Covid-19 Study

Data Analysis and Modeling

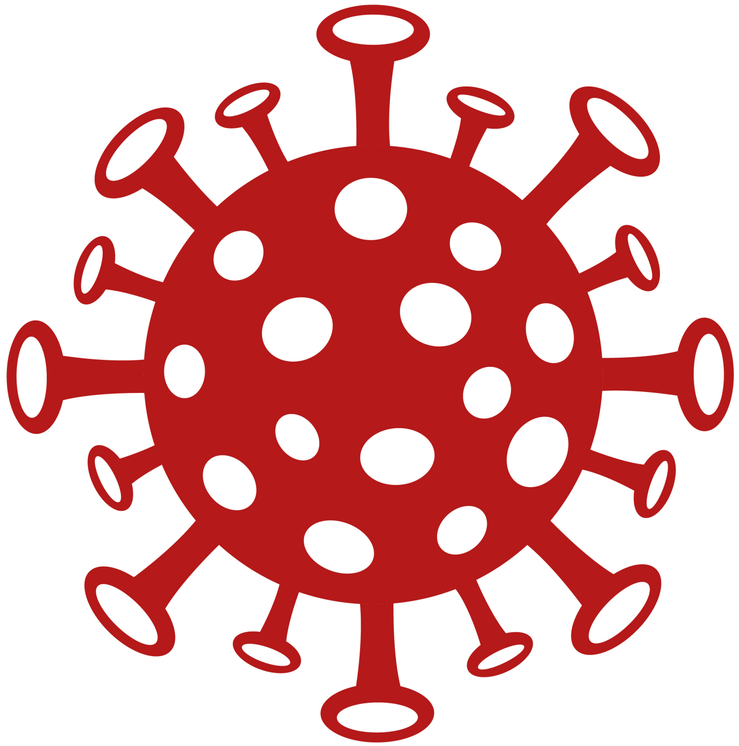
JR Garvin

February 16, 2024

Modern Day Plague

What do we do?

- Wuhan 2019 - World Wide Present
- 5th Deadliest
- China’s “zero covid” vs. Sweden’s “let it rip”
- **Follow the Data**

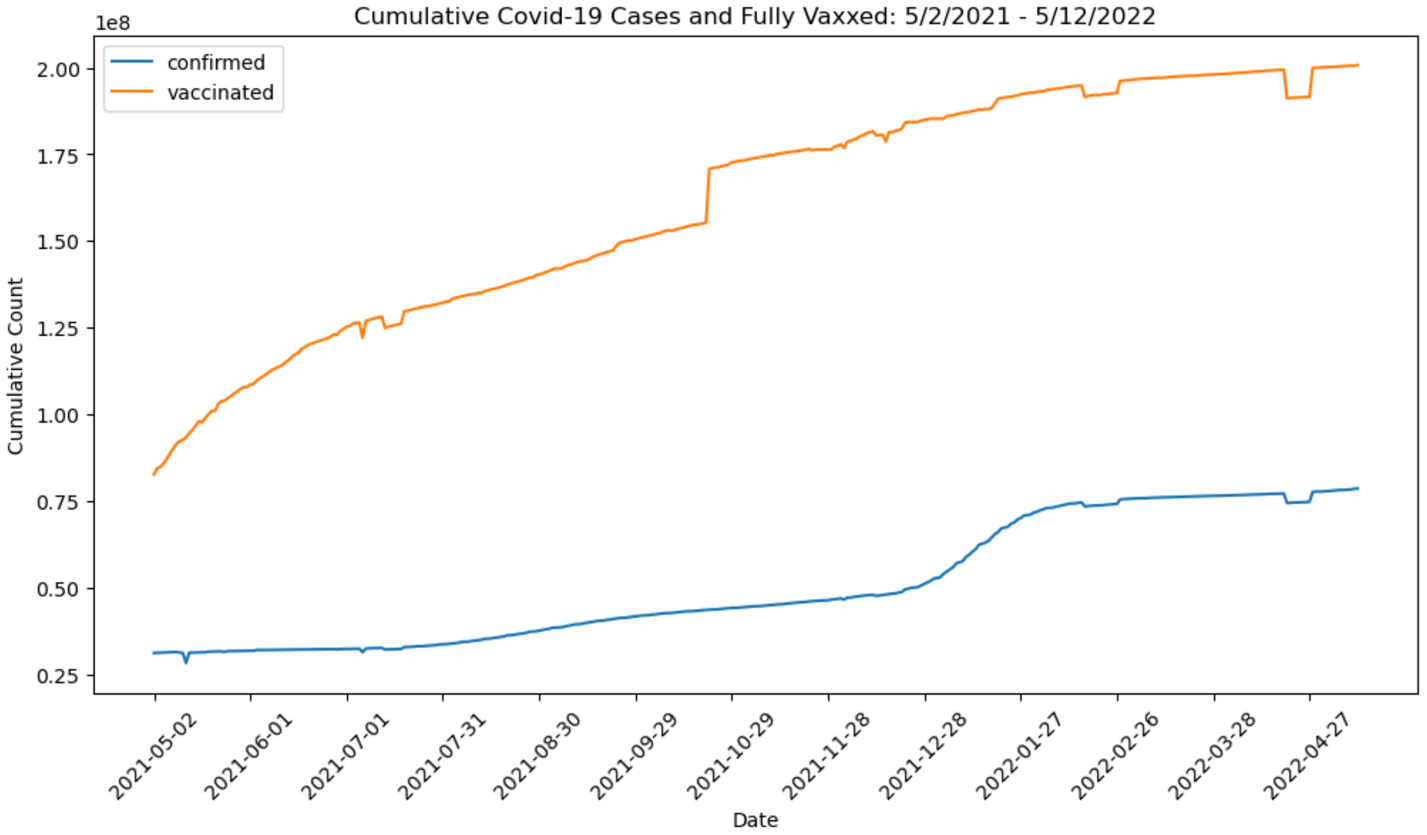


Source: https://www.istockphoto.com/portfolio/YanaKostiuchyk

Methodology

Flatten the Curve

- Collect Data
- Tools for Tomorrow
  - Identify contributing factors
  - Model the spread
  - Forecast



Identify Contributing Factors

Inferential Analysis

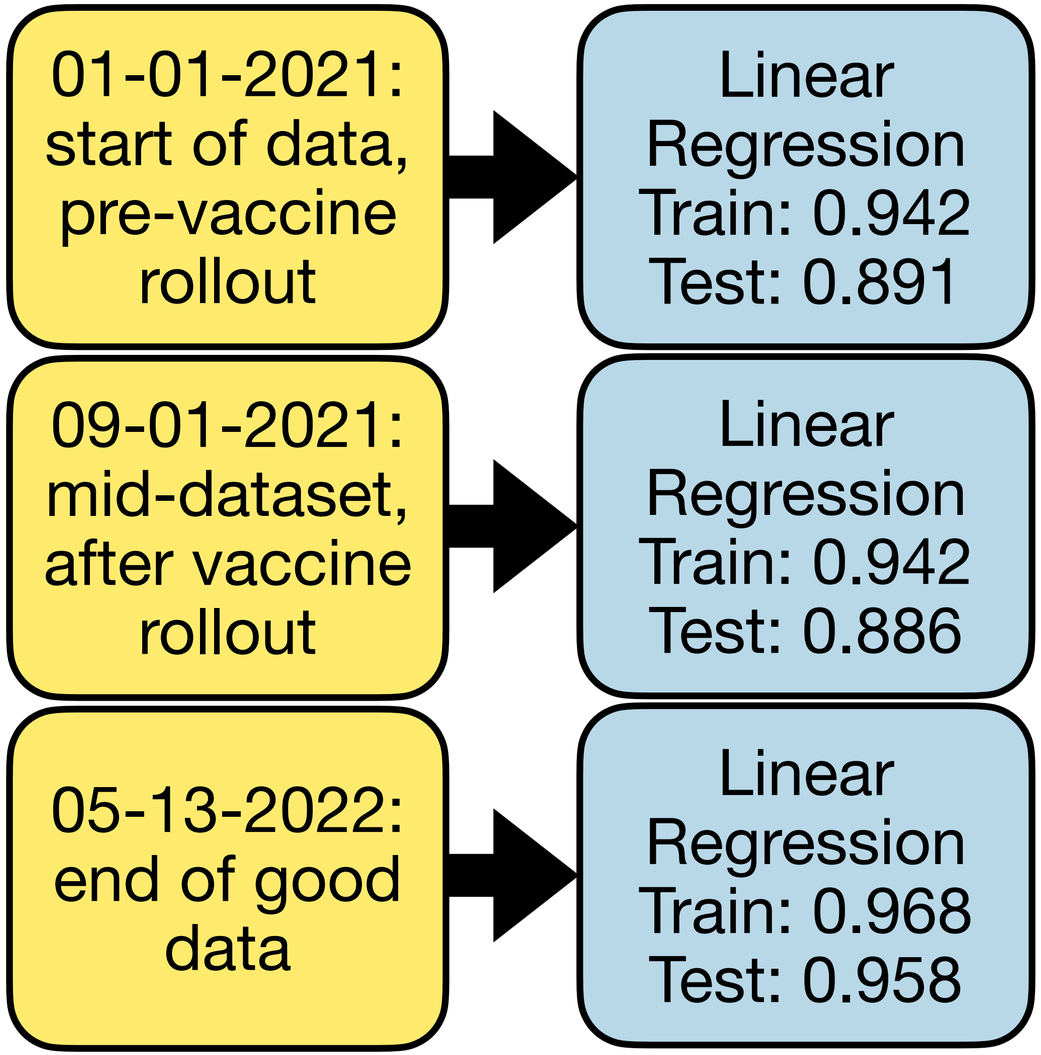
01-01-2021: start of data, pre-vaccine rollout

09-01-2021: mid-dataset, after vaccine rollout

05-13-2022: end of good data

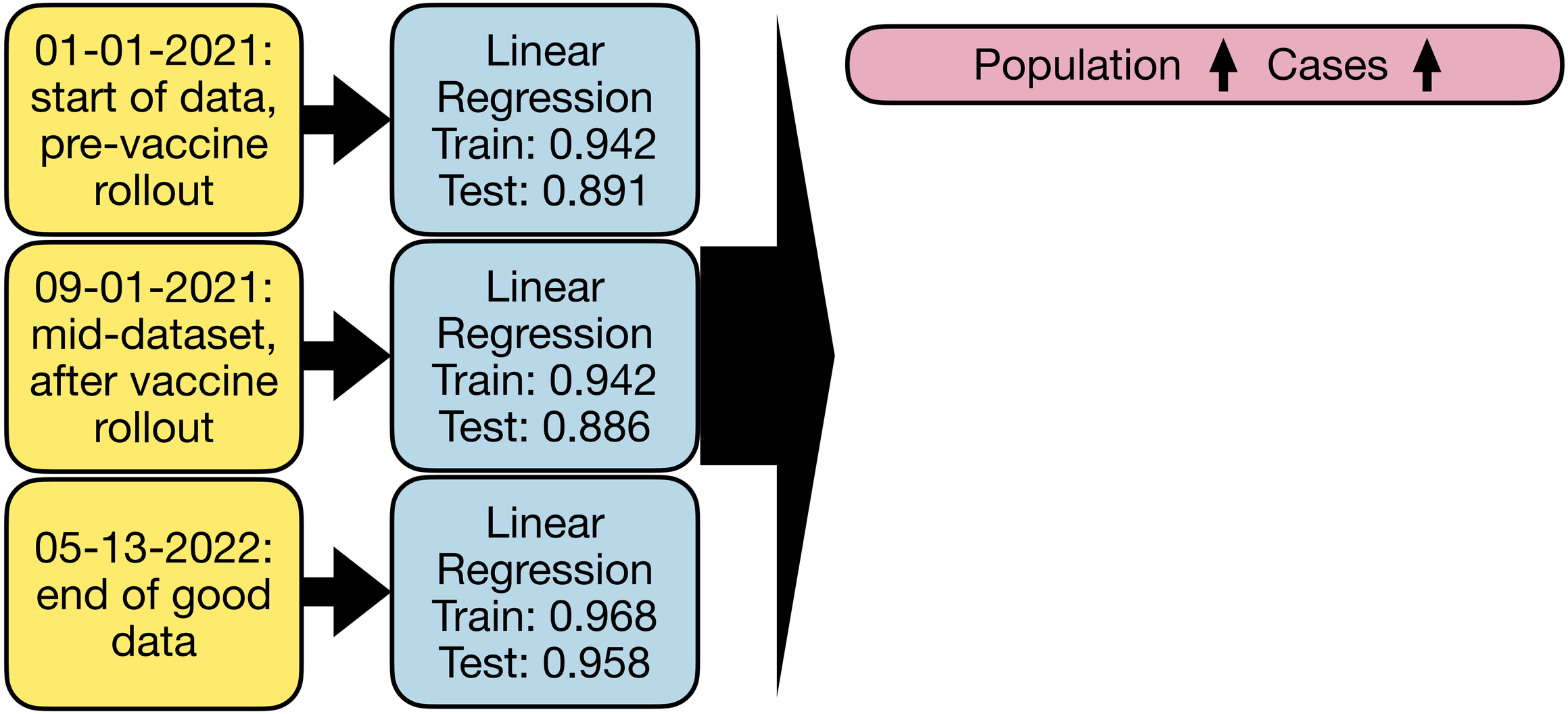
Identify Contributing Factors

Inferential Analysis



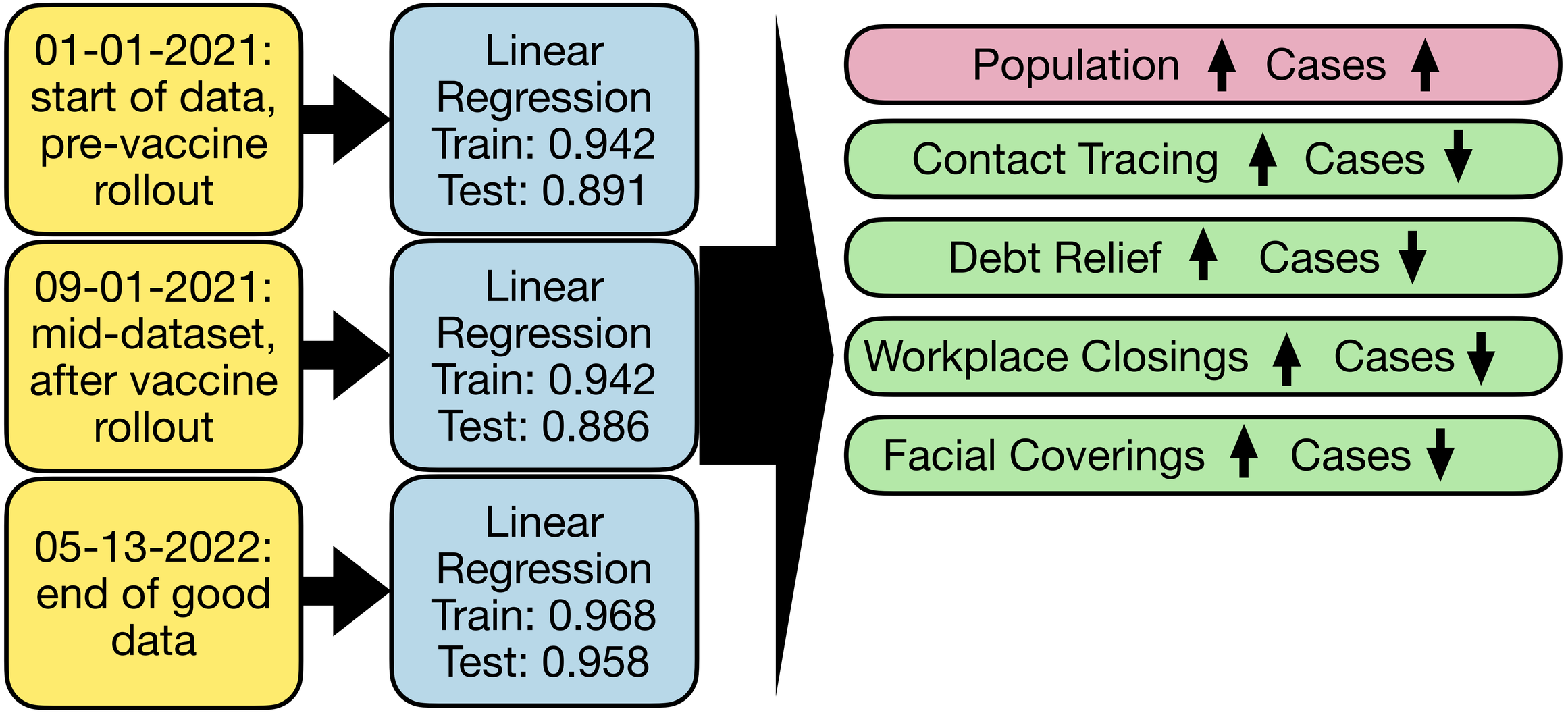
Identify Contributing Factors

Inferential Analysis



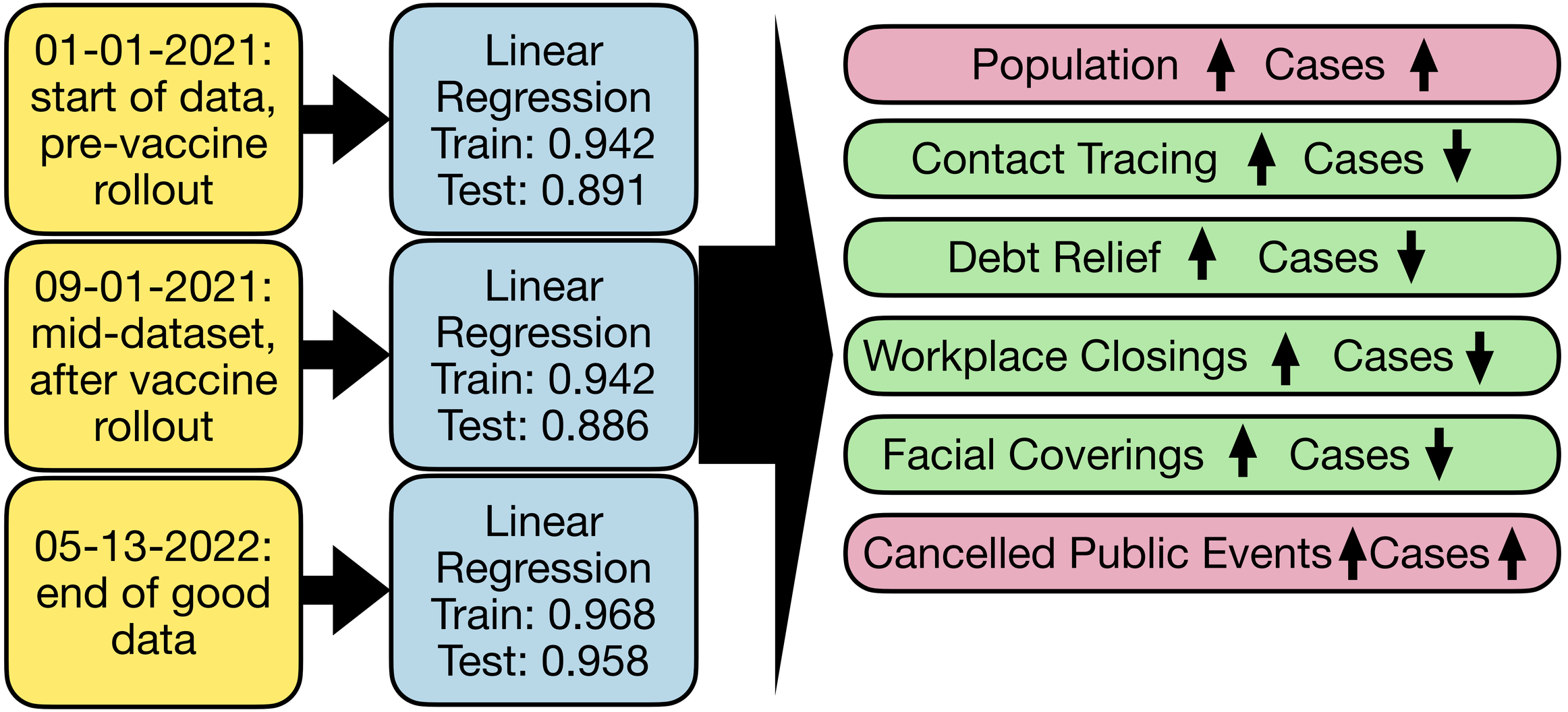
Identify Contributing Factors

Inferential Analysis



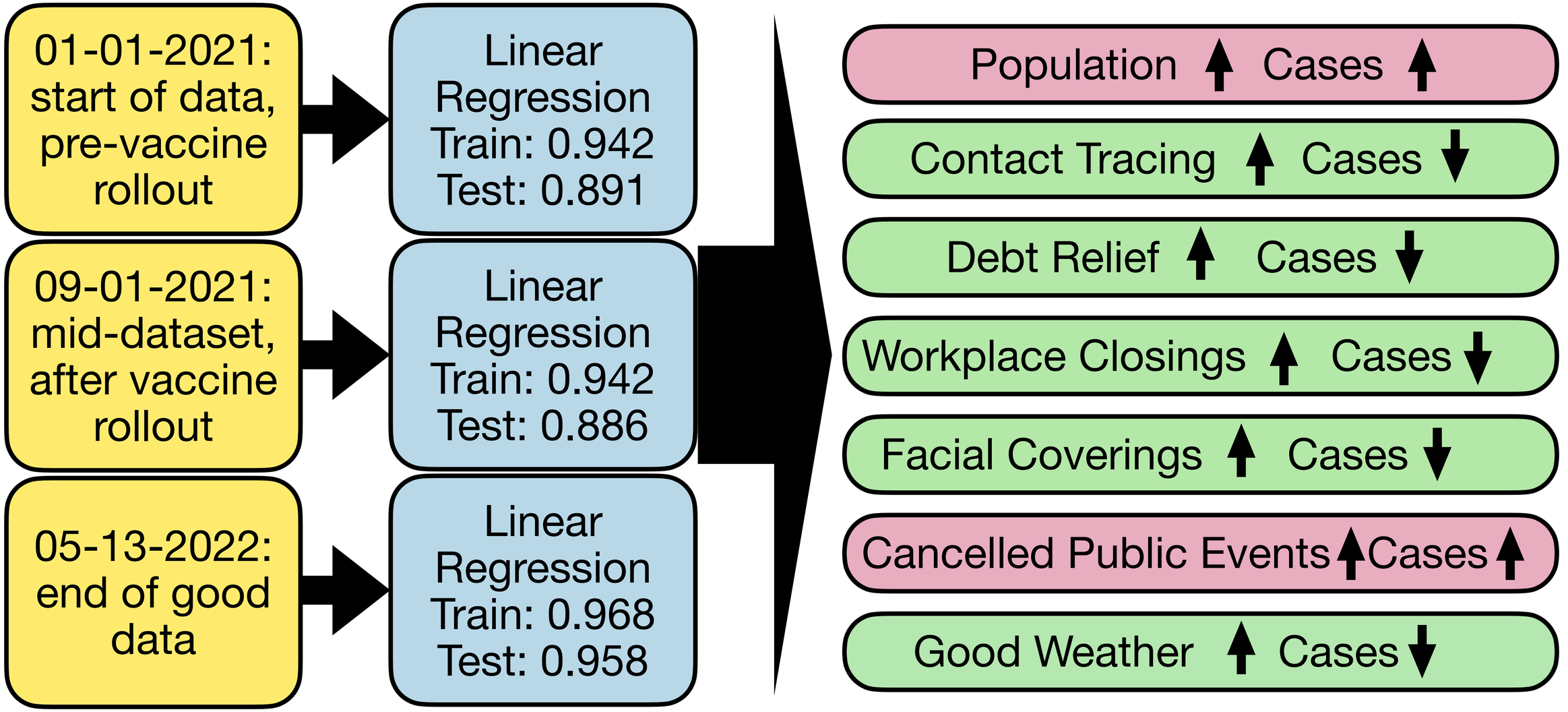
Identify Contributing Factors

Inferential Analysis



Identify Contributing Factors

Inferential Analysis



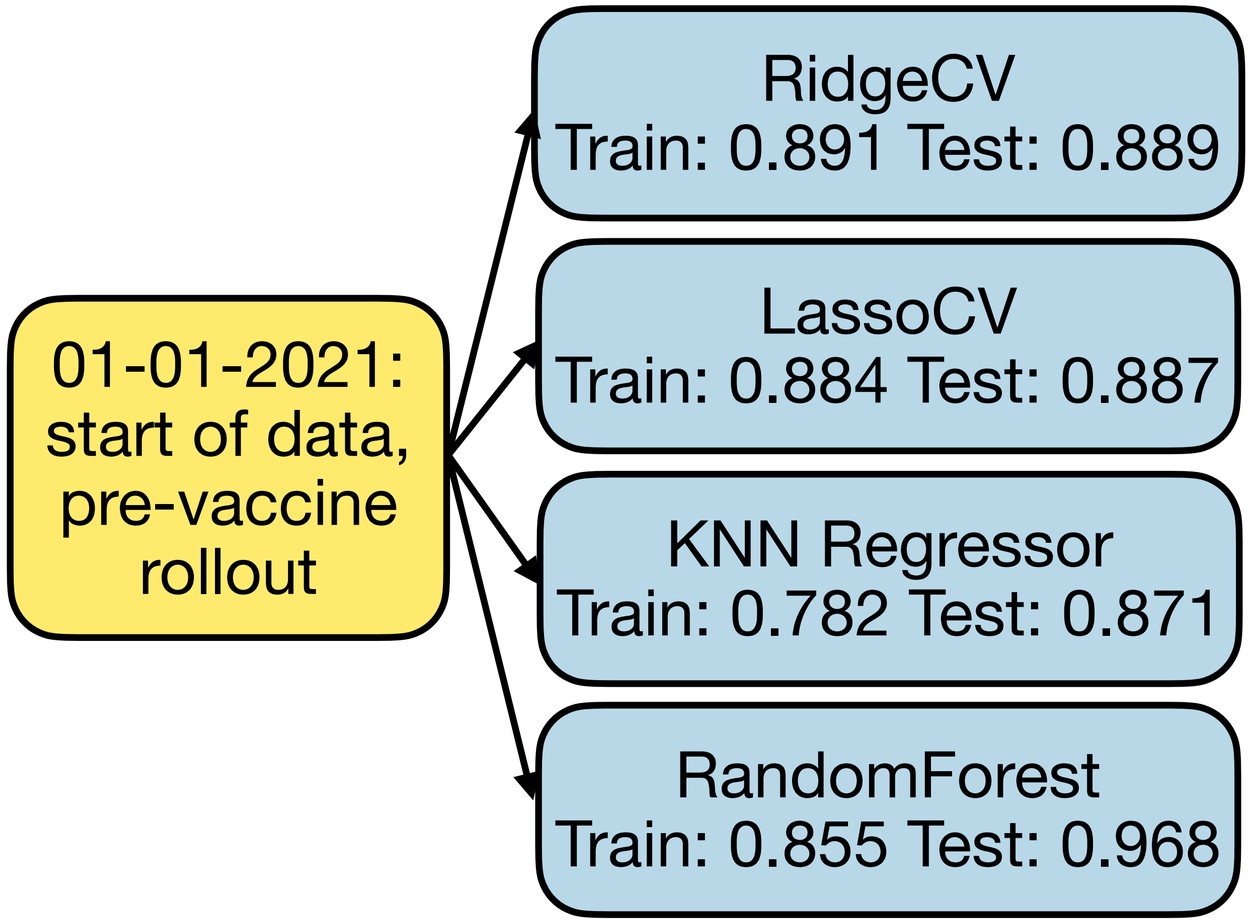
Model the Spread

Correct/Substantiate other Sources

01-01-2021: start of data, pre-vaccine rollout

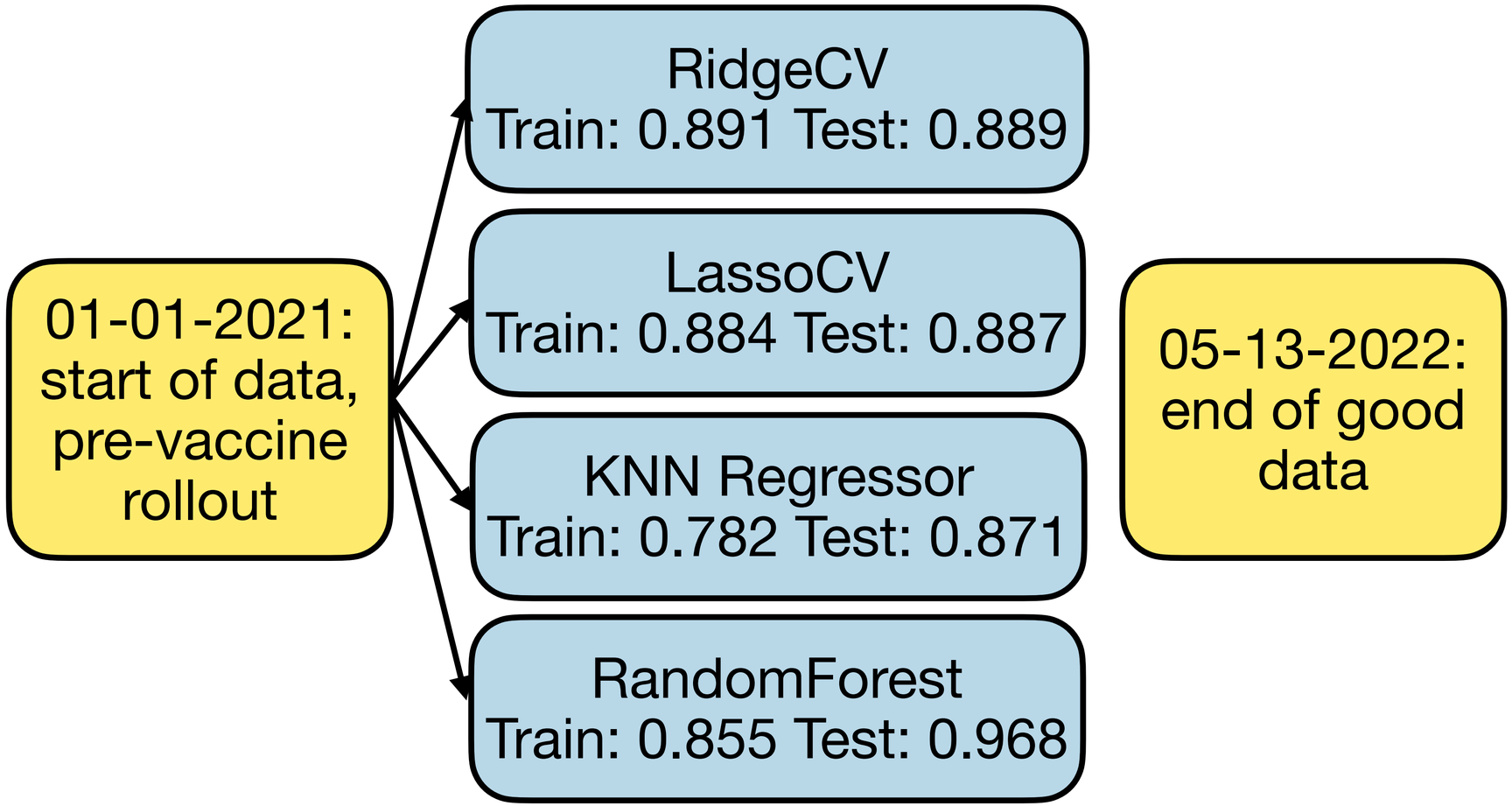
Model the Spread

Correct/Substantiate other Sources



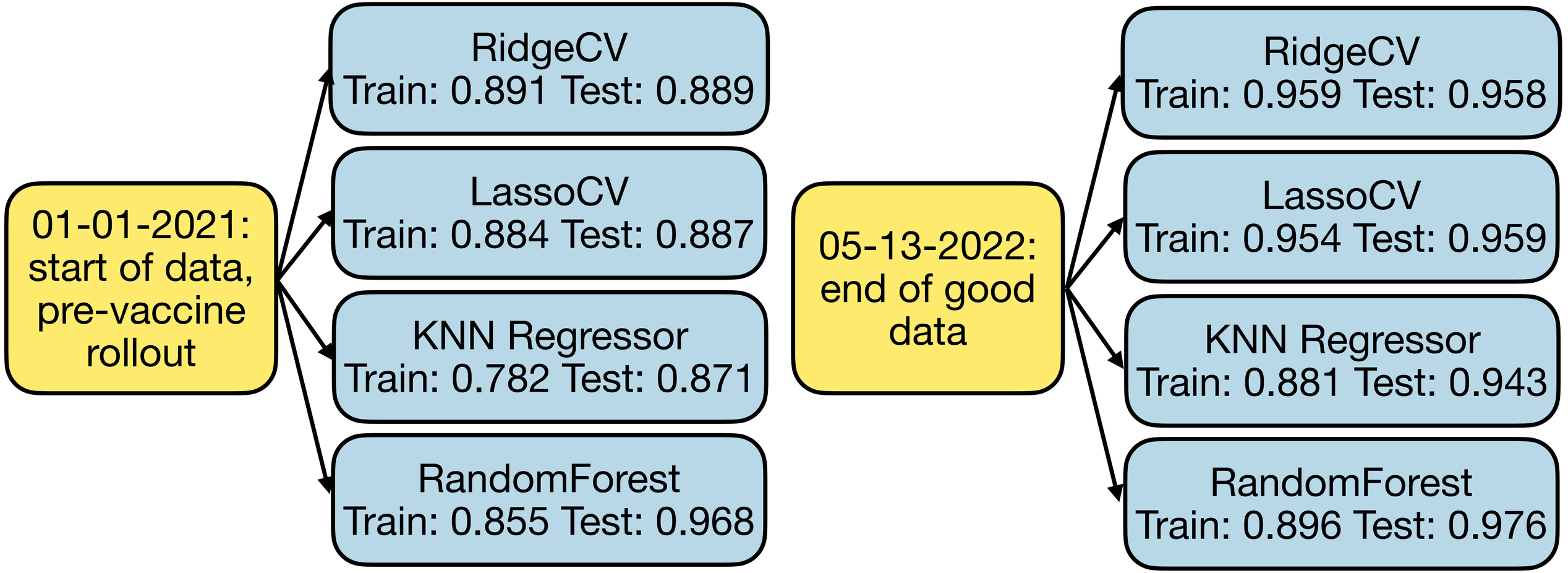
Model the Spread

Correct/Substantiate other Sources



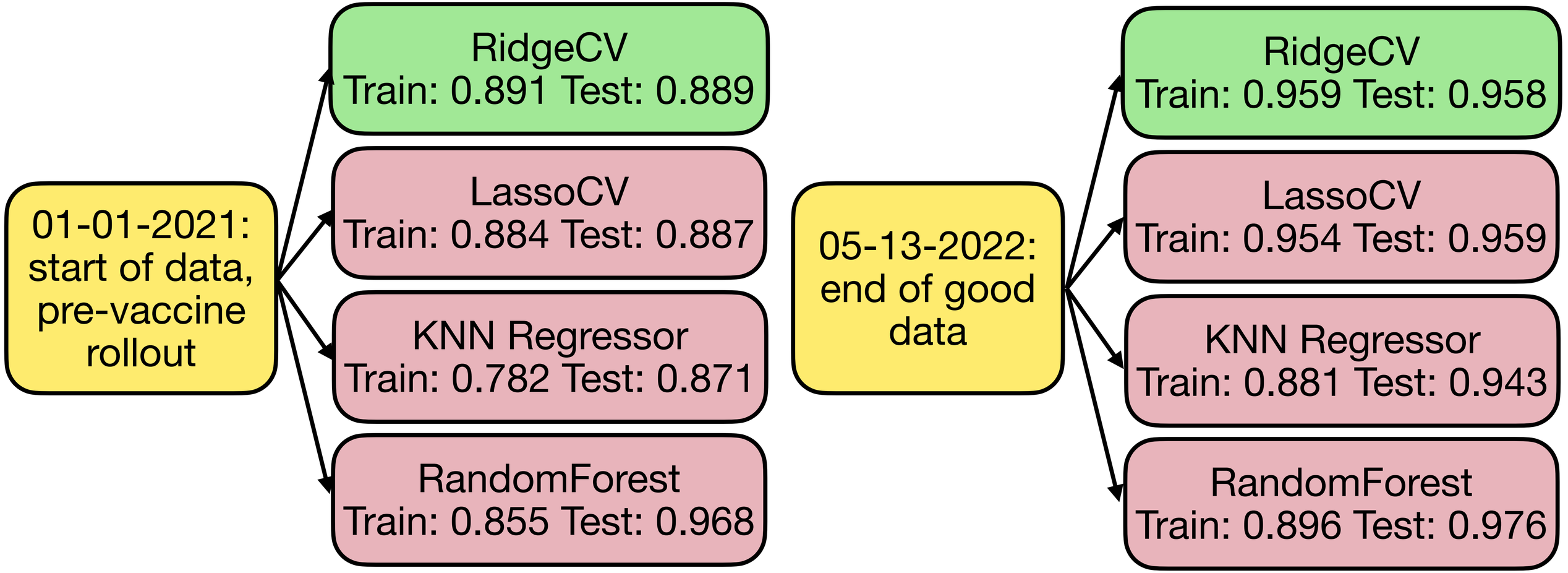
Model the Spread

Correct/Substantiate other Sources



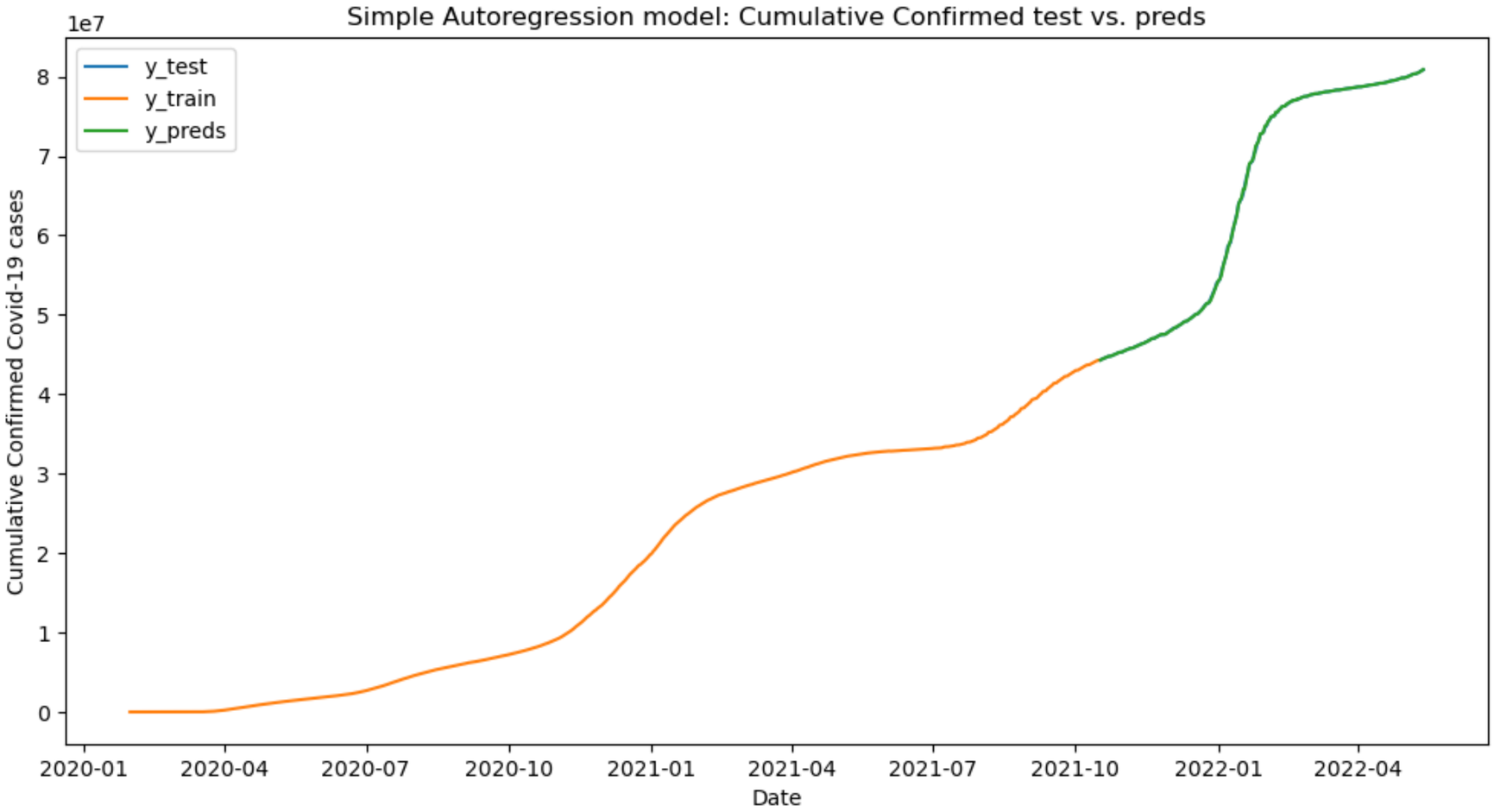
Model the Spread

Correct/Substantiate other Sources



Forecast

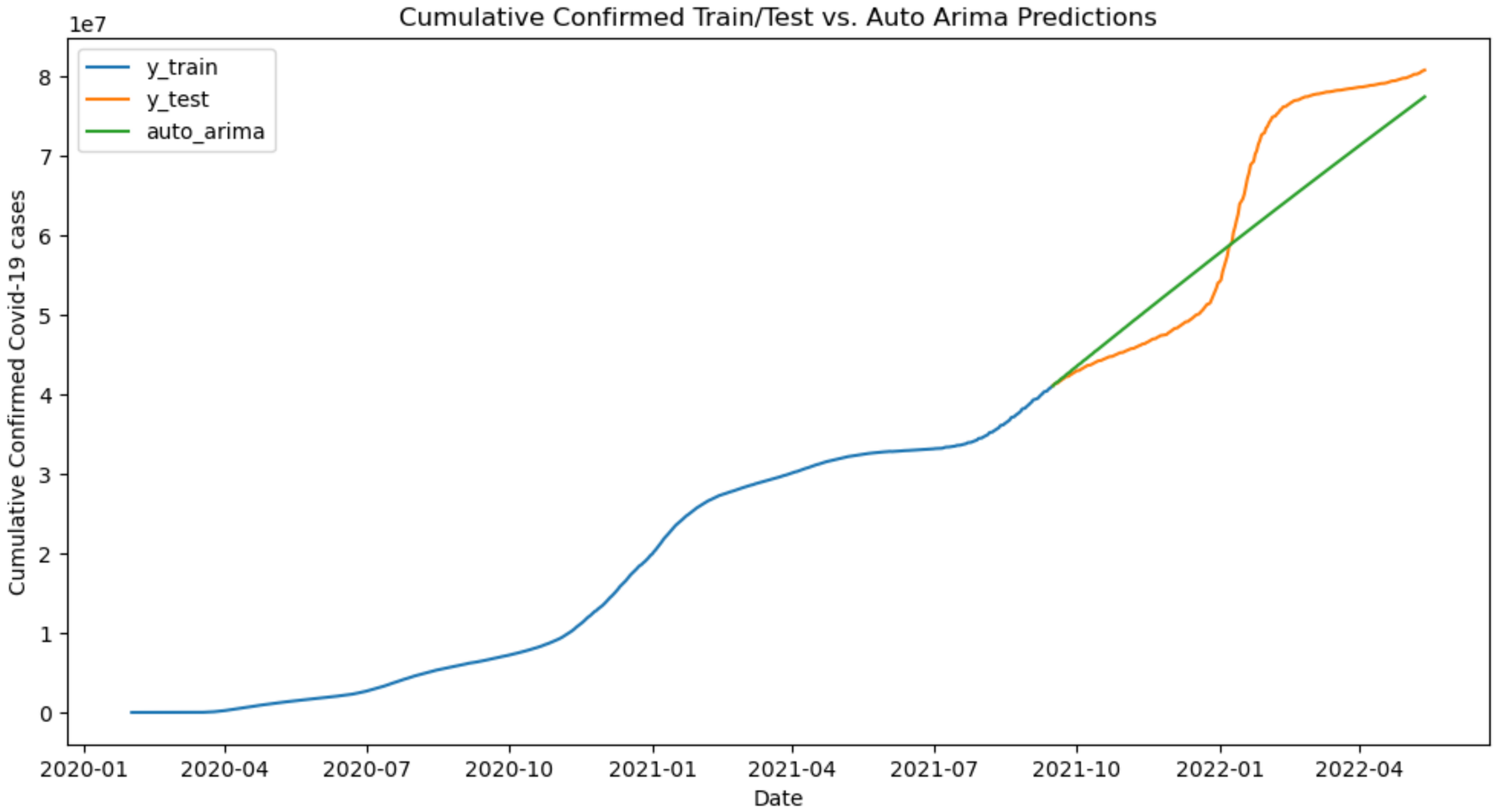
Proactive Planning



- Simple 10 lag Autoregression
- Short Term Planning

Forecast

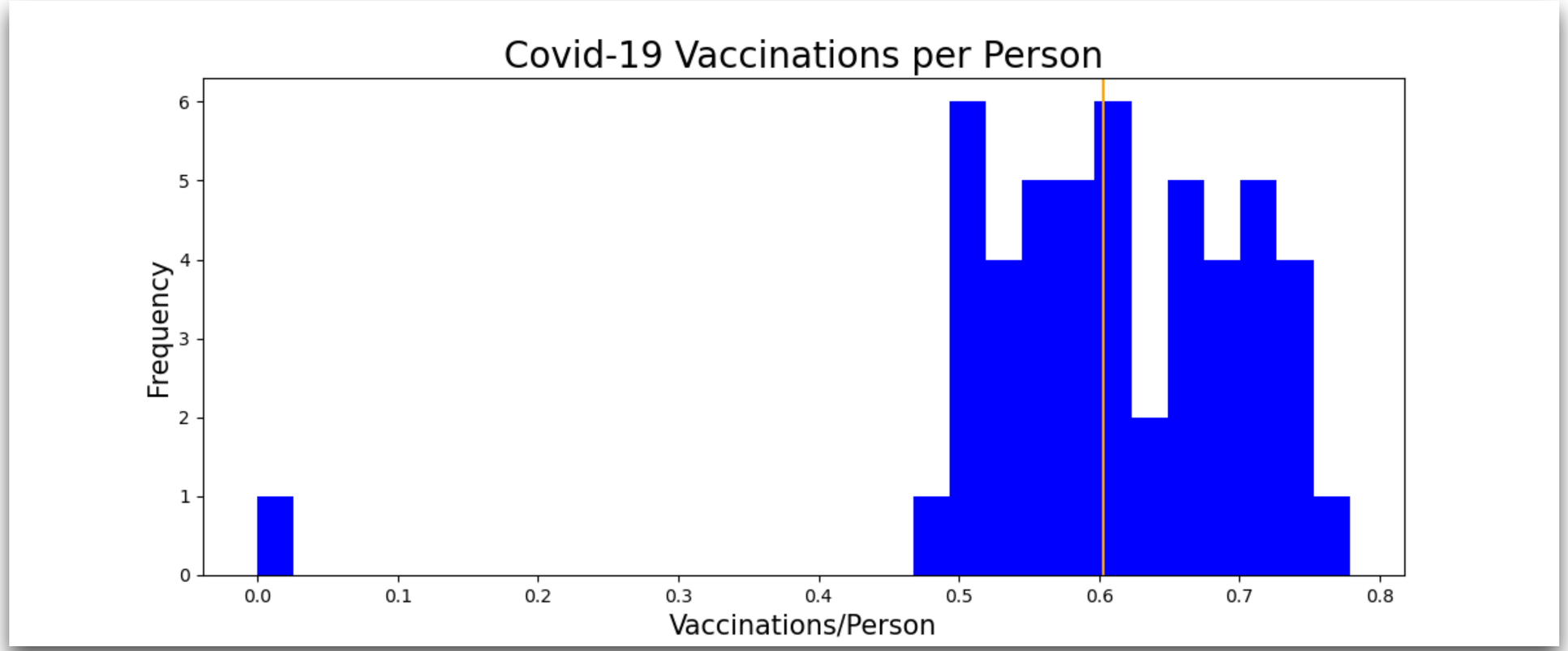
Proactive Planning



- auto-arima optimized ARIMA
- Longer term planning
- Non-seasonal, non-stationary dataset

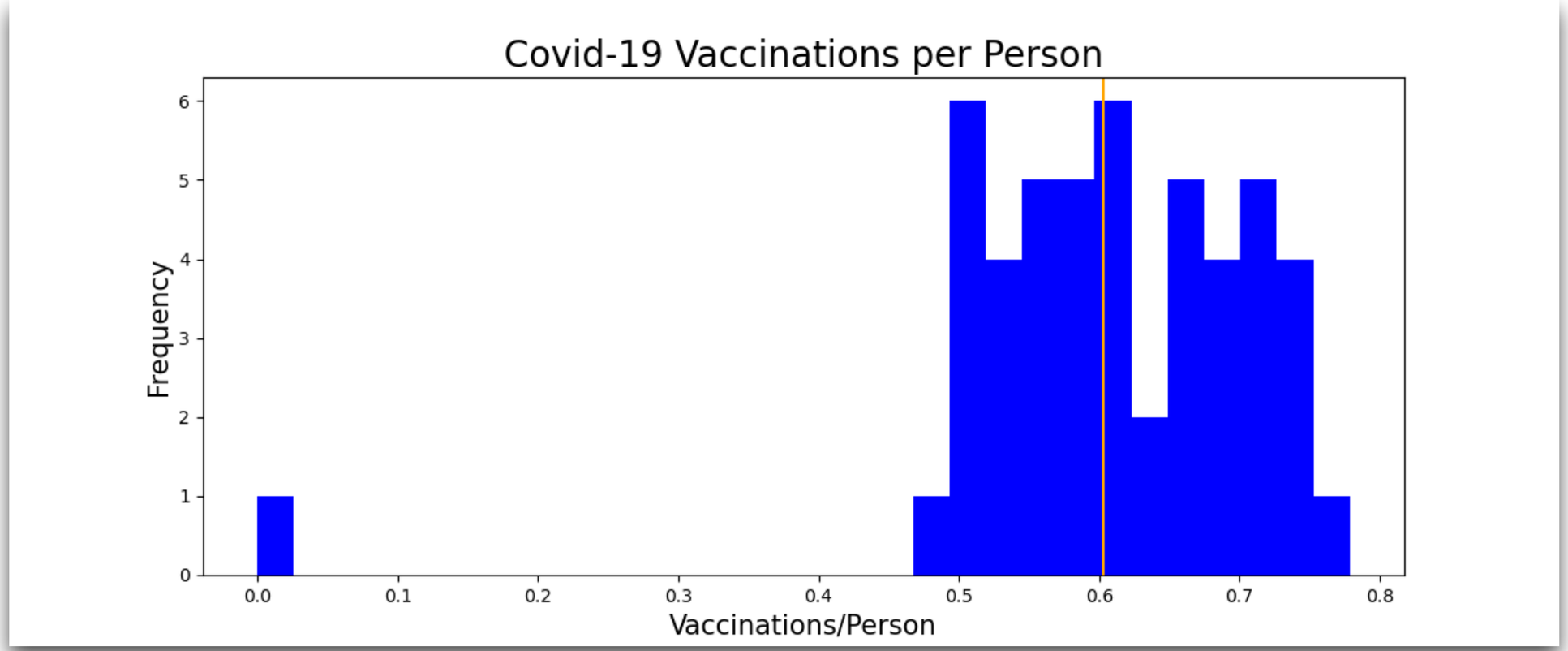
Why Does it Matter

Regaining Trust



Why Does it Matter

Regaining Trust



CT 0.78

MD 0.75

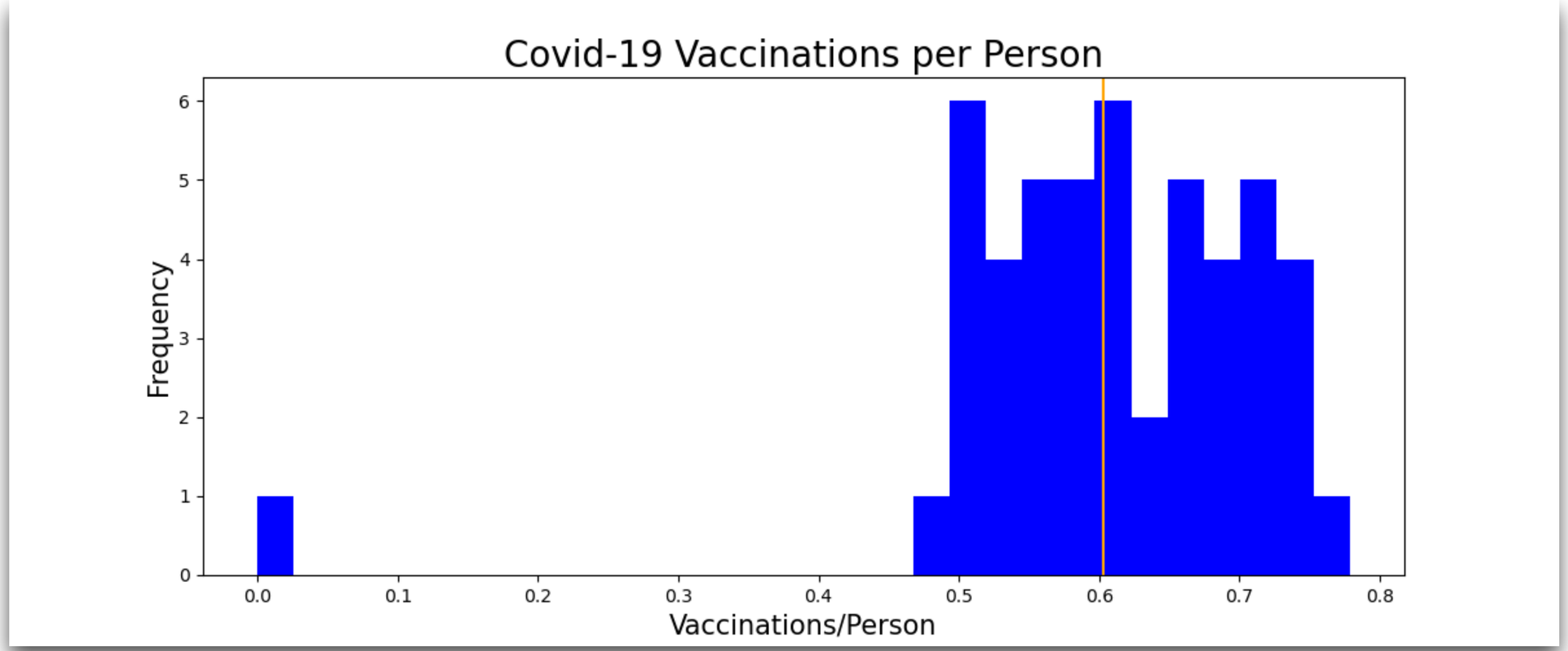
NY 0.75

RI 0.74

WA 0.72

Why Does it Matter

Regaining Trust



CT 0.78

MD 0.75

NY 0.75

RI 0.74

WA 0.72

MS 0.51

GA 0.50

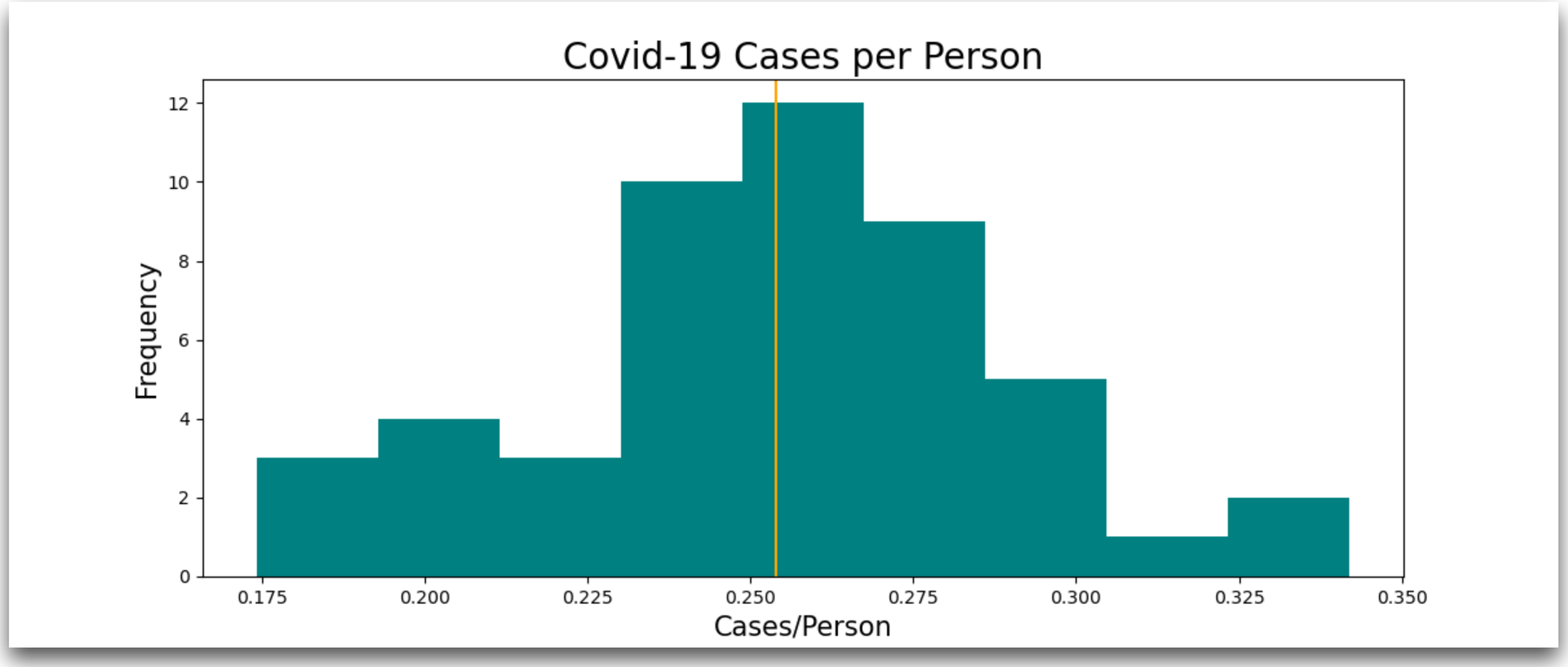
AR 0.50

WY 0.50

AL 0.48

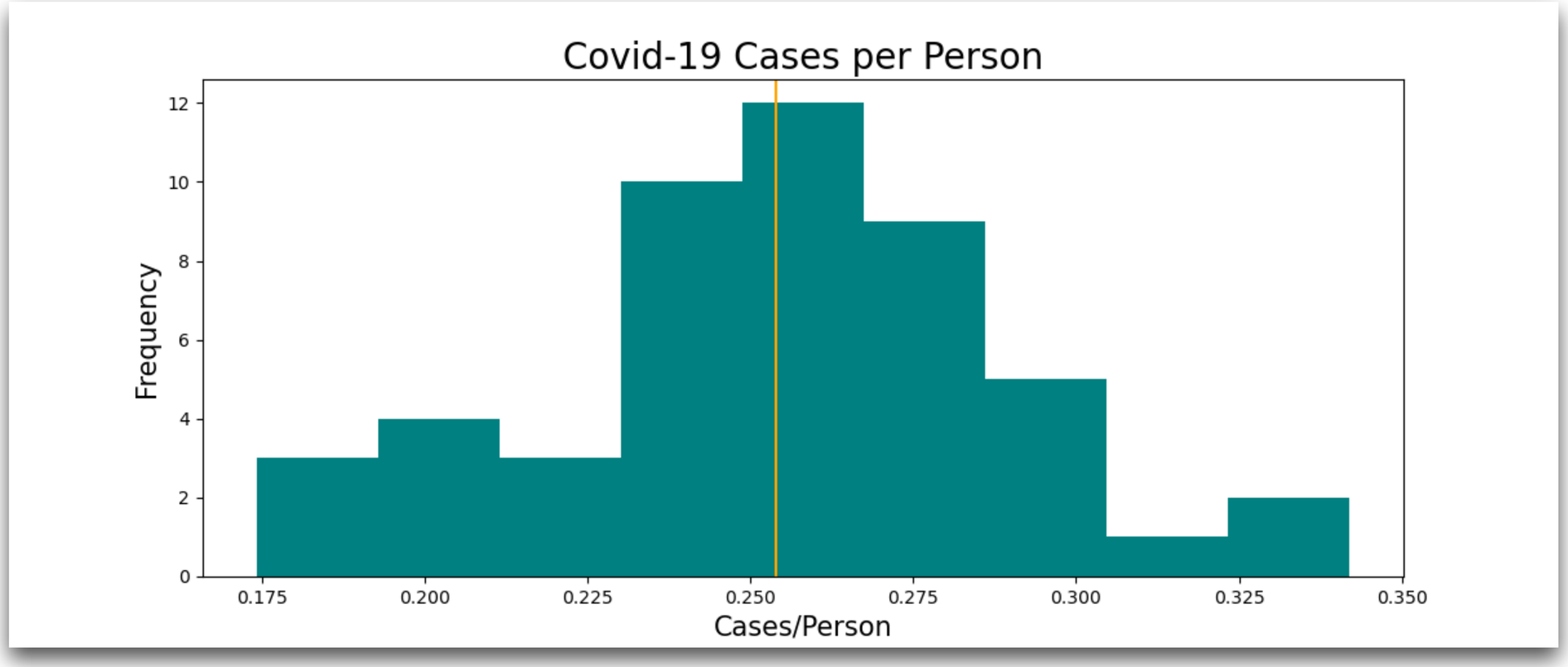
Why Does it Matter

Regaining Trust



Why Does it Matter

Regaining Trust



AK 0.34

RI 0.33

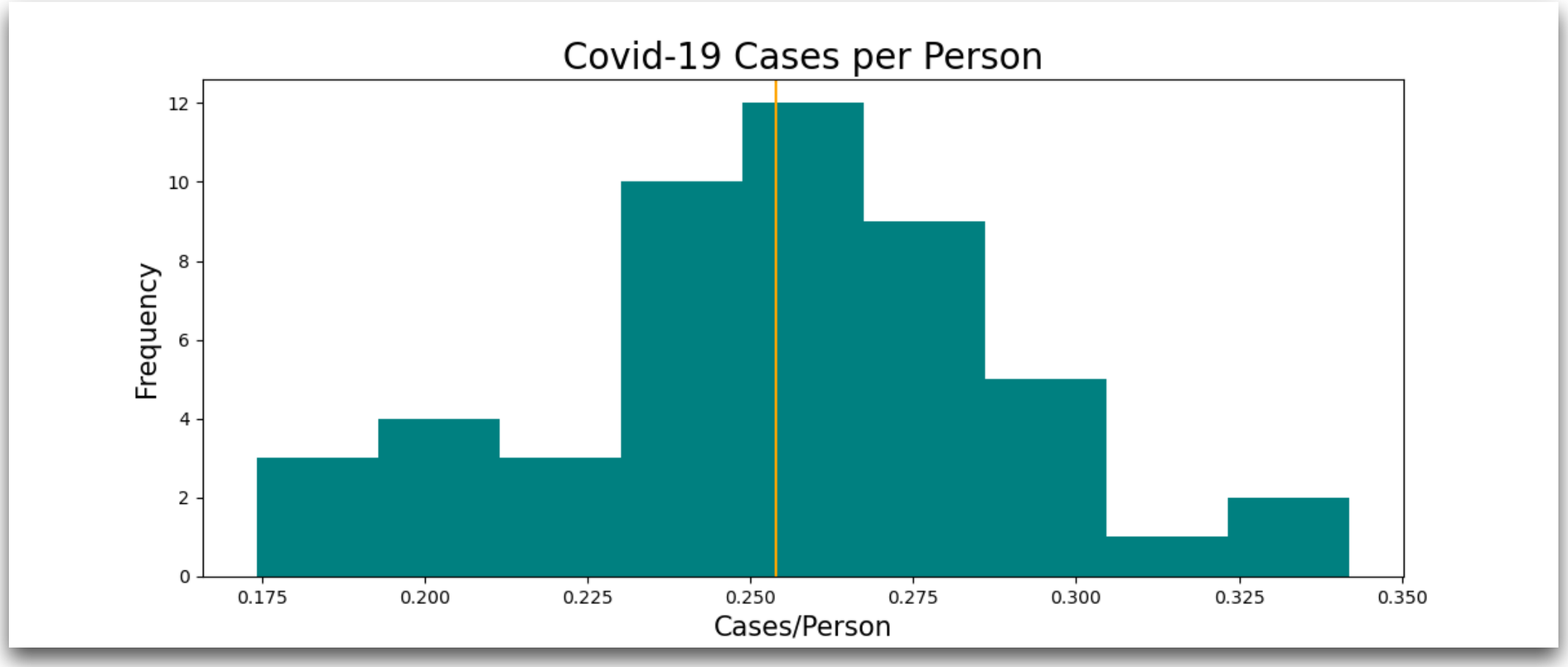
ND 0.32

KY 0.30

UT 0.30

Why Does it Matter

Regaining Trust



AK 0.34

RI 0.33

ND 0.32

KY 0.30

UT 0.30

WA 0.21

VA 0.20

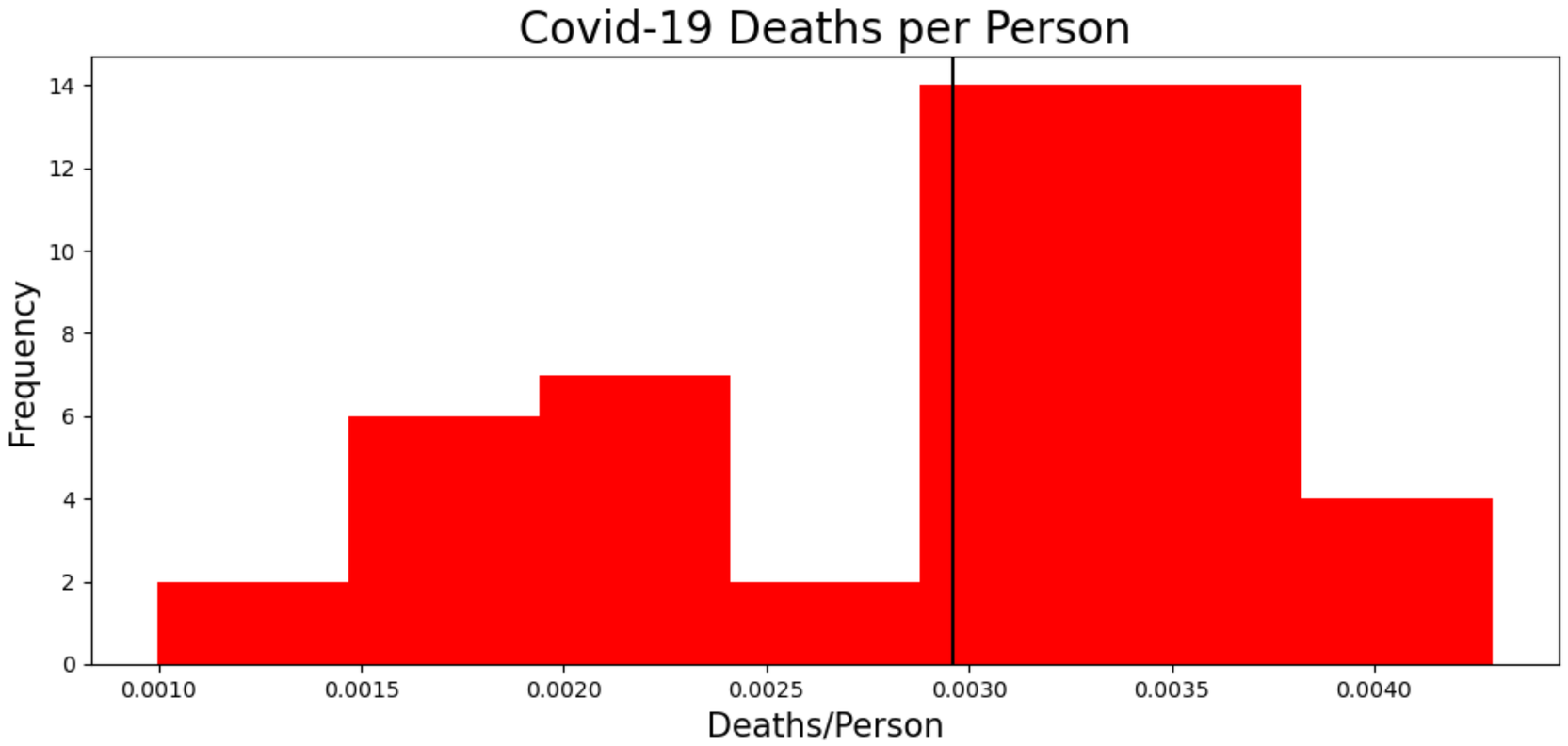
VT 0.20

OR 0.18

MD 0.17

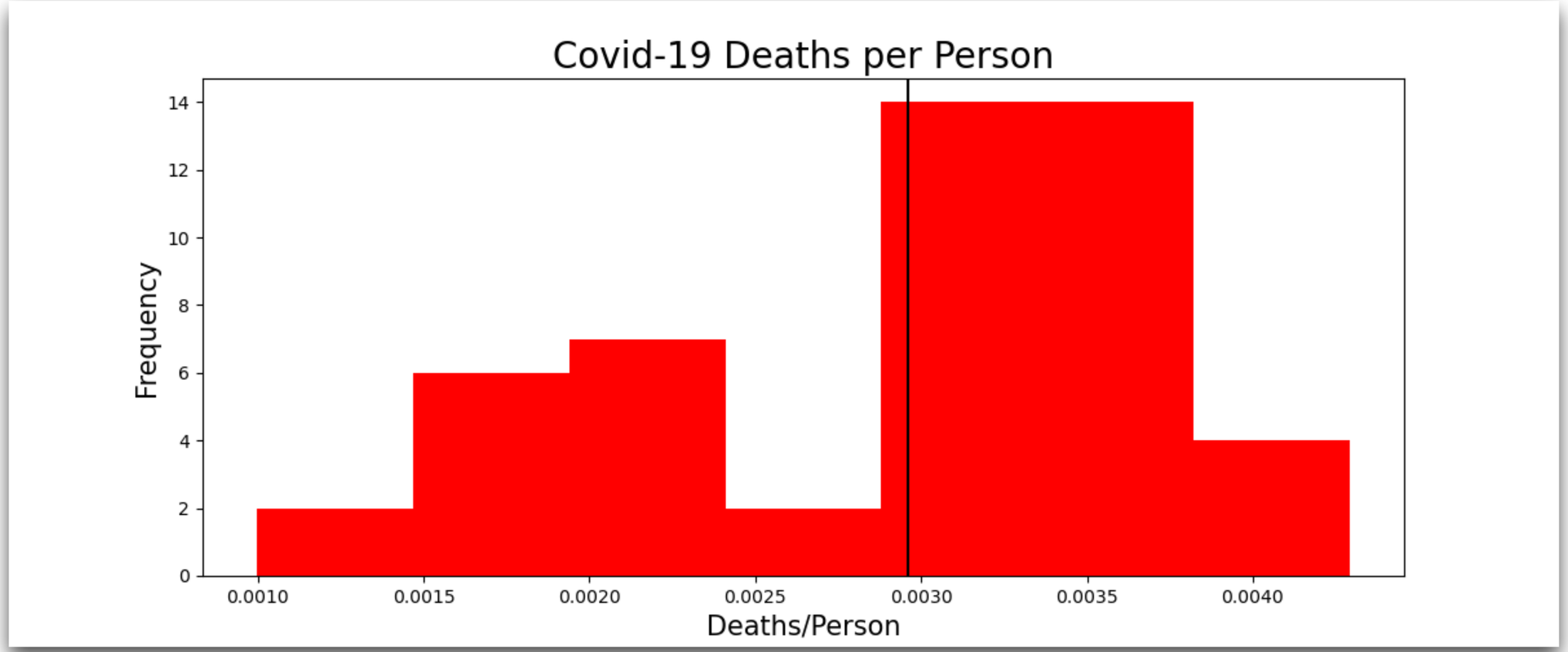
Why Does it Matter

Regaining Trust



Why Does it Matter

Regaining Trust



AZ 0.0043

MS 0.0042

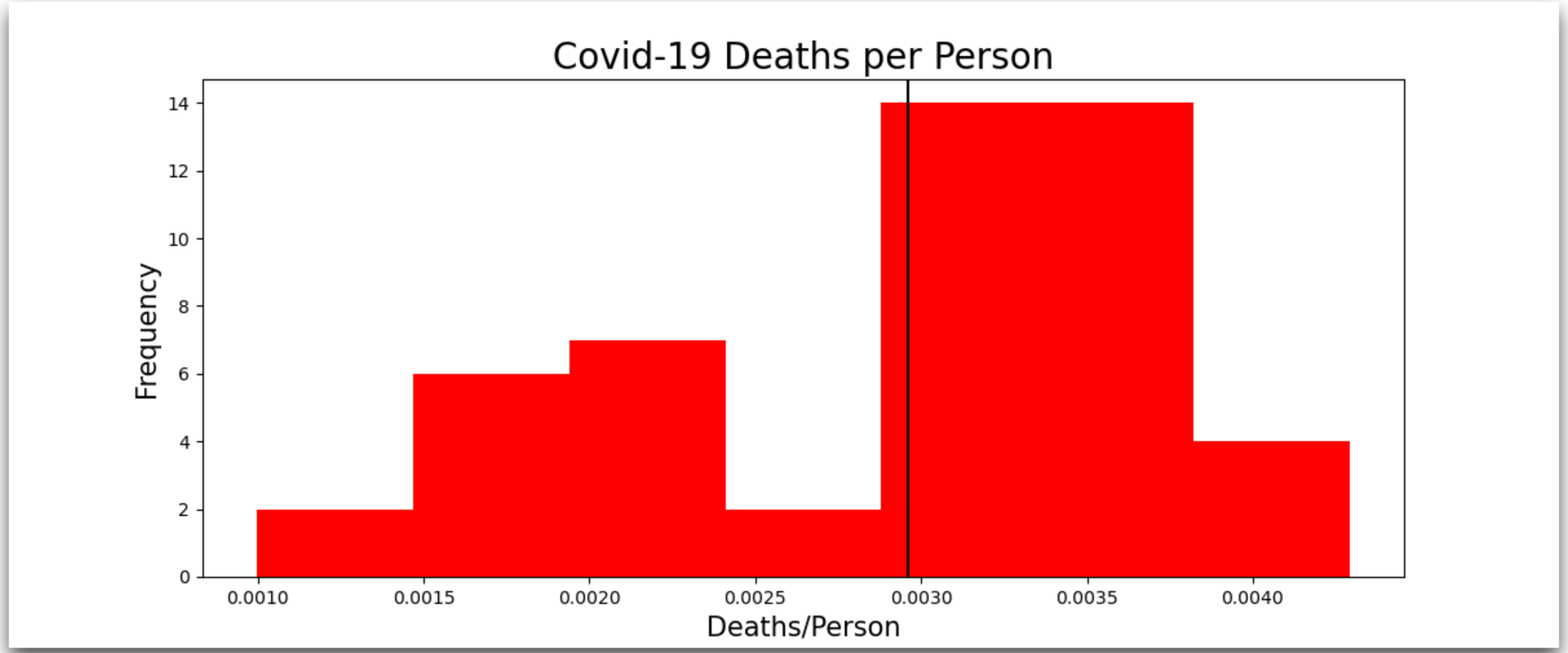
AL 0.0040

TN 0.0038

AR 0.0038

Why Does it Matter

Regaining Trust



AZ 0.0043

MS 0.0042

AL 0.0040

TN 0.0038

AR 0.0038

OR 0.0018

WA 0.0017

AK 0.0017

UT 0.0015

VT 0.0010

Conclusion

- Identify Factors
- Model for correction/ substantiation
- Forecasting
- Recommend dashboard to compile tools in one place

Source: www.freepik.com/free-vector/watercolor-germs-cartoon-illustration_49685496.htm