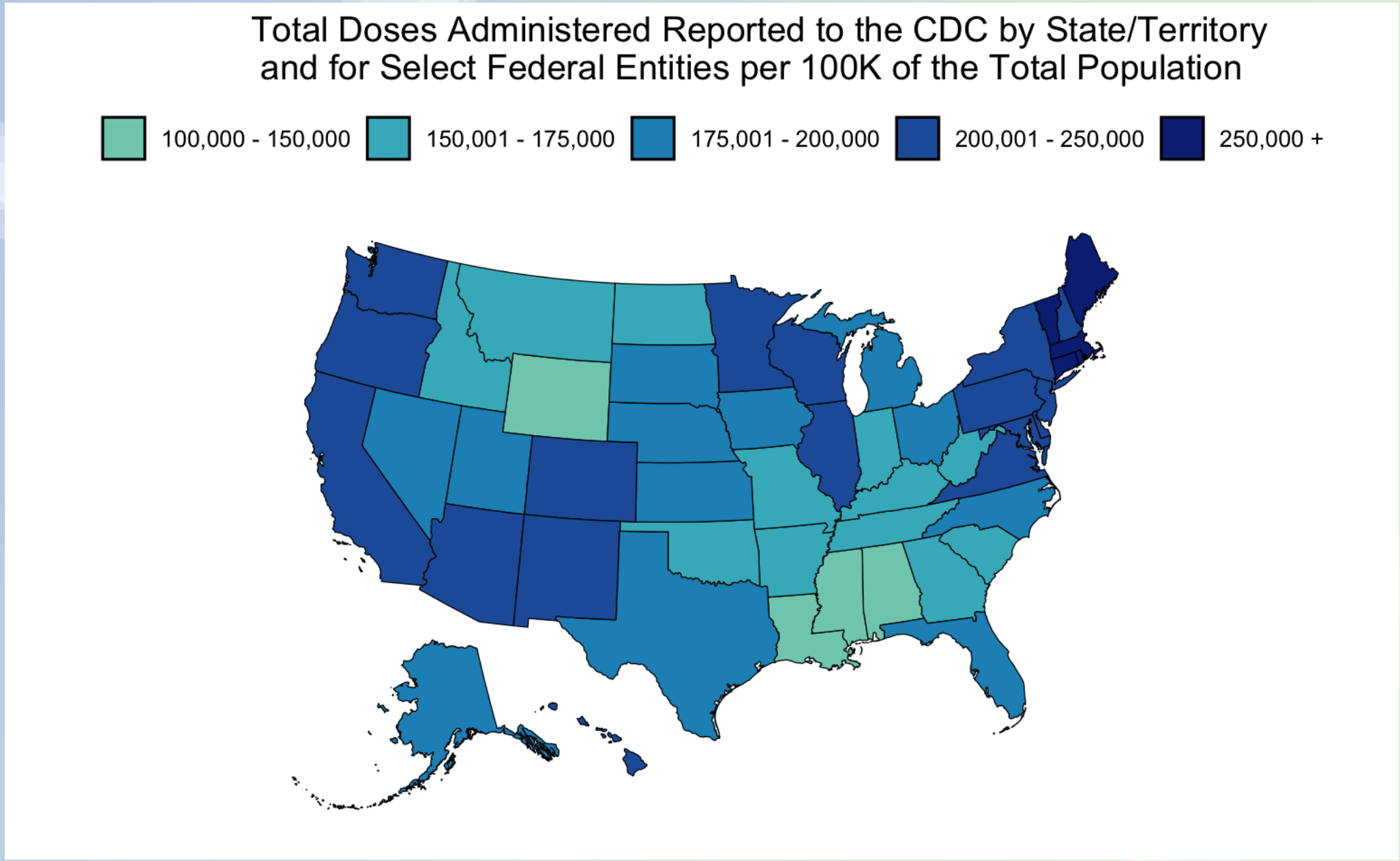
# External Dataset 1: Rate of Vaccinations

Source: https://covid.cdc.gov/covid-data-tracker/#vaccinations_vacc-total-admin-count-total
Description: Data Table for COVID-19 Vaccinations in the United States

Variables:

- State/ Territory
- Total doses distributed
- Doses administered by jurisdiction per 100K pop
- Percent of total population with at least one dose
- Percent of total population with a completed primary series
- Percent of total population with Updated Booster

# Key Dataset 1: Rate of Vaccinations – Continued



# Key Dataset 2: Mask Mandates

- Source: BallotPedia (from CDC + local state data)

*https://ballotpedia.org/State-level_mask_requirements_in_response_to_the_coronavirus_(COVID-19)_pandemic,_2020-2022*

- Variables:
  - State
  - Start of first requirement (if one exists)
  - End of first requirement (if one exists)
  - Start of second requirement (if one exists)
  - End of second requirement (if one exists)
  - Type of restriction (Legislative action/Executive Order/Court Order)
  - Length of mask requirements (if any existed)

# Key Dataset 2: Mask Mandates – Continued

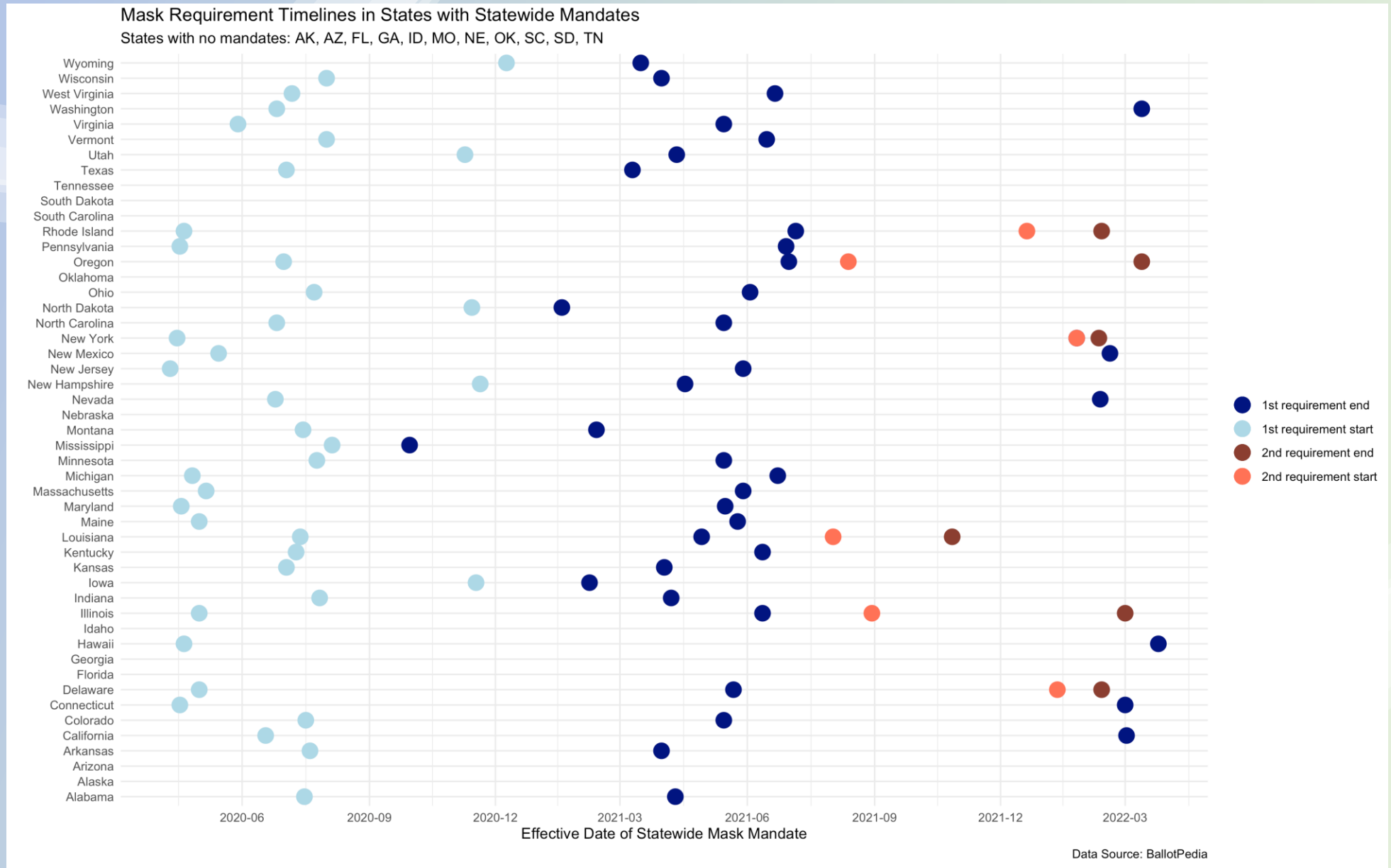
The relationship between the proportion of low-income jobs lost per state (by population) and length of mask mandates →

**$H_0$ :** There is no correlation between the proportion of low-income jobs lost per state (by population) and length of mask mandates

**$H_a$:** There is a correlation between the proportion of low-income jobs lost per state (by population) and length of mask mandates

**Results:** With a p-value of $1.929 \times 10^{-7}$, we reject the null hypothesis and conclude that there is a positive, strong correlation between low-income jobs lost per state (by population) and length of mask mandates. Furthermore, the 95% confidence interval of (0.4665281, 0.7922343) does not include 0, which further supports the conclusion that there is a relationship between these variables.

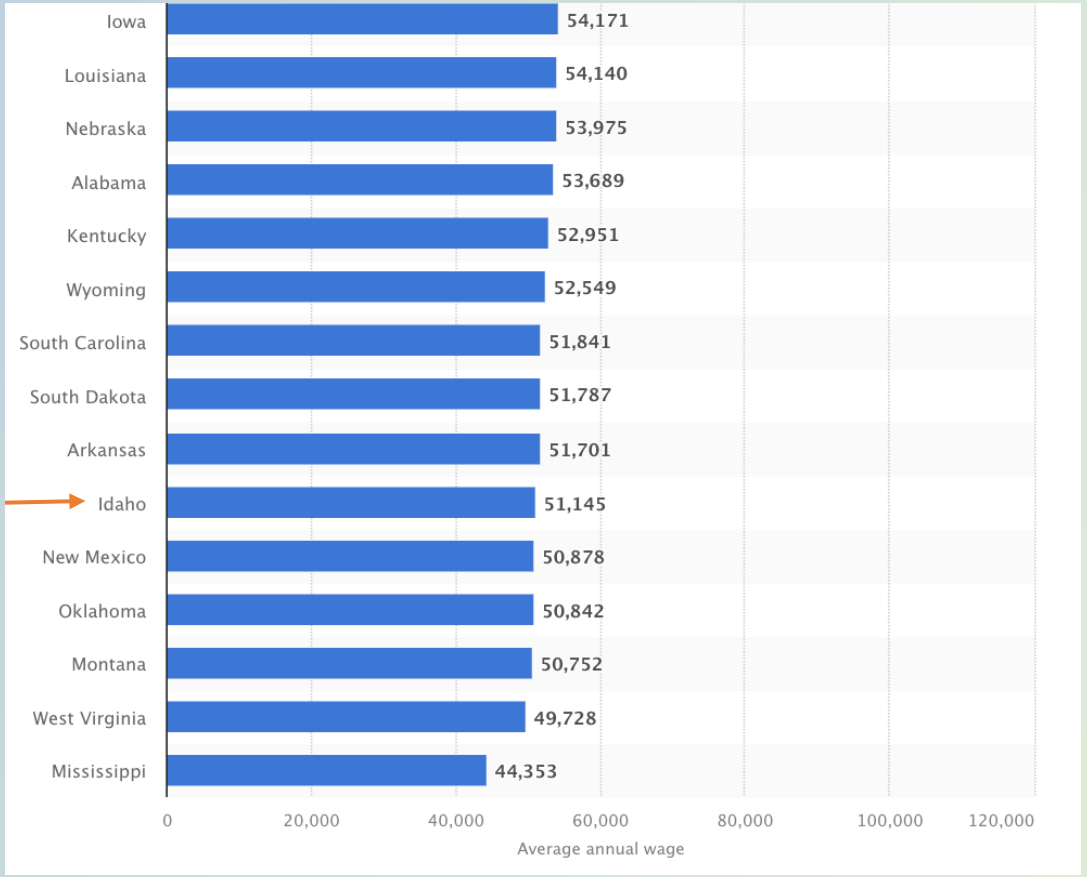
# Key Dataset 2: Mask Mandates – Continued



# Key Dataset 3: Average Salary per State (Key Variables)

- Source: https://www.statista.com/statistics/243850/private-industry-wages-per-employee-in-the-us-by-state/
- Variables:
  - State
  - Average Annual Wage

# Key Dataset 3: Average Salary per State


*Private industry mean wages per employee annually in the US in 2021, by state.*

**X-Axis:** Average annual wage in U.S. dollars ($)

**Y-Axis:** State + "United States" and "District of Columbia" are included

Statista.com (2021)

# Next Steps

Things to look out in the future:

- Mathematical measure of covid response on a state level and the impact it had on the workforce in said state
  - Looking at other datasets mentioned
- Continue seeking explanations to relationships we find (start creating a wholistic picture for what we're seeing)

# Questions?