

Aggregating Expert Opinion on COVID-19

UMassAmherst

School of Public Health
& Health Sciences

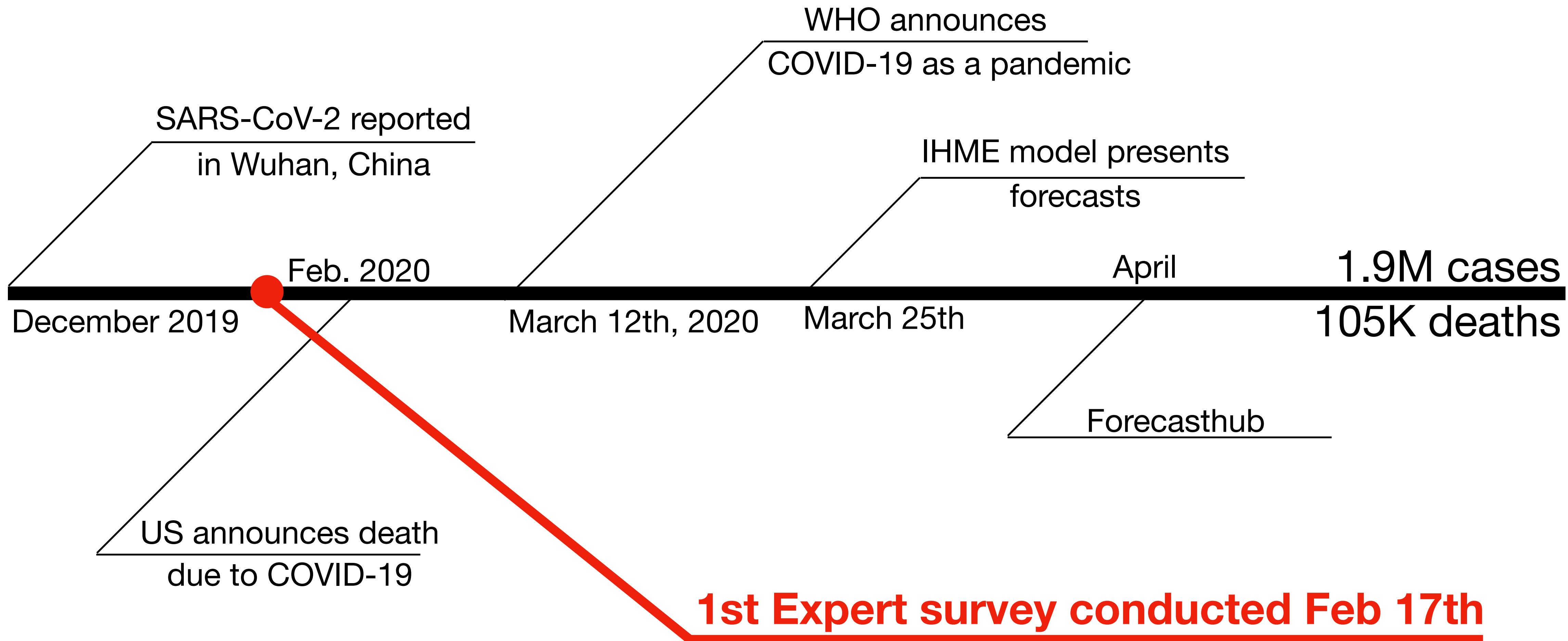
tom mcandrew

mcandrew@umass.edu



LEHIGH
UNIVERSITY

Impact of COVID-19



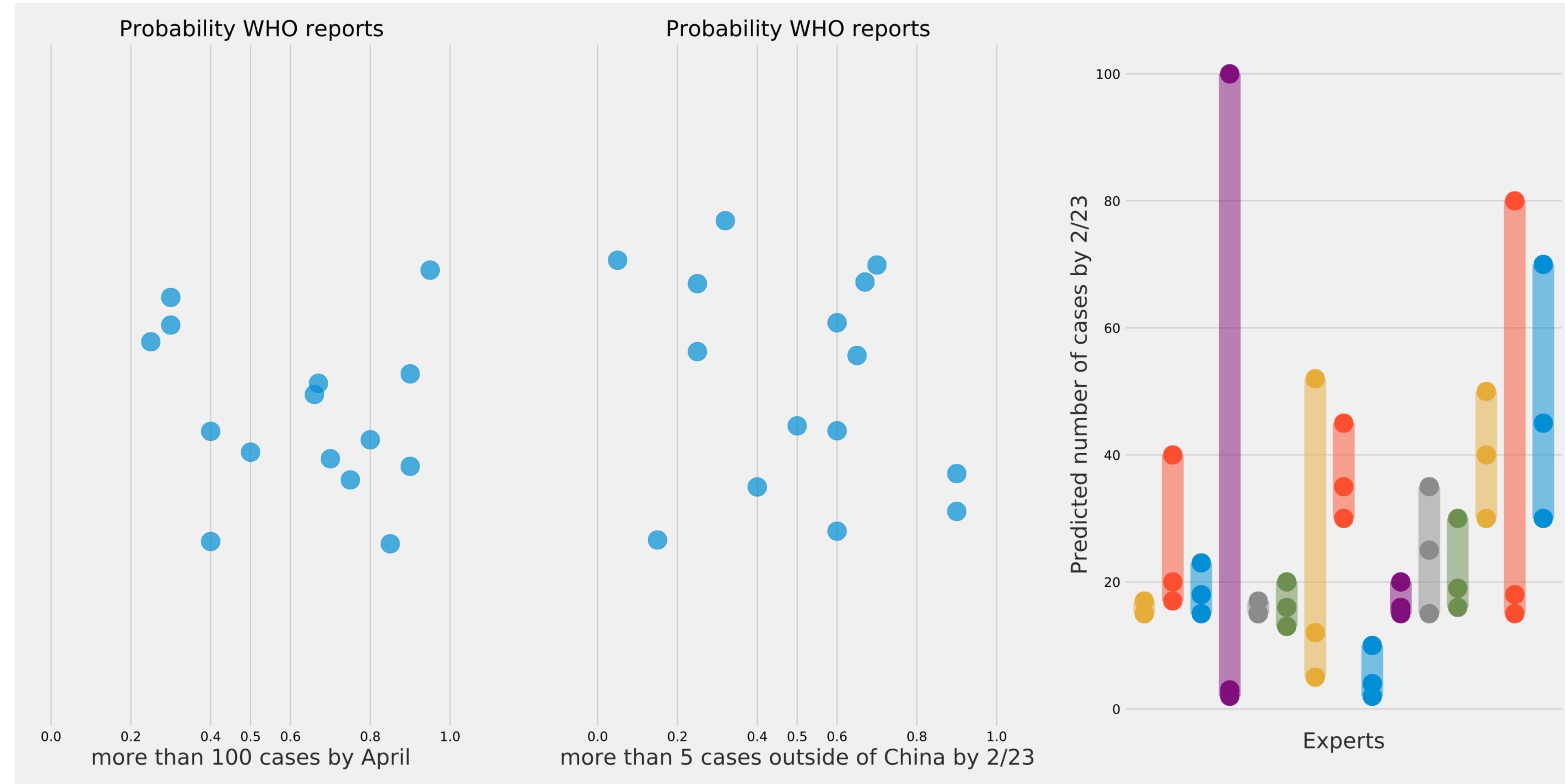
February 17th Questions

Do you think that the confirmed case count of COVID-19 cases in the US reported by WHO on April 1, 2020 will exceed 100?

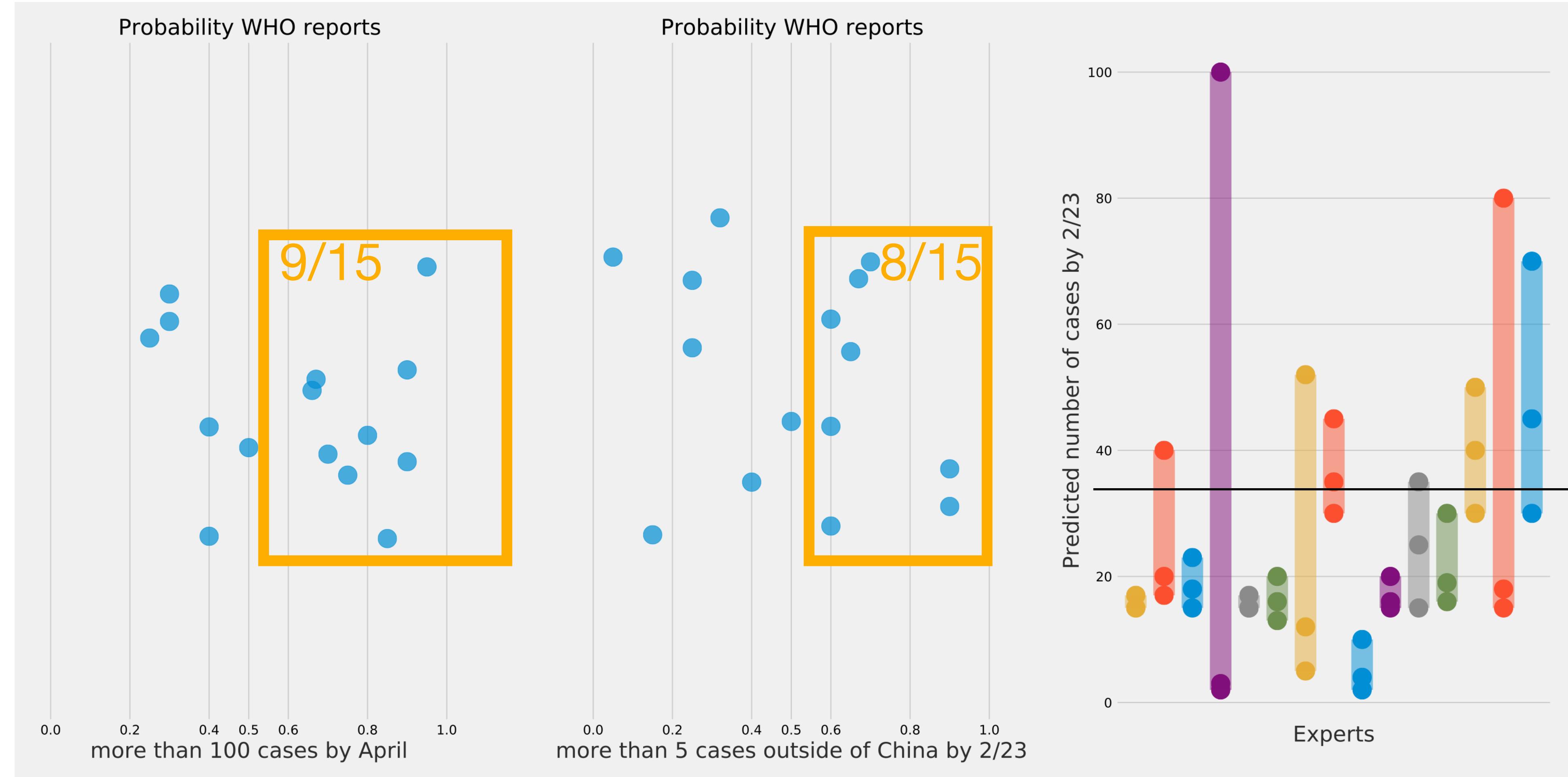
As reported by the WHO this coming Sunday, 2020-02-23, will the number of cumulative confirmed cases in the US with possible or confirmed transmission outside of China exceed 5?

What is the smallest, most likely, and largest number of all cumulative confirmed cases (including both imported cases and local transmission) in the US the WHO will report this coming Sunday 2020-02-23?

February 17th Answers

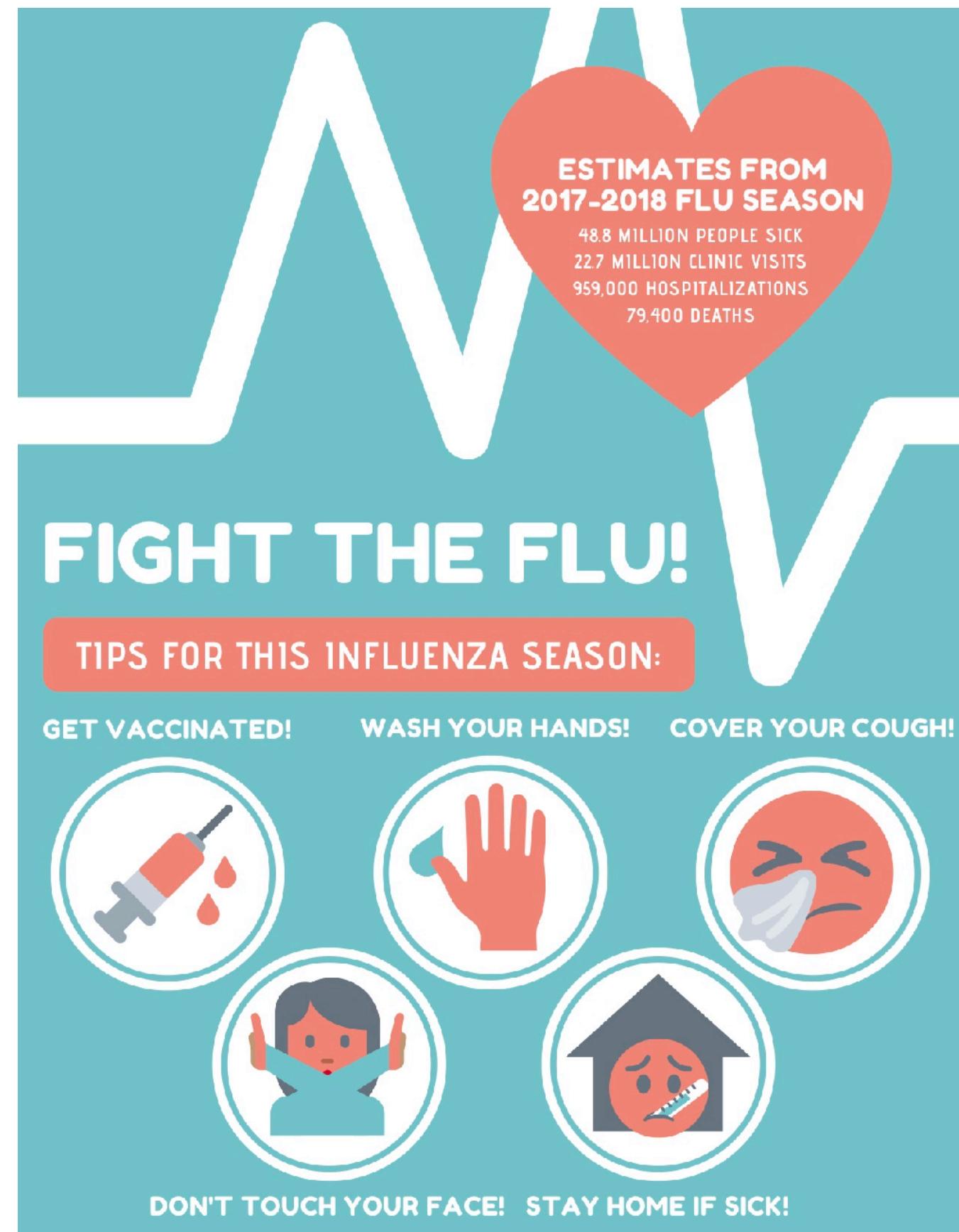


February 17th Answers



Goal of forecasting

Public Health Officials actionable information



Public health campaigns



Vaccine stockpile



Hospital burden

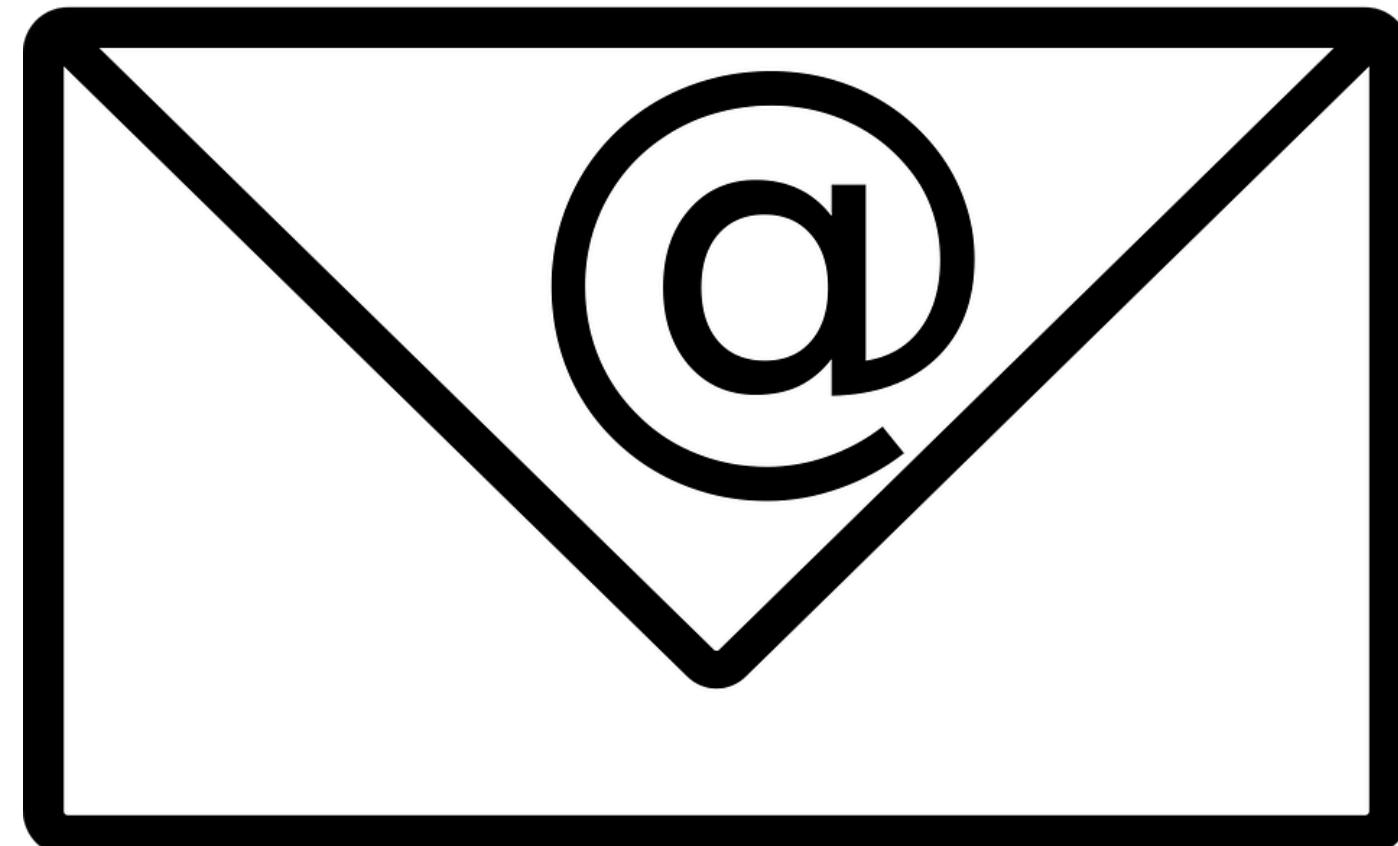


Our expert crowd

An expert was defined as a researcher who has spent a substantial amount of time in their professional career

- designing
- building
- interpreting

models to explain and understand infectious disease dynamics and/or associated policy implications in human populations.



41 Experts

Survey logistics

Dear Dr. [REDACTED]

Thank you for your previous participation in our project to aggregate expert opinion on the future trajectory of the COVID-19 outbreak. Please find attached the results from last week's survey: [20200429 covid19 expert report v0.1](https://20200429_covid19_expert_report_v0.1.pdf)

The names of experts who participate more than once will be made public, as will their participation rates, as we believe this will give more credence and transparency to the results. Your answers, as well as those from other experts, will be anonymized and shared publicly and with stakeholders at the US CDC. If you participated in last week's survey, your forecasts and the results from COVID tracker are included below.

We hope you will continue to participate in this brief weekly survey. To fill out this week's survey, please click the personalized link below. The survey will be open until 4:00pm on Tuesday, May 5th.

Follow this link to the Survey:

[Take the Survey](https://umassamherst.co1.qualtrics.com/jfe/form/SV_br2RQO5DFvBHreZ?Q_DL=owMBv8VTFTETBdl_br2RQO5DFvBHreZ_MLRP_55b8lcWrfzm9KxT&Q_CHL=email)

Or copy and paste the URL below into your internet browser:

[https://umassamherst.co1.qualtrics.com/jfe/form/SV_br2RQO5DFvBHreZ?
Q_DL=owMBv8VTFTETBdl_br2RQO5DFvBHreZ_MLRP_55b8lcWrfzm9KxT&Q_CHL=email](https://umassamherst.co1.qualtrics.com/jfe/form/SV_br2RQO5DFvBHreZ?Q_DL=owMBv8VTFTETBdl_br2RQO5DFvBHreZ_MLRP_55b8lcWrfzm9KxT&Q_CHL=email)

Follow the link to opt out of future emails:

[Click here to unsubscribe](#)

Thanks for your time and effort,

Tom McAndrew and Nicholas Reich

UMass-Amherst Department of Biostatistics and Epidemiology

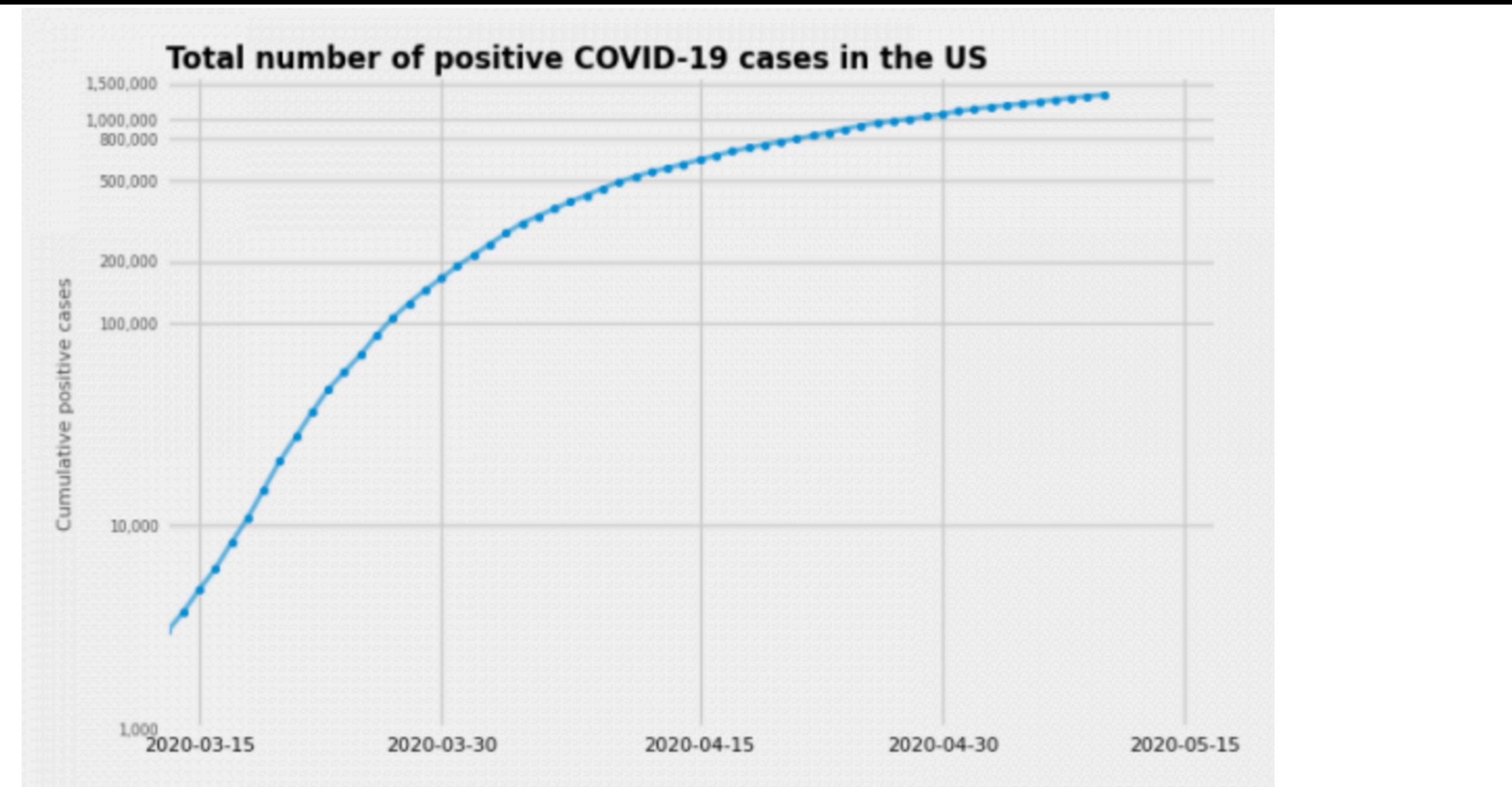
Feedback on your forecasting

Please find below your forecasts, and the COVID tracker reported data as of May 3rd, 2020. We hope you find this information useful feedback for your future forecasting efforts.

**Personalized email,
a social contract
and a default**

**Feedback on
forecasting results**

Survey platform



As shown in the table and figure above, [COVID Tracker](#) reported 1,322,807 total positive cases of COVID-19 in the US as of Monday, May 11th at 9am.

What is the number of positive cases in the US that COVID Tracker will have in the daily report this coming Sunday, May 17th?

We provided a set of intervals where the true number of positive cases could fall. Assign a probability to each bin corresponding to your belief of how many cases will be reported next Sunday. Each number must be between 0 and 1 and all numbers provided must sum to 1.

A smartphone screen displays the same COVID-19 case tracker. The top right corner shows a battery icon at 100%. The screen shows the same cumulative positive cases graph from the previous slide, with the x-axis ranging from 2020-03-15 to 2020-05-15. The y-axis is logarithmic, with major ticks at 1,000, 10,000, 100,000, 1,000,000, and 1,500,000.

As shown in the table and figure above, [COVID Tracker](#) reported 1,322,807 total positive cases of COVID-19 in the US as of Monday, May 11th at 9am.

What is the number of positive cases in the US that COVID Tracker will have in the daily report this coming Sunday, May 17th?

We provided a set of intervals where the true number of positive cases could fall. Assign a probability to each bin

Predictions

Deaths

Hospitalizations

Total infections

Confirmed cases

Predictions

Deaths

Hospitalizations

Total infections

Confirmed cases

Predictions

Over the last 9 seasons, the CDC estimates that [the seasonal death toll from influenza outbreaks](#) has ranged from between 11,000 and 95,000. What are the smallest, most likely, and largest number of deaths that will occur due to COVID-19 by the end of 2020?

Triplet

Smallest number of deaths

//

Most likely number of deaths

//

Largest number of deaths

//

Pct

5th percentile

//

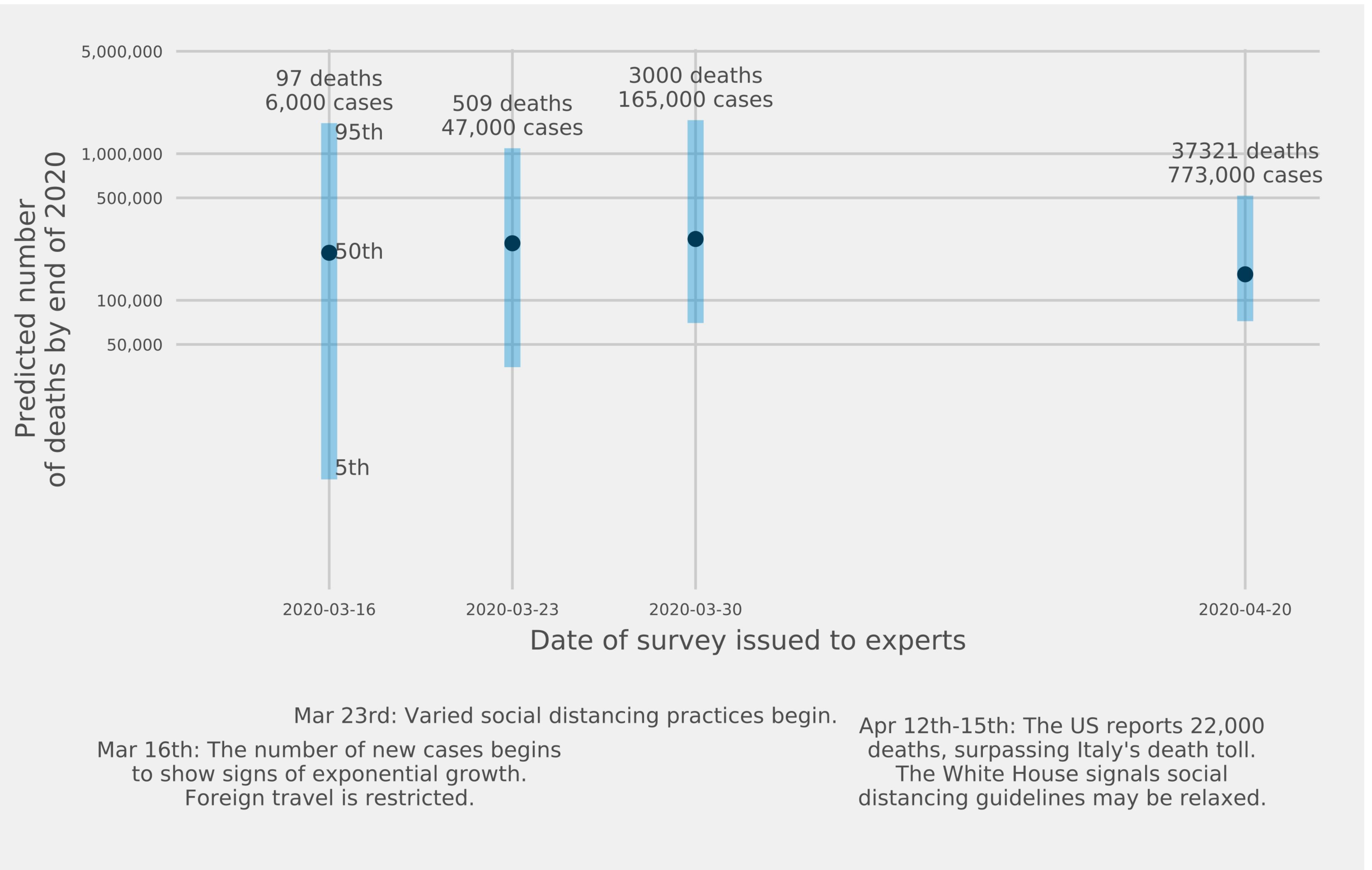
50th percentile (median)

//

95th percentile

//

Predictions



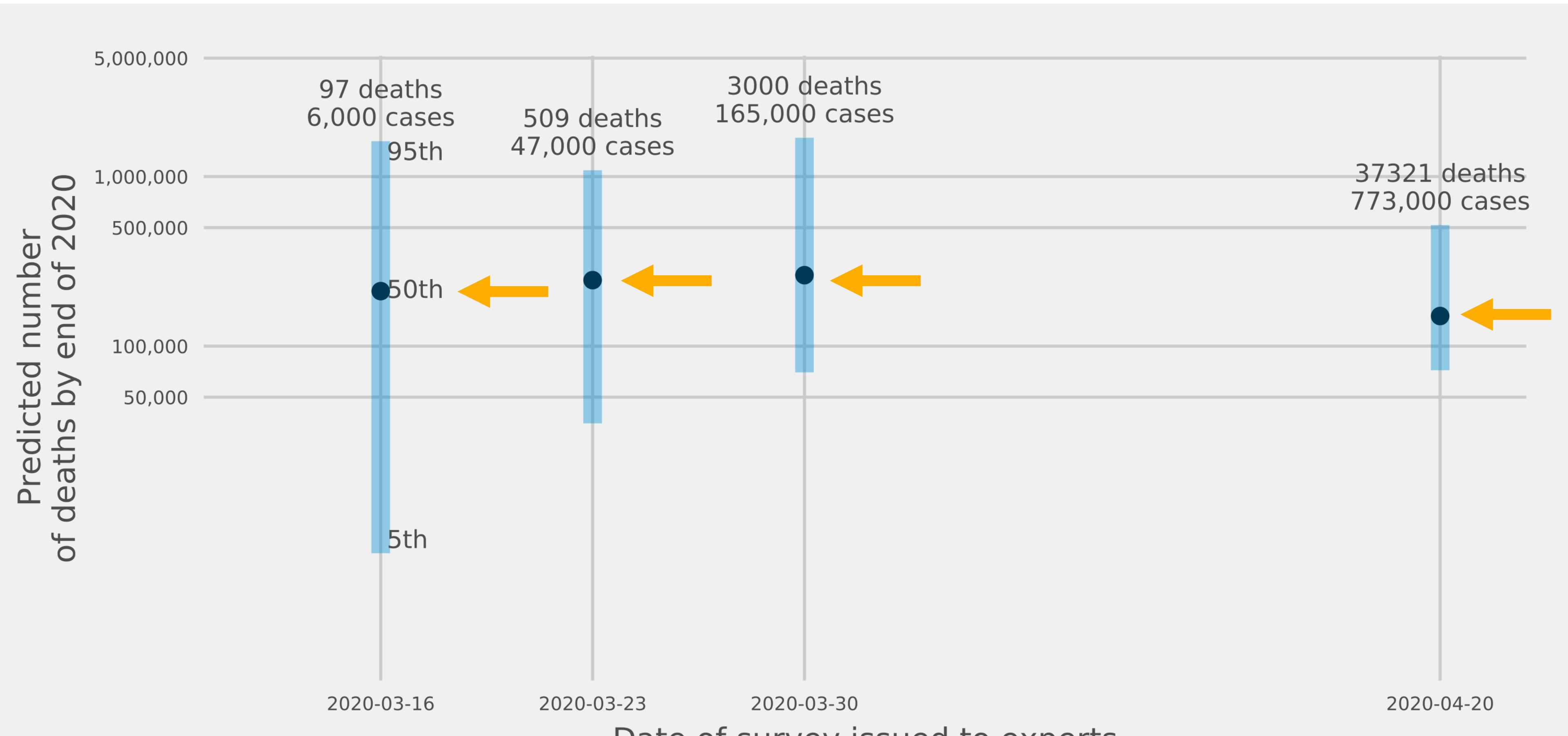
150K - 250K
deaths by the
end of 2020

Stable predictions

Broad uncertainty

Different question
format results in
different
prediction

Predictions



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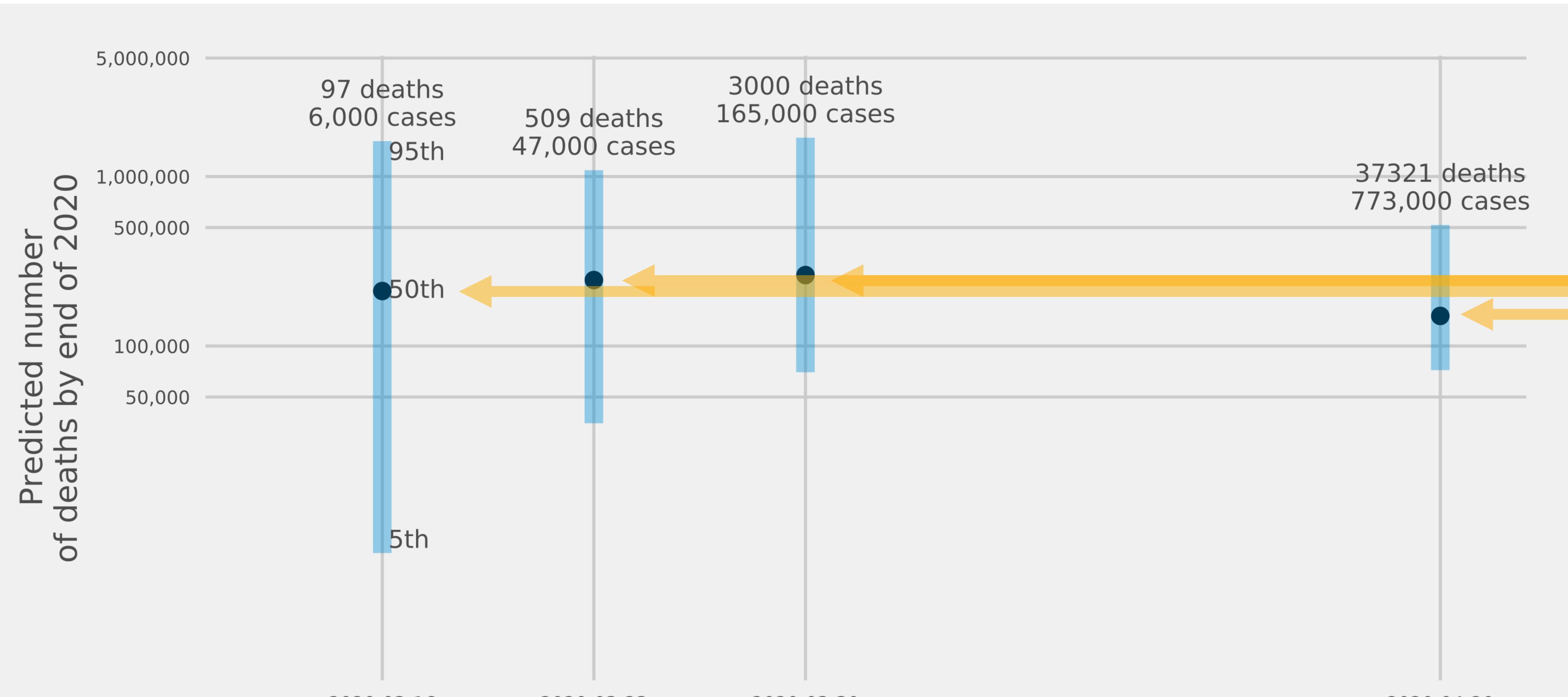
Different question
format results in
different
prediction

Mar 16th: The number of new cases begins
to show signs of exponential growth.
Foreign travel is restricted.

Mar 23rd: Varied social distancing practices begin.

Apr 12th-15th: The US reports 22,000
deaths, surpassing Italy's death toll.
The White House signals social
distancing guidelines may be relaxed.

Predictions



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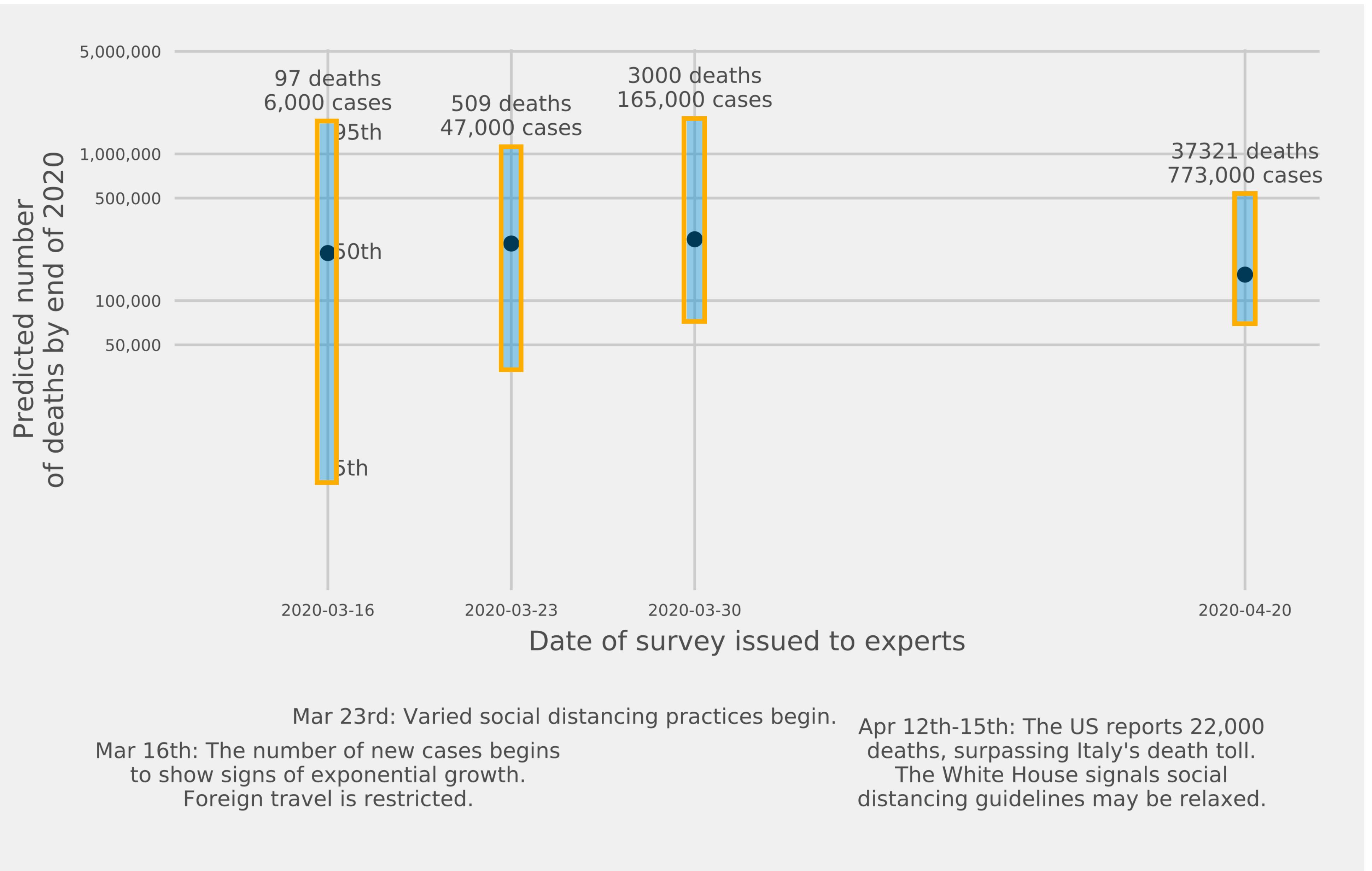
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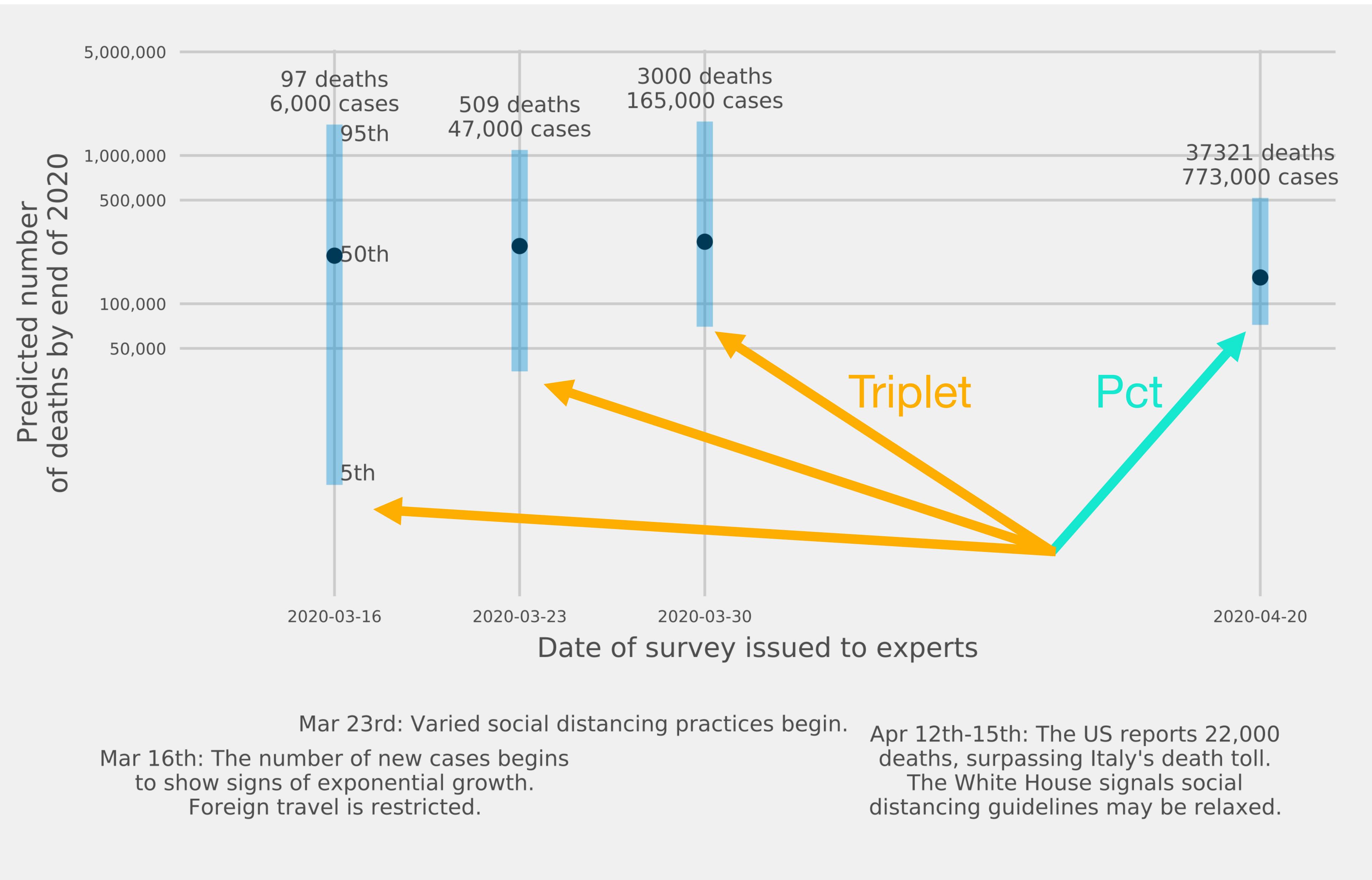
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150K - 250K deaths by the end of 2020

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Predictions

Deaths

Hospitalizations

Total infections

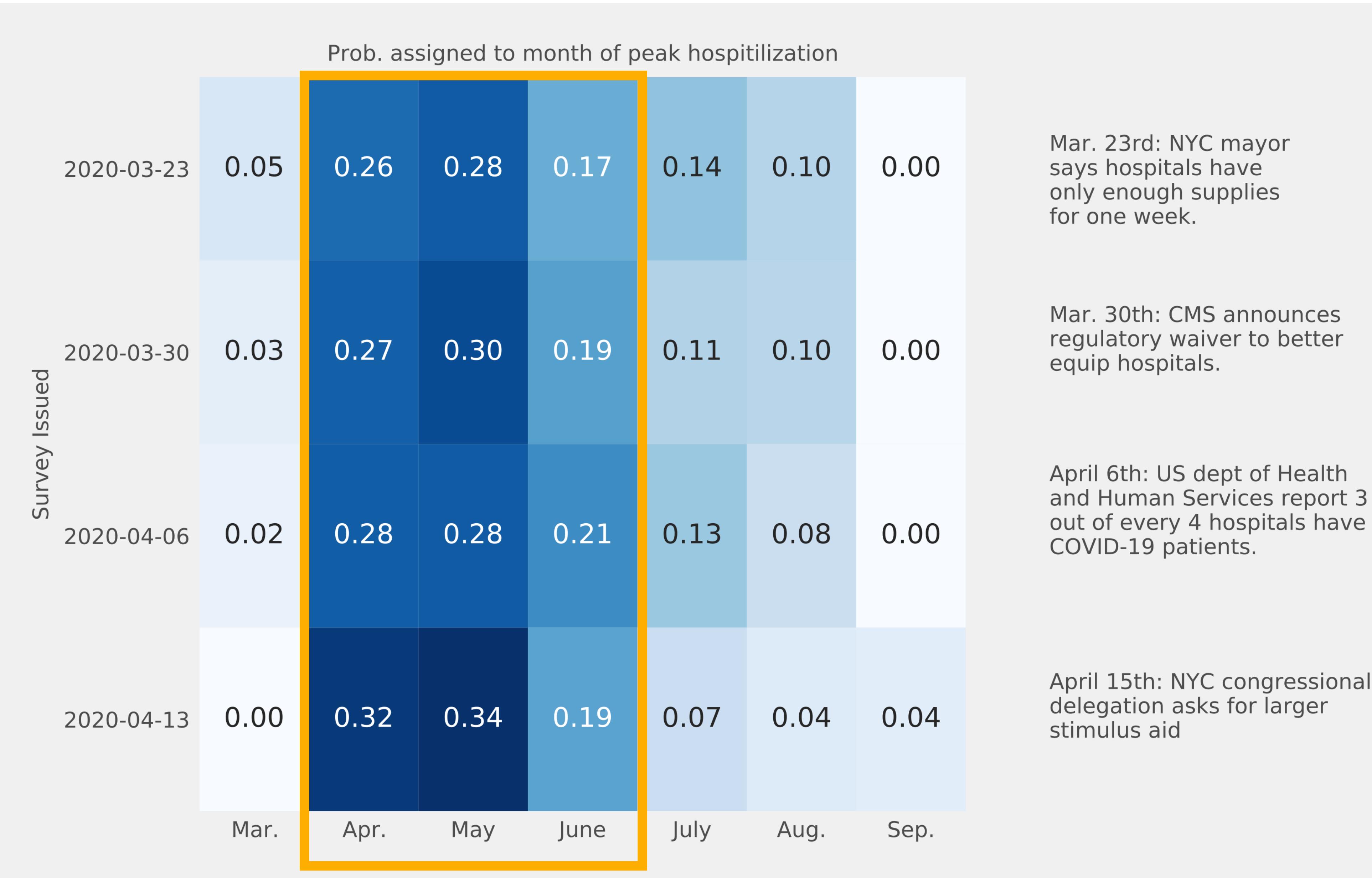
Confirmed cases

Predictions

Which of the next 6 months will see the highest total number of hospitalizations nationwide in the US for COVID-19 illness? Assign a probability to each month representing the likelihood of peak US hospitalizations occurring in that month. Each number must be between 0 and 1 and all numbers provided must sum to 1.

Prob for March	<input type="text" value="0"/>
Prob for April	<input type="text" value="0"/>
Prob for May	<input type="text" value="0"/>
Prob for June	<input type="text" value="0"/>
Prob for July	<input type="text" value="0"/>
Prob for August	<input type="text" value="0"/>
Total	<input type="text" value="0"/>

Predictions

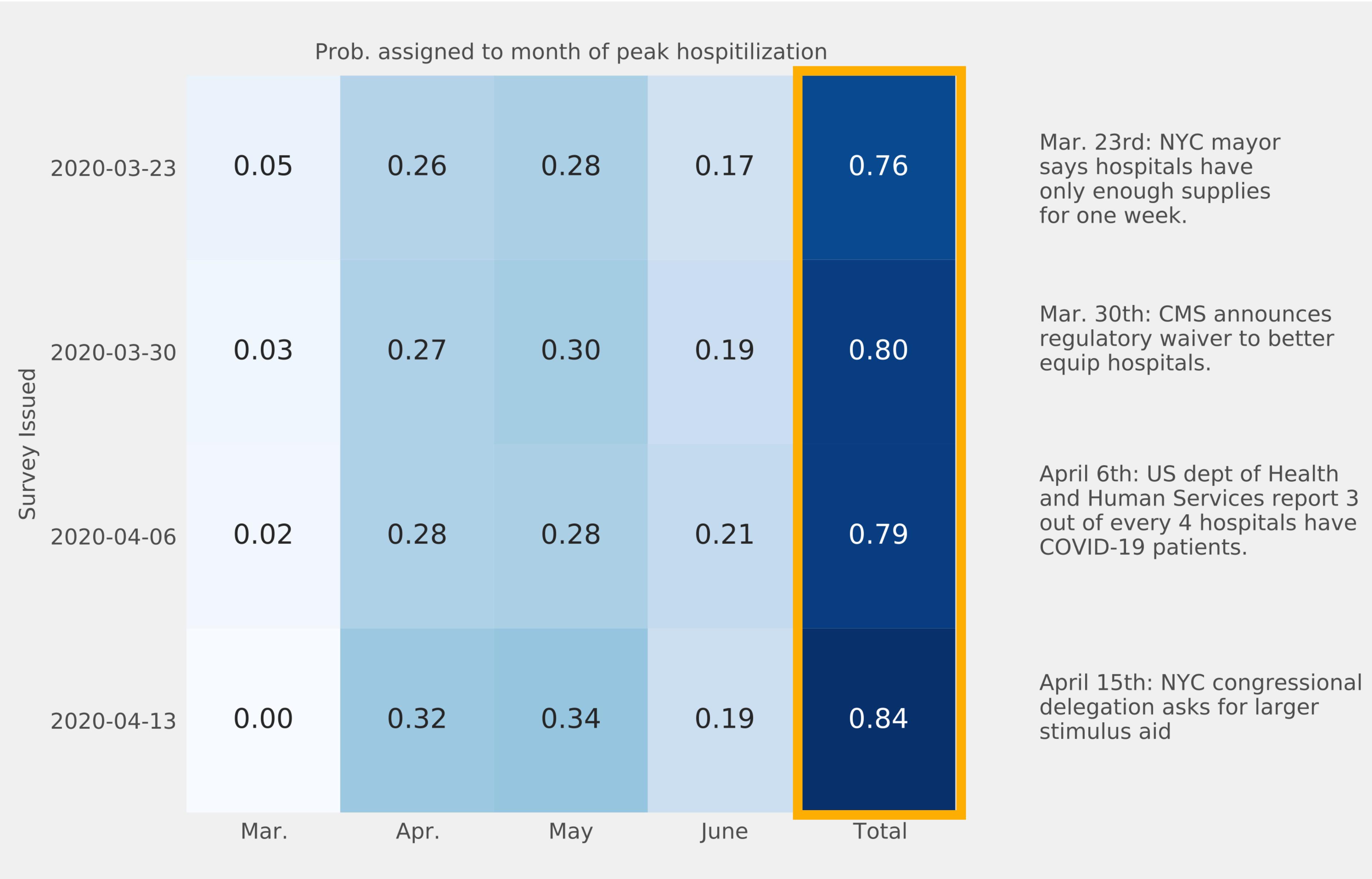


Peak hosps to occur between April and June

Probability assigned over each survey is similar

Appreciable probability assigned to a later peak

Predictions

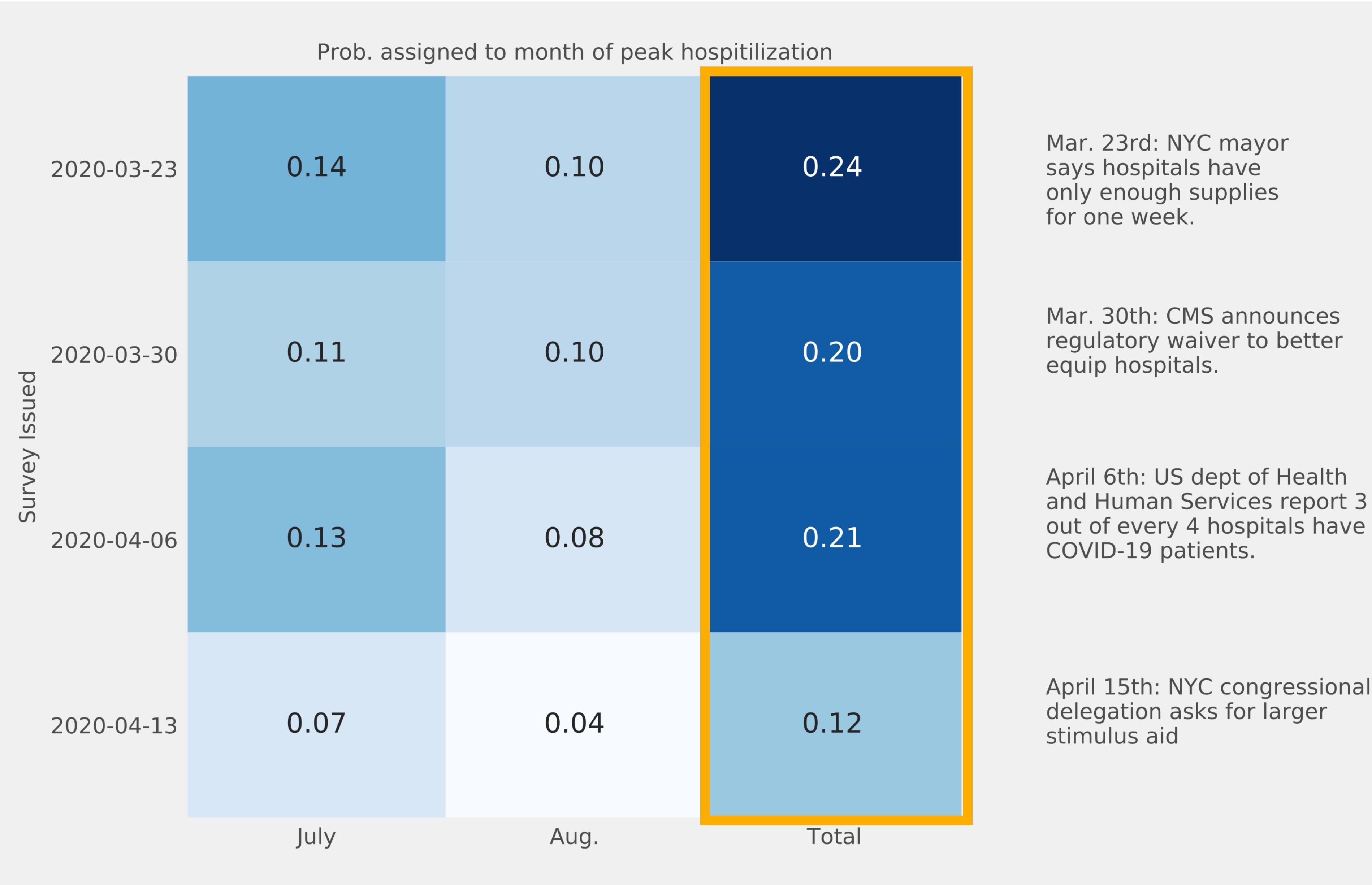


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Predictions

Deaths

Hospitalizations

Total infections

Confirmed cases

Predictions

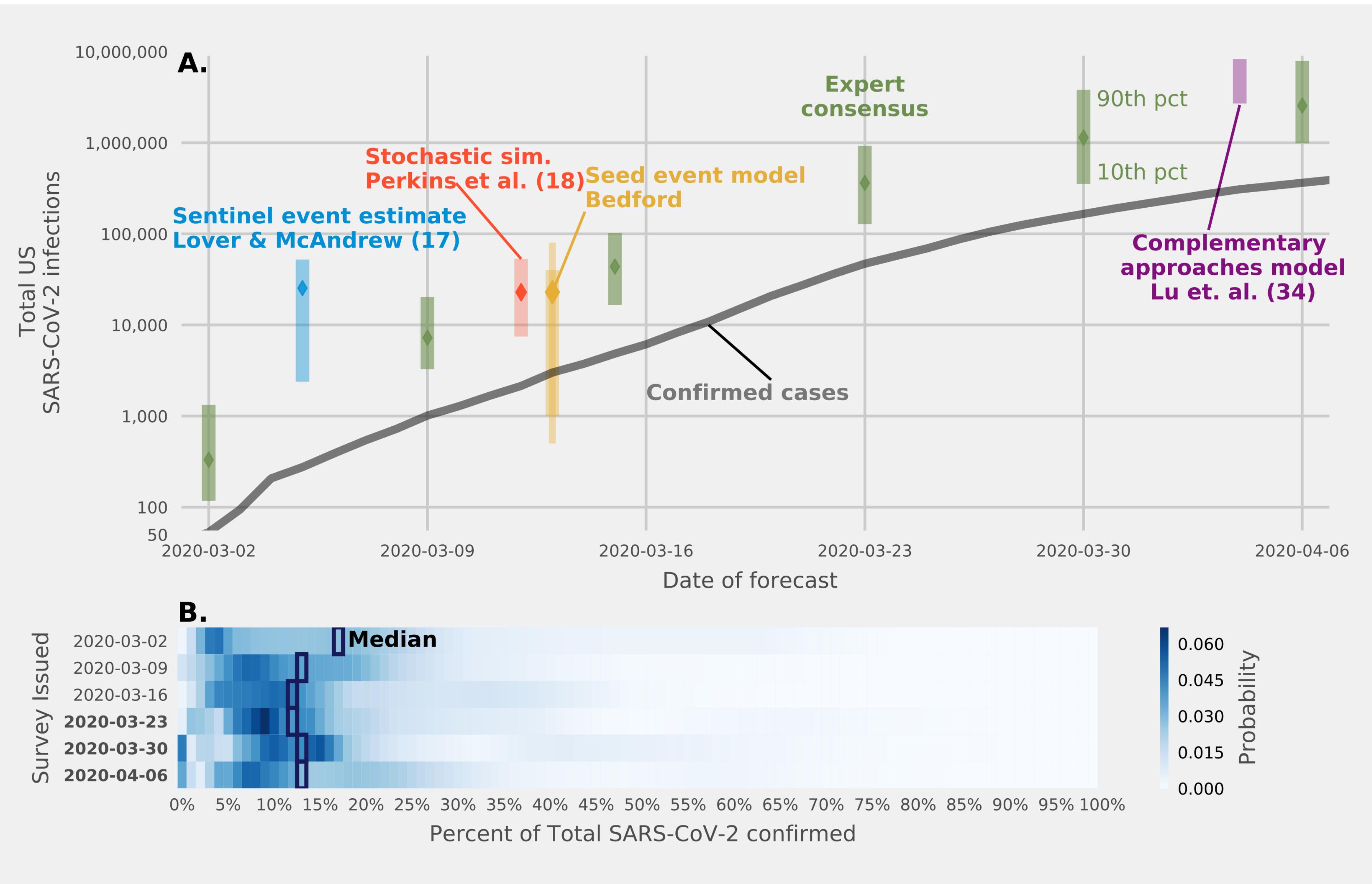
As of Monday, March 9th what percentage of all COVID-19 infections in the US (resulting in either symptomatic or asymptomatic illness) do you believe were reported as confirmed cases in the table above? Please indicate the smallest, most likely, and largest percentages below, as values between 0 and 100.

Smallest percentage

Most likely percentage

Largest percentage

Predictions

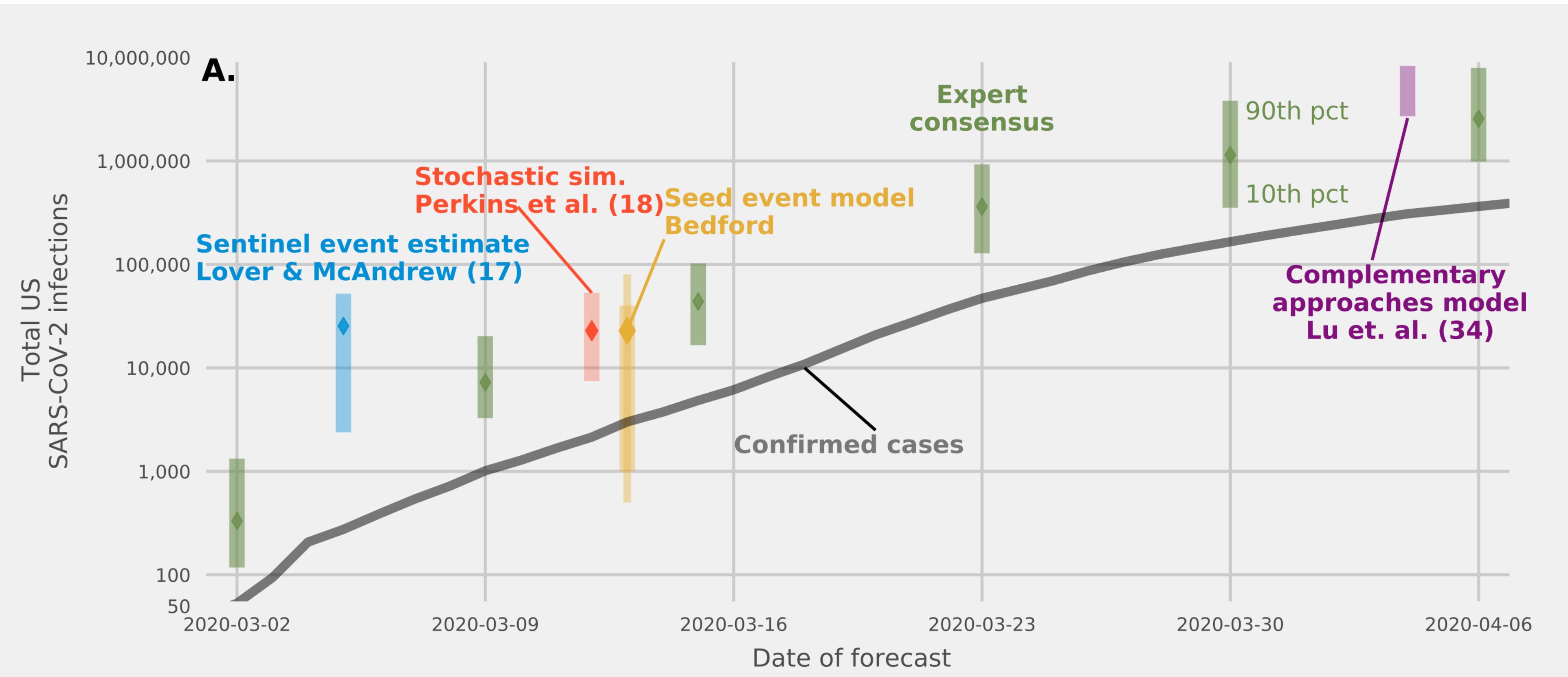


Expert and model predictions agree

Experts predict many more total infections than confirmed infections

Their estimates of the fraction of detected cases is consistent

Predictions

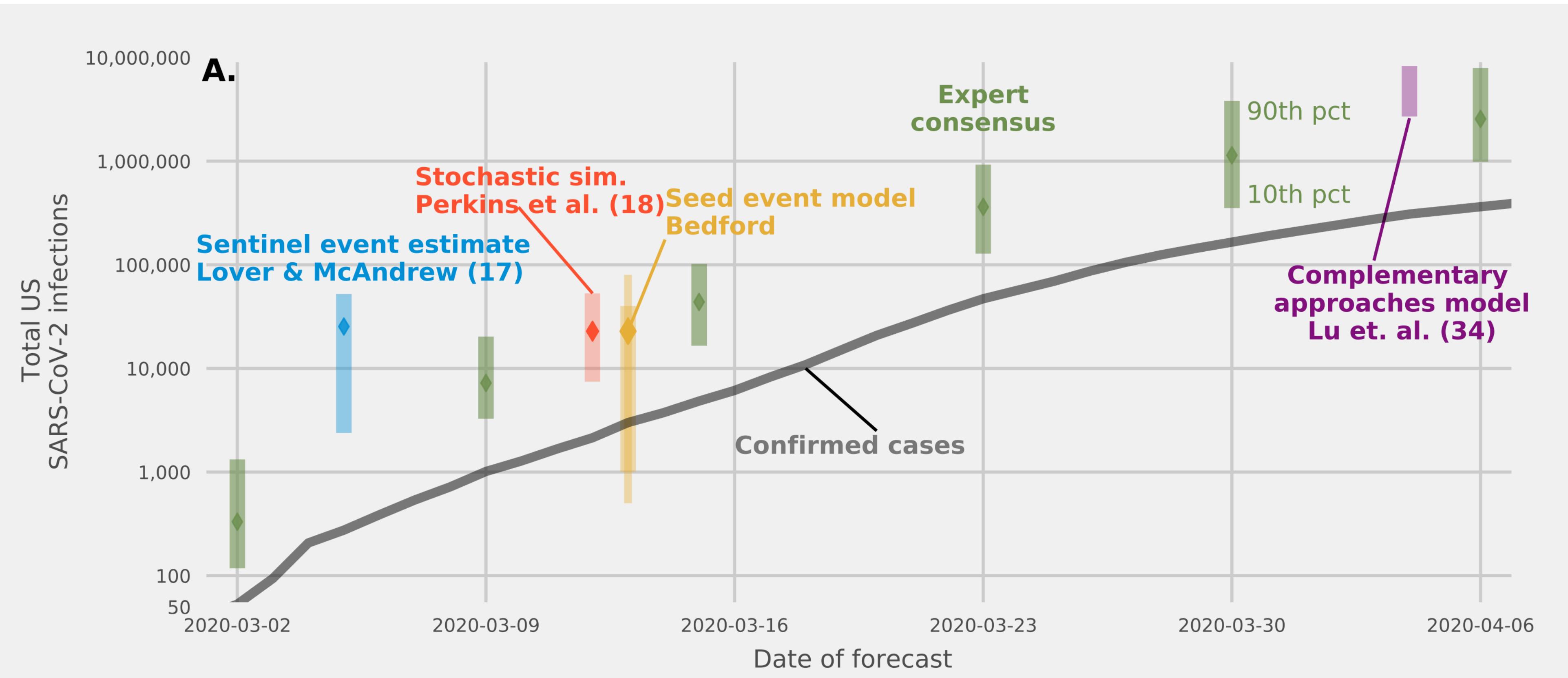


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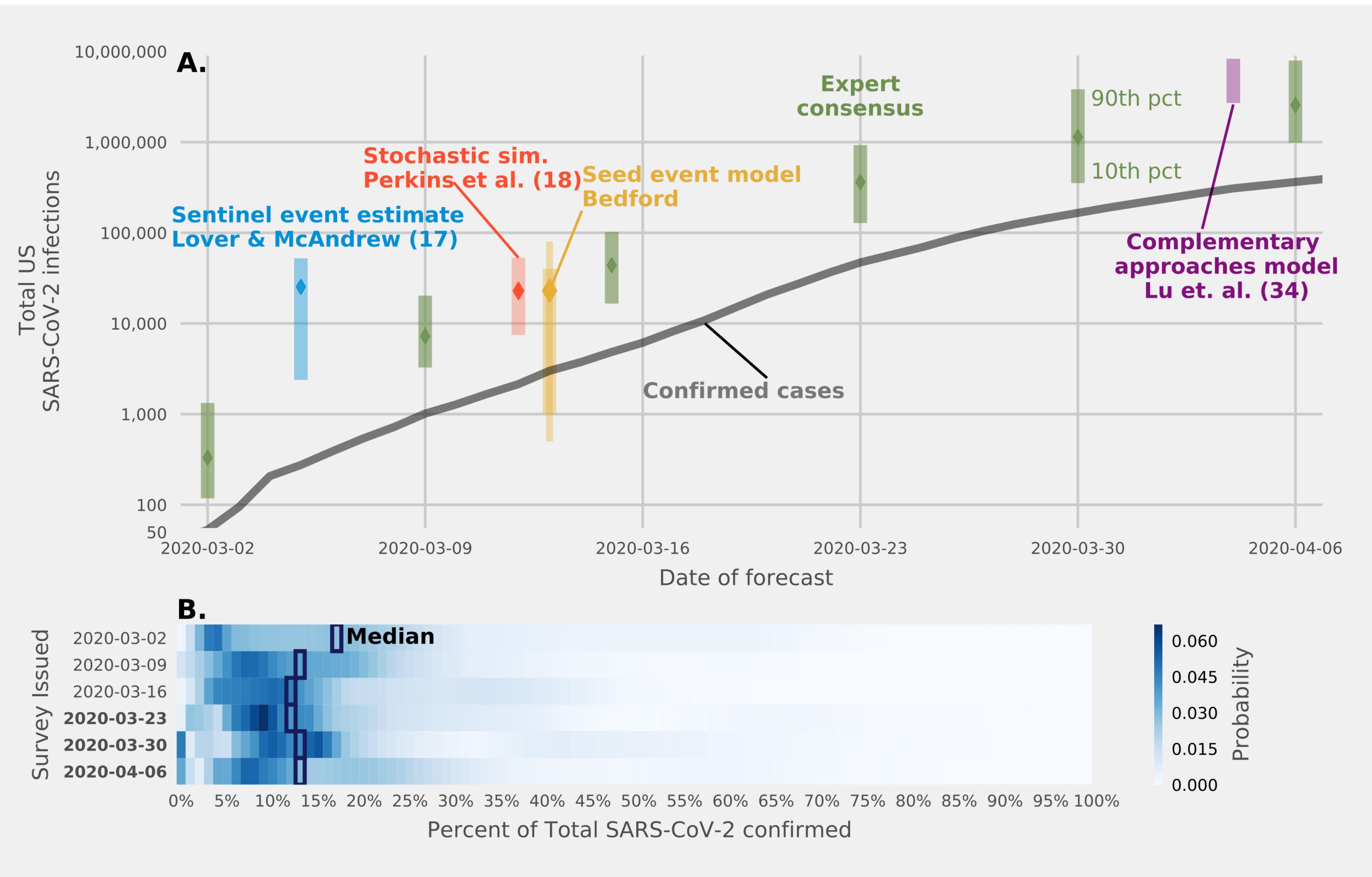


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Predictions

Deaths

Hospitalizations

Total infections

Confirmed cases

Predictions

As shown in the table and figure above, [COVID Tracker](#) reported 751,062 total confirmed cases of COVID-19 in the US as of Monday, April 20th at 9am. What is the number of total confirmed cases in the US that COVID Tracker will have in the daily report this coming Sunday, April 26th?

We provided a set of ranges of possible confirmed cases. Assign a probability to each bin corresponding to your belief of how many cases will be reported next Sunday. Each number must be between 0 and 1 and all numbers provided must sum to 1.

Less than 850,000 - [0,850,000]

0

Greater than 850,000 and less than or equal to 900,000 - (850,000, 900,000]

0

Greater than 900,000 and less than or equal to 950,000 - (900,000, 950,000]

0

Greater than 950,000 and less than or equal to 1,000,000 - (950,000, 1,000,000]

0

Greater than 1,000,000 and less than or equal to 1,050,000 - (1,000,000, 1,050,000]

0

Greater than 1,050,000 and less than or equal to 1,100,000 - (1,050,000, 1,100,000]

0

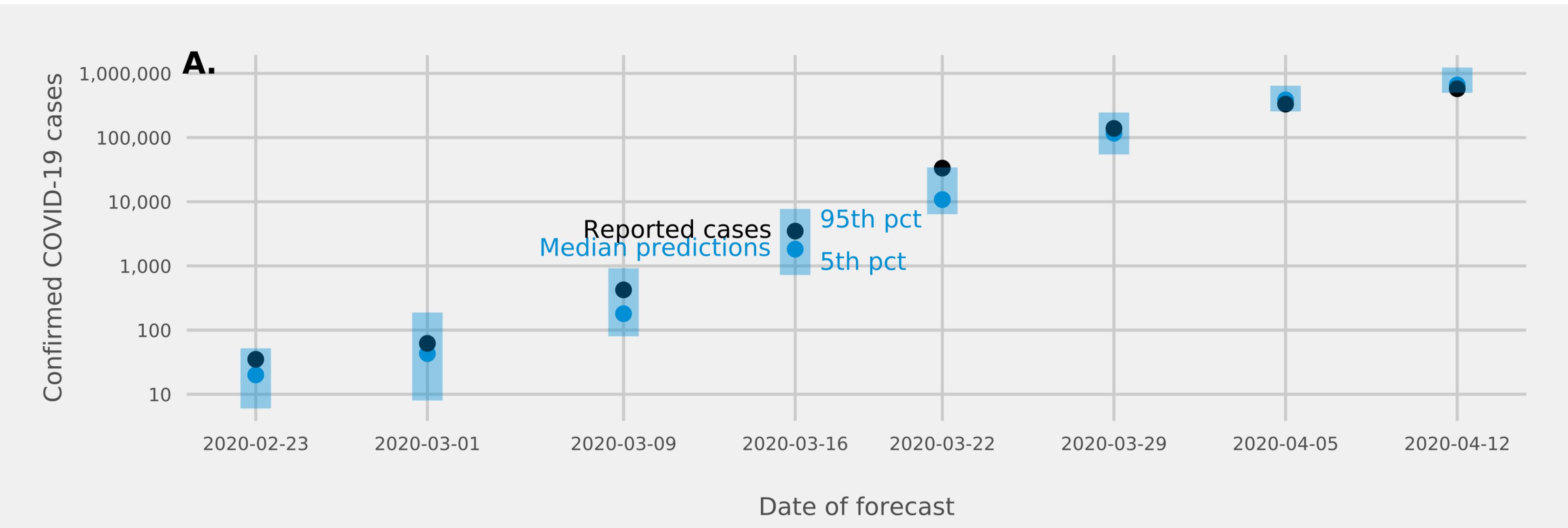
Greater than 1,100,000 - (1,100,000,)

0

Total

0

Predictions



The 90% prediction interval from our expert consensus covers the truth number of confirmed cases 7/8 times

Expert performance improves over time

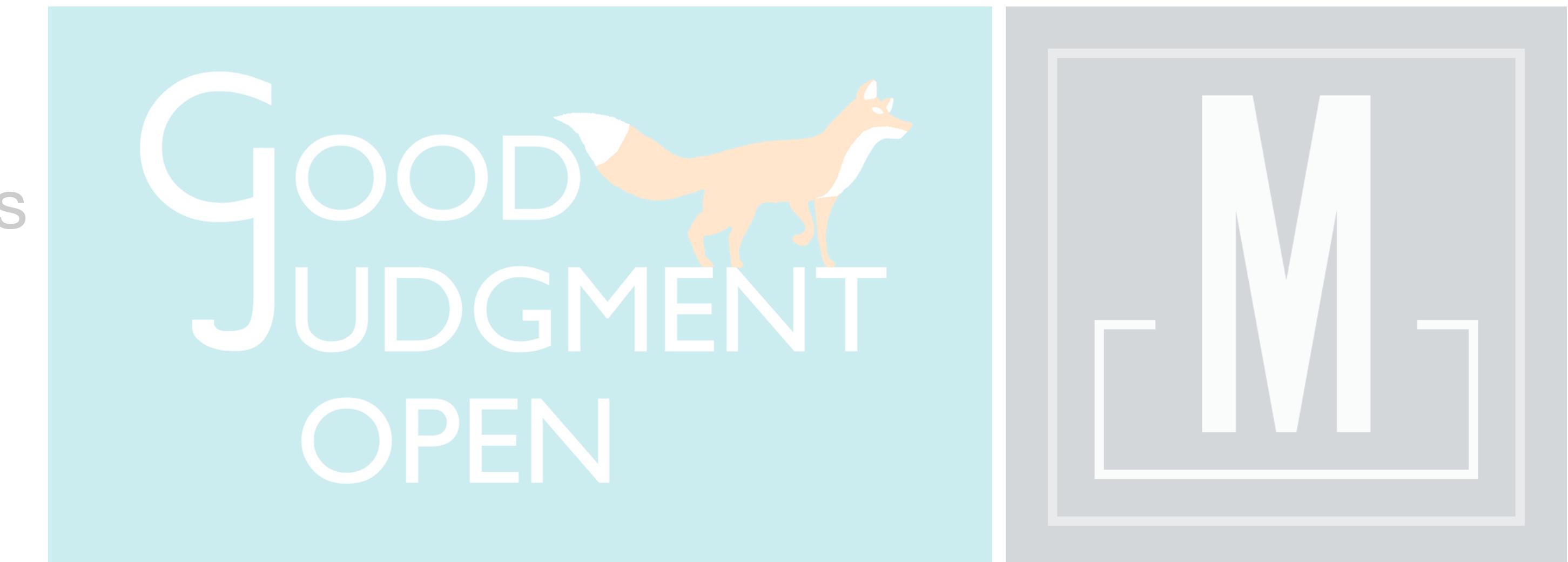
Recap

Experts gave fast, calibrated forecasts of the early COVID-19 outbreak to support decision making

Future

Shift to a complementary role to support decision making and forecast models

Good judgment Inc and Metaculus



Vaccines and Therapeutics

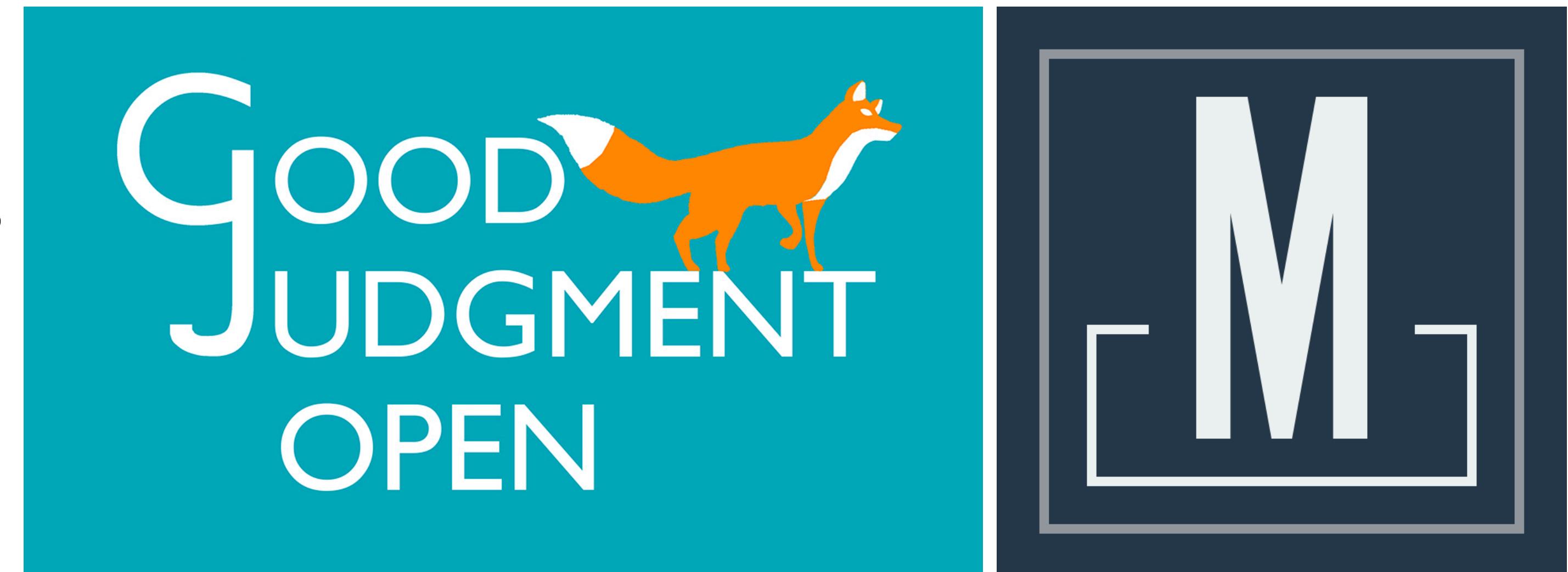
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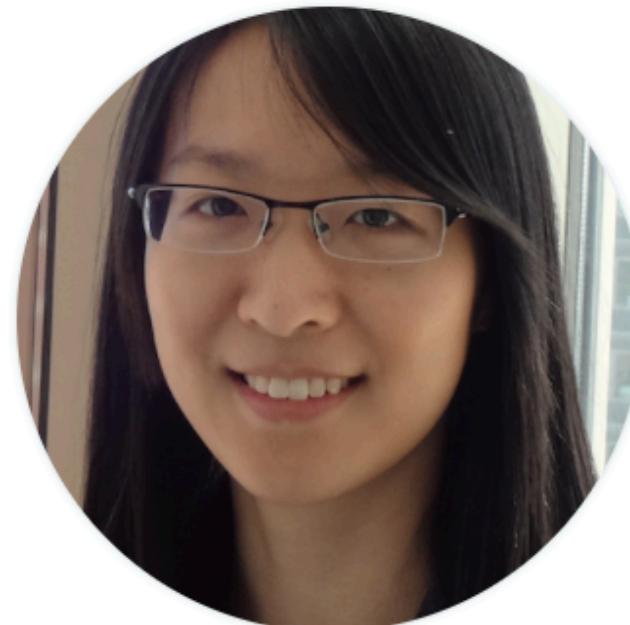
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Good judgment Inc and Metaculus



Vaccines and Therapeutics

Thank you to the lab

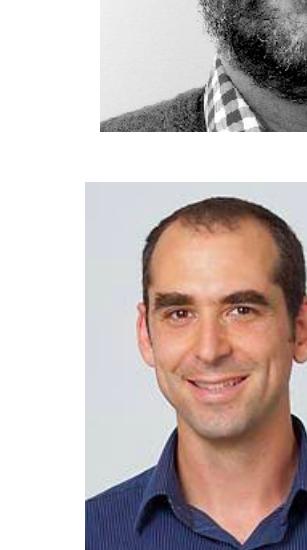
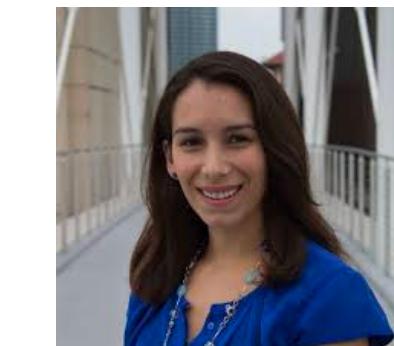
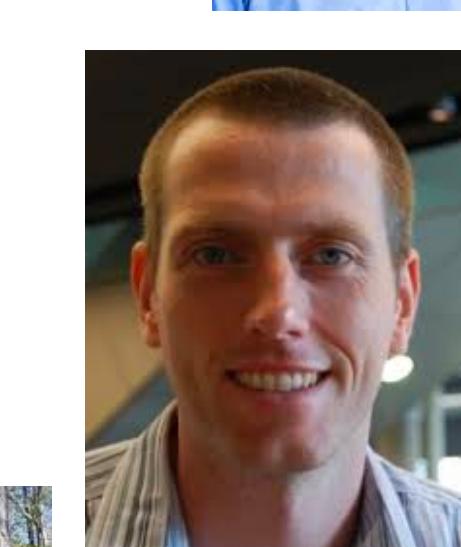
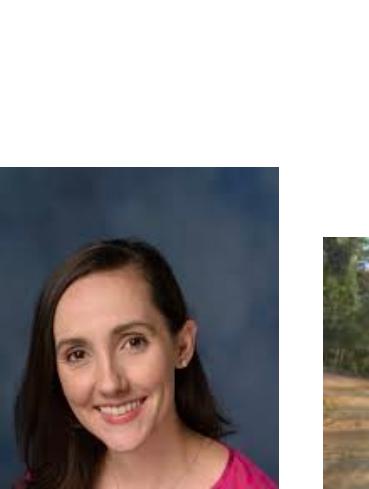
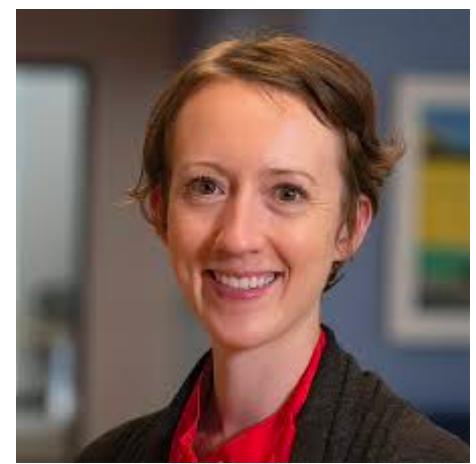


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Thank you to experts



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