COVID-19, Mask Use, and Vaccination Report

Byeolha Kim

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1. Summary

This report explores the relationship between COVID-19 outcomes and preventive behaviors across U.S. counties. By analyzing mask usage and vaccination rates in relation to COVID-19 death rates in 2022, the report highlights how these public health measures have significantly contributed to reducing mortality.

2. Data

2.1 Data Sources

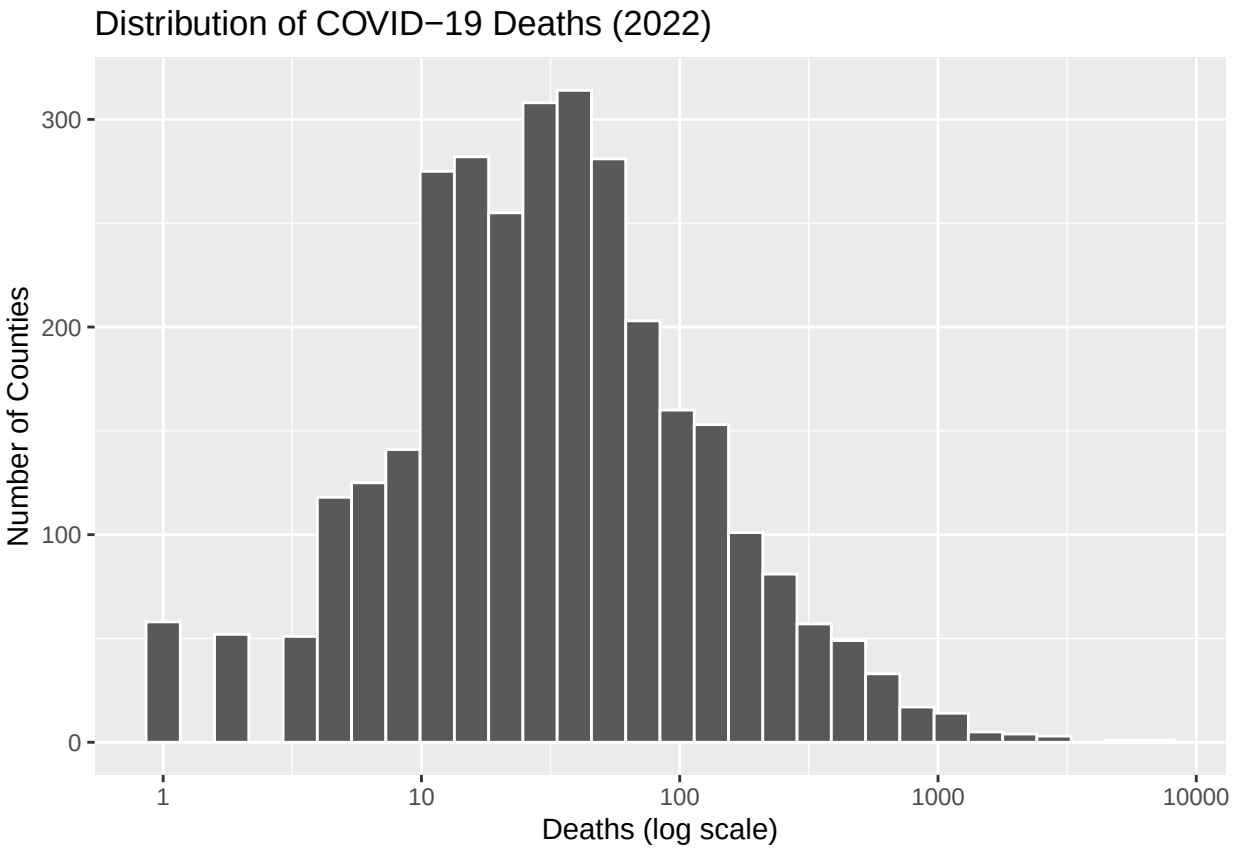
- COVID-19 county-level death data: NYT COVID-19 Repository
- Mask usage estimates: NYT July 2020 Mask Use Survey
- Vaccination data: CDC County-Level Vaccination Data

2.2 Data Preparation

2.3 Key Variables Summary

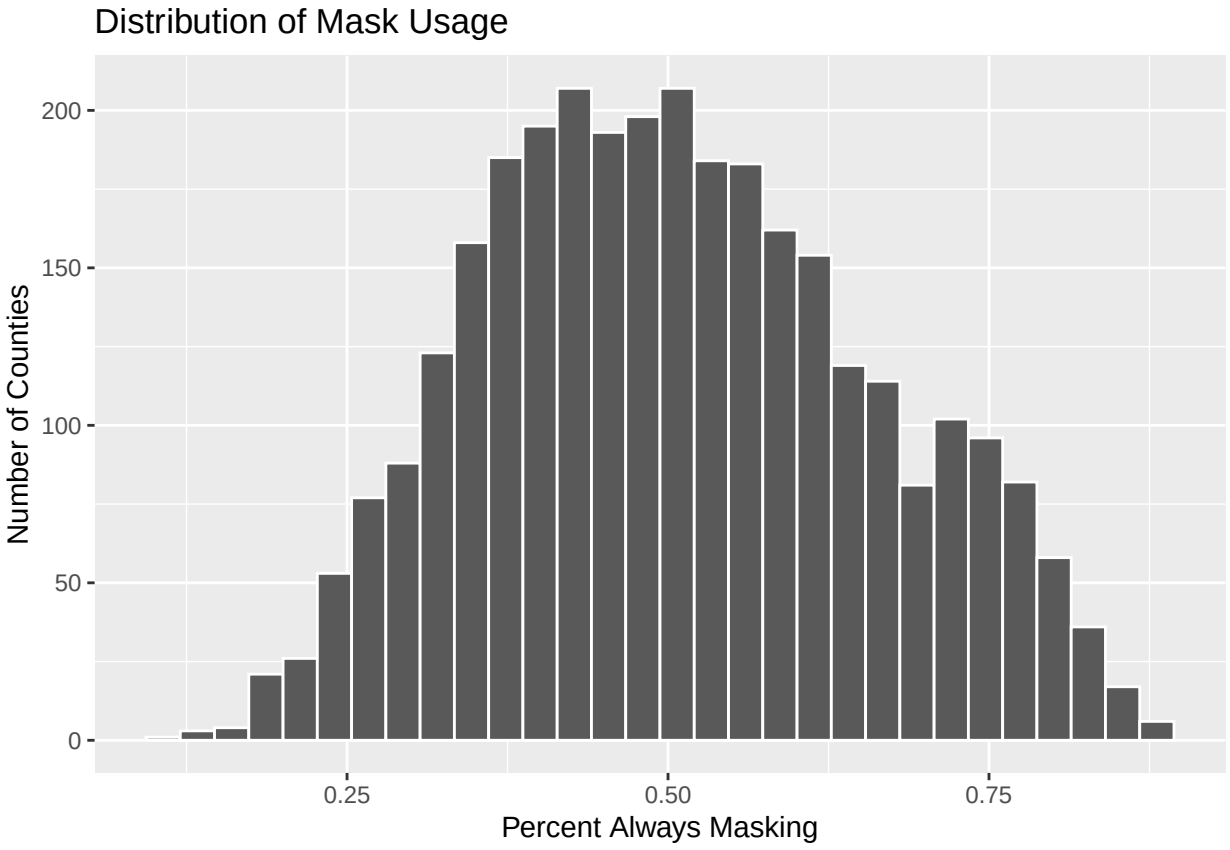
COVID-19 Deaths in 2022

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    0.00   12.00   29.00   84.14   70.00 7034.00
```



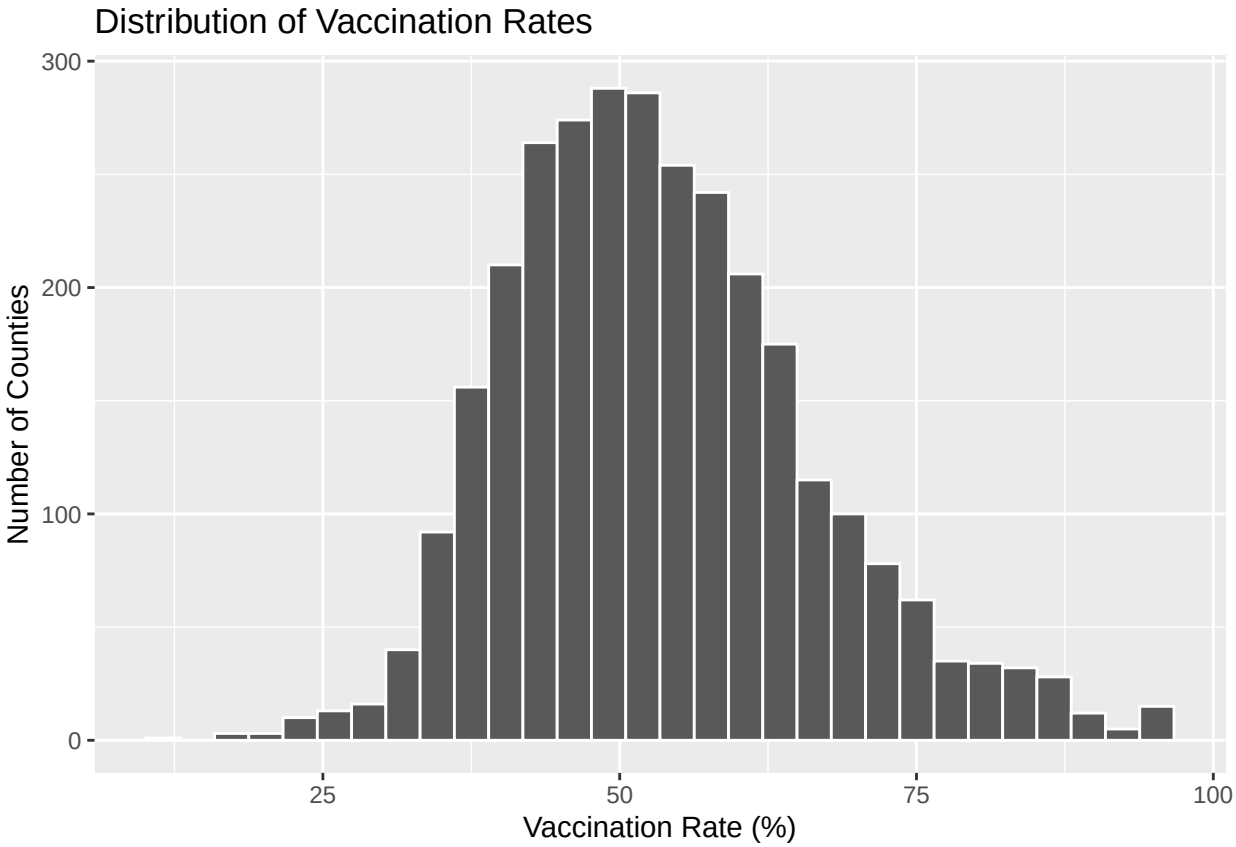
Mask Usage

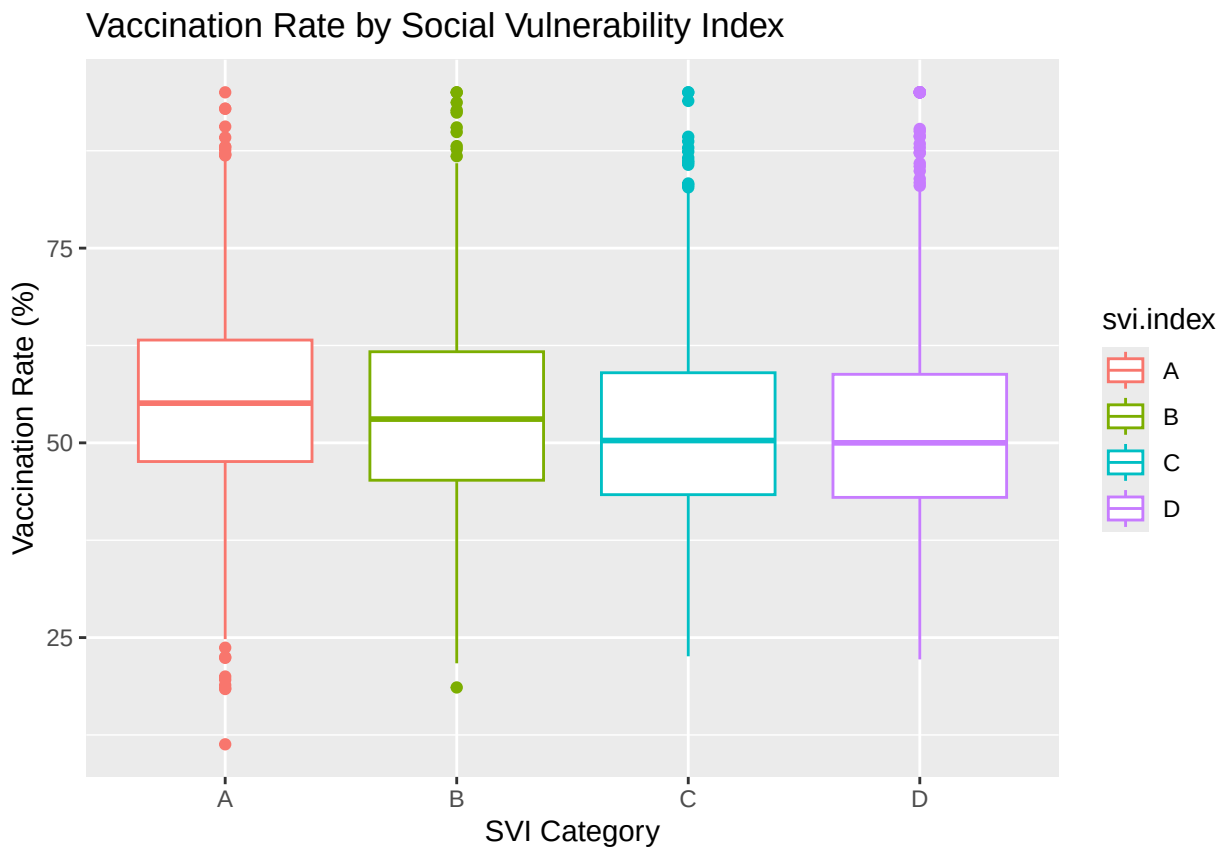
```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##  0.1150  0.3930  0.4970  0.5077  0.6130  0.8890       9
```



Vaccination Rates

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.    NA's
##   11.30   44.30   52.10   53.43   61.00   95.00      93
```


Distribution of Vaccination Rates
Number of Counties
300
200
100
0
25
50
75
100
Vaccination Rate (%)



3. Regression Analysis

To evaluate the effects of mask usage and vaccination on COVID-19 mortality rates, we estimated three regression models. The dependent variable is COVID-19 deaths per 100,000 people (`deaths.scaled`).

Appendix: Full Code

```
# Additional: Identify counties with lowest and highest vaccination rates
covid %>%
  select(vax.complete, state, county) %>%
  filter(vax.complete %in% c(min(vax.complete, na.rm = TRUE), max(vax.complete, na.rm = TRUE)))
```

```
## # A tibble: 15 x 3
##    vax.complete state        county
##           <dbl> <chr>        <chr>
##  1           95 Arizona      Apache
##  2           95 Arizona      Santa Cruz
##  3           95 California   Imperial
##  4           95 Colorado     San Juan
##  5           95 Georgia      Chattahoochee
##  6           95 Kansas       Geary
```

	m1	m2	m3
always.mask	-112.887***		-83.296***
	(10.212)		(10.834)
population	-0.000***	-0.000***	
	(0.000)	(0.000)	
svi.indexB	11.415***	9.968***	9.581***
	(2.884)	(2.878)	(2.859)
svi.indexC	15.142***	14.399***	13.128***
	(3.111)	(3.103)	(3.080)
svi.indexD	19.811***	18.353***	17.491***
	(3.401)	(3.393)	(3.367)
vax.complete		-1.123***	-0.923***
		(0.093)	(0.099)
Num.Obs.	3049	3049	3049

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

```
##  7         95   New Mexico   McKinley
##  8         11.3 North Dakota Slope
##  9         95   Texas        Brooks
## 10         95   Texas        Irion
## 11         95   Texas        Maverick
## 12         95   Texas        Presidio
## 13         95   Texas        Starr
## 14         95   Texas        Webb
## 15         95   Wyoming      Teton
```

```
# All code used above is consolidated here for reference.
```