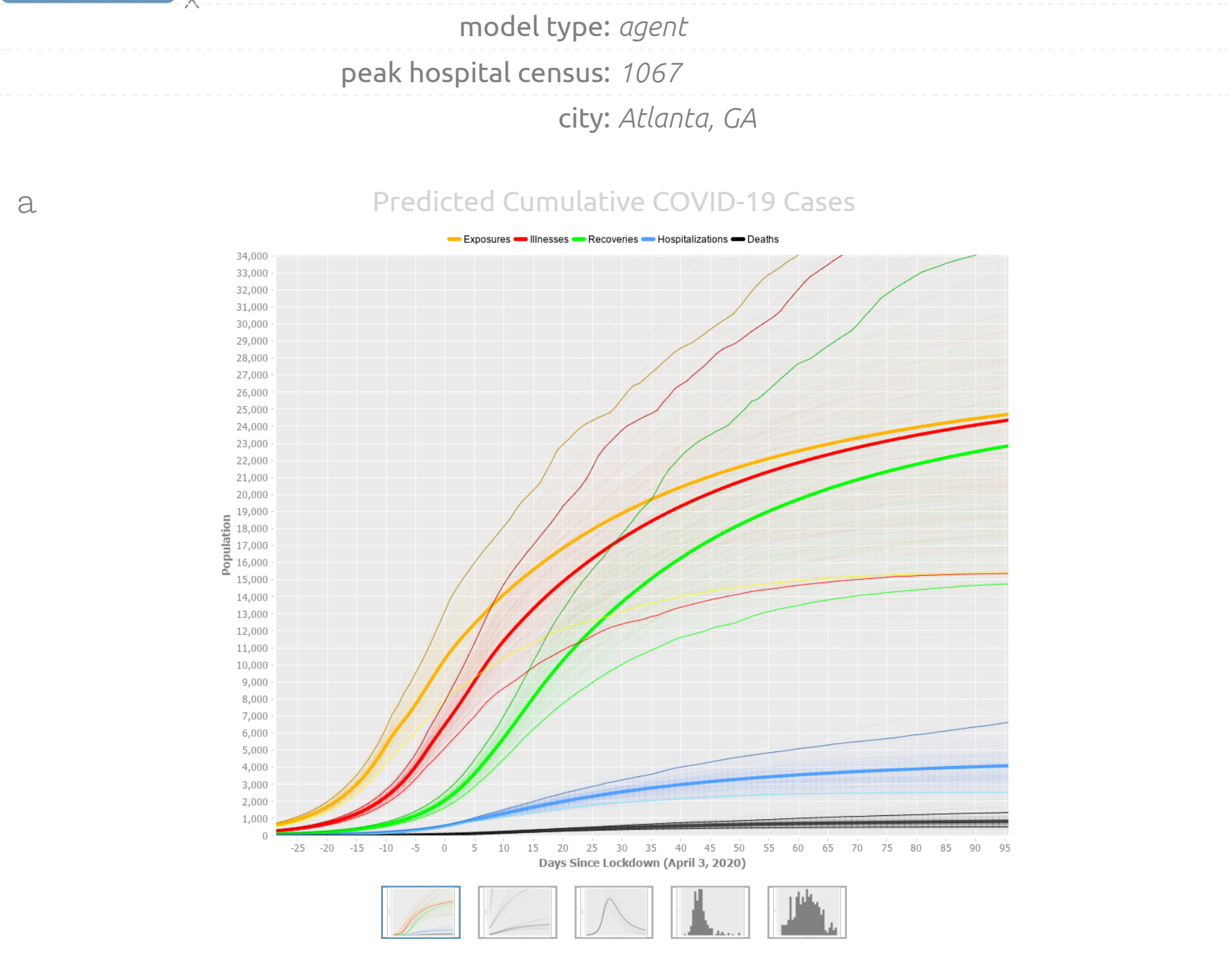


COVID-19 Forecast for Atlanta, GA, April 2020

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covid-19-spread



We used an agent-based modeling approach to demonstrate the criticality of the COVID-19 outbreak in Atlanta, GA, USA. Georgia’s first confirmed case was on March 2, 2020; it is currently marked as the 10th most impacted state. A variety of mitigation efforts have helped lower the burden of disease, but incident cases continue to rise.

Using an agent-based modeling technique, we simulated an outbreak represented by an SEIHRD (Susceptible, Exposed, Infected, Hospitalized, Recovered, Dead) model in order to estimate the expected number of total infections and deaths, the peak hospitalization date, and the number of days the crisis will last. This stochastic model is used to assign various attributes to agents (people of Atlanta) 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.

We expect there to be 27904 (90% CI: 15447, 50129) cases (confirmed and unconfirmed), 1067 (90% CI: 758, 1421) peak hospital census, 4825 (90% CI: 2572, 8966) total hospital admissions, and 998 (90% CI: 517, 1922) total deaths in Atlanta. Our model indicates the peak hospitalization date to occur on April 22, 2020 (sometime between April 17 to April 30). It is important to note that our model assumes continued observation of the current mitigation efforts. With more stringent efforts and/or increased resources, we expect the total number of hospitalizations and deaths to be decreased.

The metro Atlanta area is estimated to have approximately 3338 hospital beds and 436 ICU beds available. Given our predicted peak hospital census of 1067, we expect Atlanta area hospitals to have sufficient capacity. Assuming an ICU rate of 25% of hospitalizations, there will also be sufficient ICU capacity.

We hope that this information can inform critical and time-sensitive decisions made by hospital administrators and local officials regarding resource allocation and clinical operation.

References:

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

Protocols:

- 1) [Agent-Based Model for Simulation of COVID-19 Spread](#)

Code:

- 1) [Terminus](#)

Datasets:

- 1) [Atlanta COVID Predictions](#)
- 2) [Harvard Hospital Bed Predictions](#)
- 3) [Metro Atlanta COVID Data](#)



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