

HiPAM COVID Forecast – August 28

Presentation to

Senate Special Committee on COVID-19 (SCCOVID)

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About HiPAM

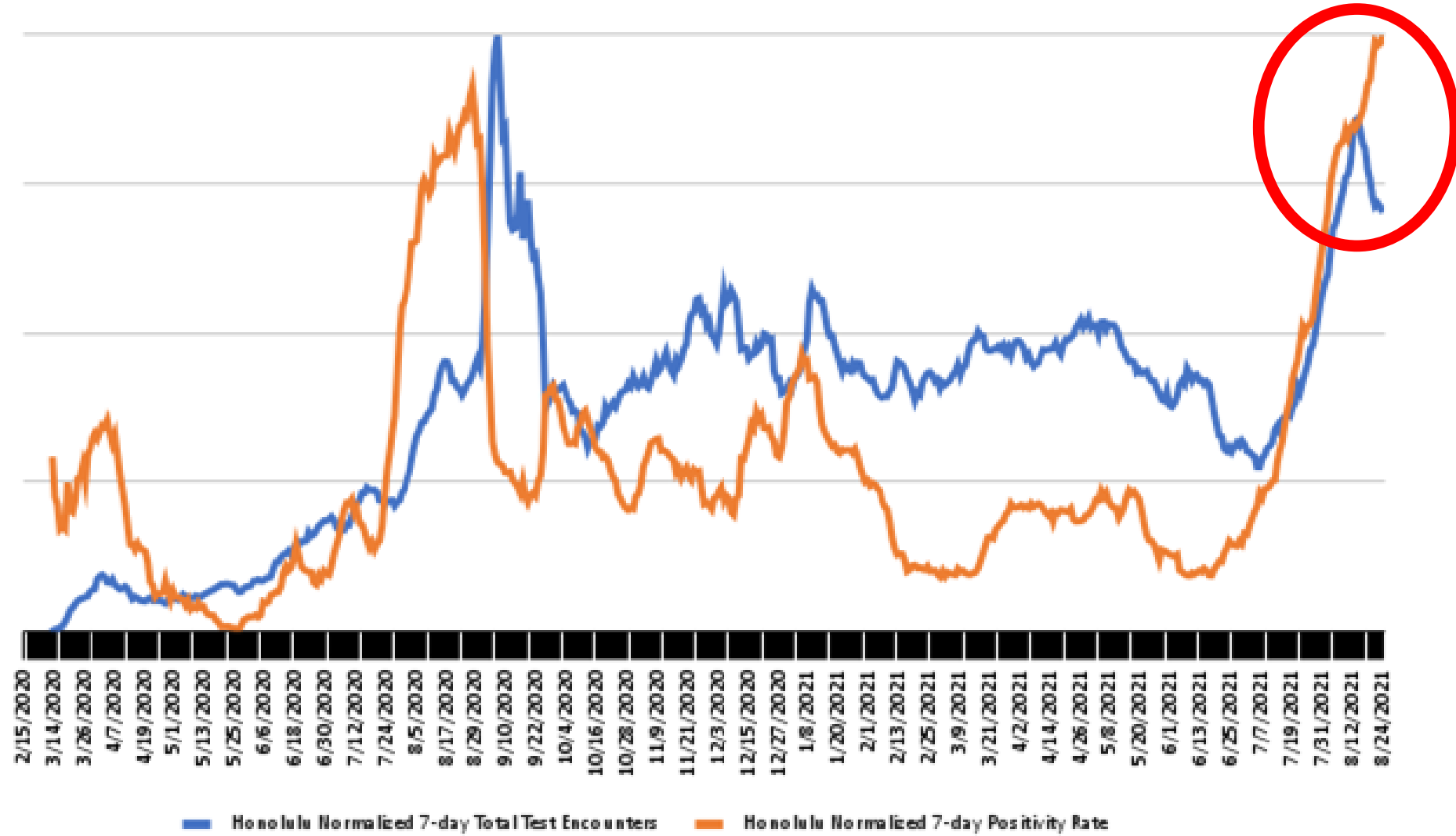
- HiPAM is a voluntary partnership of Hawaii-based epidemiologists, data scientists, and health professionals.
- HiPAM continues to calibrate our model to provide the best forecast for our state, based on most recent data, best available evidence, and ever-evolving science.
- Since April 2020, HiPAM has
 - Closely monitored COVID transmission and data
 - Examined the influence of multiple policy interventions on COVID transmission
 - Publicly maintained a two-week COVID forecast since July 2020 through calibrating multiple models (compartmental and agent based)
 - Communicated to the public about the forecast
 - Upon request, provided scenario and decision support of different interventions ('What If' scenarios)

Key Forecast Messages

- In Honolulu City & County, test positivity is increasing, a leading indicator for a surge. But tests encounters were, for a period, decreasing, indicating underreporting of cases.
- COVID cases in Honolulu City & County continues to trend upwards. Neighbor island counties also appear to trend upwards though less steeply.
- The model suggests that the need for total hospitalizations will likely surpass 500 in Honolulu by Sept 13.
- Past modeling work indicated that the tier system and Safe Travels Program were likely very supportive in controlling spread.
 - The negative incentive of tier changes may have influenced people to act more safely.
 - Safe Travels gives more protection since vaccinated people can spread asymptotically.
- Timeliness, transparency, and public trust are essential. There is no silver bullet for COVID.

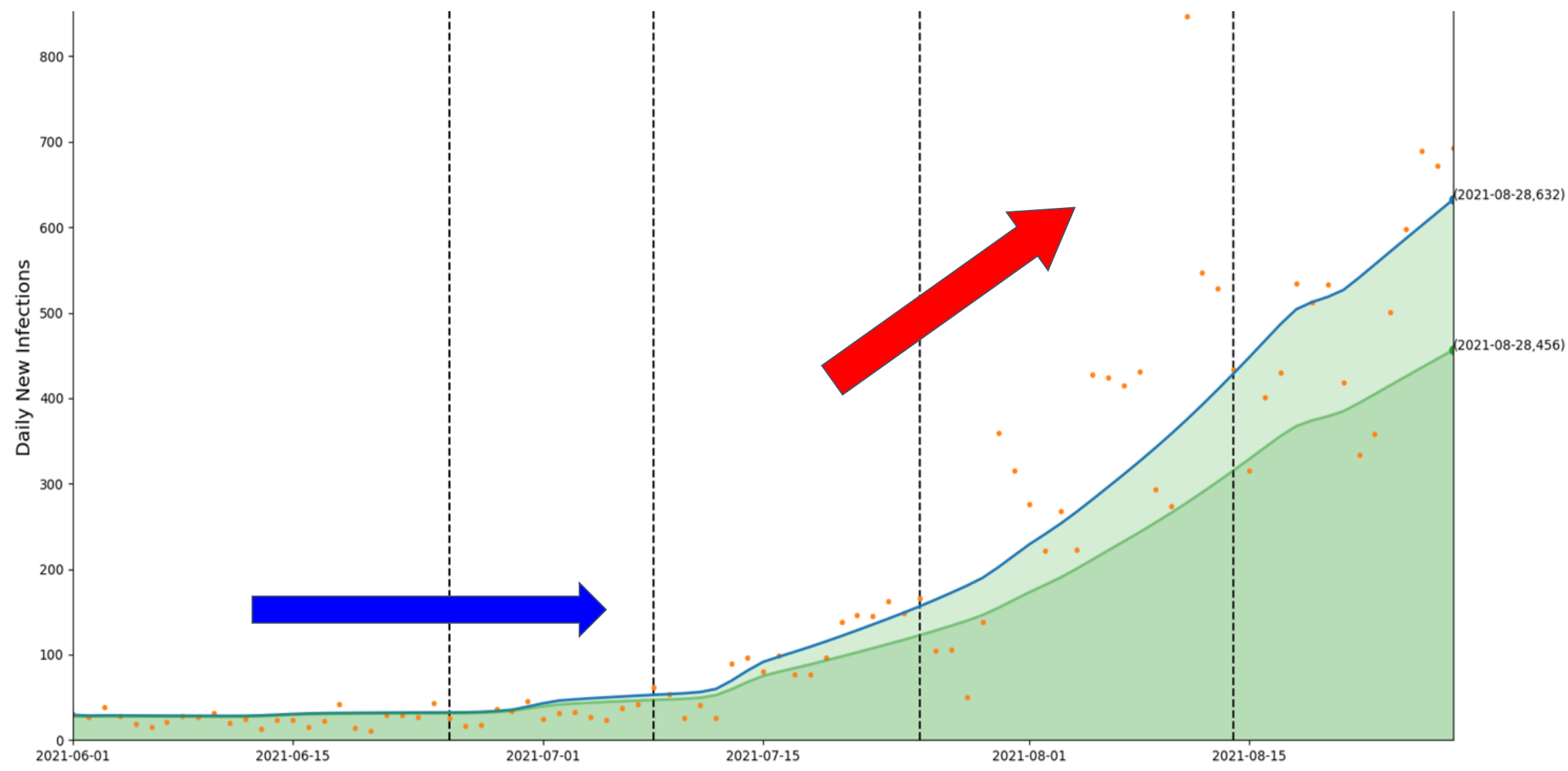
Honolulu County Forecast – August 28

Honolulu: Test positivity is increasing, a leading indicator for a surge. But tests encounters are decreasing, indicating underreporting of cases.



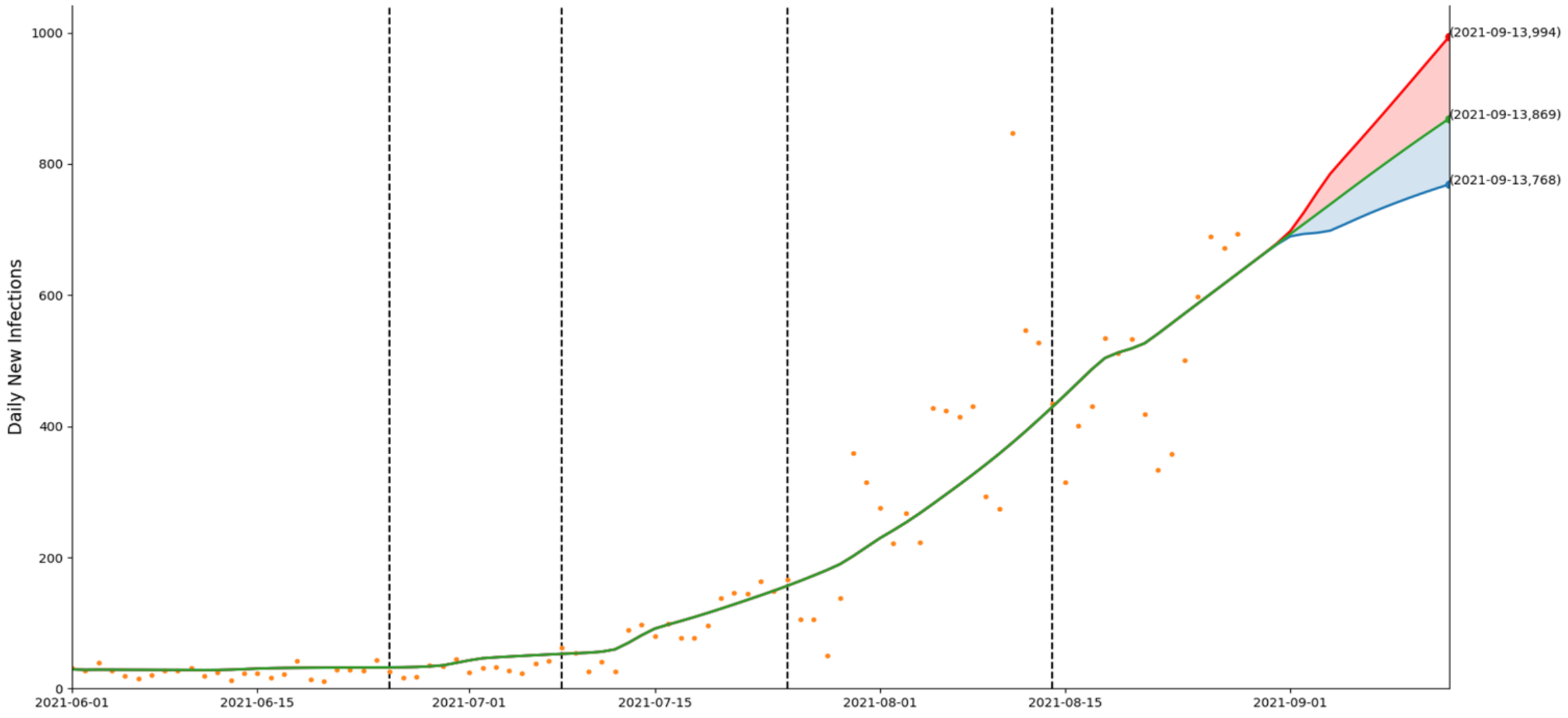
COVID Infections – Model has been calibrated to Honolulu vaccination data

- Light Green: Estimated number of vaccinated COVID cases
- Dark Green: Estimated number of unvaccinated COVID cases



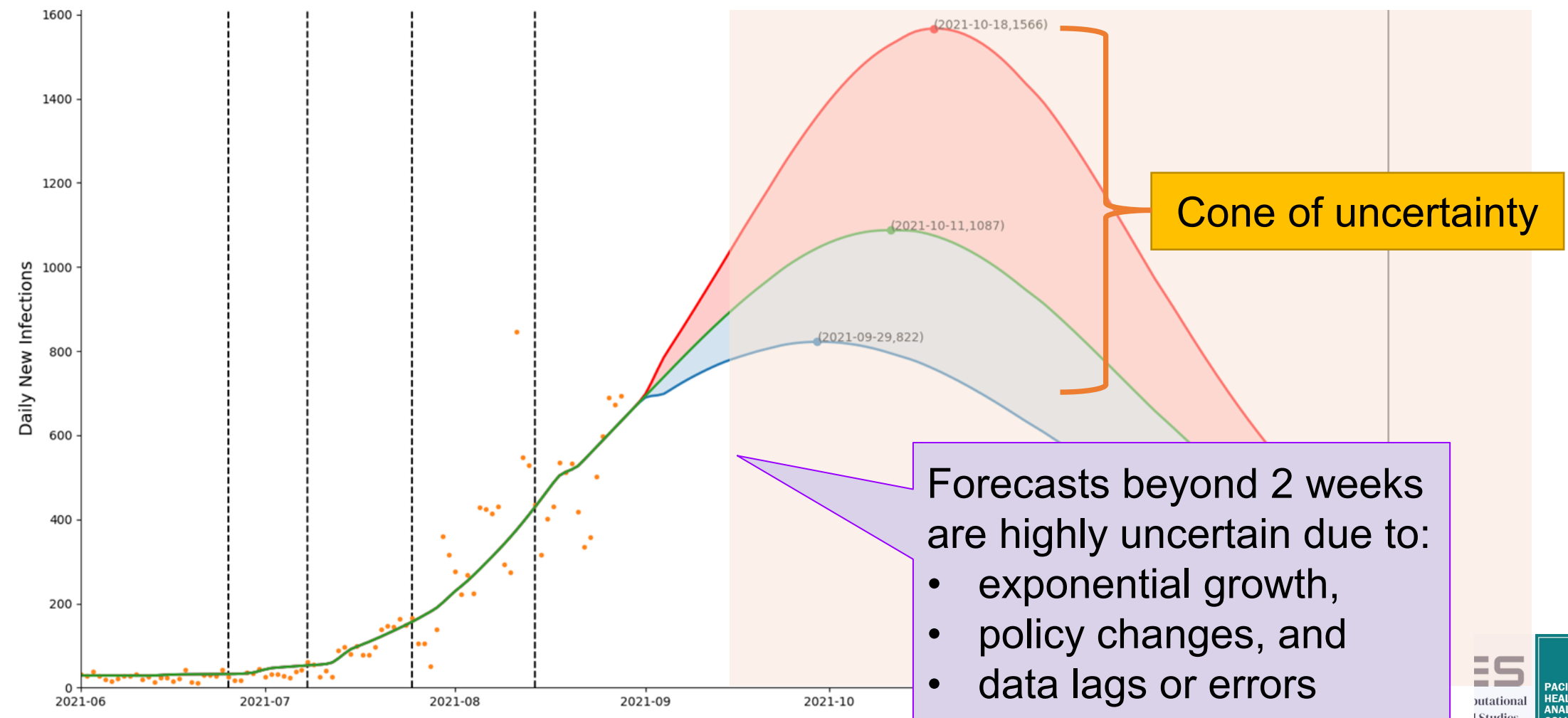
COVID Infections – Honolulu City & County Scenarios:

- **Red:** Vaccination daily average down by 20% and transmission rate up by 5.8%
- **Green:** No changes in vaccination rate and transmission
- **Blue:** Vaccination daily average up by 20% and transmission down by 5.8%



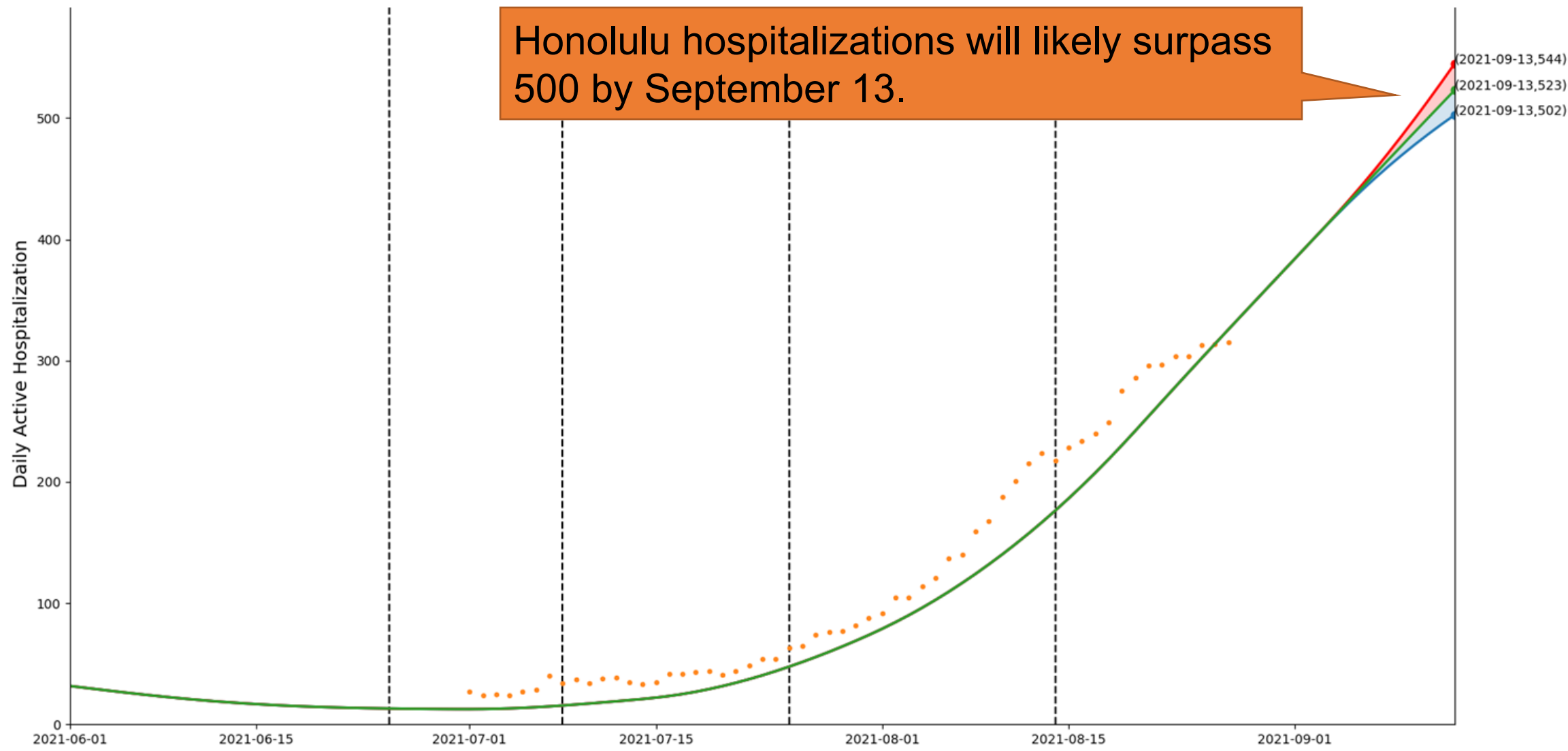
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Need for Active Hospitalizations – Honolulu Scenarios:

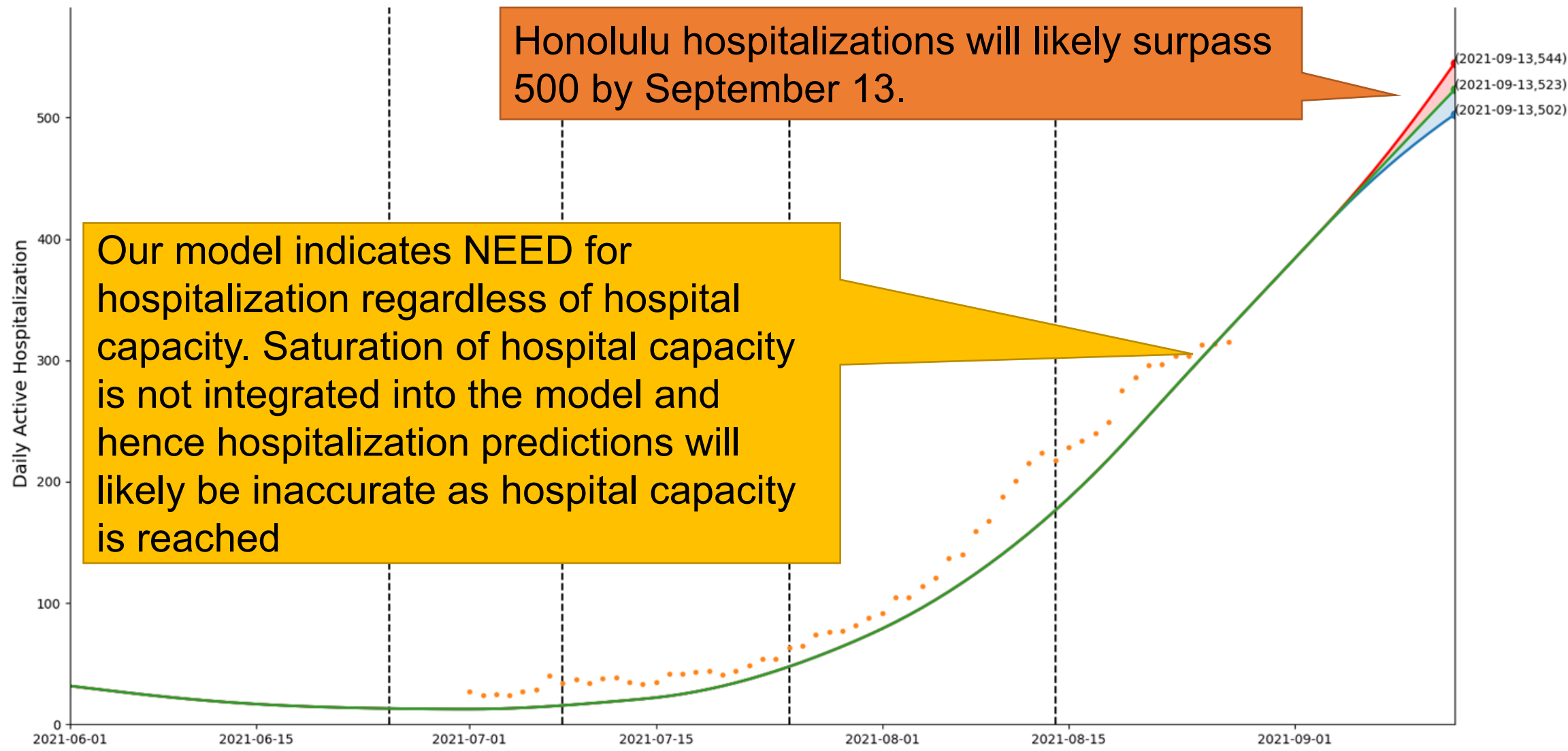
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Honolulu hospitalizations will likely surpass 500 by September 13.

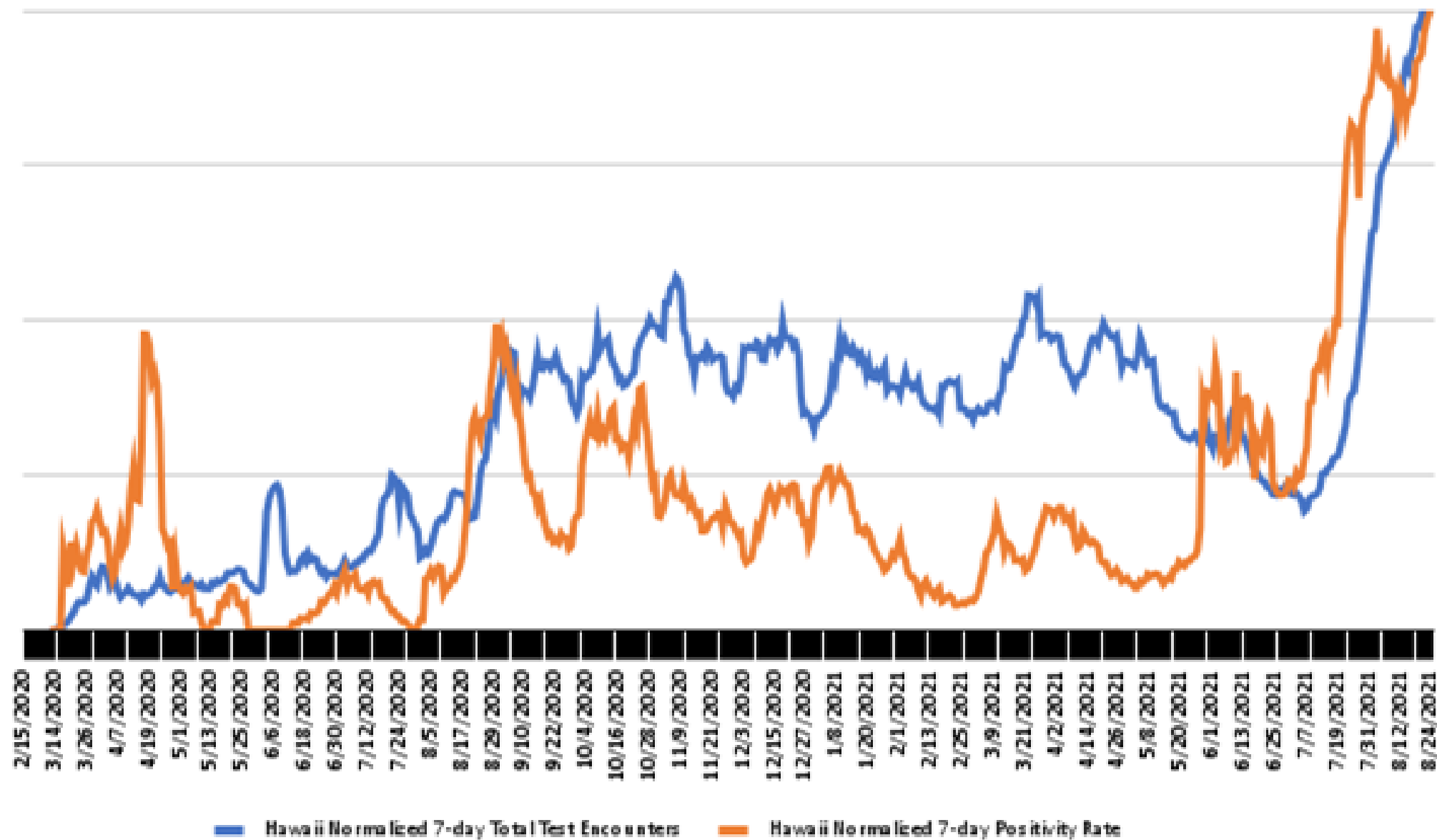
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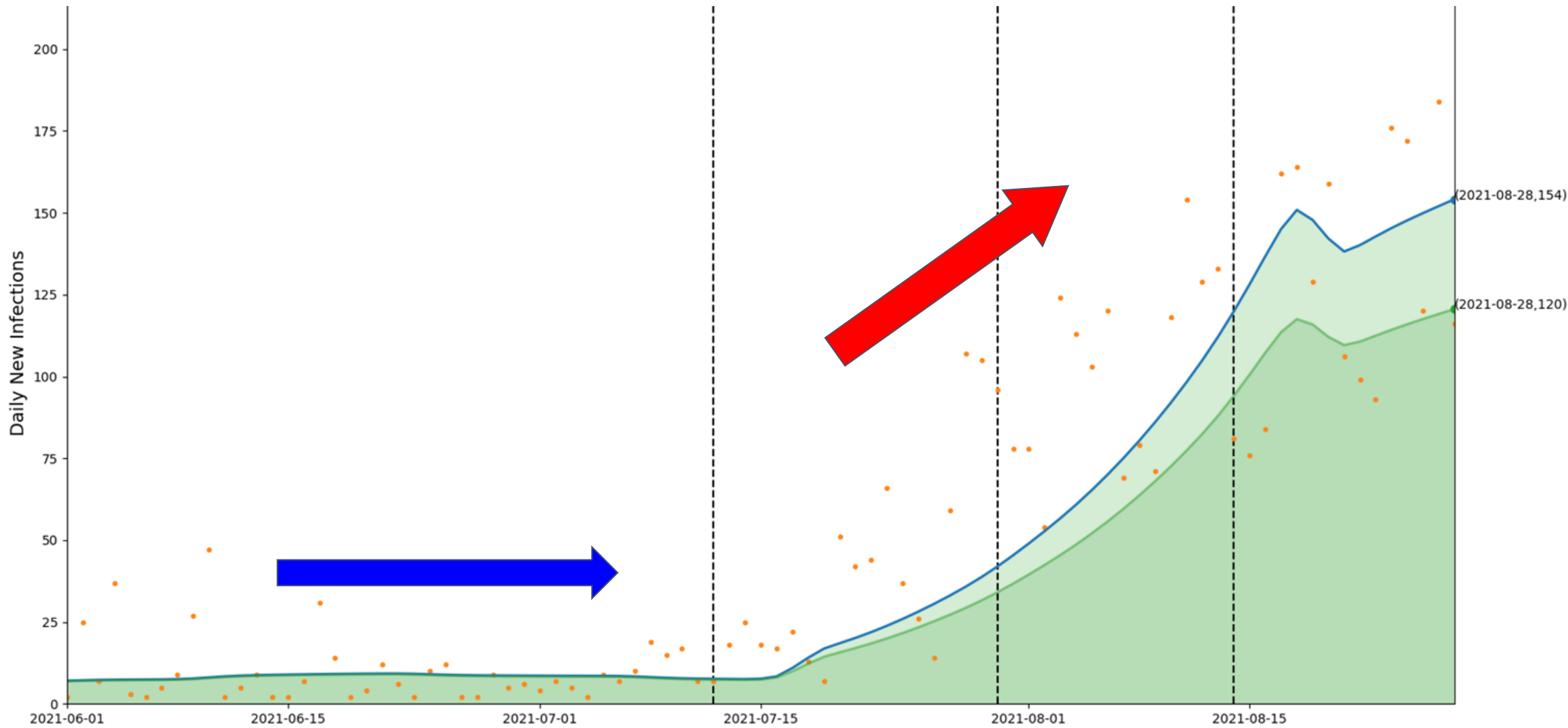
Hawaii County Forecast – August 28

Hawaii County: Test positivity is increasing, a leading indicator for a surge, and test encounters are also increasing.



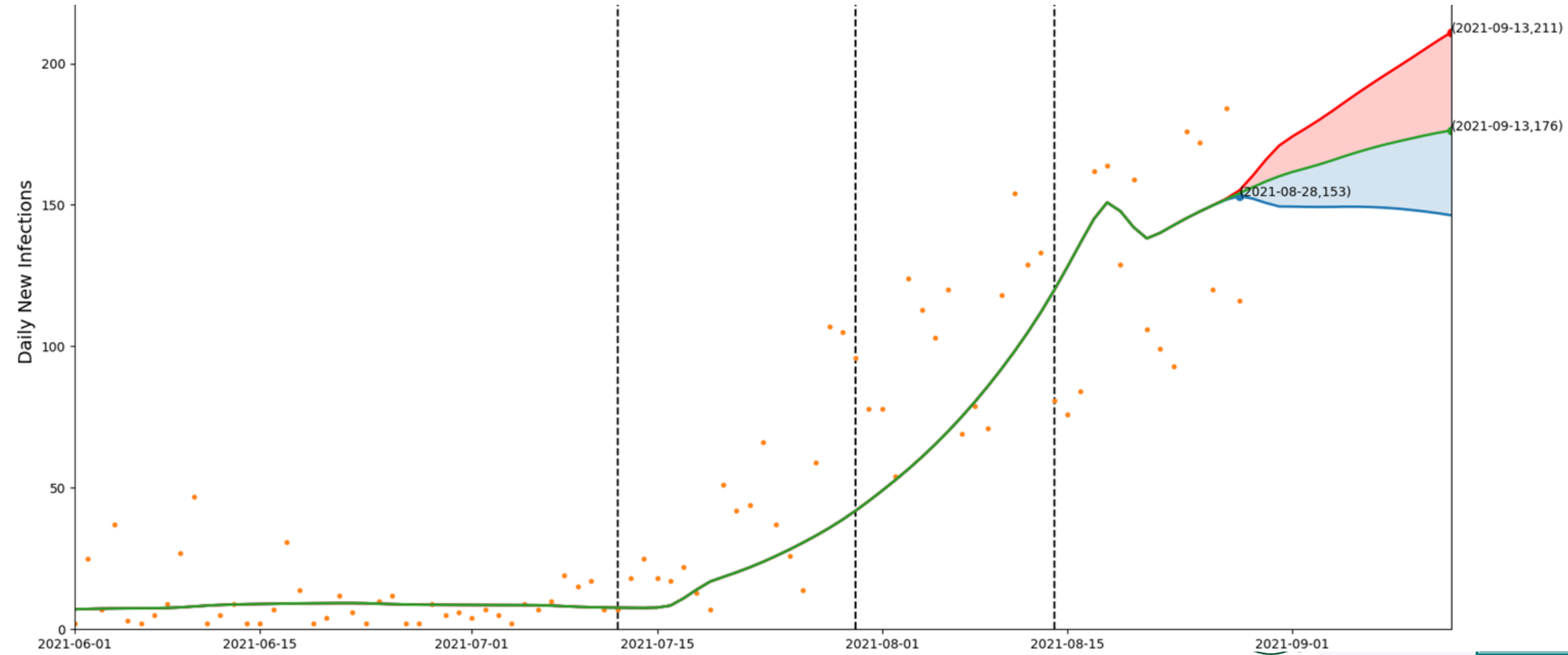
COVID Infections – Model has been calibrated to Hawaii county vaccination data

- Light Green: Estimated number of vaccinated COVID cases
- Dark Green: Estimated number of unvaccinated COVID cases



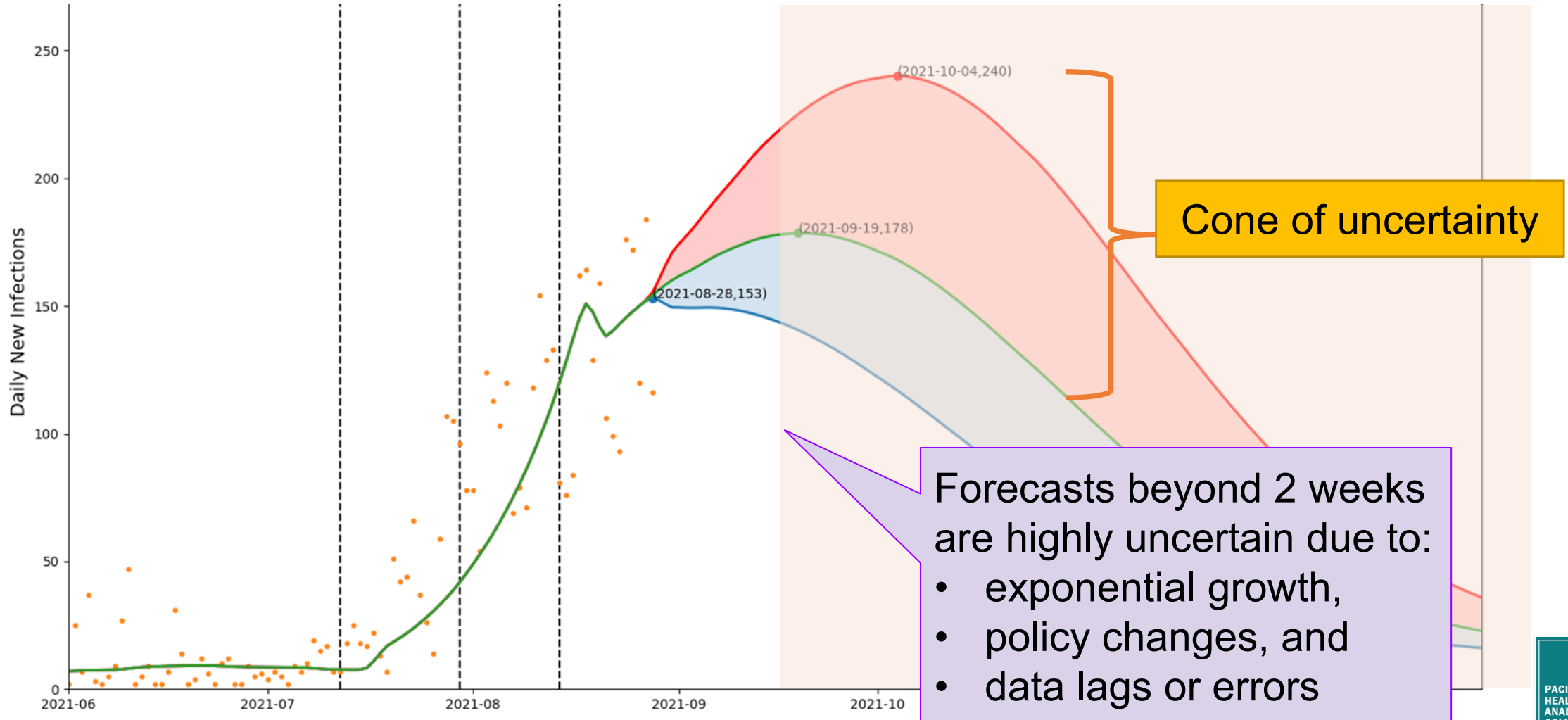
COVID Infections – Hawaii County Scenarios:

- **Red:** Vaccination daily average down by 20% and transmission rate up by 8%
- **Green:** No changes in vaccination rate and transmission
- **Blue:** Vaccination daily average up by 20% and transmission down by 8%



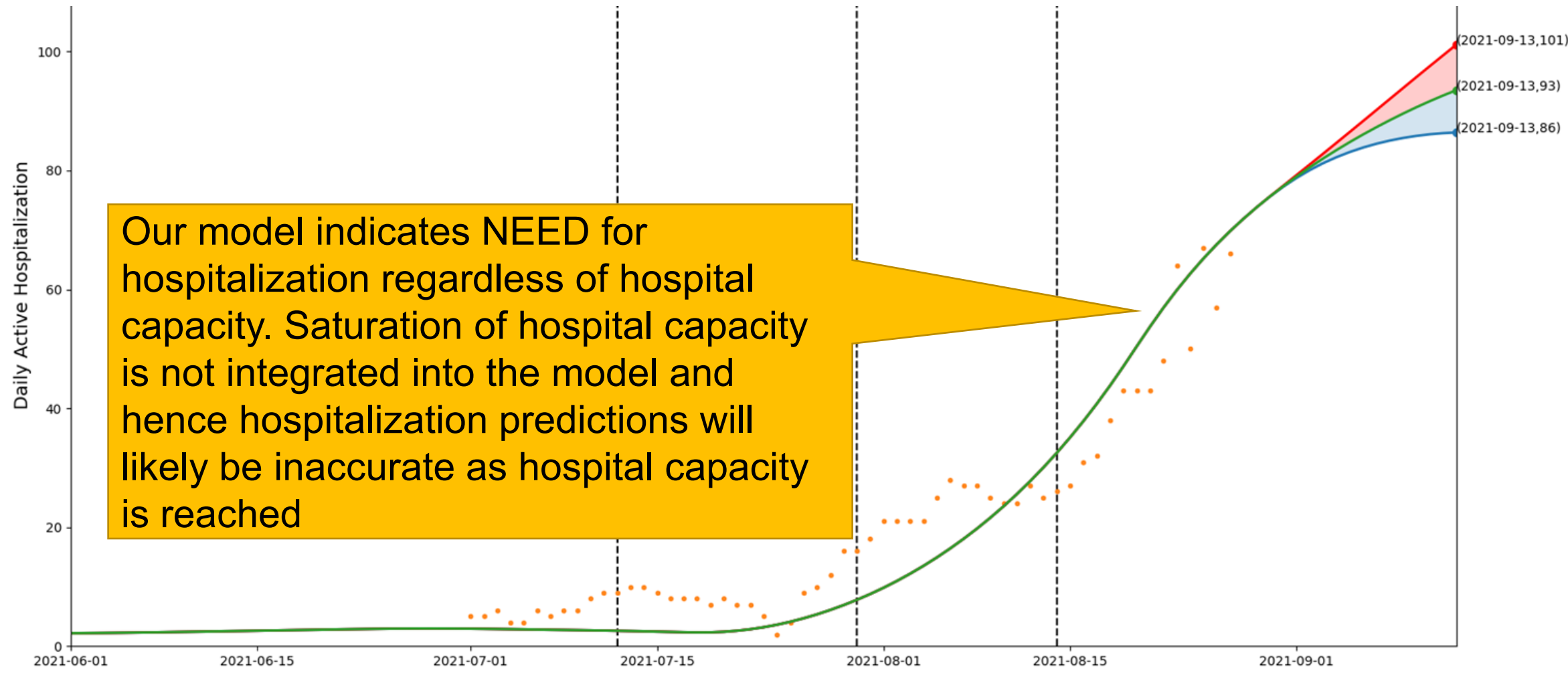
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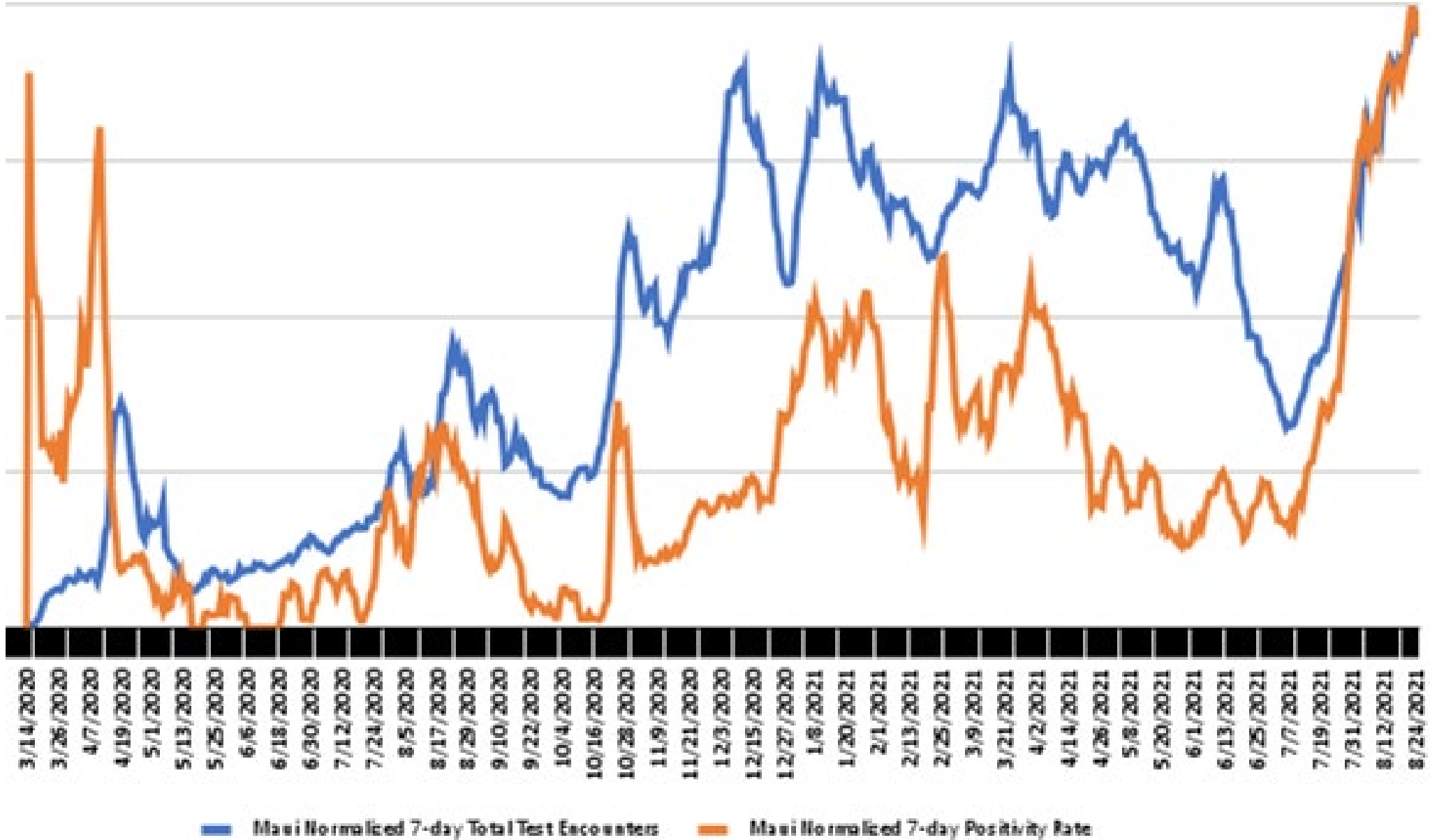
Need for Active Hospitalizations – Hawaii County Scenarios:

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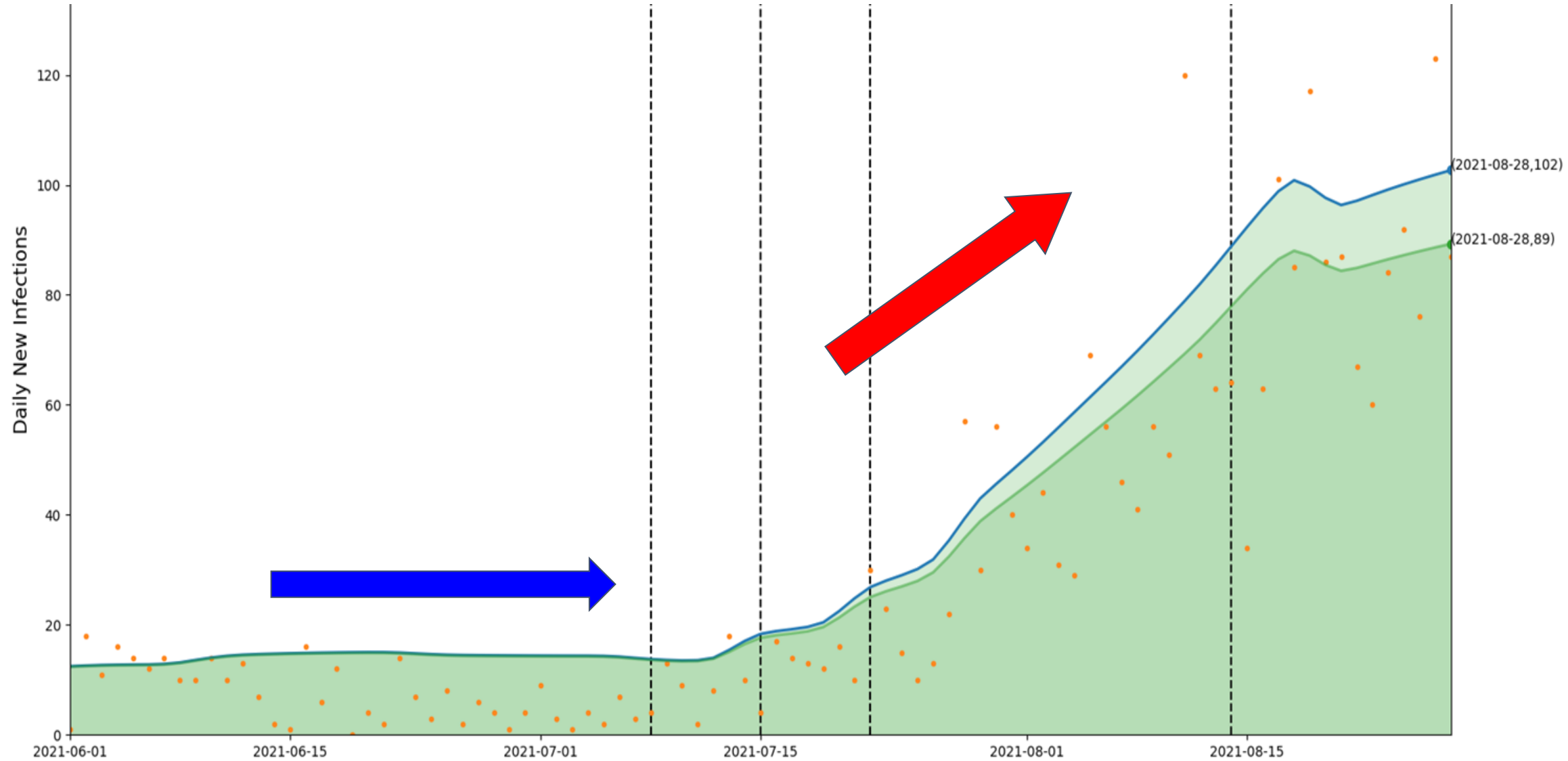
Maui County Forecast – August 28

Maui County: Test positivity is increasing, a leading indicator for a surge, and test encounters are also increasing.



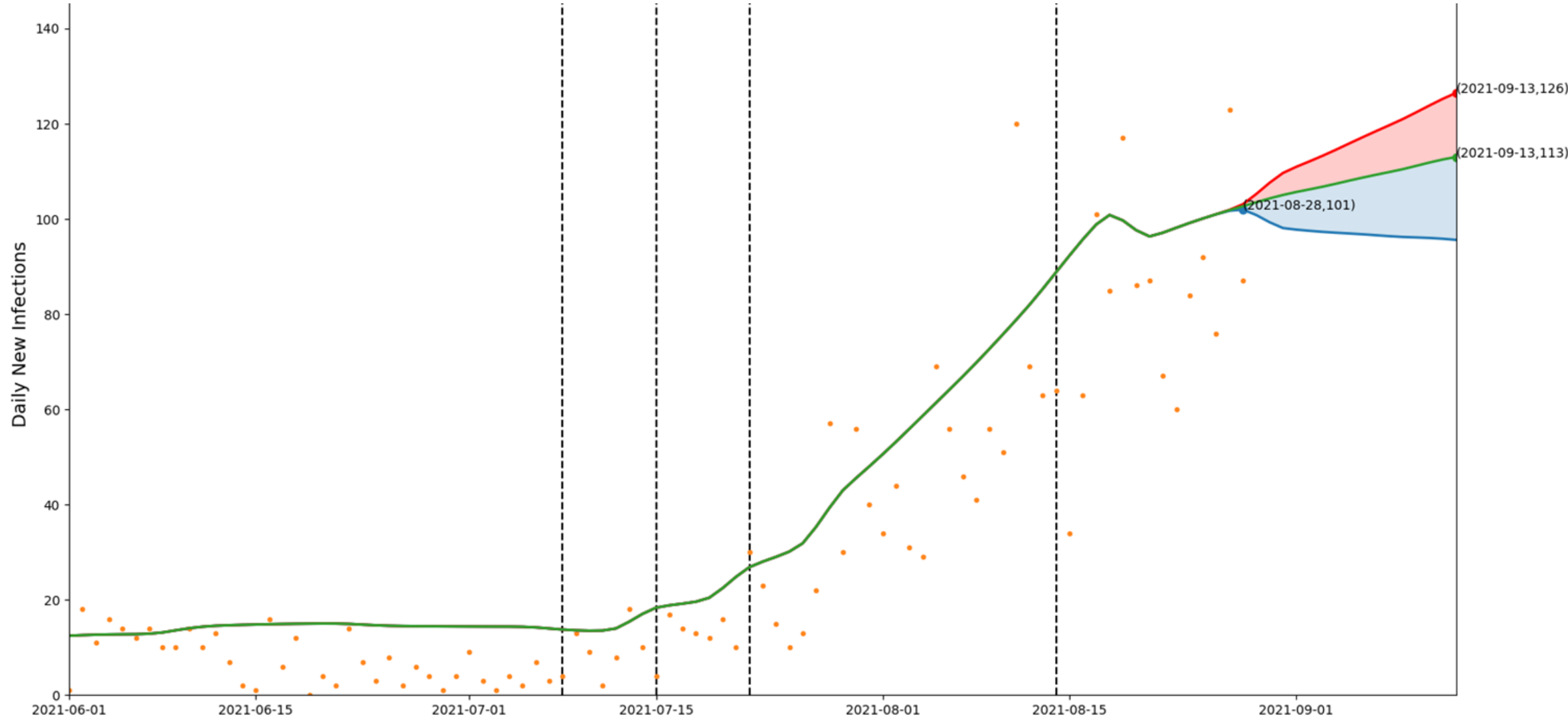
COVID Infections – Model has been calibrated to Maui County vaccination data

- Light Green: Estimated number of vaccinated COVID cases
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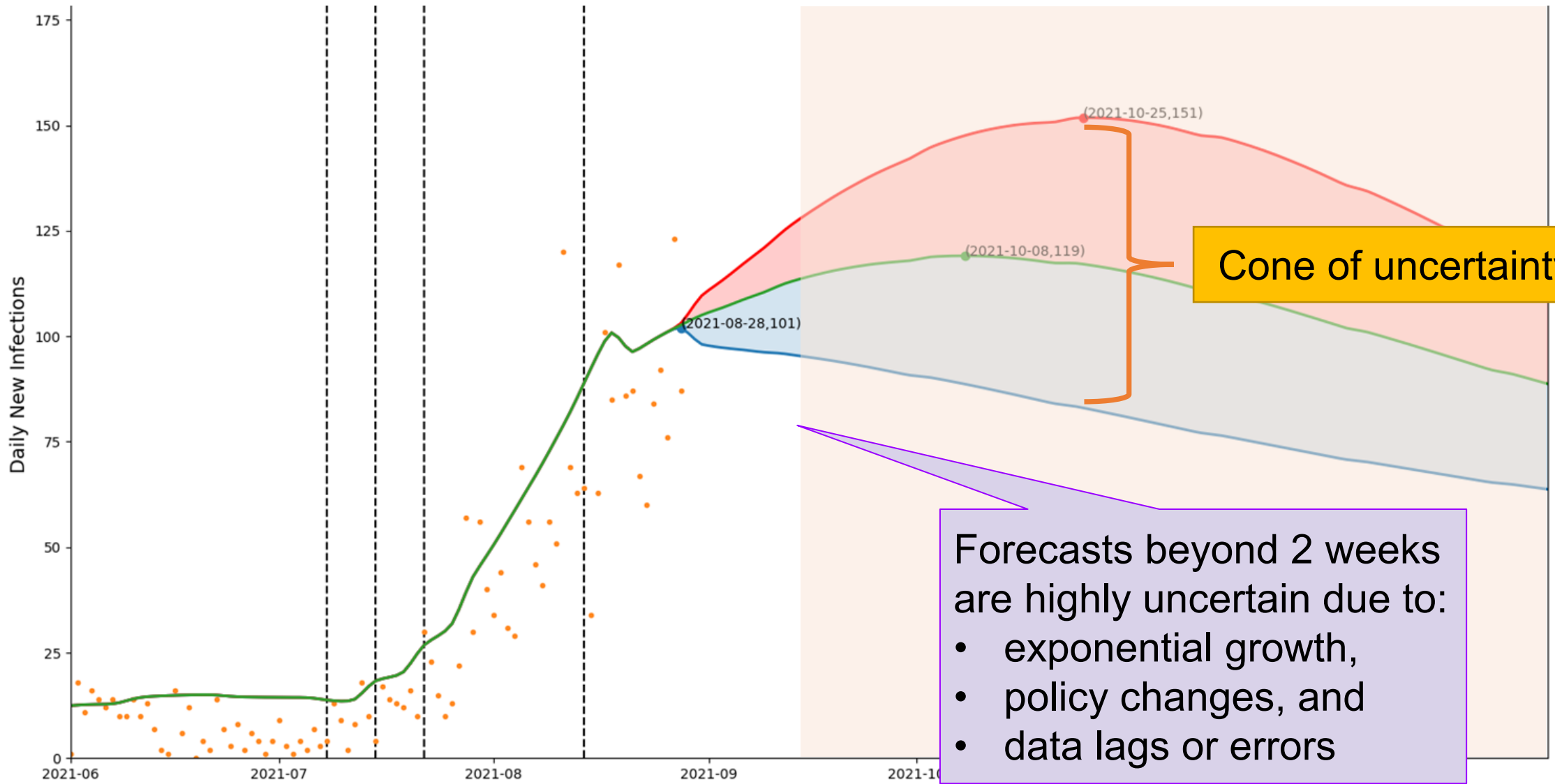
COVID Infections – Maui County Scenarios:

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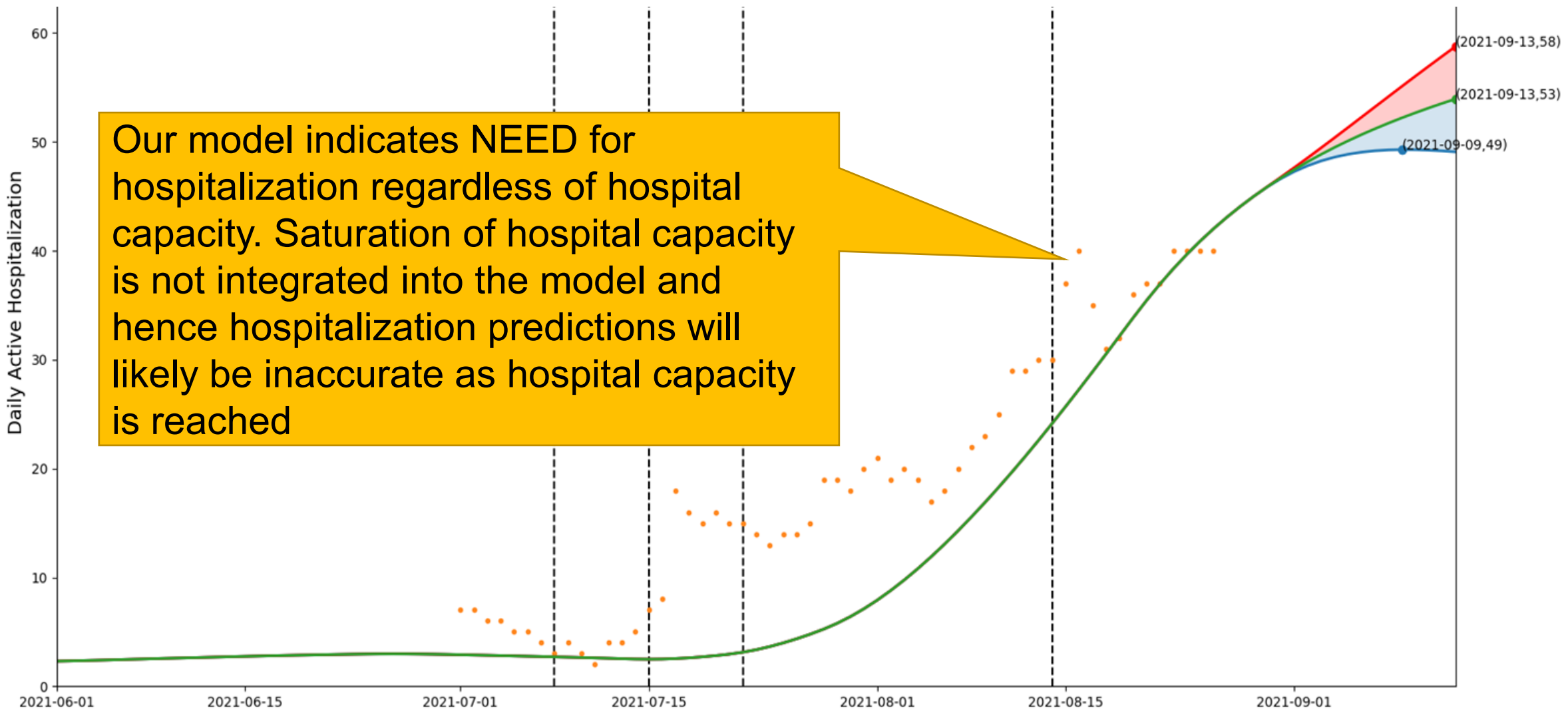
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Need for Active Hospitalizations – Maui County Scenarios:

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Key Caveats

- **Huge uncertainty and ranges of forecast arise from:**
 - Exponential growth of COVID and the delta variant and ongoing day-to-day fluctuation
 - Uncertainty of human behavior and the impact of policy interventions
 - There is a lag of 7-14 days before policy impact on active cases is observed
 - New policies implemented and behavior change can change the trajectory and thus forecasts should not be viewed as static but rather ever changing.
 - Inaccurate or lagged data
 - Cases reflect total estimated cases and not just reported/tested/symptomatic cases
 - HiPAM relies on publicly available data and has no other special data access

- **Future modeling considerations:**
 - Increased risk of death in the absence of available hospital capacity (eg oxygen)
 - Increased health burden for non-COVID conditions due to lack of hospital capacity
 - Differences in hospitalization risk by age (eg risk for children is not well documented)

Key Emerging Issues

- Risk of flu and COVID co-occurring epidemic present this fall.
 - Conditions for elimination of flu transmission this year were not present.
- Waning vaccine efficacy and increased susceptible population will increase transmission.
- Impacts on pregnant women and children can be long-lasting due to developmental impacts, not only of COVID but also from co-occurring stress, economic, and educational conditions.
- Risk of ongoing variants that are not preventable by vaccine
 - Challenge of creating understanding of “New Normal” rather than “Return to Normal”
 - Avoiding extremes (lockdown vs laissez-faire) and continued need for the pillars
 - Testing, Tracing, and Isolation/Quarantine with Ongoing Surge Capacity Planning
 - Masking, Social Distancing, Washing Hands

Formal request for support of COVID modeling efforts

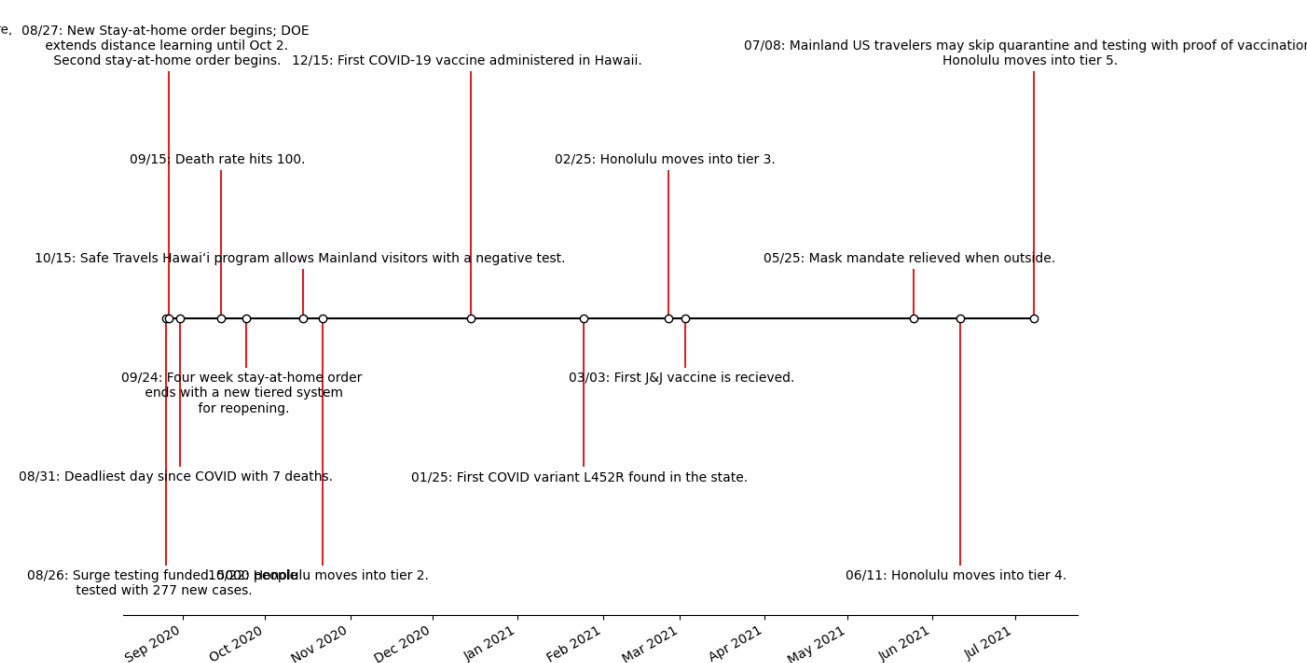
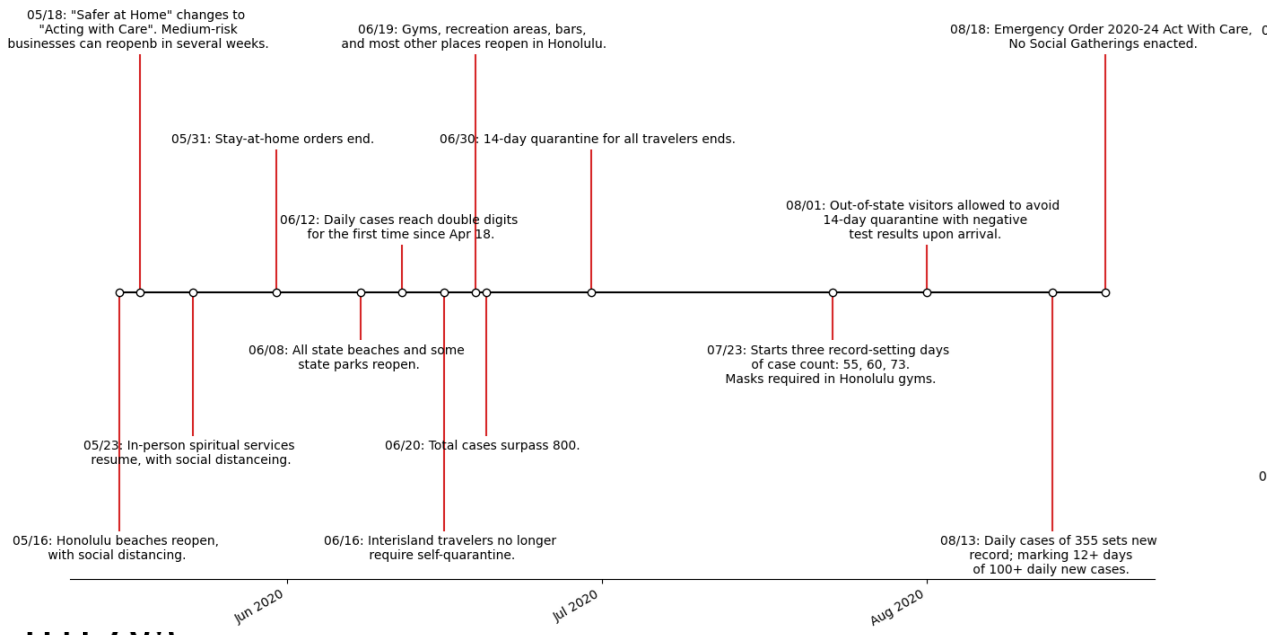
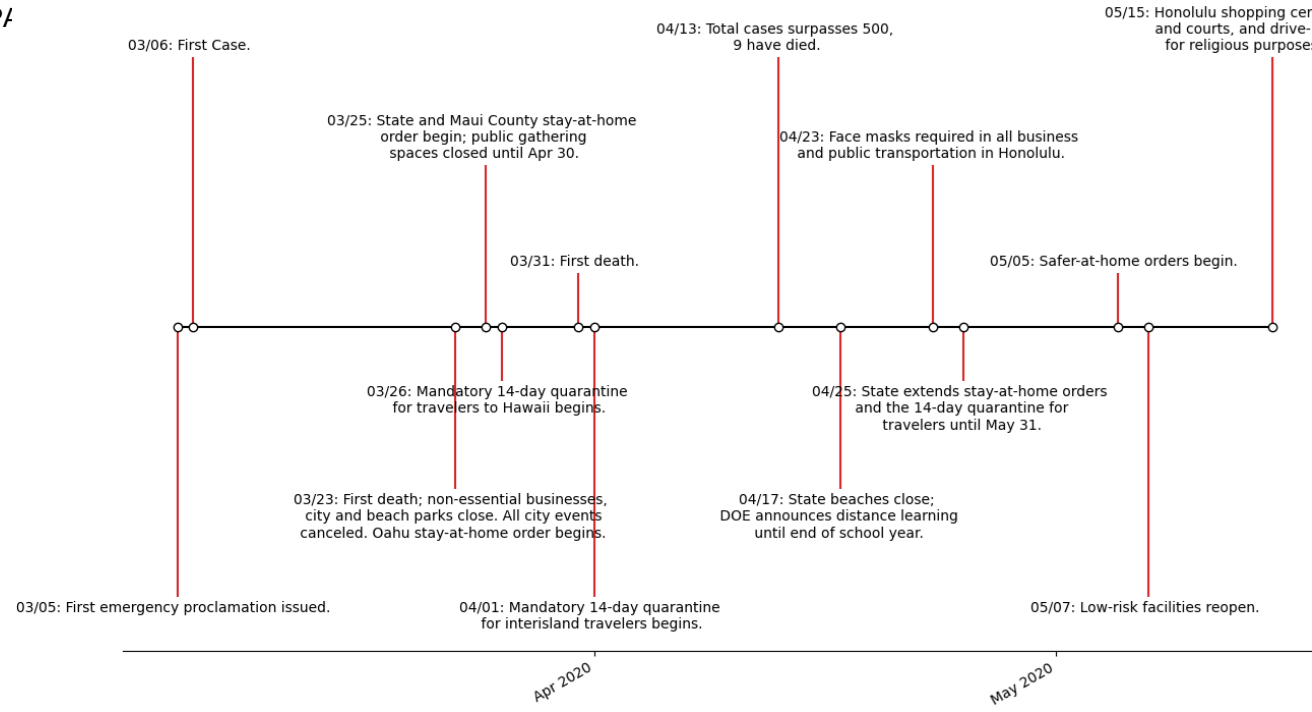
- Forecasting and modeling are essential tools for planning for mitigation and preparedness, for the economy and health.
- The field of weather forecasting is far more advanced compared to that of epidemic forecasting.
- Previous support from the National Science Foundation, Hawaii Data Collaborative, and the Department of Health Alcohol and Drug Abuse Division enabled this work from April, 2020 but has since ended.
- This work based at the University of Hawaii supports workforce development in interdisciplinary data science across mathematics, computer science, and health.

References

1. Kunwar P, Markovichenko O, Chyba M, Mileyko Y, Koniges A, Lee T. A study of computational and conceptual complexities of compartment and agent based models. arXiv:210811546 [q-bio] [Internet]. 2021 Aug 25 [cited 2021 Sep 1]; Available from: <http://arxiv.org/abs/2108.11546>
2. Chyba M, Koniges A, Kunwar P, Lau W, Mileyko Y, Tong A. COVID-19 Heterogeneity in Islands Chain Environment. arXiv:210207646 [q-bio] [Internet]. 2021 Feb 12 [cited 2021 Sep 1]; Available from: <http://arxiv.org/abs/2102.07646>

Note: Modeling efforts led by Monique Chyba won Best Paper Award from the 9th Global Health 2020 International Conference for our paper “Epidemiological Model of the Spread of COVID-19 in Hawaii’s Challenging Fight Against the Disease”.

Timeline Pre-Delta Variant Impact of Mitigations Measures



HiPAM AUG 2020 FORECAST – SEPT 3 PRESENTATION TO SENATE SPECIAL COMMITTEE ON COVID-19 (SCOID)

