

Analysis of Vaccine Adverse Event Data



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VAERS

(Vaccine Adverse Event Reporting System)*

- ◆ CDC and FDA project
- ◆ Used to monitor trends and detect problems
- ◆ Providers encouraged to report adverse events even if cause is unclear
- ◆ Underreporting is a known issue



* <https://vaers.hhs.gov/data/datasets.html>



Why We Chose It

- Current through July 1, 2021
- COVID-19 vaccine relevant to us all
- Questions - differences in adverse events for:
 - COVID-19 by age group, gender, geography
 - COVID-19 versus other vaccines





Data Exploration and Cleanup

- Obtained data for 2011 - 2021
- Dropped age < 12 years
- Messy data (missing values, entry errors)
- Disproportionate COVID-19 vaccine reporting
 - 386,000 COVID-19, < 1 year (64%)
 - 217,000 all other vaccines, 10 years (36%)





Outcome classes

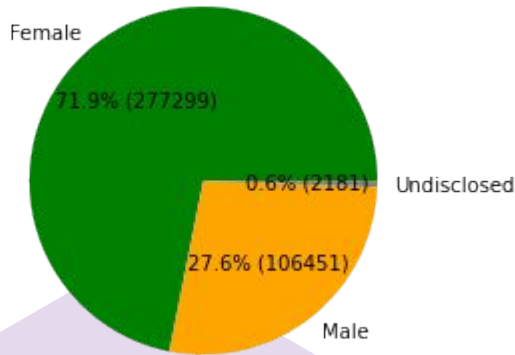
- More than one outcome possible per person
- Classes:
 - Doctor/ER visit
 - Hospitalization
 - Life-threatening illness
 - Disability following vaccination
 - Death



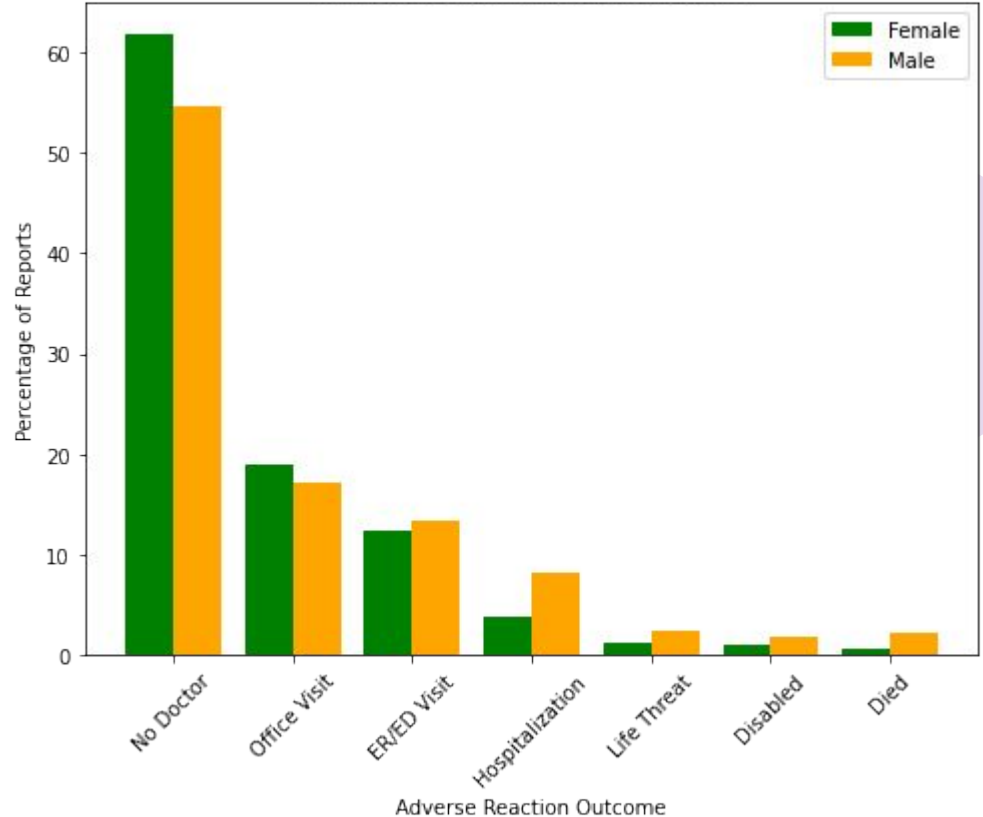
COVID Vaccine Outcomes Based on Gender

- Women contributed the majority of the reports.

Reported Covid Vaccine Reactions - Gender Distribution



COVID-19 Vaccine Related Reactions

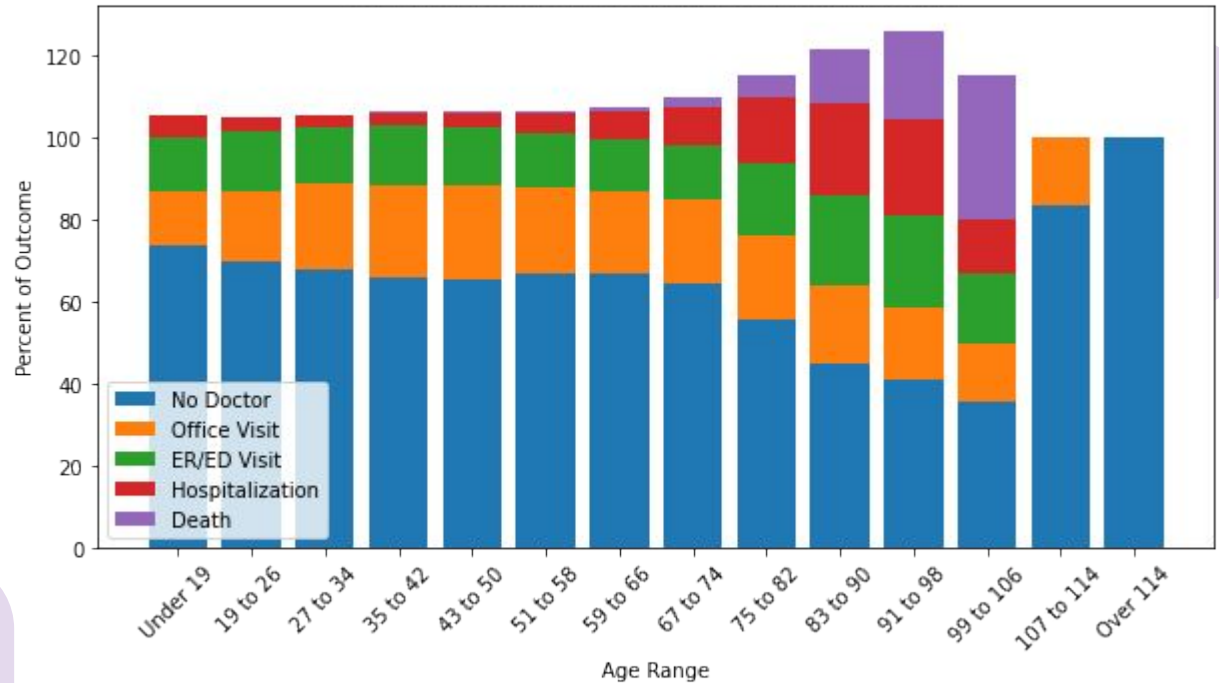


COVID Vaccine Age Group Analysis

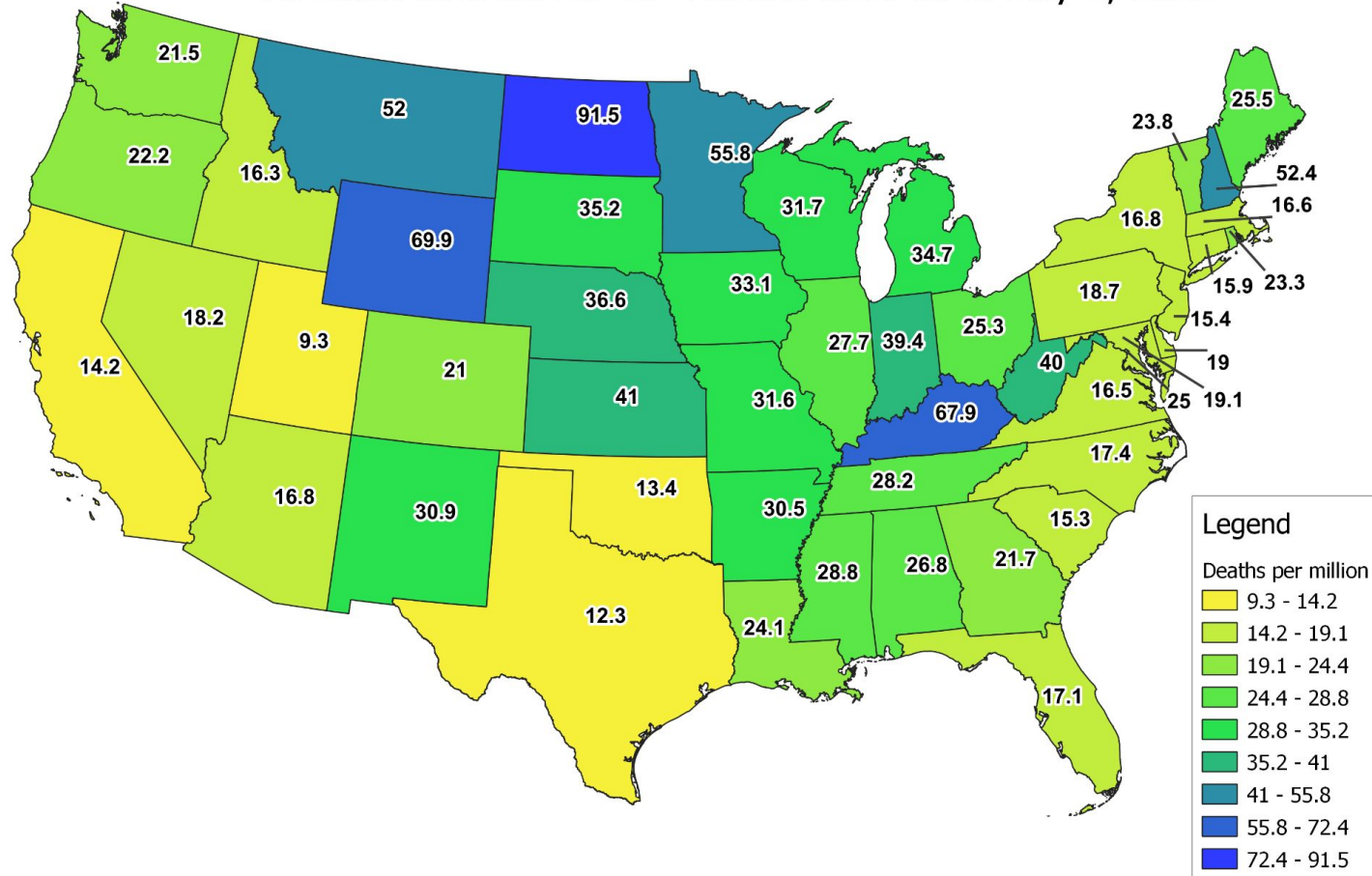
- Younger people tended to have less severe outcomes than older people.

| | count | mean | std | min | 25% | 50% | 75% | max |
|---------|----------|------|------|------|------|------|------|-------|
| AGE_YRS | 385931.0 | 48.8 | 18.1 | 12.0 | 35.0 | 49.0 | 63.0 | 119.0 |

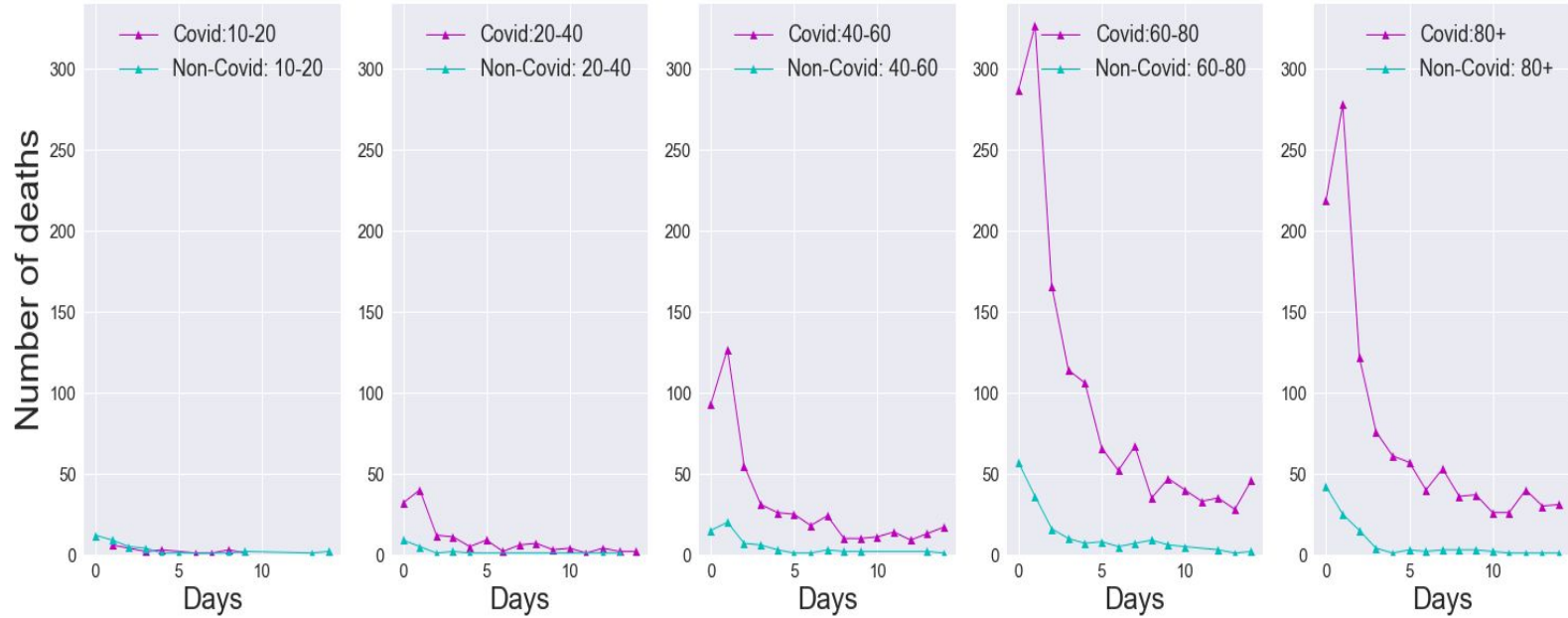
COVID-19 Vaccine adverse outcomes by age group



VAERS Reported Deaths Per Million Residents Receiving At Least One COVID-19 Vaccine dose as of July 2, 2021



Vaccines Adversity (Deaths) in Age Groups

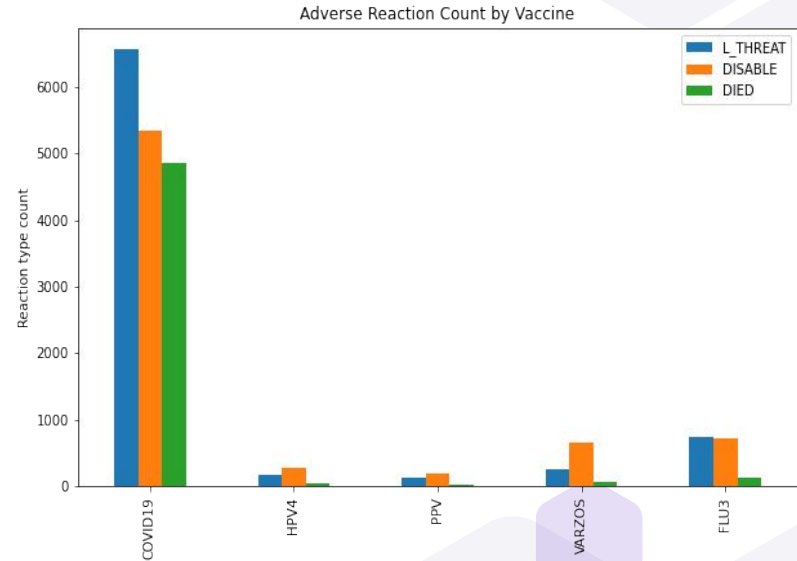


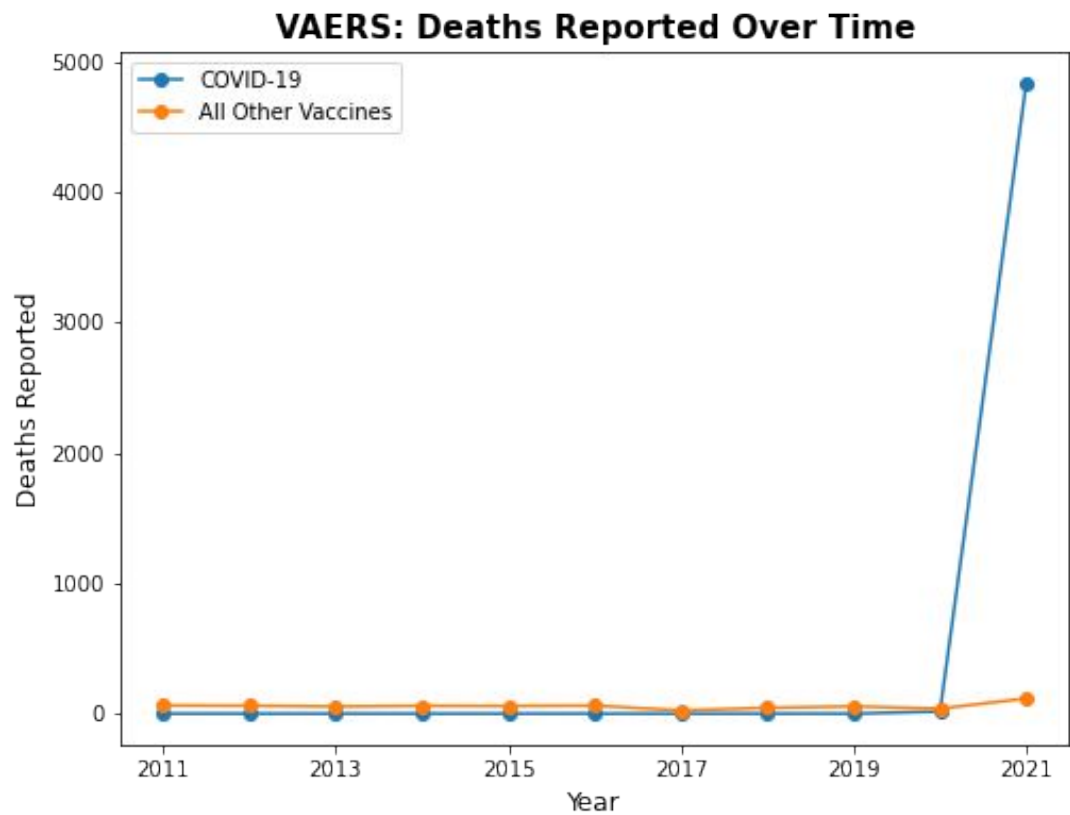
Days: Number of days from vaccination date to adversity happened



Vaccines and Adverse Reaction Data

- COVID-19 Vaccines have a higher proportion of adverse outcomes
- If you are likely to have an adverse reaction it is unlikely you will die from the reaction







Summary

- Considerably more reporting for COVID-19 versus other vaccines.
- Reported deaths typically occur within a few days of vaccination.
- Possible geographical trends in reported deaths, but reason not known.
- Women reported more adverse effects than men, but severity of effects was similar between genders.
- Our analysis leaves an open question:

Does the high incidence of adverse effects for COVID-19 reflect a large increase in reporting or an issue with vaccine safety?



THANKS!

Any questions?

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