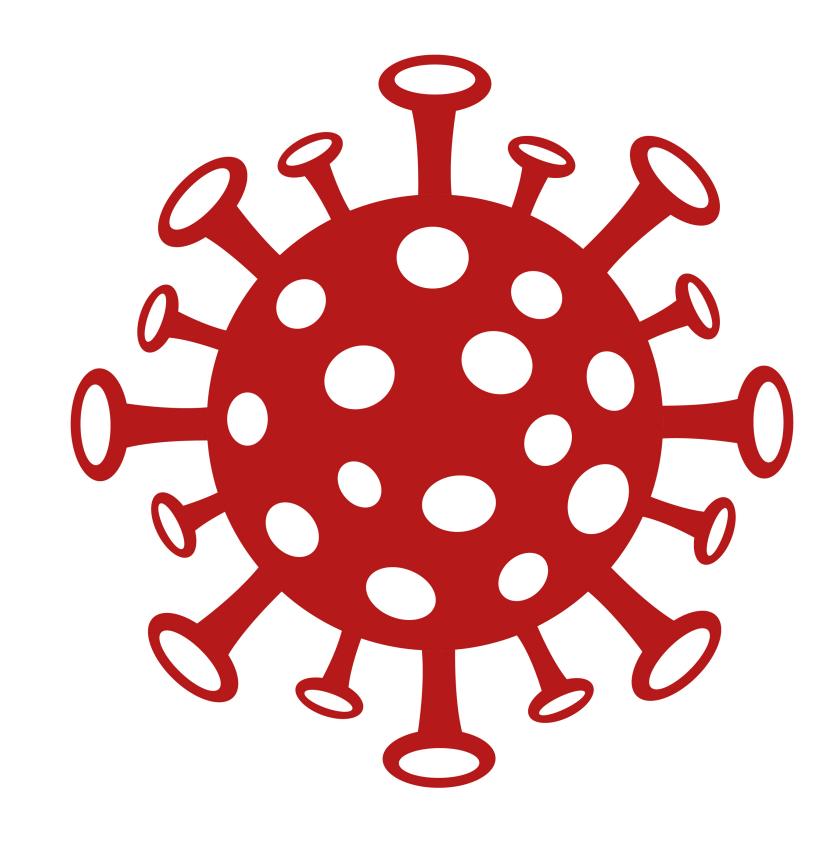
Covid-19 Study

Data Analysis and Modeling

Modern Day Plague

What do we do?

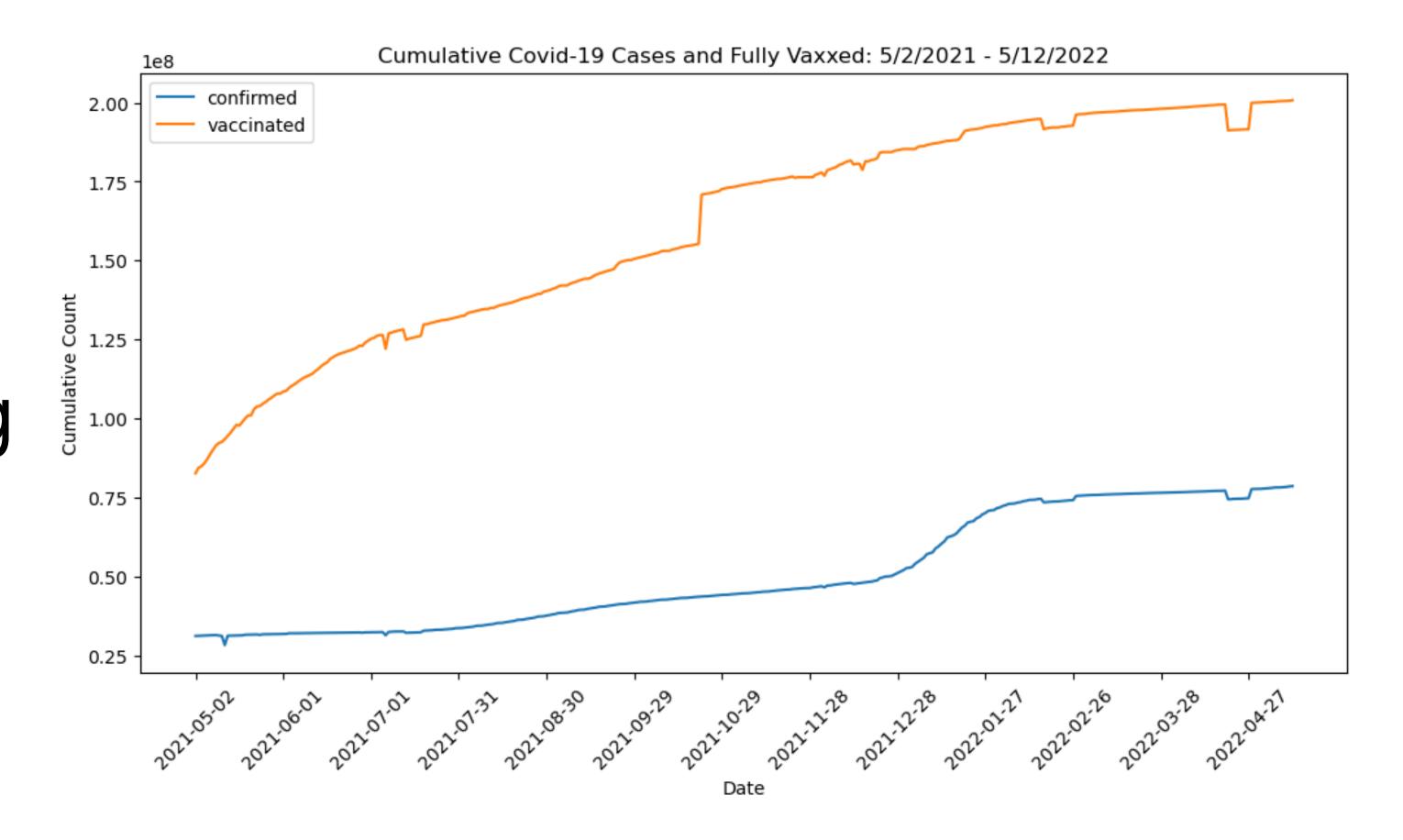
- Wuhan 2019 World
 Wide Present
- 5th Deadliest
- China's "zero covid" vs.
 Sweden's "let it rip"
- Follow the Data



Methodology

Flatten the Curve

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



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

Inferential Analysis

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

Linear Regression

Train: 0.942

Test: 0.891

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

Linear
Regression

Train: 0.942

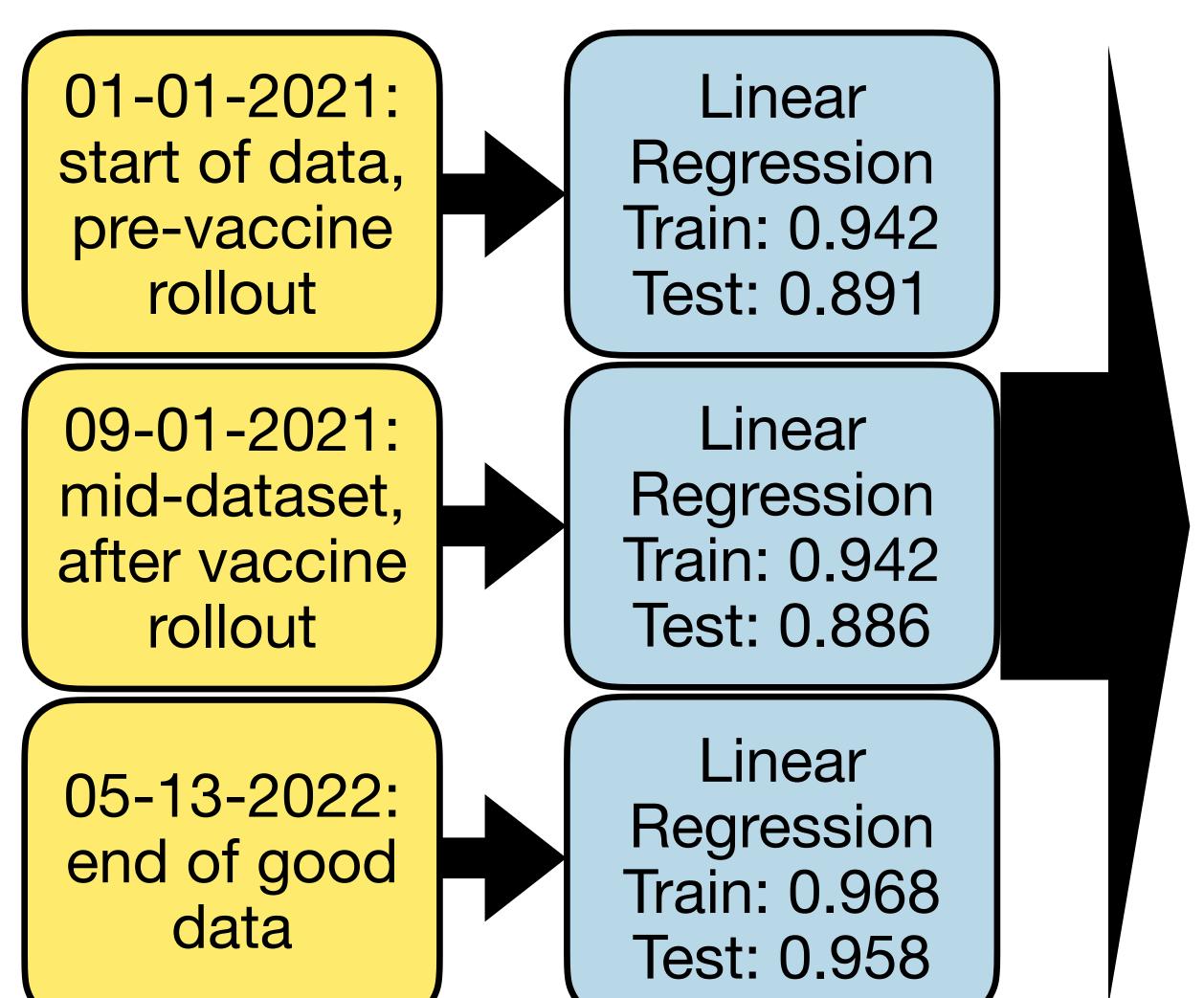
Test: 0.886

05-13-2022: end of good data Linear Regression

Train: 0.968

Test: 0.958

Inferential Analysis



Population A Cases A

Test: 0.958

Inferential Analysis

data

01-01-2021: Linear start of data, Regression Train: 0.942 pre-vaccine rollout Test: 0.891 09-01-2021: Linear mid-dataset, Regression Train: 0.942 after vaccine Test: 0.886 rollout Linear 05-13-2022: Regression end of good Train: 0.968

Population A Cases A Contact Tracing A Cases V Debt Relief Cases 1 Workplace Closings Cases • Facial Coverings Cases •

Test: 0.958

Inferential Analysis

01-01-2021: Linear start of data, Regression Train: 0.942 pre-vaccine rollout Test: 0.891 09-01-2021: Linear mid-dataset, Regression Train: 0.942 after vaccine Test: 0.886 rollout Linear 05-13-2022: Regression end of good Train: 0.968 data

Population A Cases A Contact Tracing Cases Debt Relief Cases 1 Workplace Closings • Cases • Facial Coverings Cases • Cancelled Public Events Cases

Inferential Analysis

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

Linear Regression Train: 0.942

Test: 0.891

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

Linear Regression Train: 0.942

Test: 0.886

05-13-2022: end of good data Linear Regression Train: 0.968 Test: 0.958

Population A Cases A Contact Tracing Cases Debt Relief Cases 1 Workplace Closings • Cases • Facial Coverings Cases • Cancelled Public Events Cases Good Weather Cases

Correct/Substantiate other Sources

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

Correct/Substantiate other Sources

RidgeCV

Train: 0.891 Test: 0.889

LassoCV

Train: 0.884 Test: 0.887

KNN Regressor

Train: 0.782 Test: 0.871

RandomForest

Train: 0.855 Test: 0.968

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

Correct/Substantiate other Sources

RidgeCV

Train: 0.891 Test: 0.889

LassoCV

Train: 0.884 Test: 0.887

KNN Regressor

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05-13-2022: end of good

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Train: 0.855 Test: 0.968

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

Correct/Substantiate other Sources

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

Train: 0.891 Test: 0.889

LassoCV

Train: 0.884 Test: 0.887

05-13-2022:

end of good

data

KNN Regressor

Train: 0.782 Test: 0.871

RandomForest

Train: 0.855 Test: 0.968

RidgeCV

Train: 0.959 Test: 0.958

LassoCV

Train: 0.954 Test: 0.959

KNN Regressor

Train: 0.881 Test: 0.943

RandomForest

Train: 0.896 Test: 0.976

Correct/Substantiate other Sources

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

Train: 0.891 Test: 0.889

LassoCV

Train: 0.884 Test: 0.887

05-13-2022:

end of good

data

KNN Regressor

Train: 0.782 Test: 0.871

RandomForest

Train: 0.855 Test: 0.968

RidgeCV Train: 0.959 Test: 0.958

LassoCV

Train: 0.954 Test: 0.959

KNN Regressor

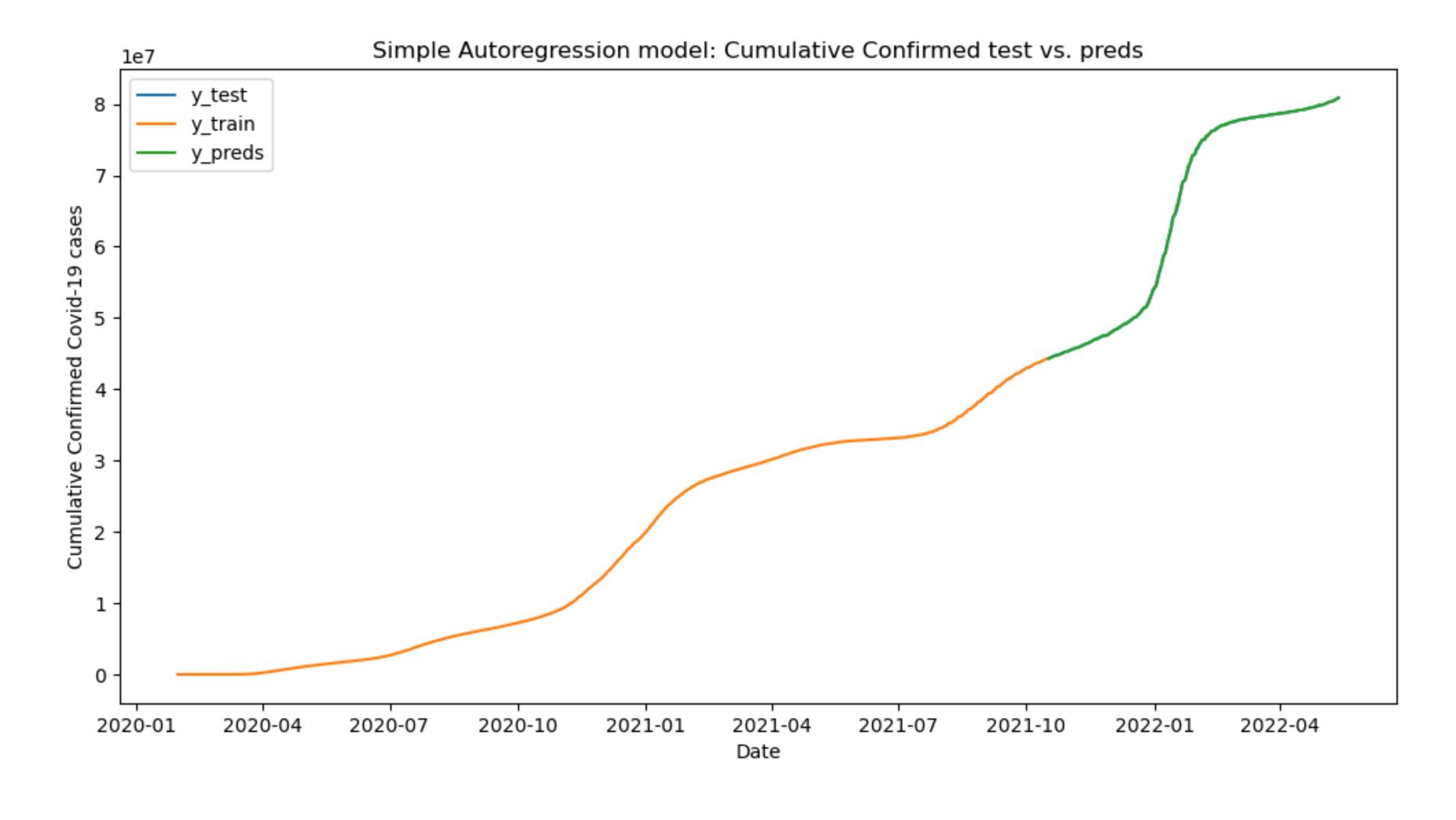
Train: 0.881 Test: 0.943

RandomForest

Train: 0.896 Test: 0.976

Forecast

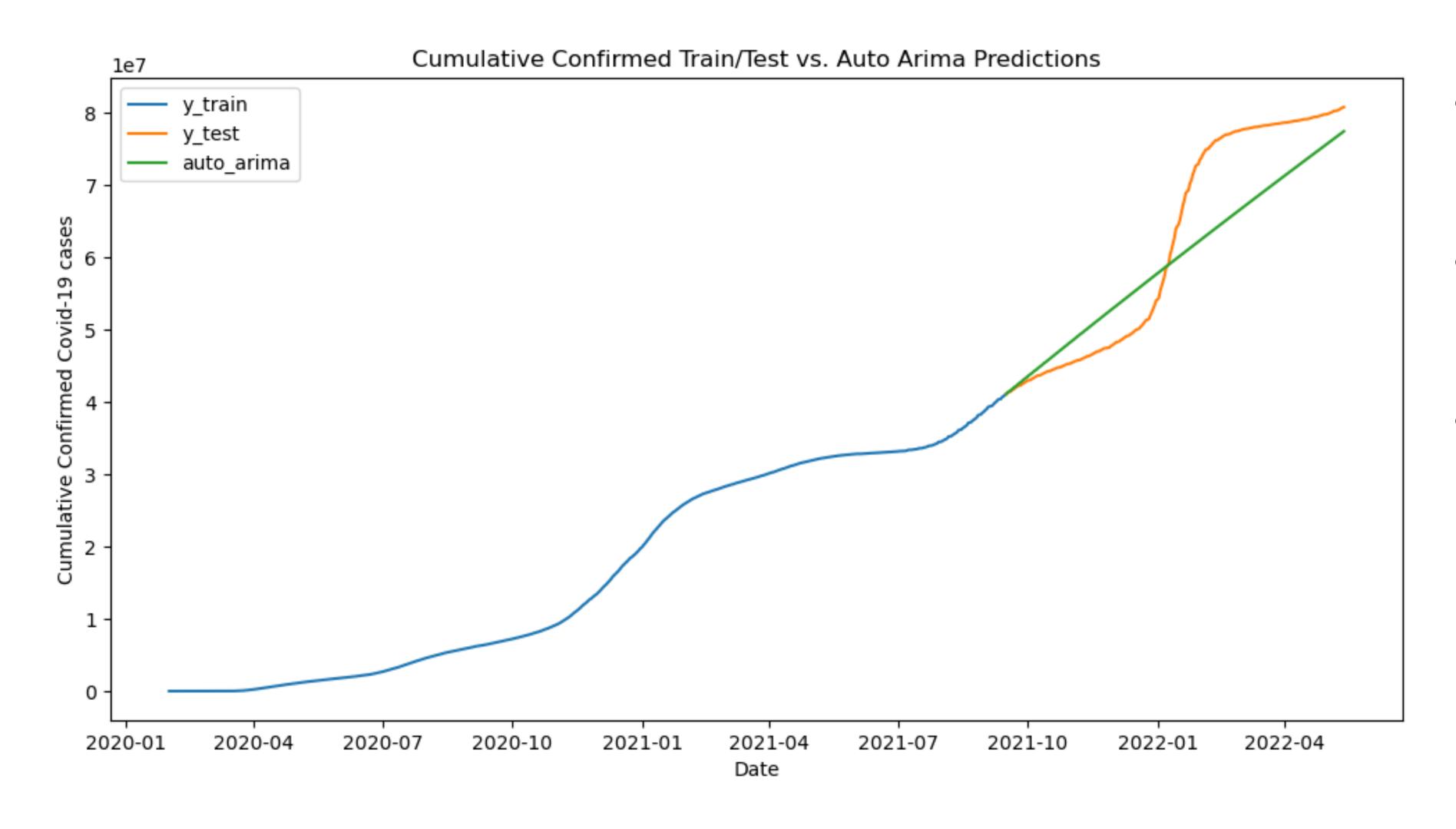
Proactive Planning



- Simple 10 lag Autoregression
- Short Term Planning

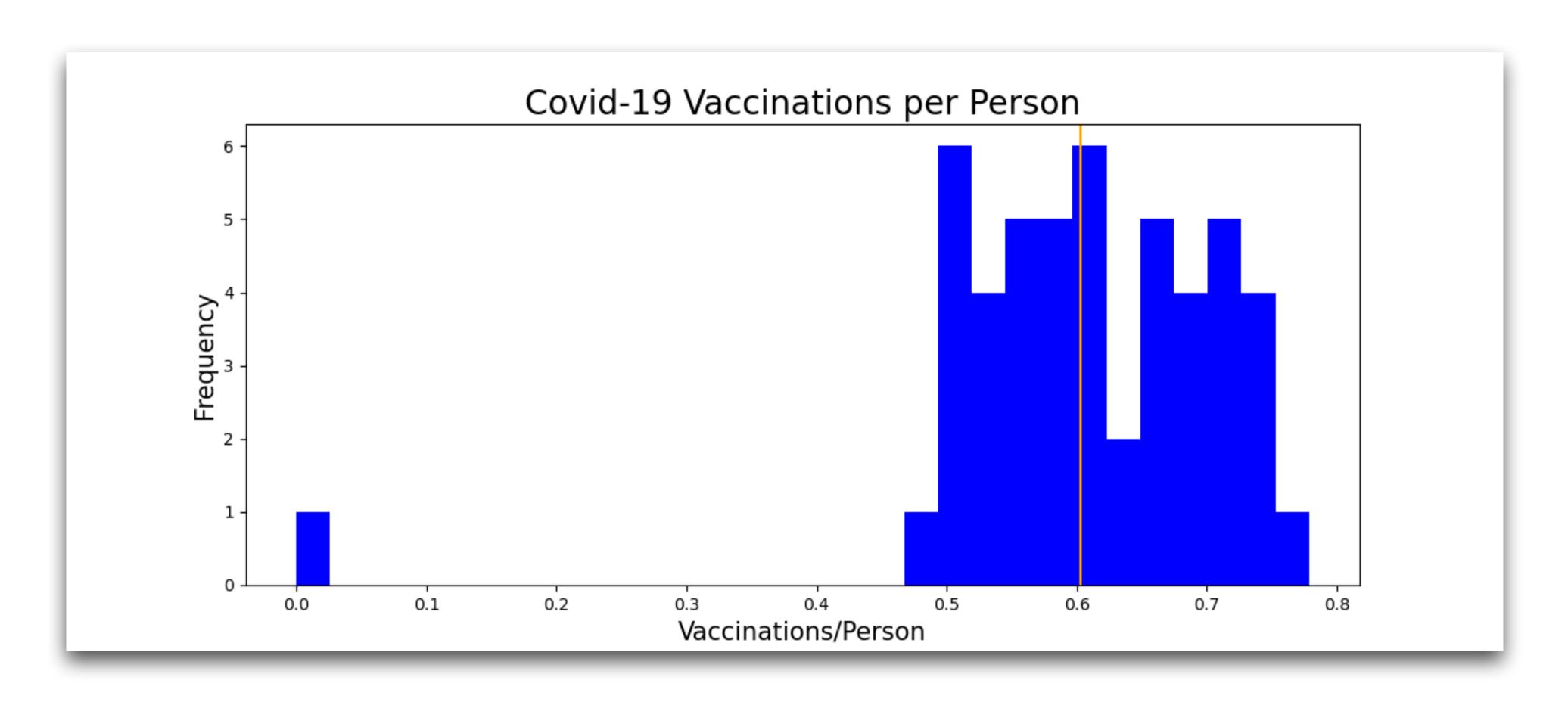
Forecast

Proactive Planning

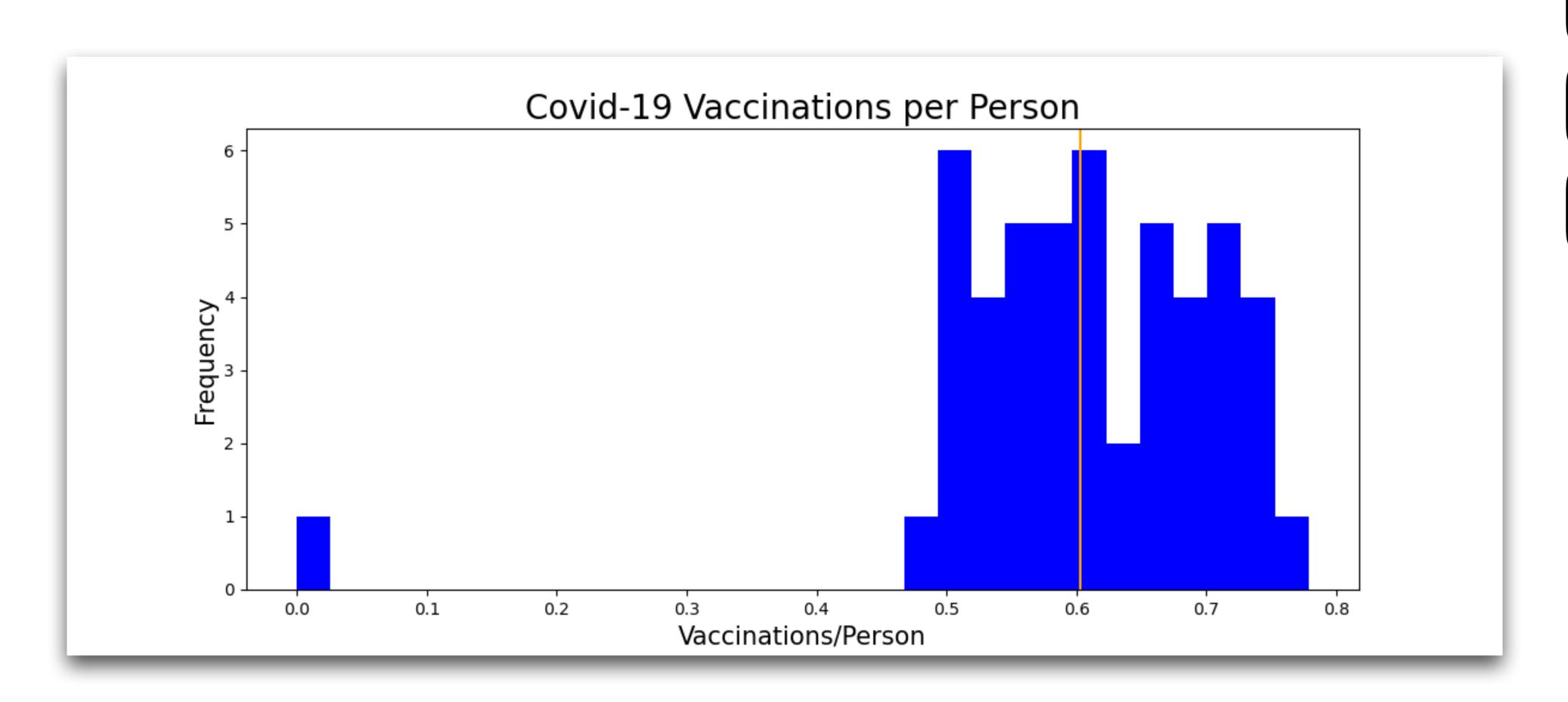


- auto-arima
 optimized ARIMA
- Longer term planning
- Non-seasonal, non-stationary dataset

Regaining Trust



Regaining Trust



CT 0.78

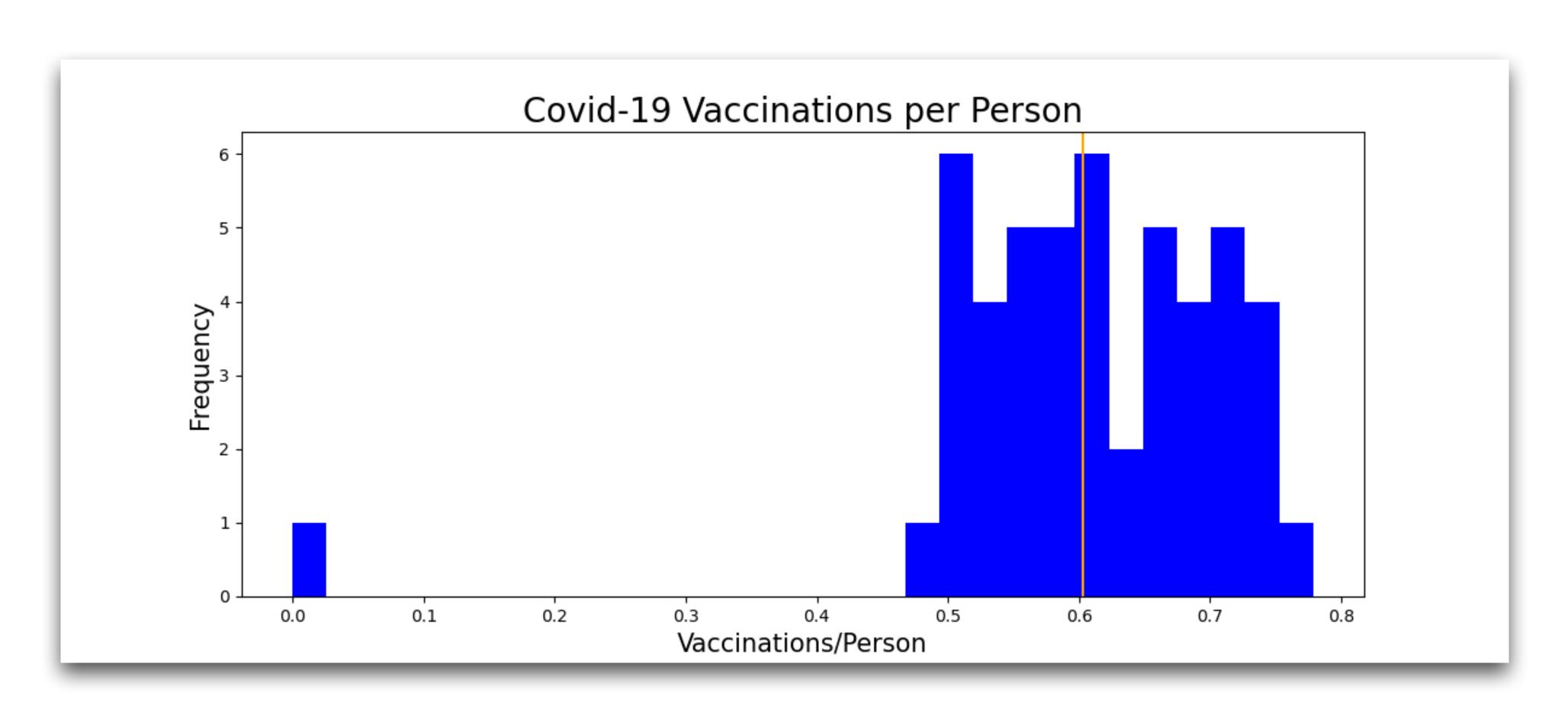
MD 0.75

NY 0.75

RI 0.74

WA 0.72

Regaining Trust



CT 0.78

MD 0.75

NY 0.75

RI 0.74

WA 0.72

MS 0.51

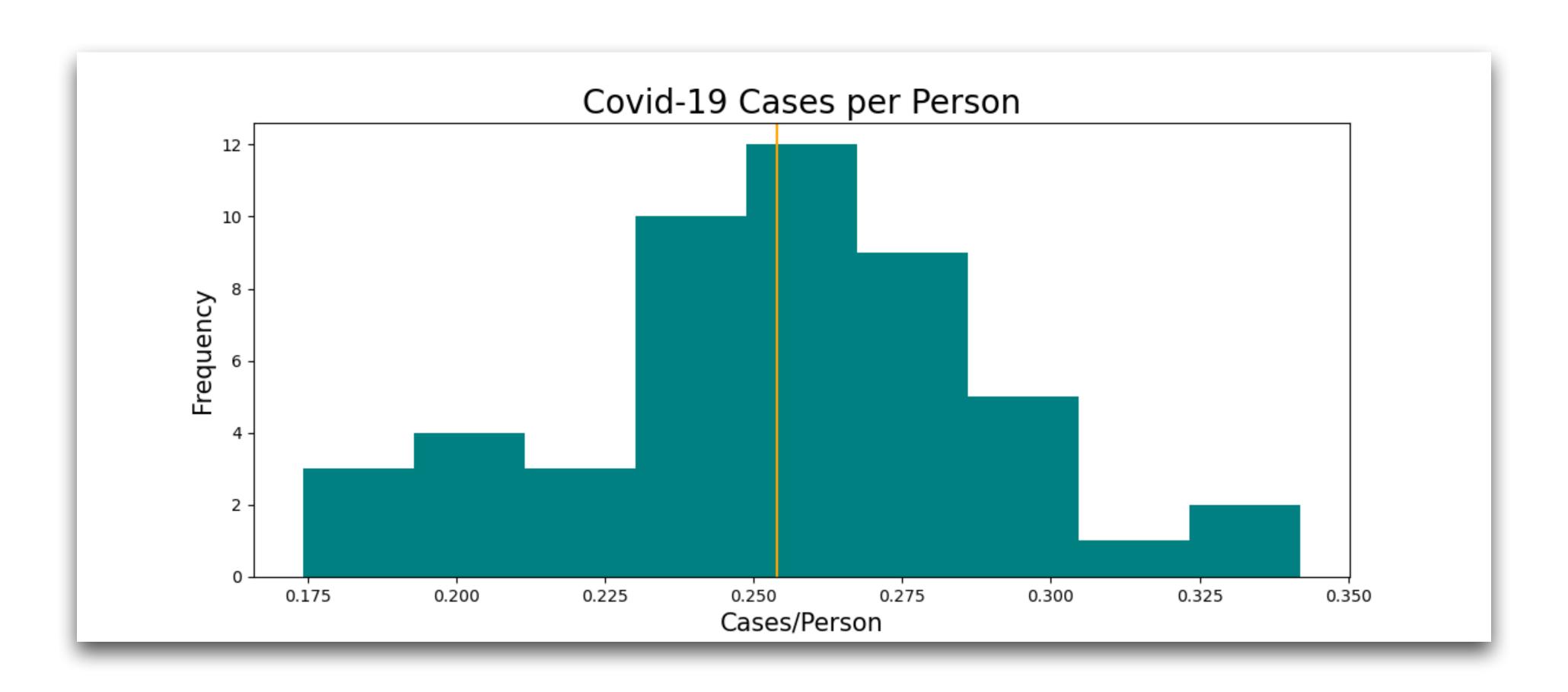
GA 0.50

AR 0.50

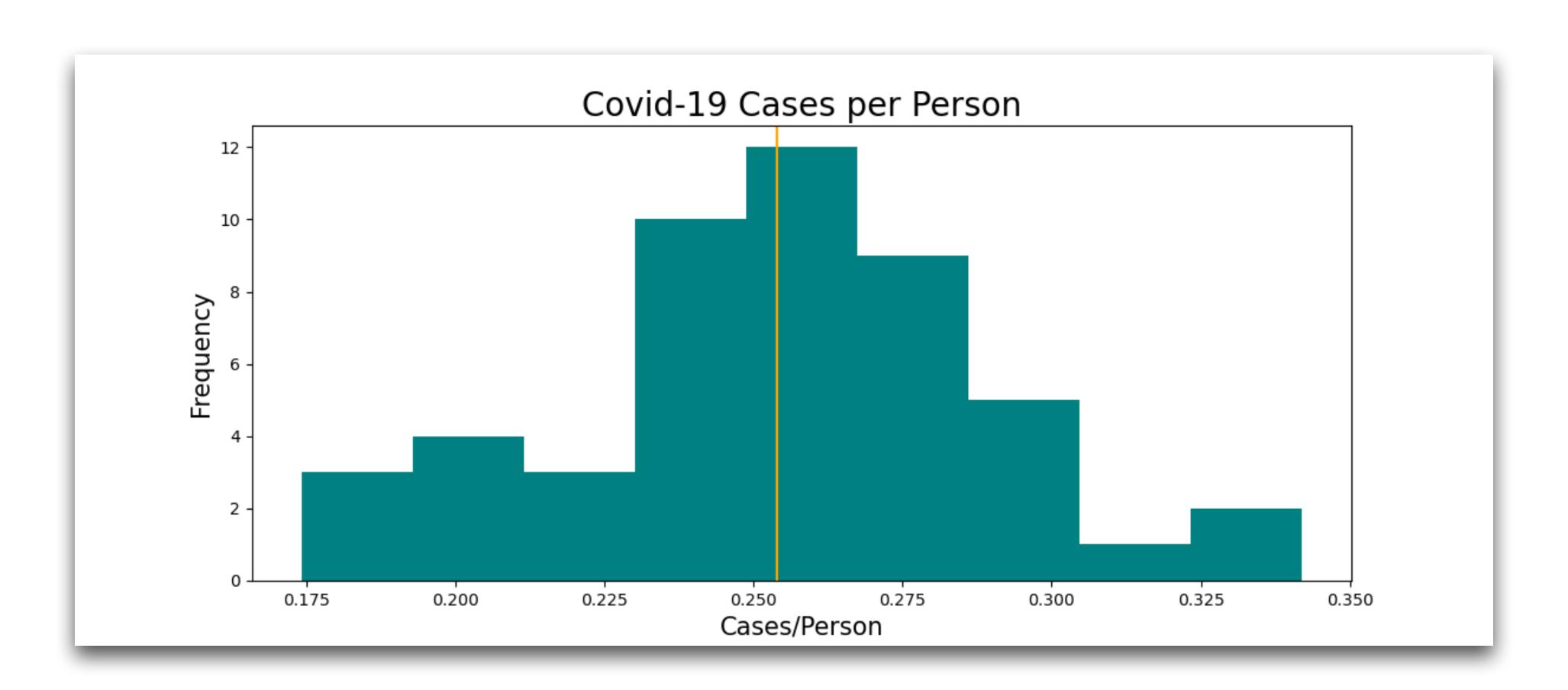
WY 0.50

AL 0.48

Regaining Trust



Regaining Trust



AK 0.34

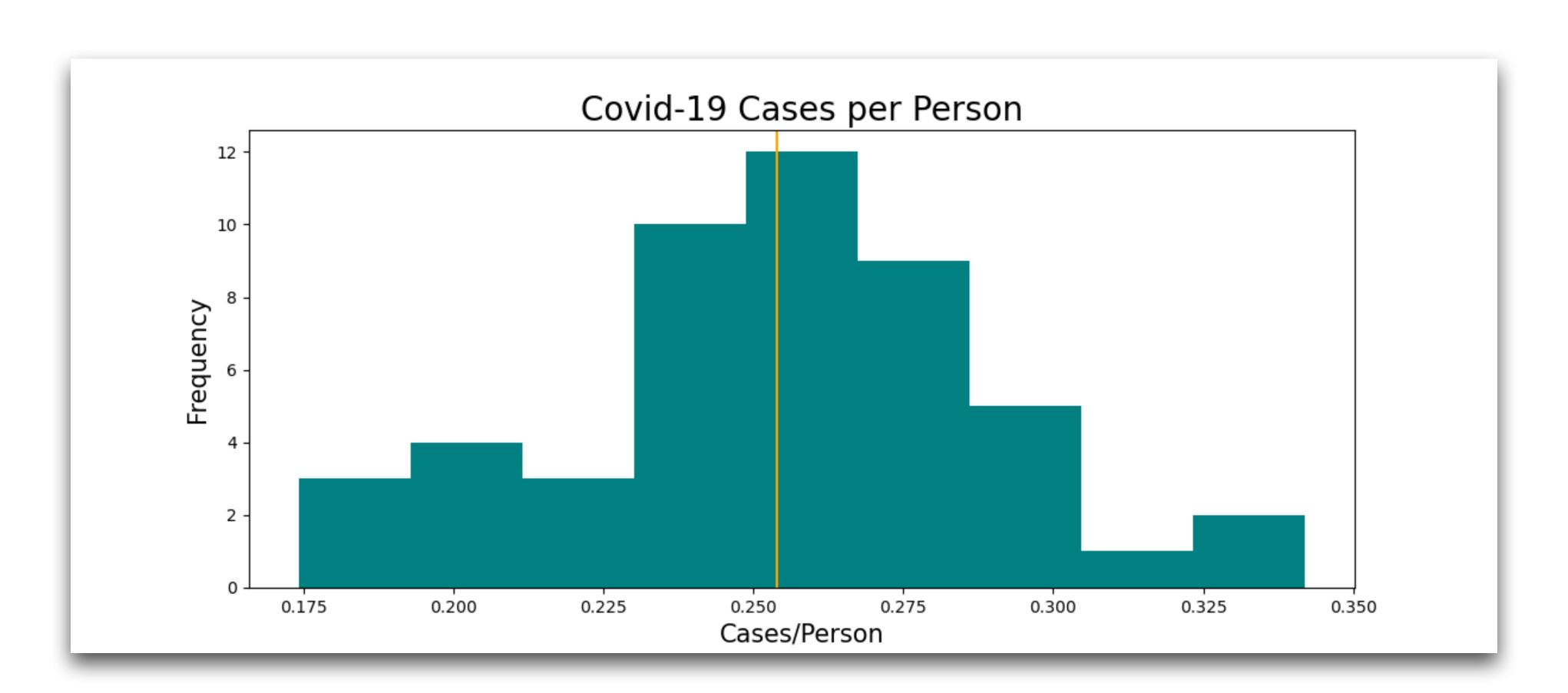
RI 0.33

ND 0.32

KY 0.30

UT 0.30

Regaining Trust



AK 0.34

RI 0.33

ND 0.32

KY 0.30

UT 0.30

WA 0.21

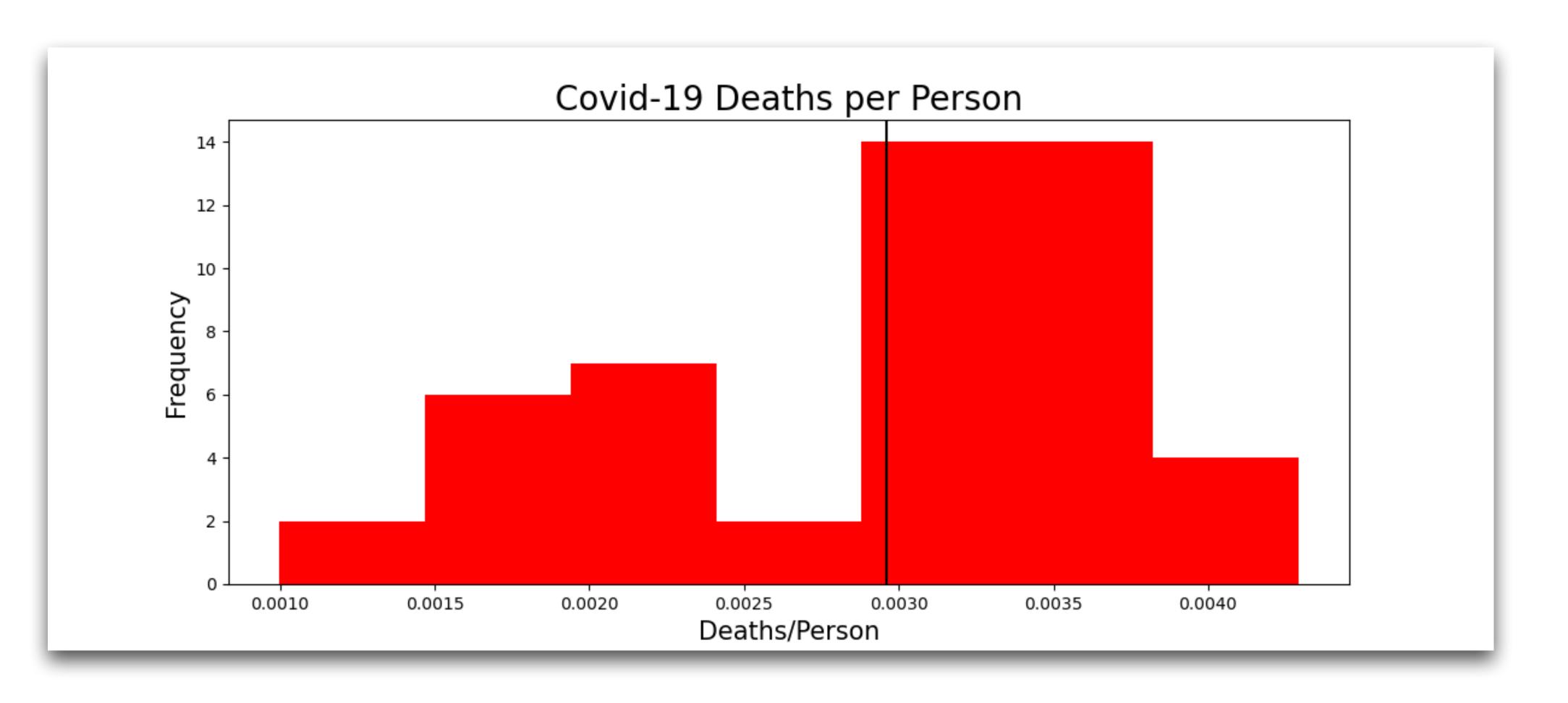
VA 0.20

VT 0.20

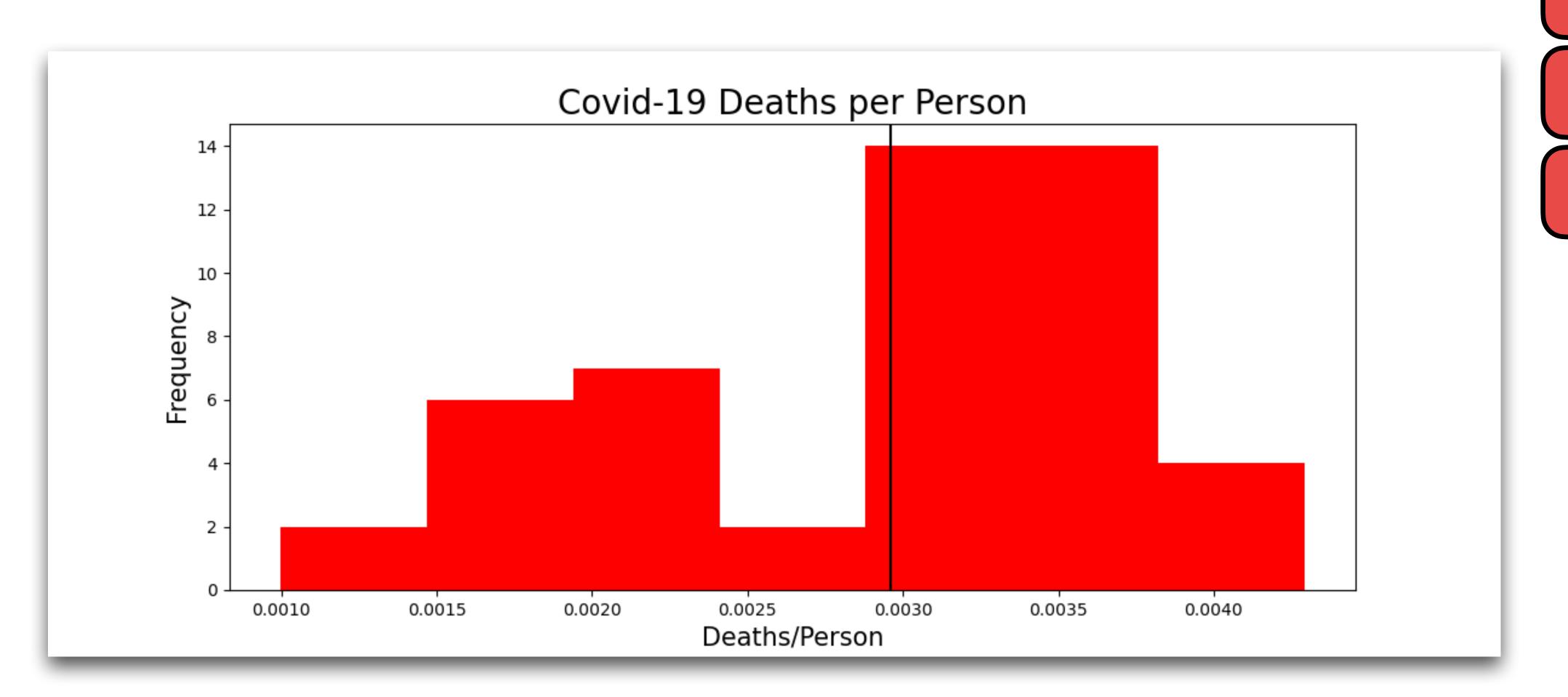
OR 0.18

MD 0.17

Regaining Trust



Regaining Trust



AZ 0.0043

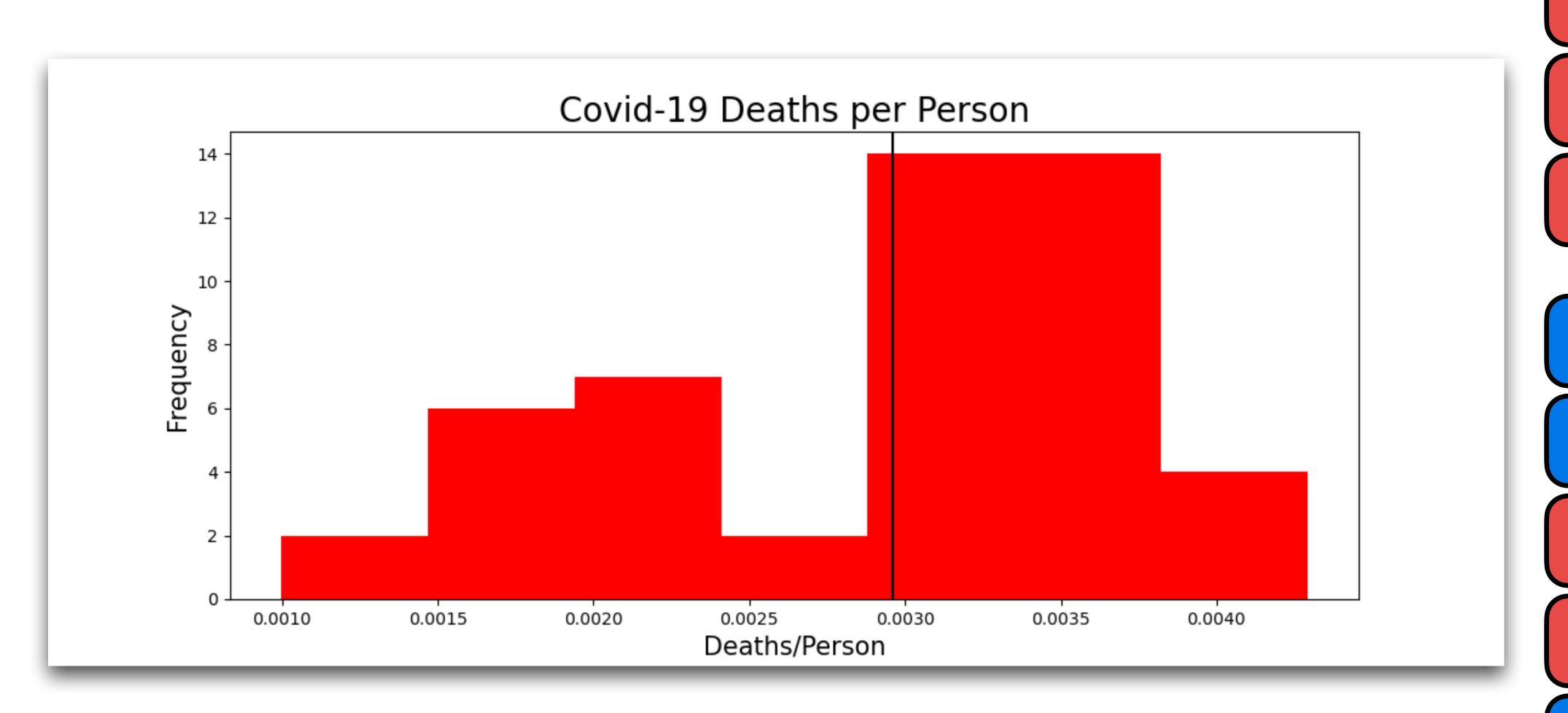
MS 0.0042

AL 0.0040

TN 0.0038

AR 0.0038

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

