PROJECT 5

COVID -19 Vaccine Consumption

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Background

COVID - 19

- SARS-CoV-2
- DEC. 2019
- Wuhan, China

VACCINE

- Pfizer-BioNTech
- Moderna
- Janssen

HESITANCY

- safety and efficacy concerns
- preference for physiological immunity
- distrust in government and health organizations
- autonomy and personal freedom

Problem Statement

GOAL

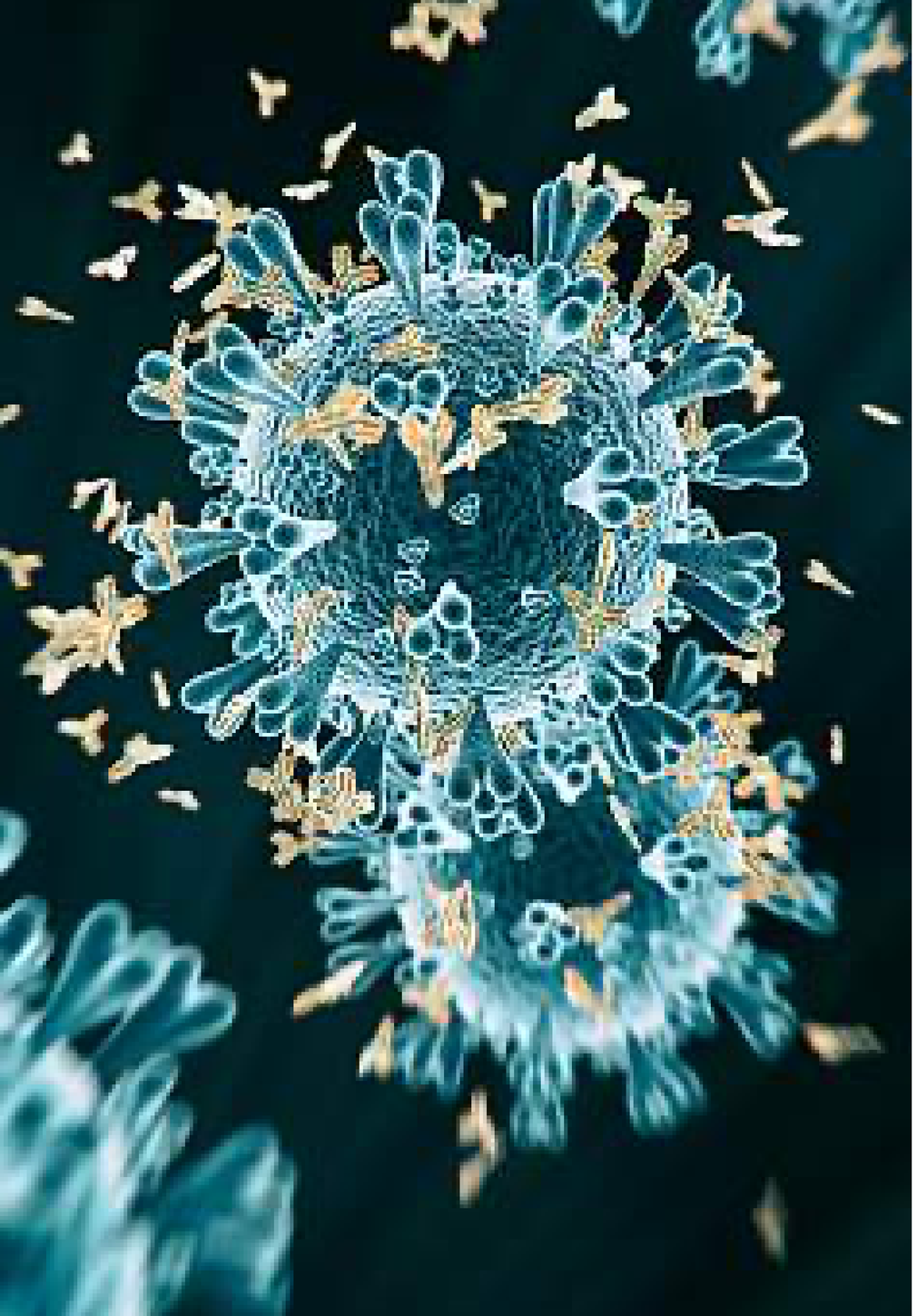
Estimate county vaccine consumption

FOR WHO?

- common public
- government
- medical companies

SUCCESS METRIC

RMSE



Datasets

CDC

01

Vaccination Rates by County

02

Vaccine Hesitancy by County

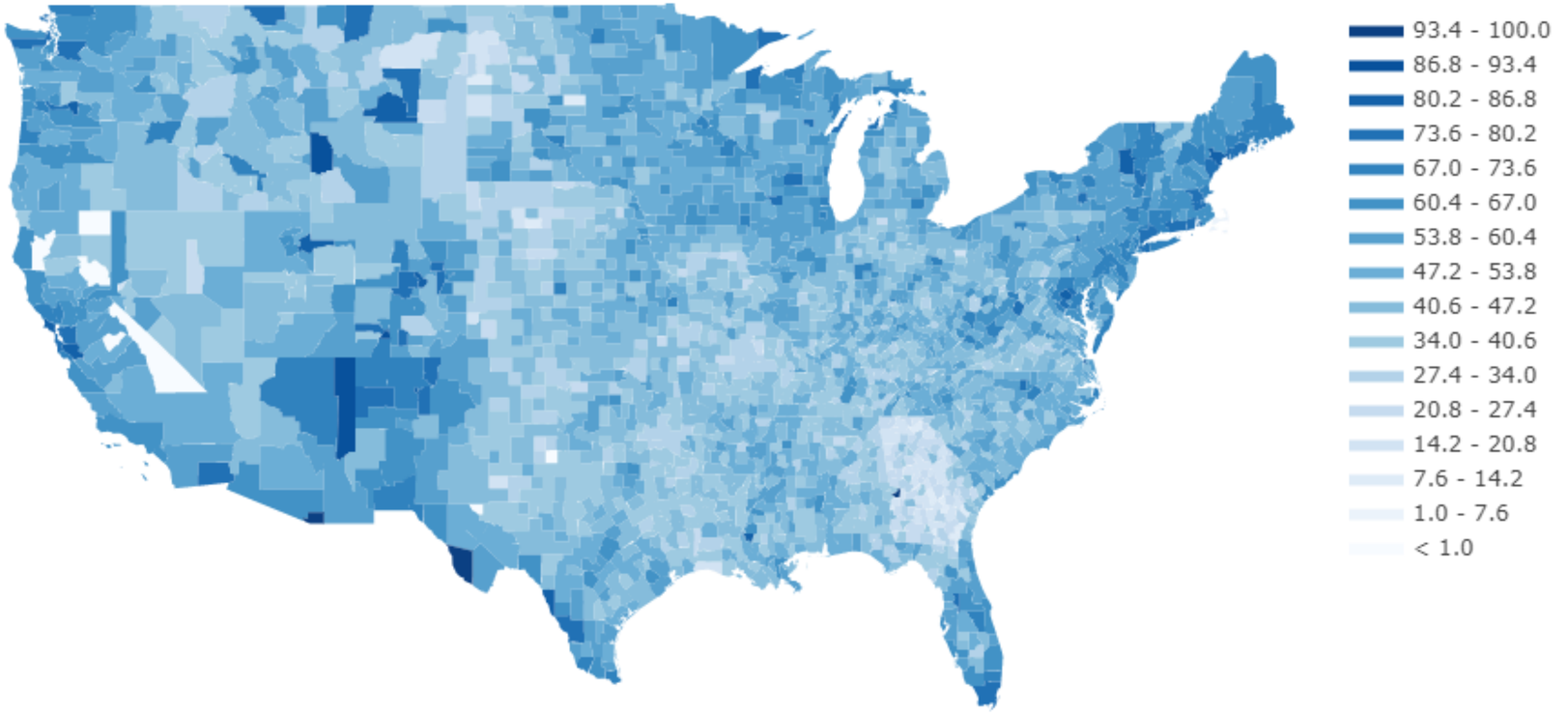
03

Vaccination Distribution by State

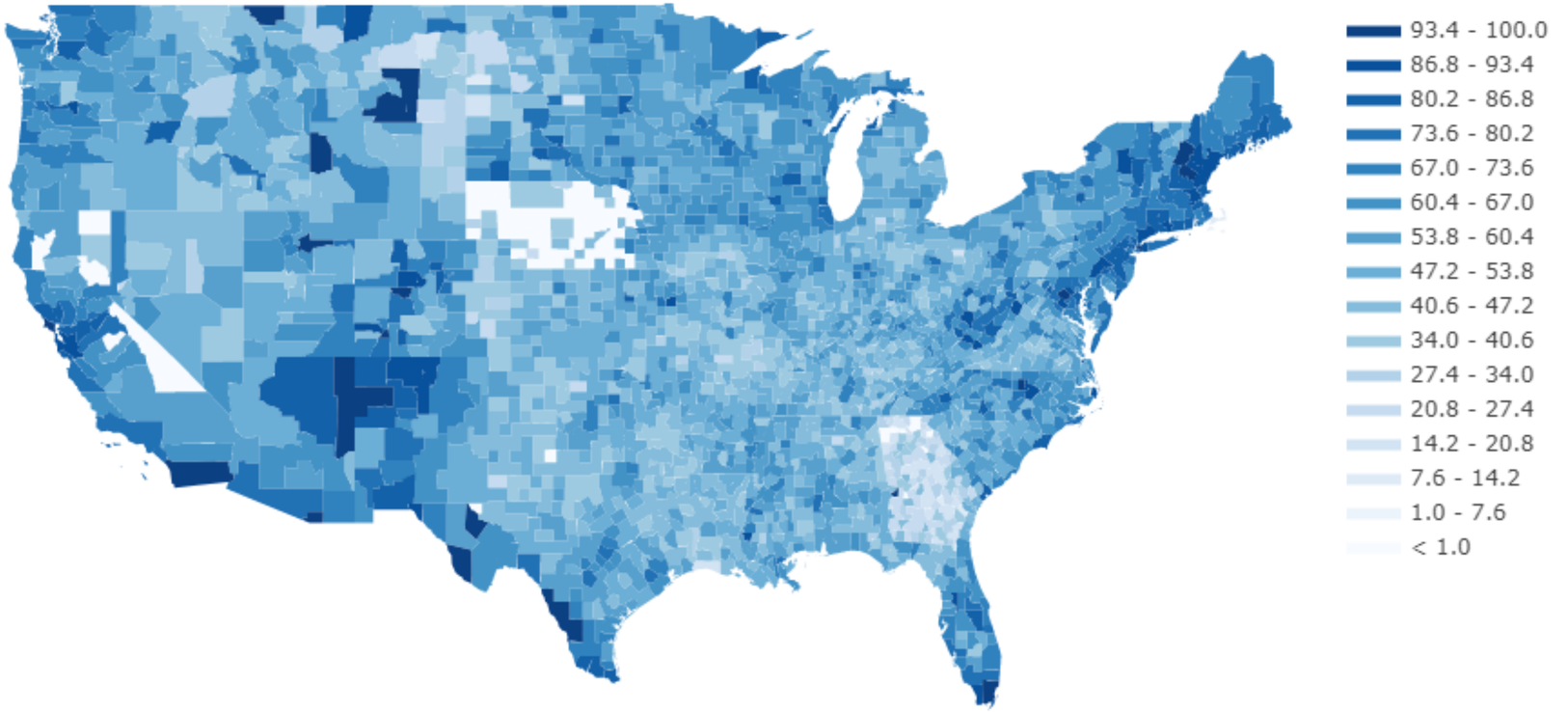
EDA

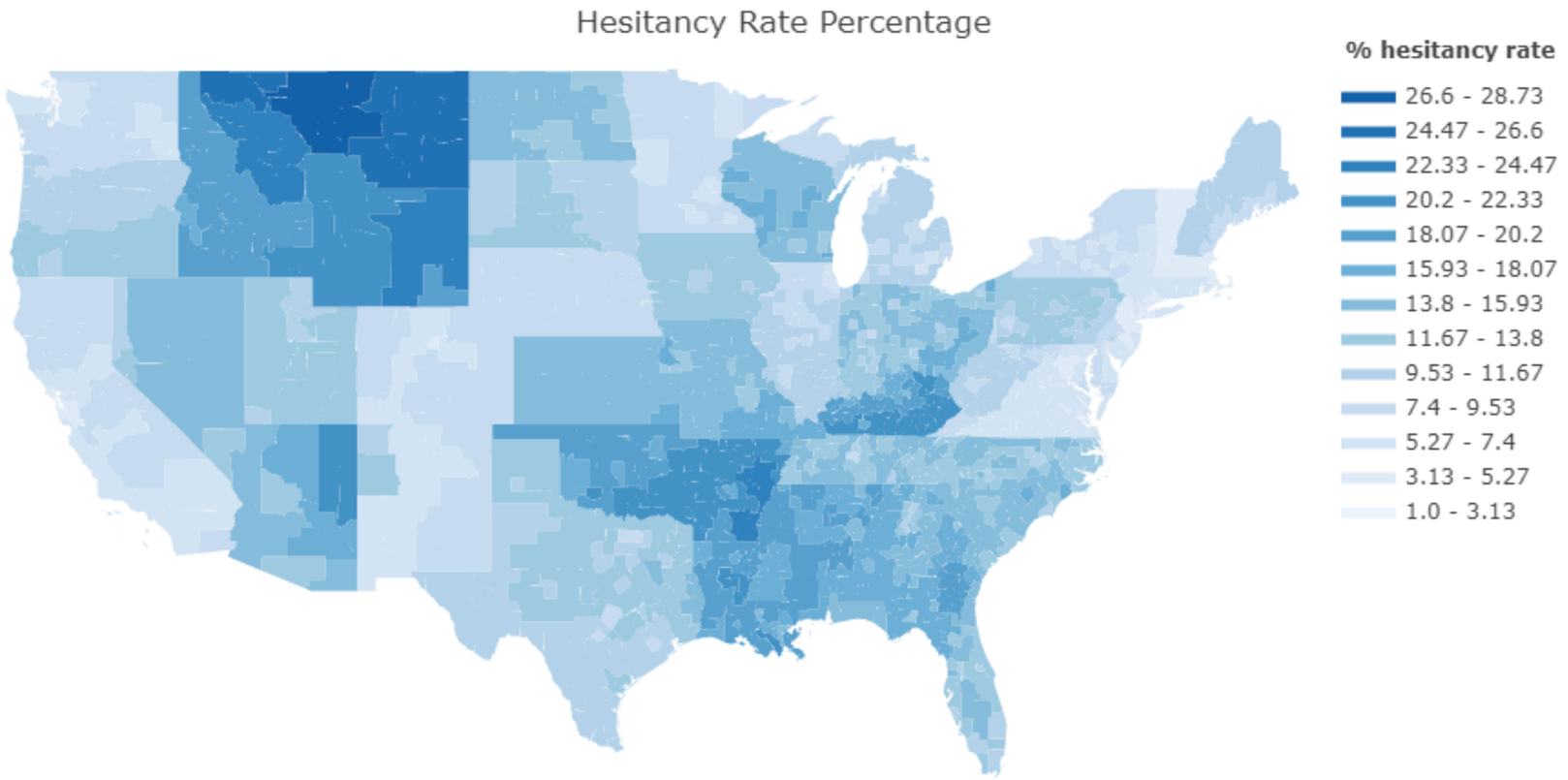
COVID -19 VACCINE CONSUMPTION

Percentage Fully Vaccinated

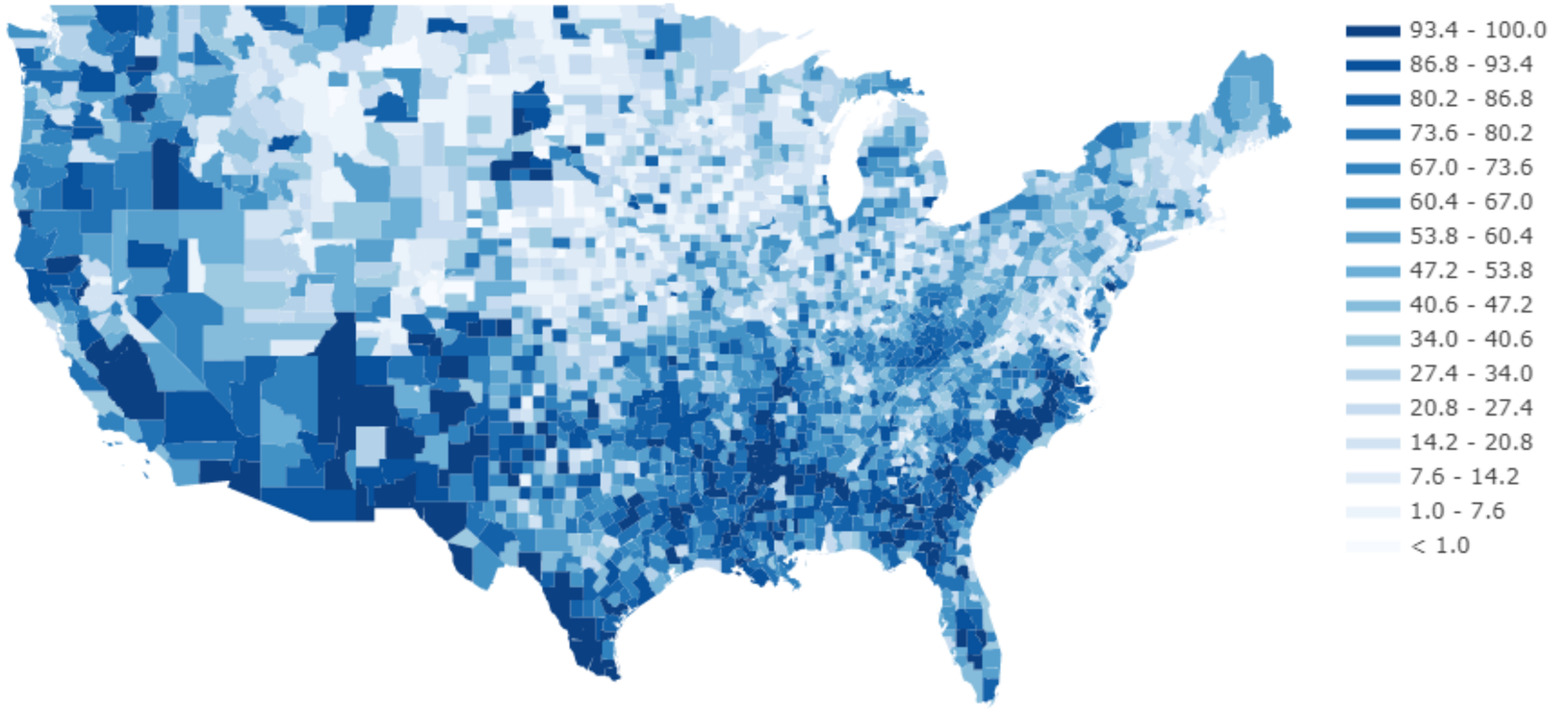


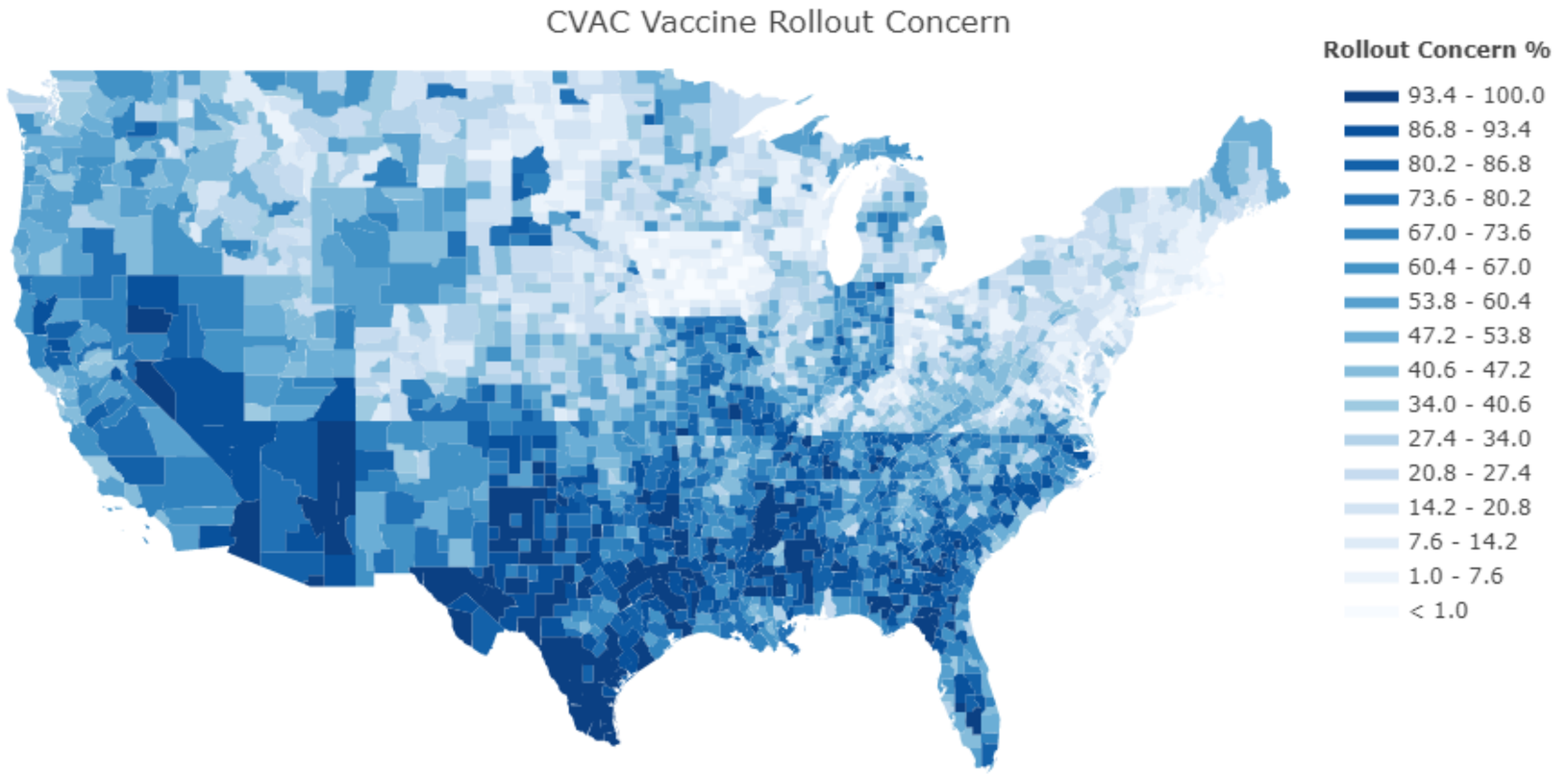
Percentage One Dose

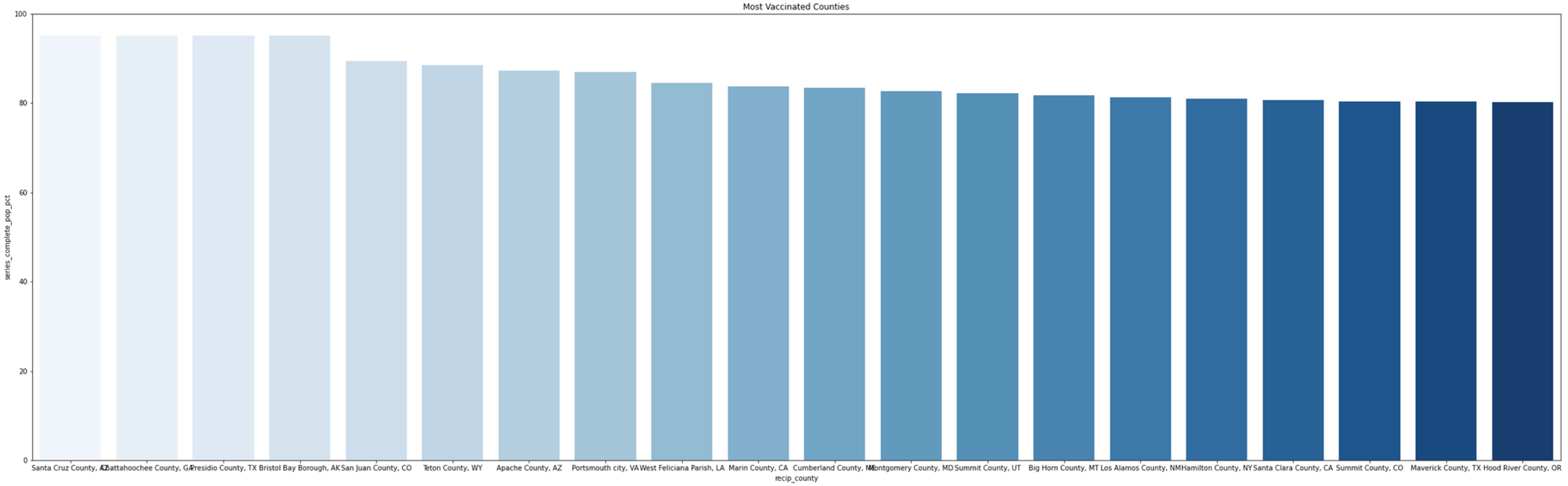


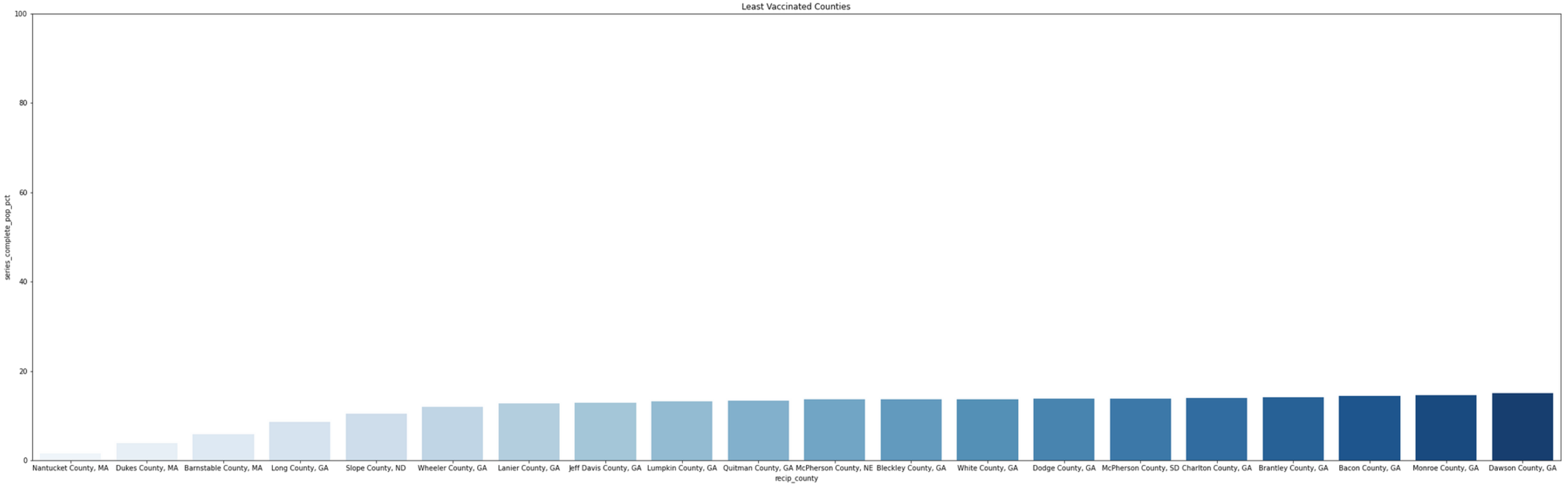

Hesitancy Rate Percentage
% hesitancy rate
26.6 - 28.73
24.47 - 26.6
22.33 - 24.47
20.2 - 22.33
18.07 - 20.2
15.93 - 18.07
13.8 - 15.93
11.67 - 13.8
9.53 - 11.67
7.4 - 9.53
5.27 - 7.4
3.13 - 5.27
1.0 - 3.13

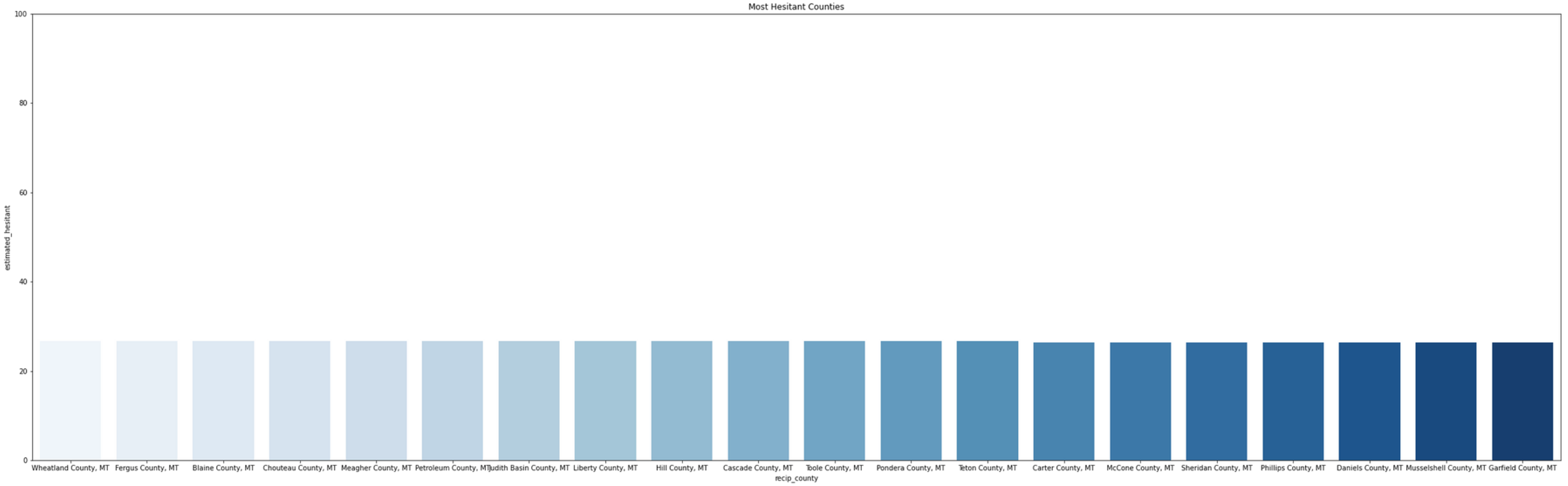
Social Vulnerability Index

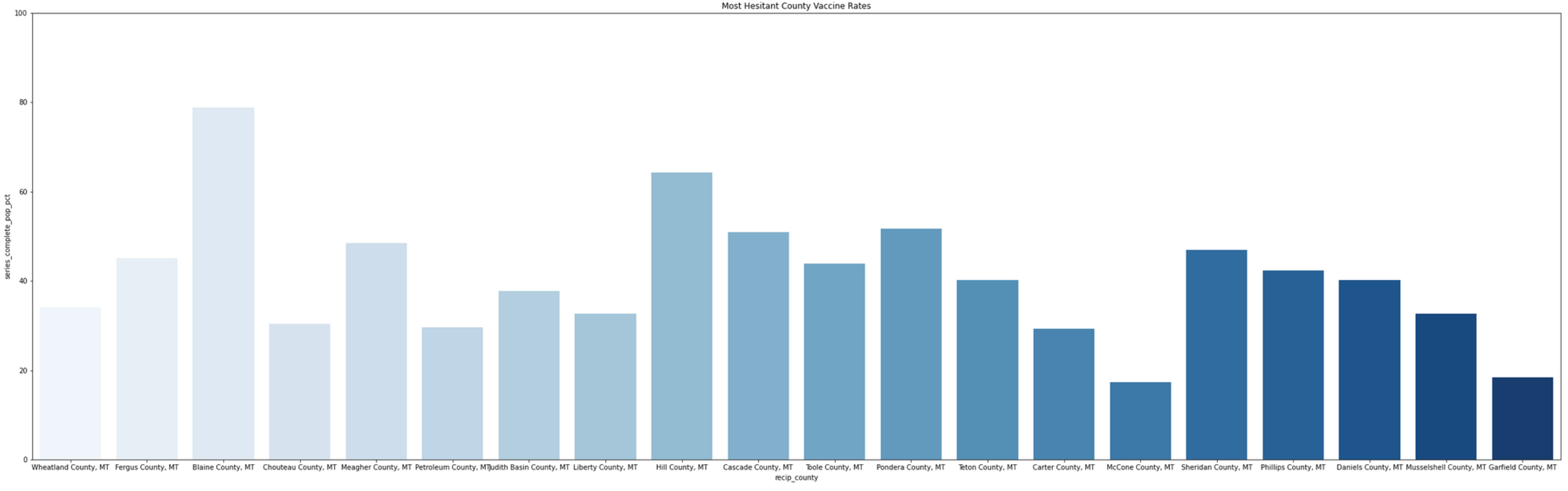


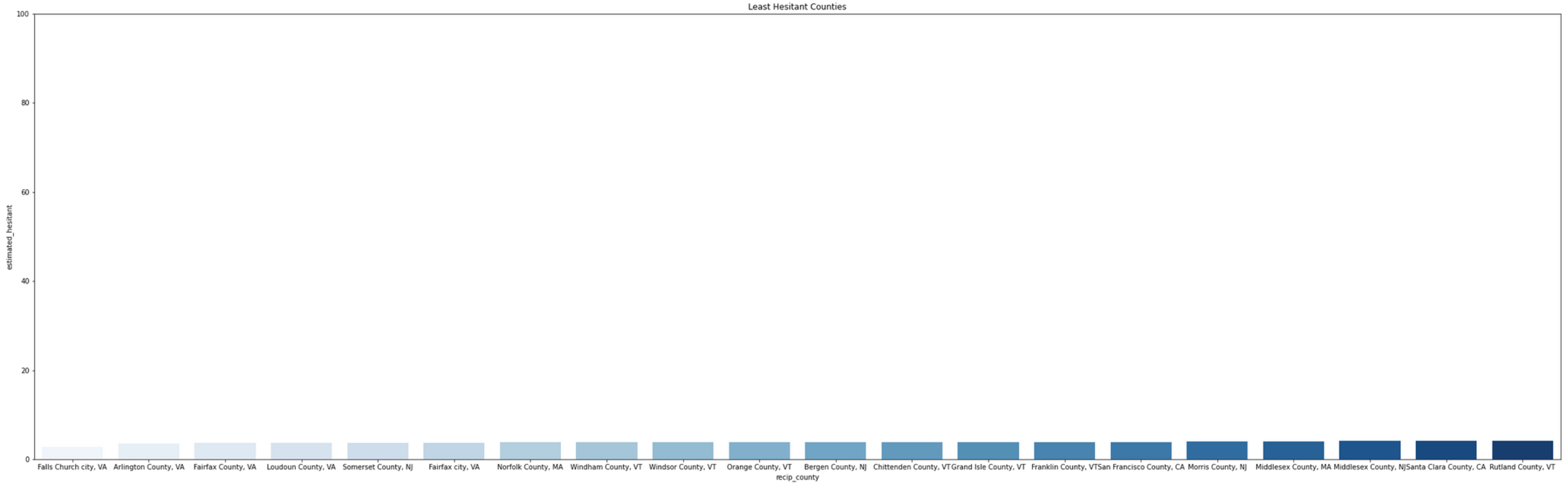

CVAC Vaccine Rollout Concern
Rollout Concern %
93.4 - 100.0
86.8 - 93.4
80.2 - 86.8
73.6 - 80.2
67.0 - 73.6
60.4 - 67.0
53.8 - 60.4
47.2 - 53.8
40.6 - 47.2
34.0 - 40.6
27.4 - 34.0
20.8 - 27.4
14.2 - 20.8
7.6 - 14.2
1.0 - 7.6
< 1.0

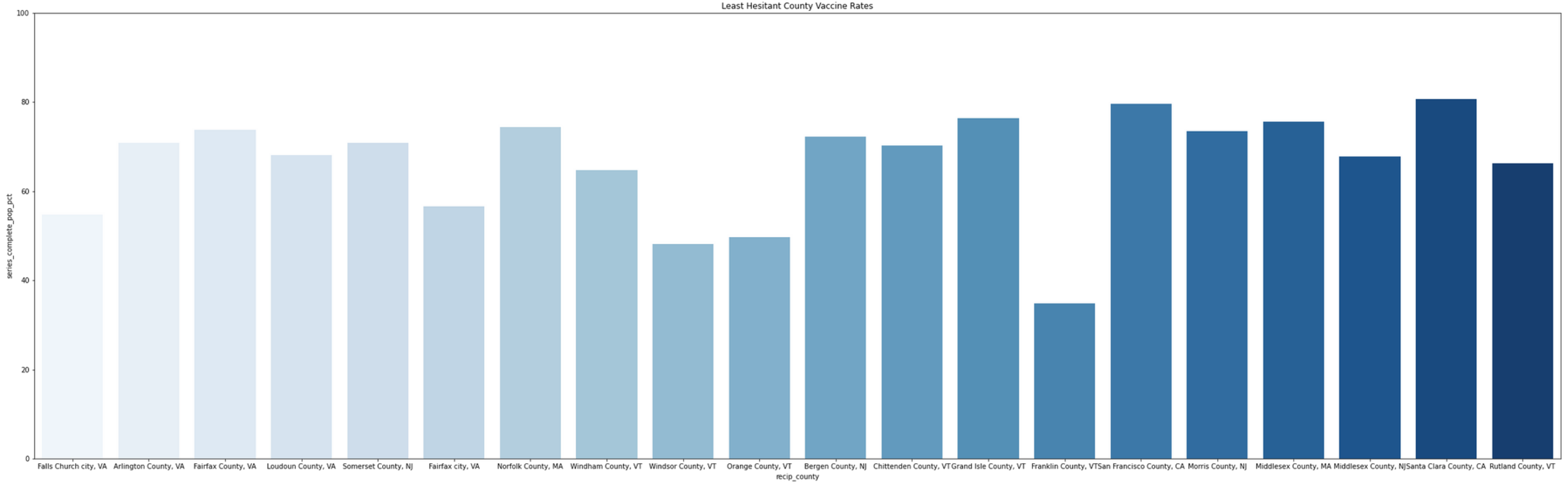

Most Vaccinated Counties
series_complete_pop_pct
0
20
40
60
80
100
Santa Cruz County, AZ
Chattahoochee County, GA
Presidio County, TX
Bristol Bay Borough, AK
San Juan County, CO
Teton County, WY
Apache County, AZ
Portsmouth city, VA
West Feliciana Parish, LA
Marin County, CA
Cumberland County, NC
Montgomery County, MD
Summit County, UT
Big Horn County, MT
Los Alamos County, NM
Hamilton County, NY
Santa Clara County, CA
Summit County, CO
Maverick County, TX
Hood River County, OR
recip_county

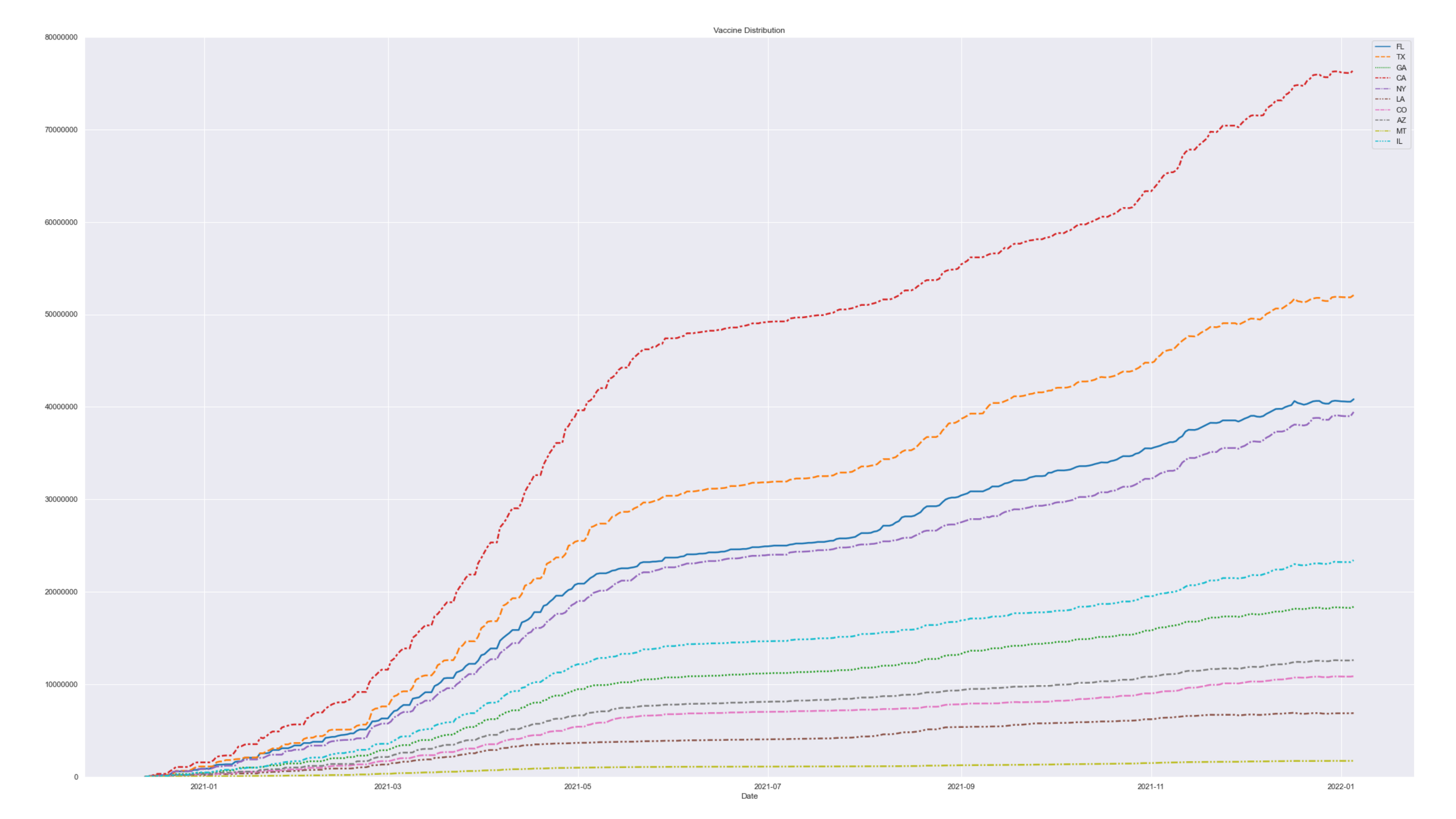

Least Vaccinated Counties
series_complete_pop_pct
0
20
40
60
80
100
Nantucket County, MA
Dukes County, MA
Barnstable County, MA
Long County, GA
Slope County, ND
Wheeler County, GA
Lanier County, GA
Jeff Davis County, GA
Lumpkin County, GA
Quitman County, GA
McPherson County, NE
Bleckley County, GA
White County, GA
Dodge County, GA
McPherson County, SD
Charlton County, GA
Brantley County, GA
Bacon County, GA
Monroe County, GA
Dawson County, GA
recip_county

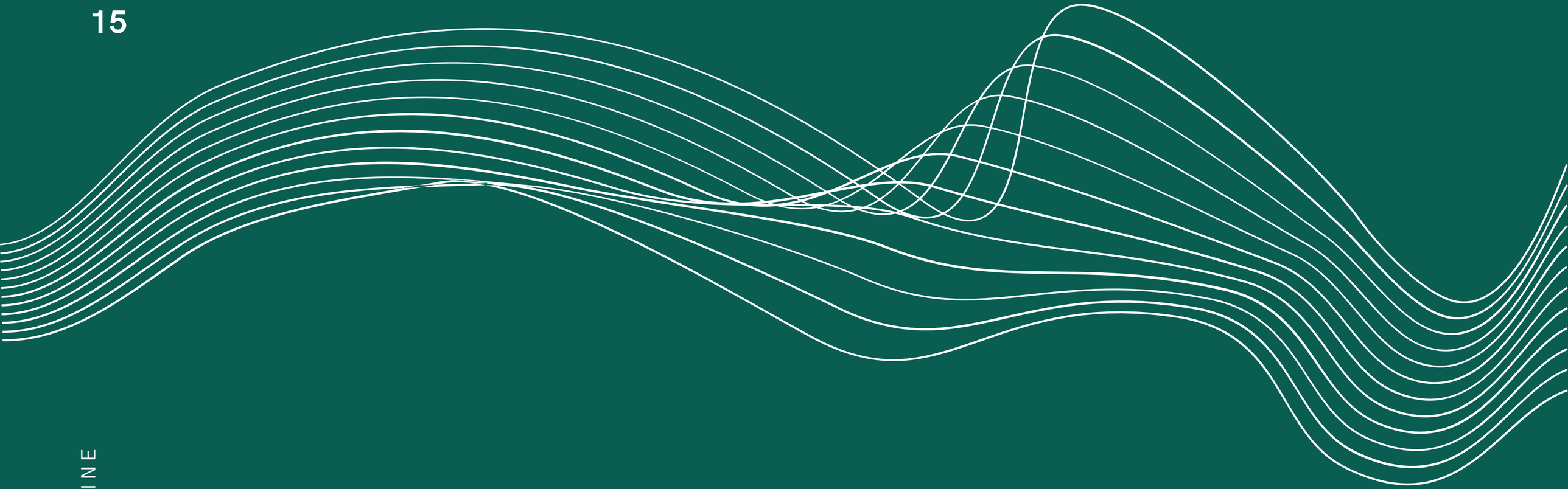

Most Hesitant Counties
estimated_hesitant
0
20
40
60
80
100
Wheatland County, MT
Fergus County, MT
Blaine County, MT
Chouteau County, MT
Meagher County, MT
Petroleum County, MT
Judith Basin County, MT
Liberty County, MT
Hill County, MT
Cascade County, MT
Toole County, MT
Pondera County, MT
Teton County, MT
Carter County, MT
McCone County, MT
Sheridan County, MT
Phillips County, MT
Daniels County, MT
Musselshell County, MT
Garfield County, MT
recip_county


Most Hesitant County Vaccine Rates
series_complete_pop_pct
0
20
40
60
80
100
Wheatland County, MT
Fergus County, MT
Blaine County, MT
Chouteau County, MT
Meagher County, MT
Petroleum County, MT
Judith Basin County, MT
Liberty County, MT
Hill County, MT
Cascade County, MT
Toole County, MT
Pondera County, MT
Teton County, MT
Carter County, MT
McCone County, MT
Sheridan County, MT
Phillips County, MT
Daniels County, MT
Musselshell County, MT
Garfield County, MT
recip_county

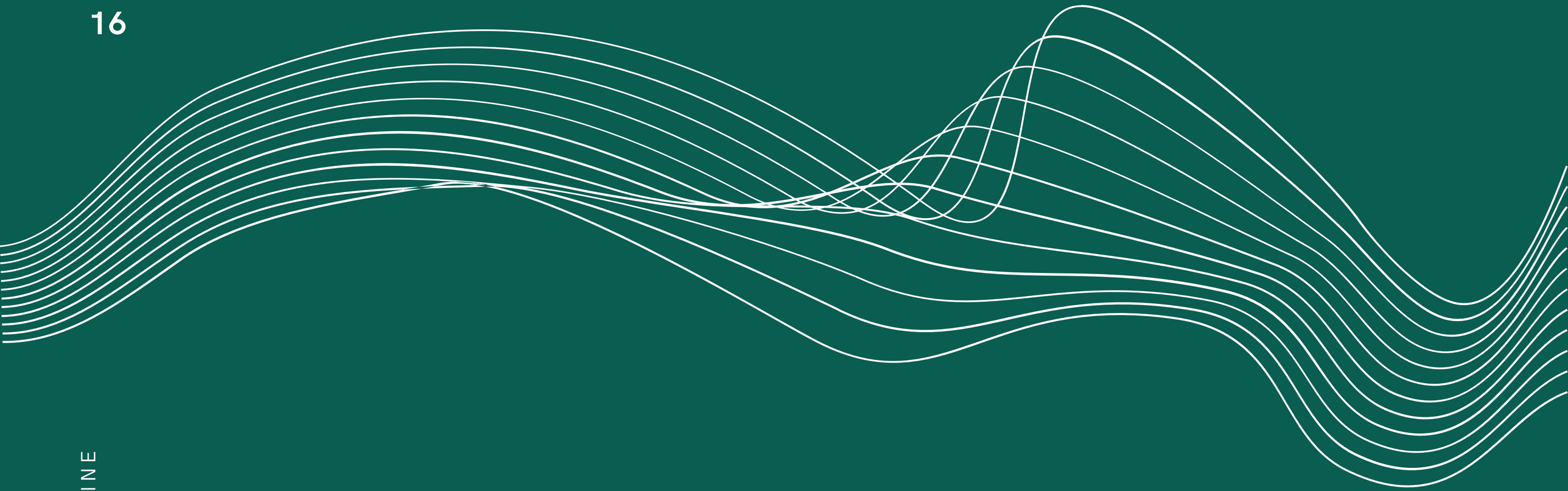

Least Hesitant Counties
estimated_hesitant
0
20
40
60
80
100
Falls Church city, VA
Arlington County, VA
Fairfax County, VA
Loudoun County, VA
Somerset County, NJ
Fairfax city, VA
Norfolk County, MA
Windham County, VT
Windsor County, VT
Orange County, VT
Bergen County, NJ
Chittenden County, VT
Grand Isle County, VT
Franklin County, VT
San Francisco County, CA
Morris County, NJ
Middlesex County, MA
Middlesex County, NJ
Santa Clara County, CA
Rutland County, VT
recip_county


Least Hesitant County Vaccine Rates
series_complete_pop_pct
0
20
40
60
80
100
Falls Church city, VA
Arlington County, VA
Fairfax County, VA
Loudoun County, VA
Somerset County, NJ
Fairfax city, VA
Norfolk County, MA
Windham County, VT
Windsor County, VT
Orange County, VT
Bergen County, NJ
Chittenden County, VT
Grand Isle County, VT
Franklin County, VT
San Francisco County, CA
Morris County, NJ
Middlesex County, MA
Middlesex County, NJ
Santa Clara County, CA
Rutland County, VT
recip_county


Vaccine Distribution
80000000
70000000
60000000
50000000
40000000
30000000
20000000
10000000
0
2021-01
2021-03
2021-05
2021-07
2021-09
2021-11
2022-01
Date
FL
TX
GA
CA
NY
LA
CO
AZ
MT
IL



MODELS



ASSUMPTIONS

Random Forest Regressor

TRAIN

70054.81

TEST

323067.93

Steps Going Forward

Get More Data
-Dosages/Brand/Etc.

Check Assumptions

Incorporate More Features

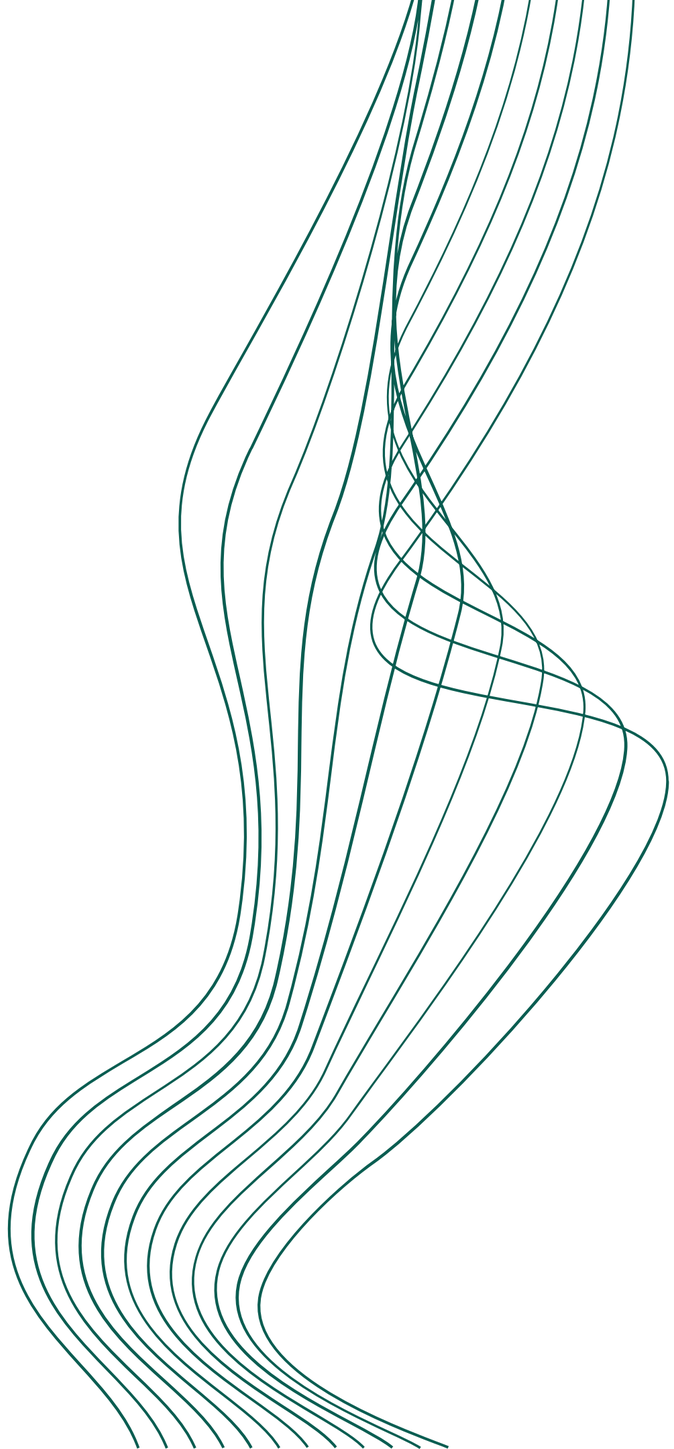
XGBoost

TRAIN

22341.45

TEST

336950.11



Thank You for Listening

Questions