

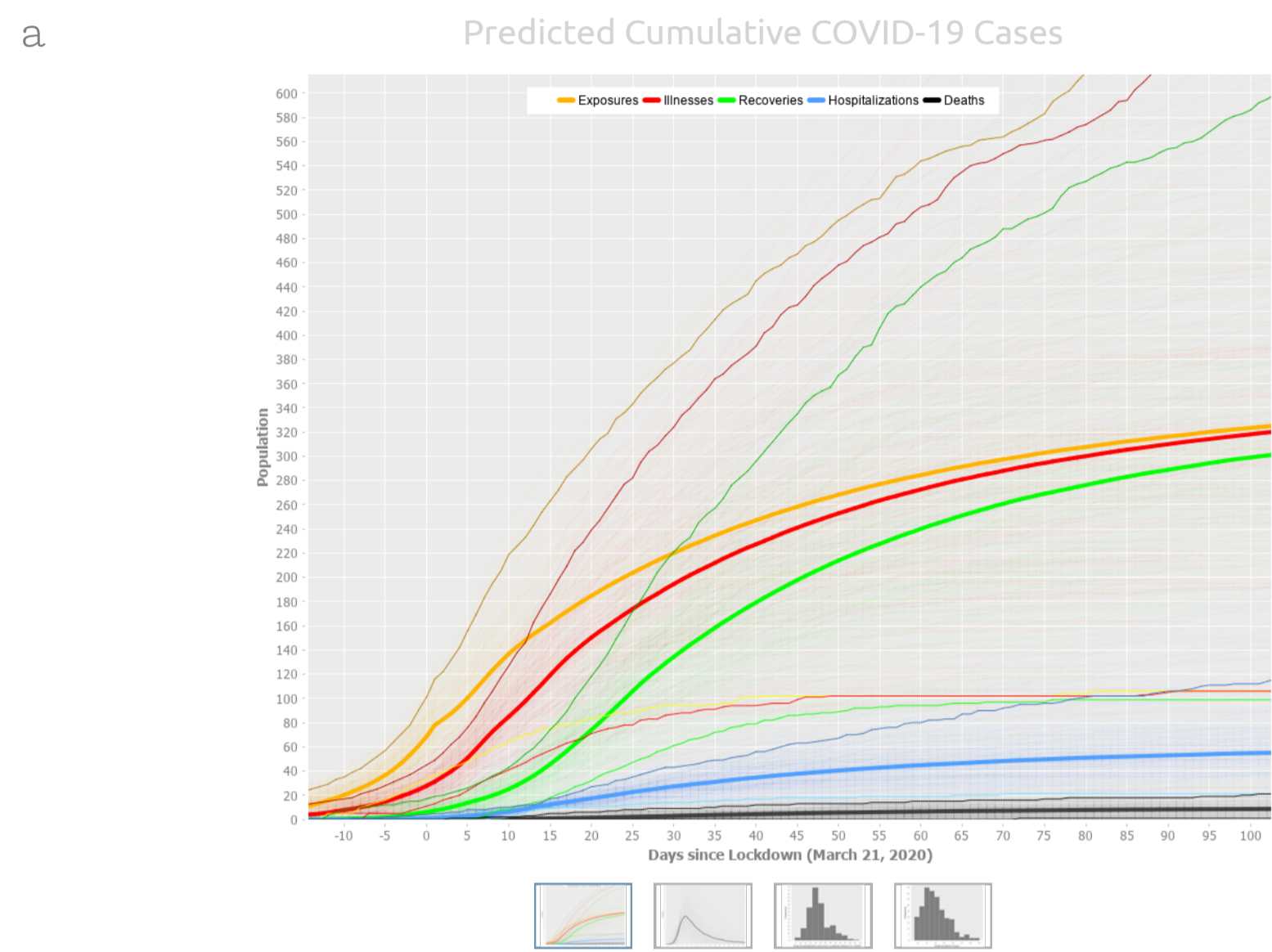
# COVID-19 Forecast for Chemung County, NY, April 2020

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covid-19-spread

model type: agent  
city: Chemung County, NY  
peak hospital census: 19  
peak hospital census date: 4/16/2020  
peak hospitalization census 95 p: 33  
total deaths: 9



We used an agent-based modeling approach to predict the scope of the COVID-19 outbreak in Chemung County, NY, USA. Chemung County’s first confirmed case was on March 21, 2020. A variety of mitigation efforts were placed prior to announcement of the first confirmed case; this has kept the burden of disease low, in contrast to other areas of New York.



Using an agent-based modeling technique, we simulated an outbreak in order to estimate the expected number of total infections and deaths, and the peak hospitalization date and census. This stochastic model is used to assign various attributes to agents (people of Chemung County) and simulate interaction between these agents at various time points. The model simulation took place 256 times; these observations were used to compile key outcomes.

Panel A presents our predictions for cumulative values at the mean, 95th, and 5th percentile of the simulations for Exposures (Orange), Illnesses (Red), Recoveries (Green), Hospitalizations (Blue), and Deaths (Black).

Panel B presents our predictions for Hospital Census, with a highlight of the mean.

We expect there to be a total of 312 (90% CI: 106, 784) combined diagnosed and undiagnosed cases, 19 (90% CI: 10, 33) peak hospital census, and 9 (90% CI: 2, 28) total deaths in Chemung County. Our model indicates the peak hospitalization date to occur on April 17, 2020 (90% CI: April 5, May 16). It is important to note that these estimates do not include data from local assisted living facilities, due to variance and lack of available data. With the continued enforcement of the state-mandated stay-at-home order, we expect that Chemung County health care resources can accommodate the increase in need due to COVID-19, provided other sources such as assisted living facilities do not contribute significantly to the totals.

Our analysis of Chemung County serves as an example for modeling rural areas and can inform critical, time-sensitive decisions made by hospital administrators and local officials regarding resource allocation and clinical operation.

References:

- 1) <https://doi.org/10.1146/annurev-publhealth-040617-014317>

Protocols:

- 1) [Chemung County Predction Methods](#)

Code:

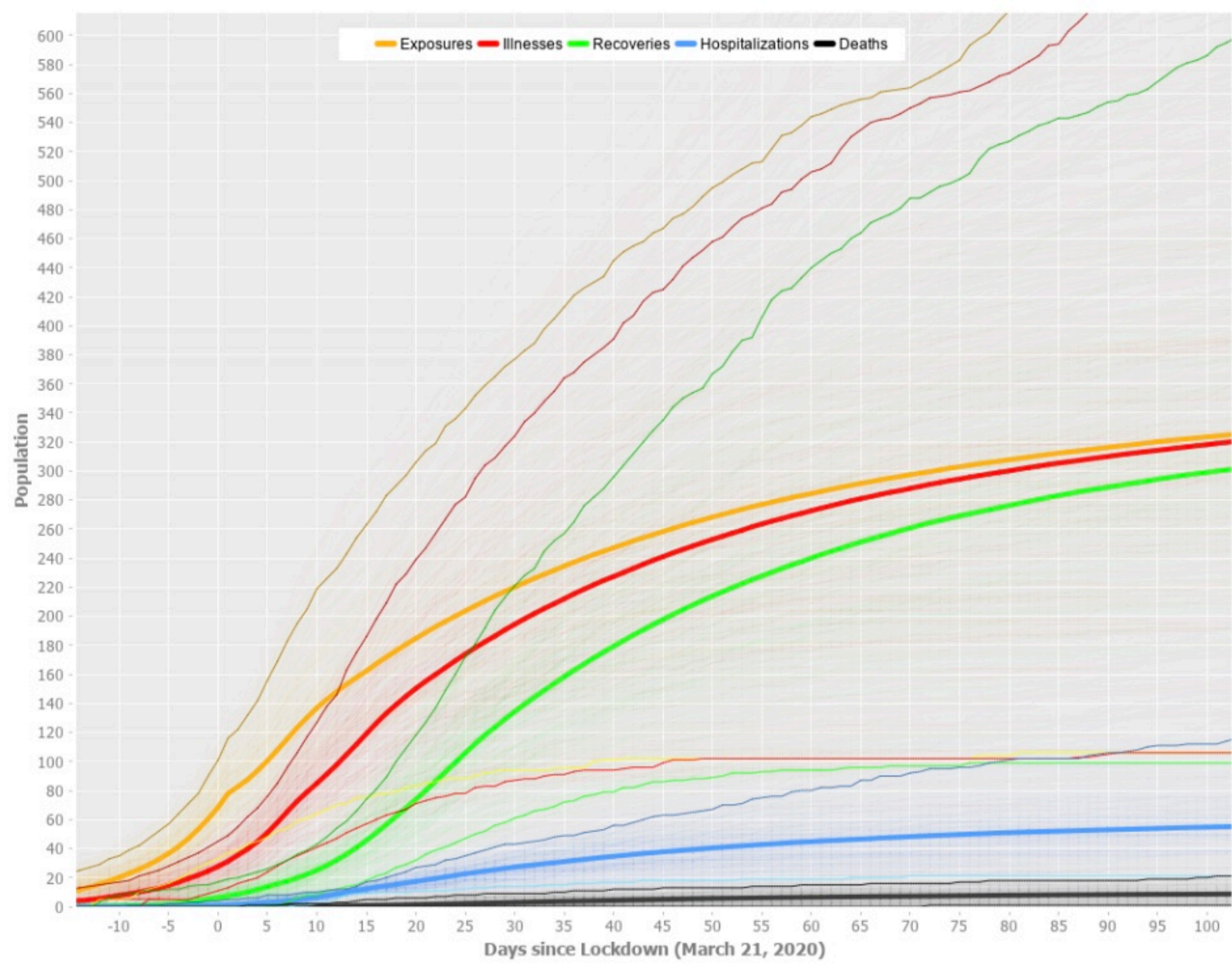
- 1) [Terminus](#)

Datasets:

- 1) [Chemung County Simulation Data](#)

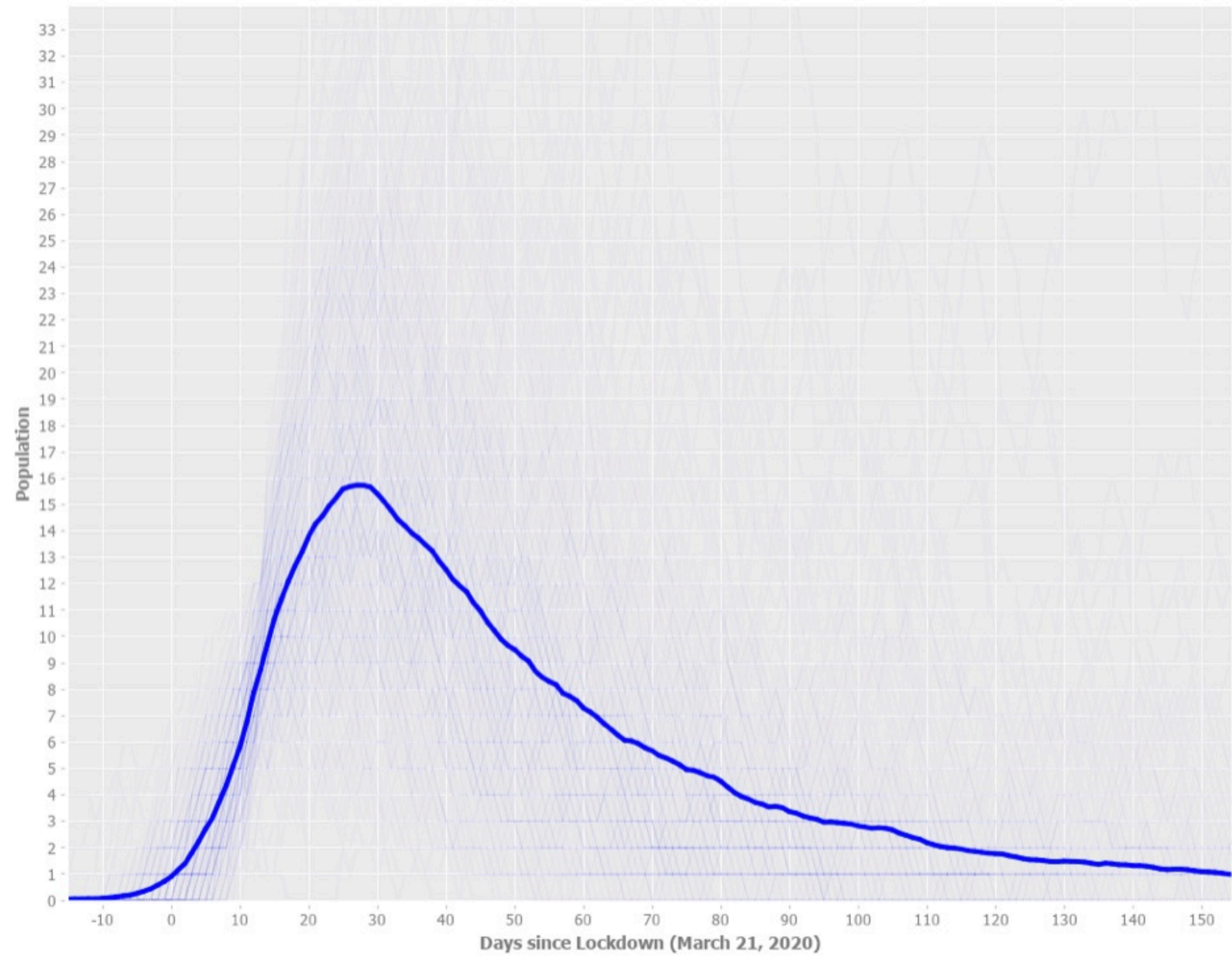
a

Predicted Cumulative COVID-19 Cases



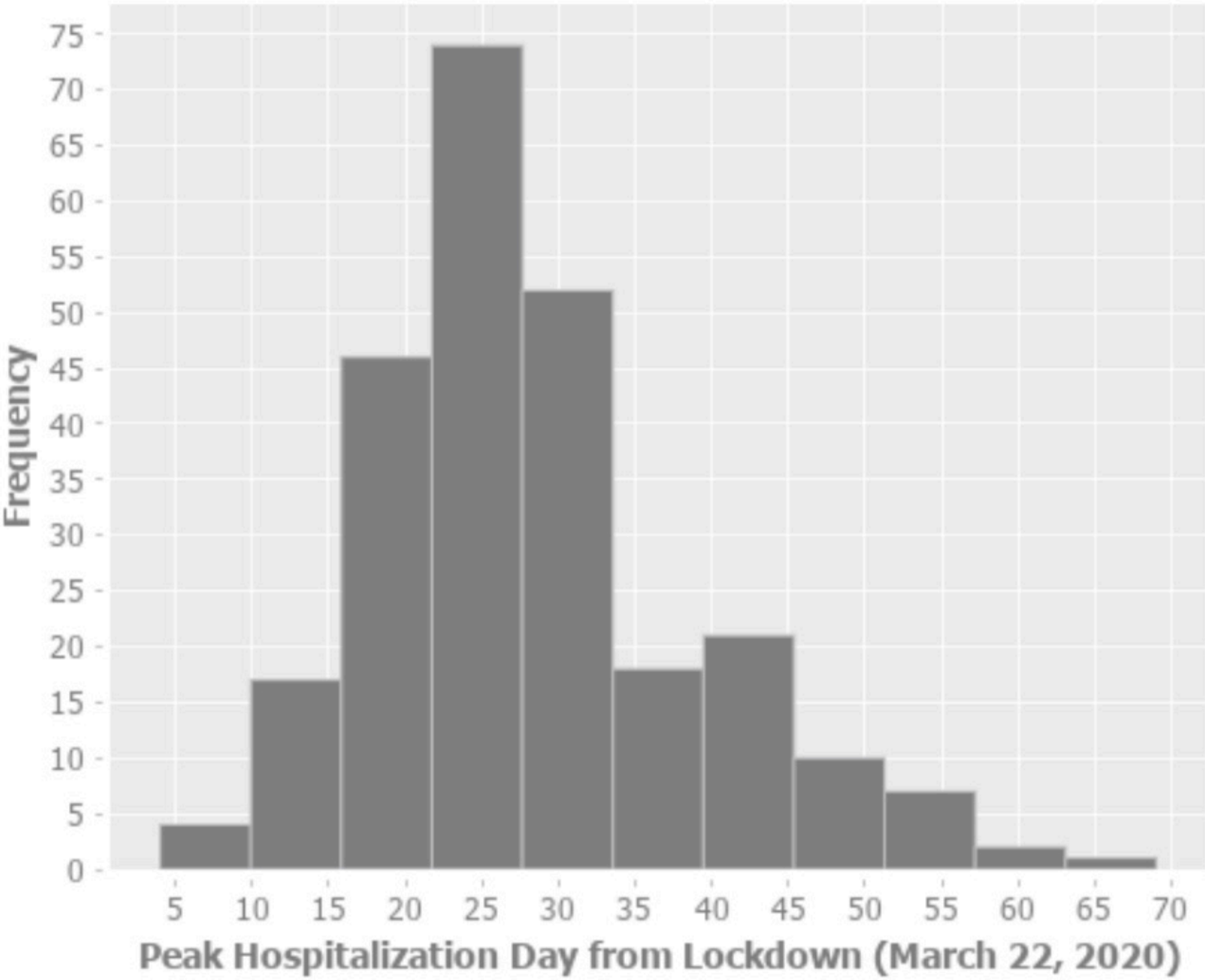
b

Predicted Hospital Census



C

Most Likely Peak Hospital Census Day



d

