

# Could a mass testing campaign or a brief shutdown avoid a second SARS-CoV-2 wave in NYC?

November 10, 2020

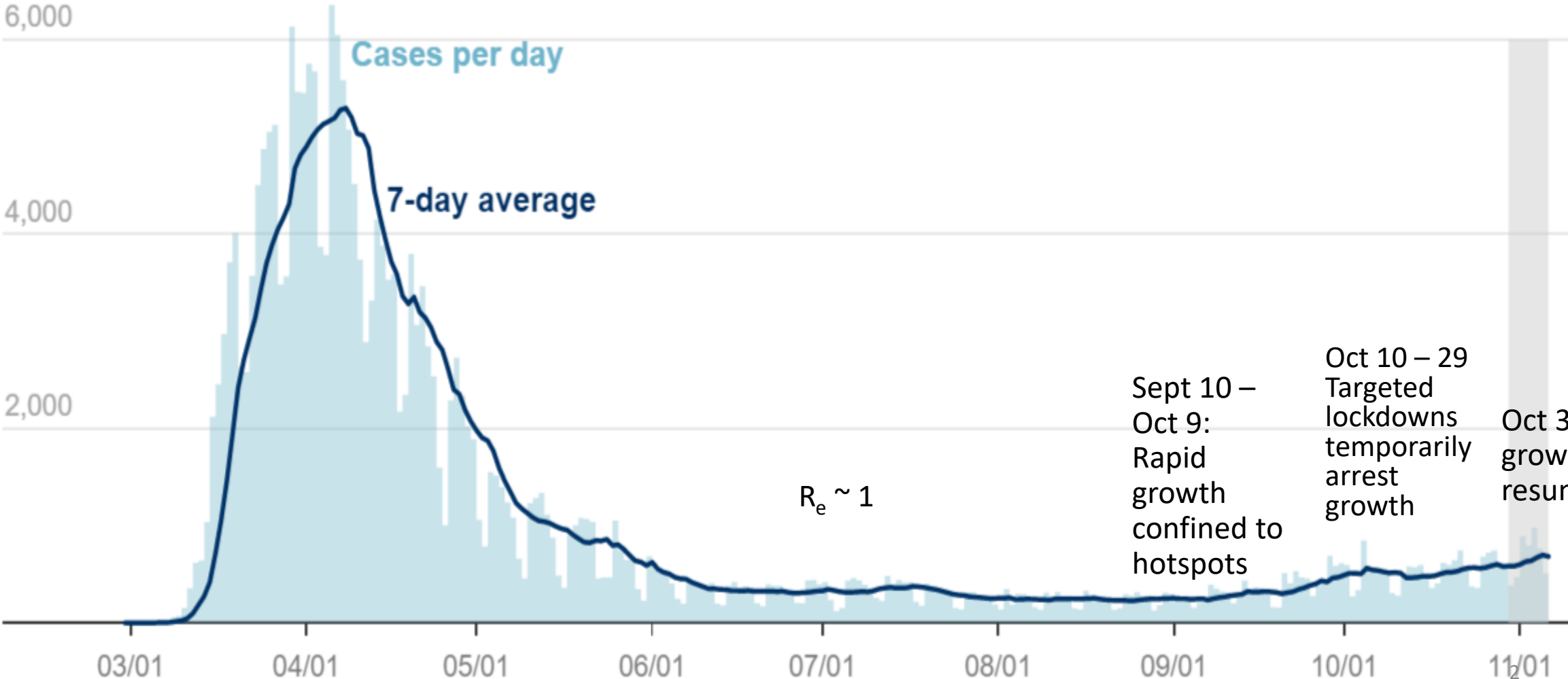
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**Department of  
Population Health**



# Status of NYC epidemic

Citywide: cases



Cases per day

7-day average

$R_e \sim 1$

Sept 10 – Oct 9:  
Rapid growth confined to hotspots

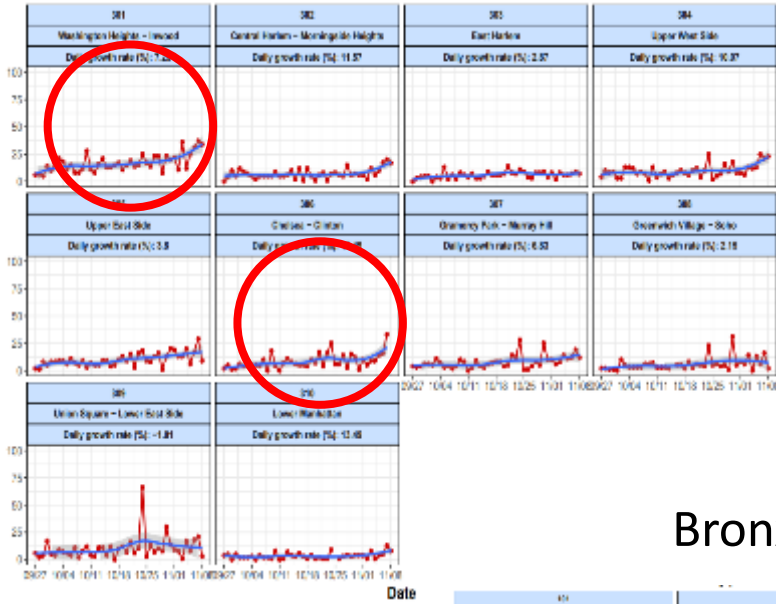
Oct 10 – 29  
Targeted lockdowns temporarily arrest growth

Oct 30:  
growth resumes

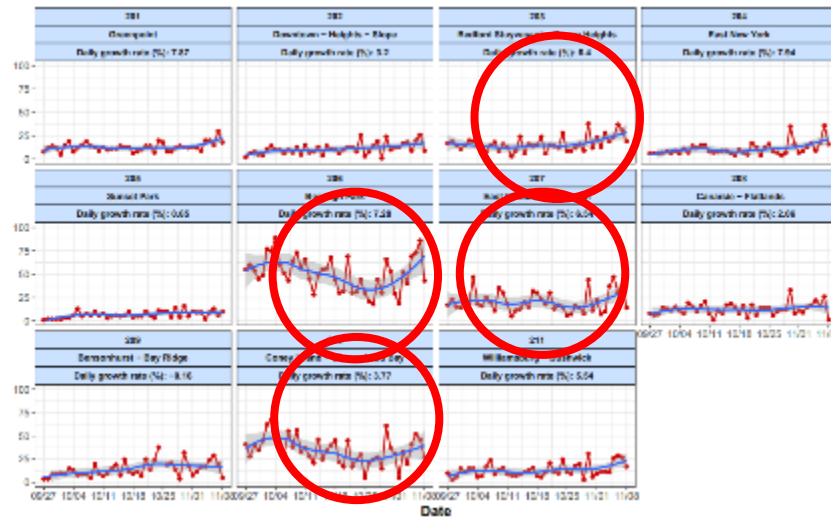
# Cases now rising in neighborhoods across the city

City-wide cases growing at 1.83% per day

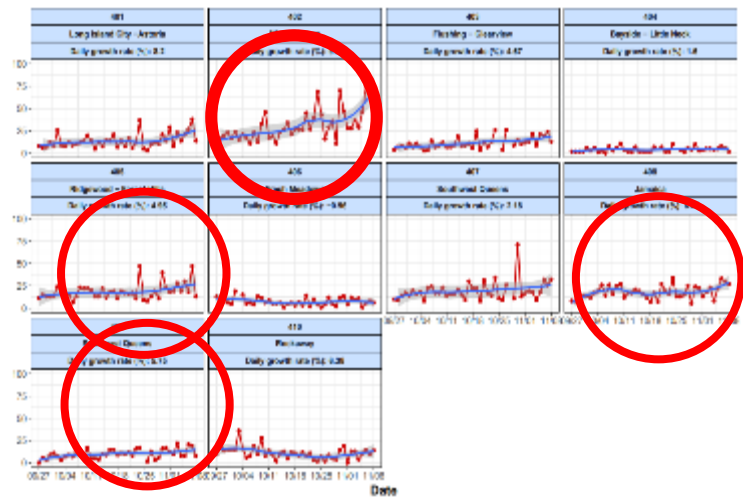
## Manhattan



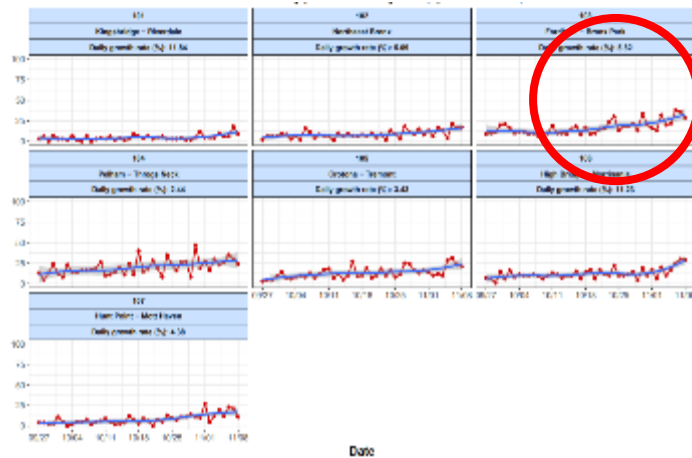
## Brooklyn



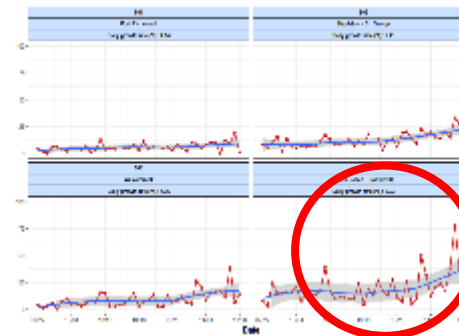
## Queens



## Bronx



## Staten Island



# Could mass testing prevent a second wave?

There is precedent for mass testing campaigns in China and, recently, Slovakia

World Report



## Slovakia to test all adults for SARS-CoV-2

Slovakia plans to be the first country to test its whole population for SARS-CoV-2, but experts warn of logistical and technical challenges. Ed Holt reports from Bratislava.

Slovakia has begun a massive operation to test its entire adult population for SARS-CoV-2 in a bid to halt what its government has said is an alarming acceleration of the spread of the virus in the country.

An initial 3-day pilot testing scheme in four regions in the north of the country that have become infection hotspots began on Oct 23, 2020, ahead of mass testing of the rest of the population on the two weekends of Oct 30–Nov 1, and Nov 6–8. But questions remain about the effectiveness and safety of an operation that was only announced

testing site and take an antigen test. After being tested, people must wait in a separate disinfected room and, around half an hour later, will be given their results.

Anyone testing positive must remain in strict self-isolation at their home for 10 days, or they can go to a quarantine facility provided by the state. Many shops are being closed and restrictions on movement imposed

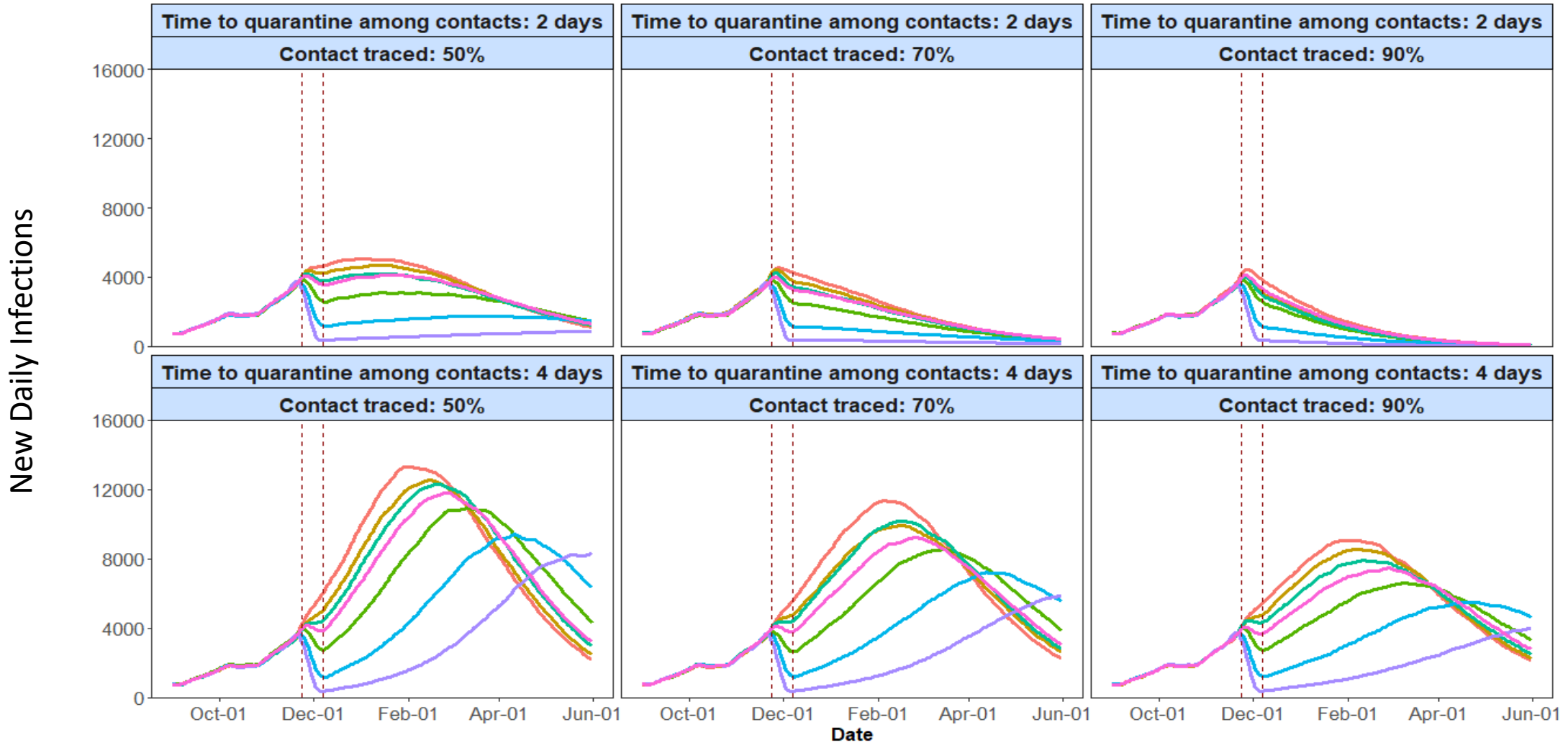
**“This kind of testing can’t be implemented overnight. Doing so would be optimistic to the point of fallacy.”**

Scientists have questioned the use of antigen tests, which WHO has said are not suitable for mass testing unless used alongside PCR tests. The tests that have been purchased by the government include BIOCREDIT COVID-19 Ag (RapiGEN, South Korea) and Standard Q COVID-19 Ag (SD Biosensor, South Korea). The Prime Minister Igor Matovič, reading from the package insert for the latter, said the test has a specificity of 99.68% and a sensitivity of 96.52% compared with PCR tests. One study, however, has suggested that some specificities and sensitivities are much lower than

# Model scenarios for testing and tracing

- **Assumes that without further intervention, we are headed for a second wave**
  - Exponential growth begins in hotspots on Sept 10<sup>th</sup>, is arrested by targeted policies, then resumes city-wide on Oct 30<sup>th</sup>
  - Mid-range  $R_e = 1.17$
  - Pessimistic  $R_e = 1.30$
- **Impact of one-time mass testing campaign**
  - One-time mass testing campaign over two weeks starting on Nov 24<sup>th</sup>
    - No test, 2 million, 4 million, 8 million, 14 million, 28 million, 56 million tests over two weeks
  - After mass test campaign, return to current level of ~40,000 daily tests
  - Assumes sufficient tracing capacity
- **Impact of contact tracing performance**
  - Time from index's test to contact's quarantine: 2 or 4 days
  - Percentage of contacts traced (among all index cases): 50%, 70% or 90%

# New daily COVID-19 infections (Mid-range)



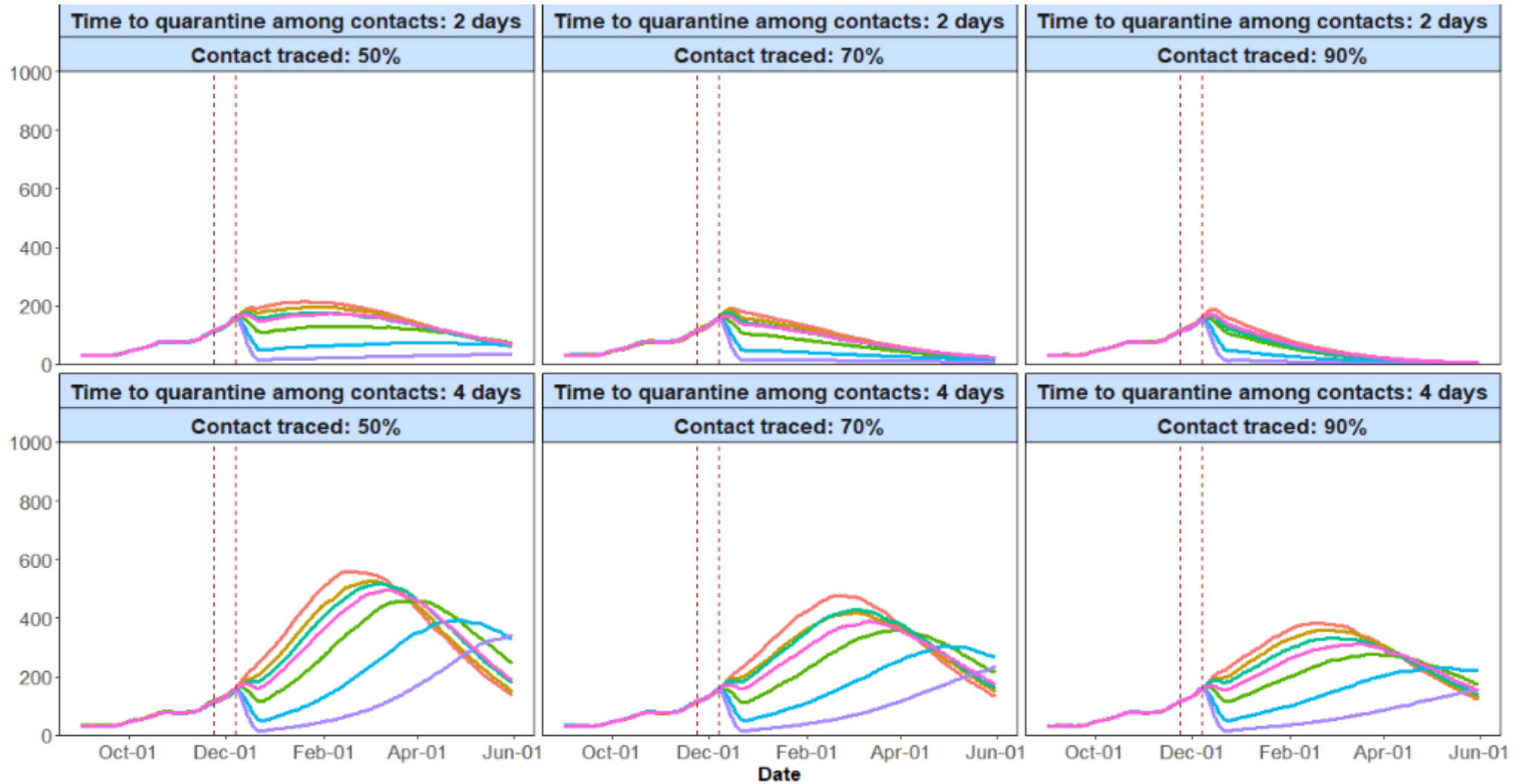
One-time mass test campaign over 2 weeks (Nov 24<sup>th</sup> – Dec 8<sup>th</sup>)

— No mass test   
 — 4 million   
 — 14 million   
 — 56 million  
— 2 million   
 — 8 million   
 — 28 million

\*Time to quarantine represents the time from the index's positive test until the contacts are quarantined.

# New daily COVID-19 hospitalizations (Mid-range)

New Daily Hospitalizations



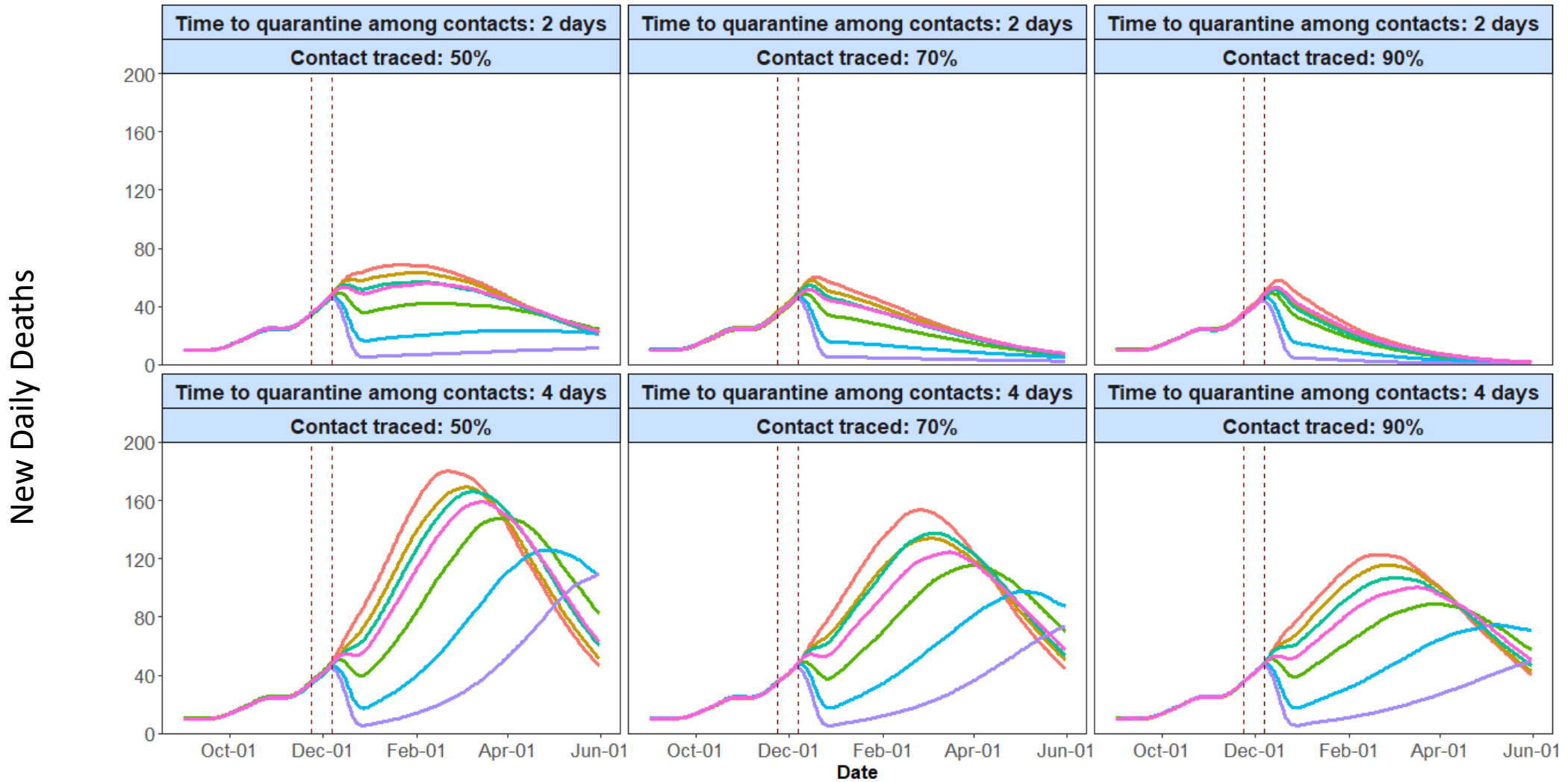
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# New daily COVID-19 deaths (Mid-range)



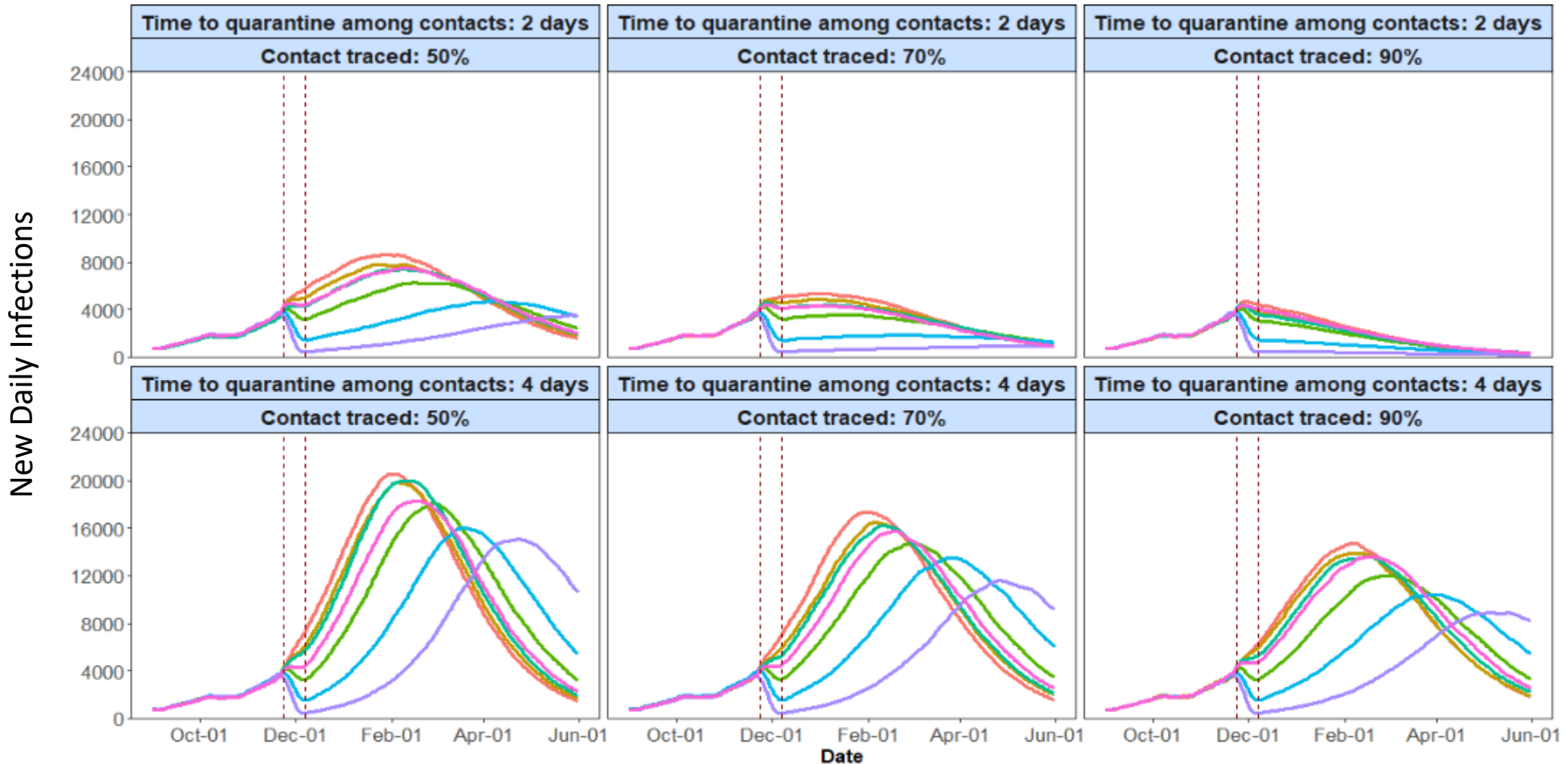
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# New daily COVID-19 infections (Pessimistic)

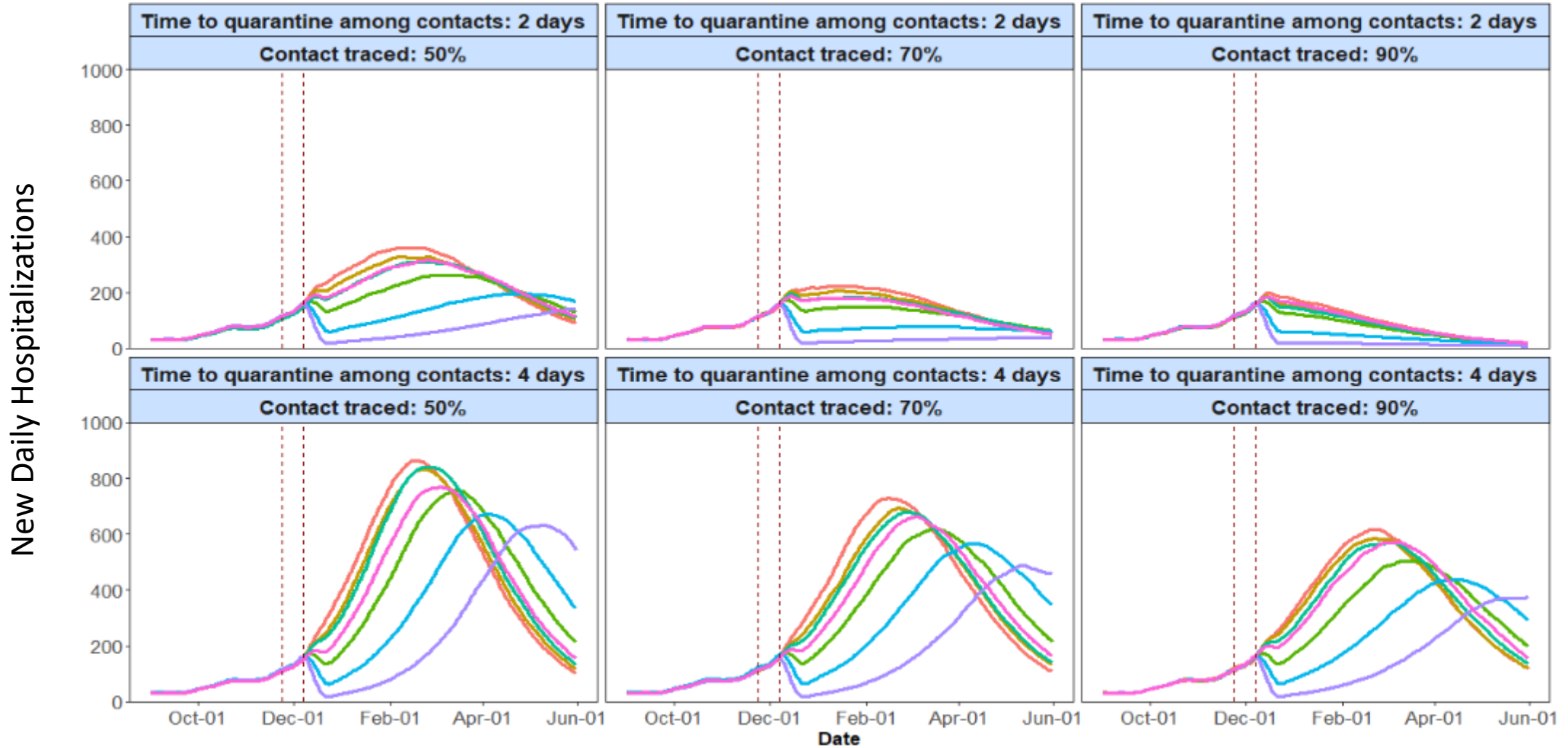


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# New daily COVID-19 hospitalizations (Pessimistic)

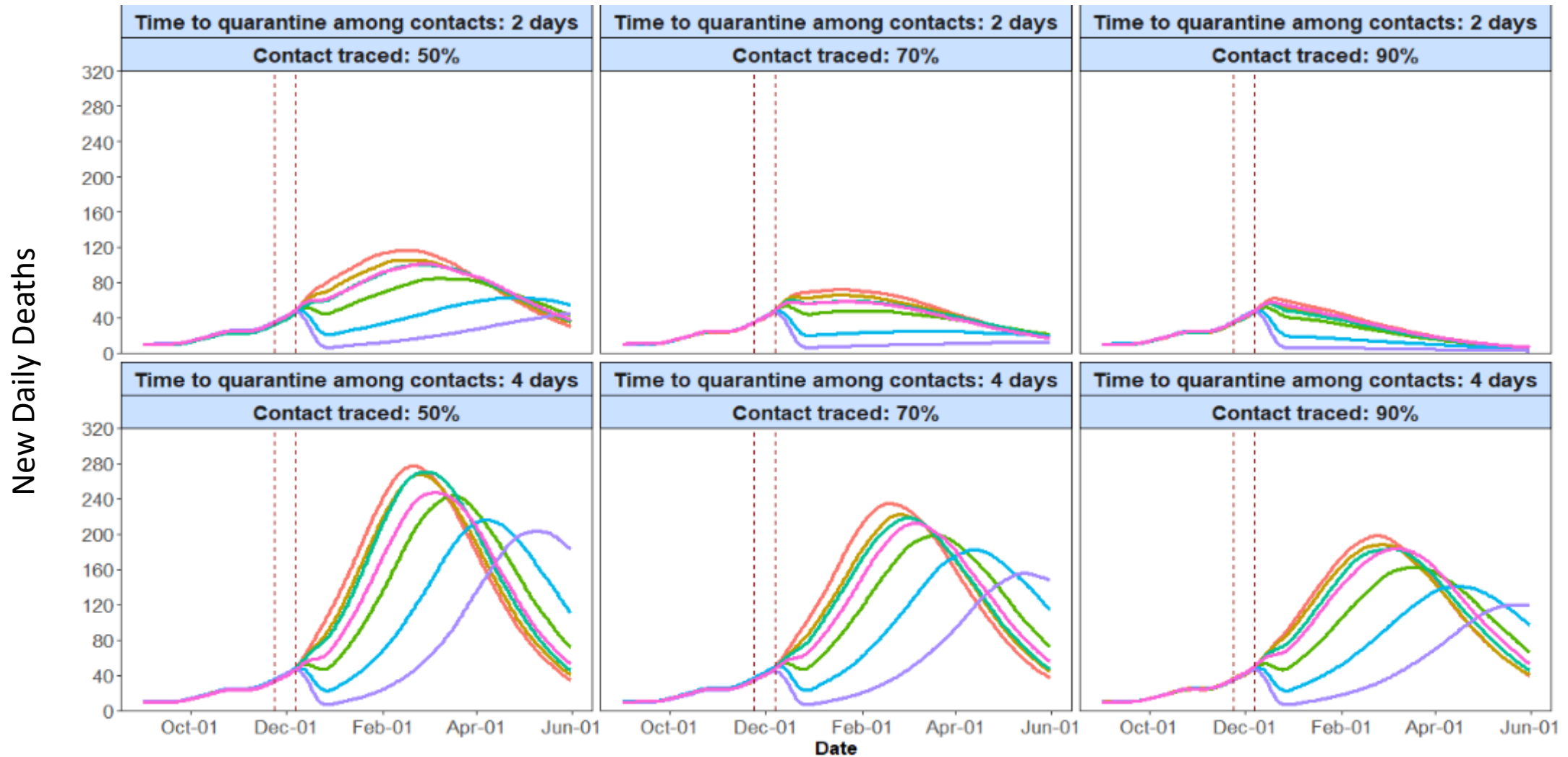


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# New daily COVID-19 deaths (Pessimistic)



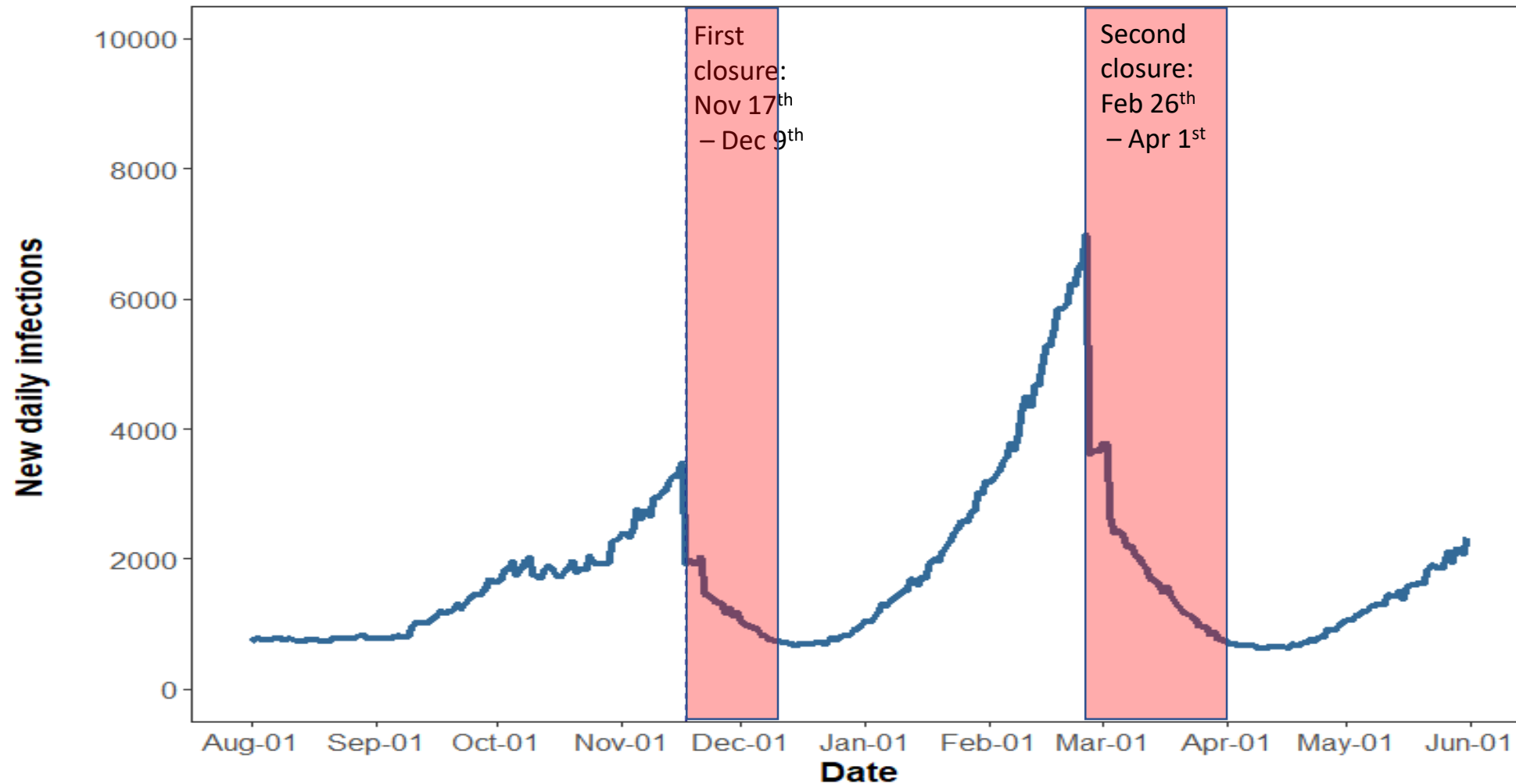
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# Could a time-limited shutdown to contain a second wave?

New Daily Infections in NYC

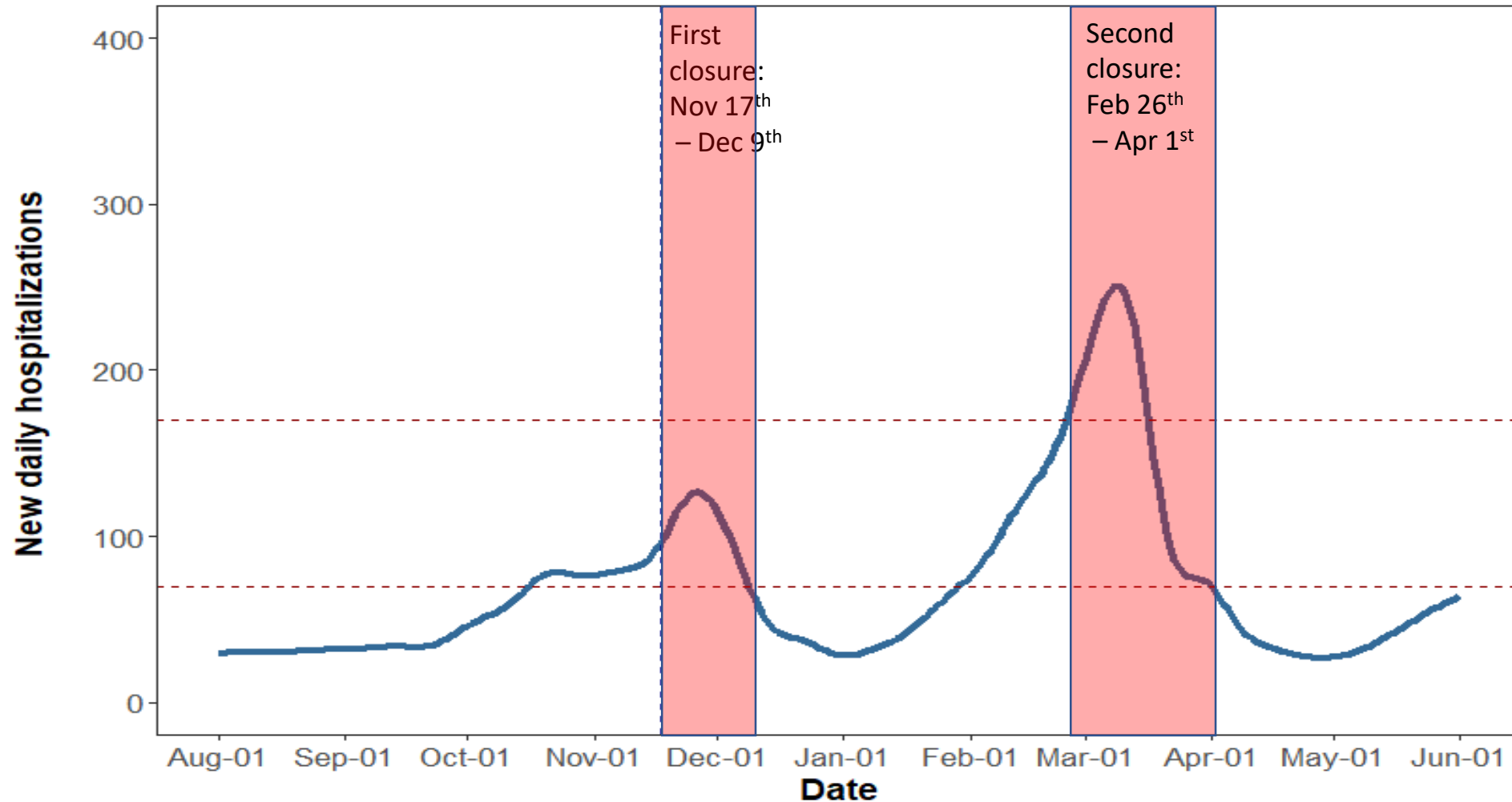


Overall, **29%** of the time is spent under shutdown between Nov 17<sup>th</sup> and May 31<sup>st</sup>.

\*Uses mid-range assumption of  $R_e = 1.17$ , no mass testing campaign, and 70% of all contacts of index cases traced and quarantined within 4 days of index's test. Assumes first closure on Nov 17<sup>th</sup>, re-opening occurs when hospitalizations fall below 0.8 per 100,000, and re-closing when hospitalizations exceed 2 per 100,000

# Could a time-limited shutdown to contain a second wave?

New Daily Hospitalizations in NYC

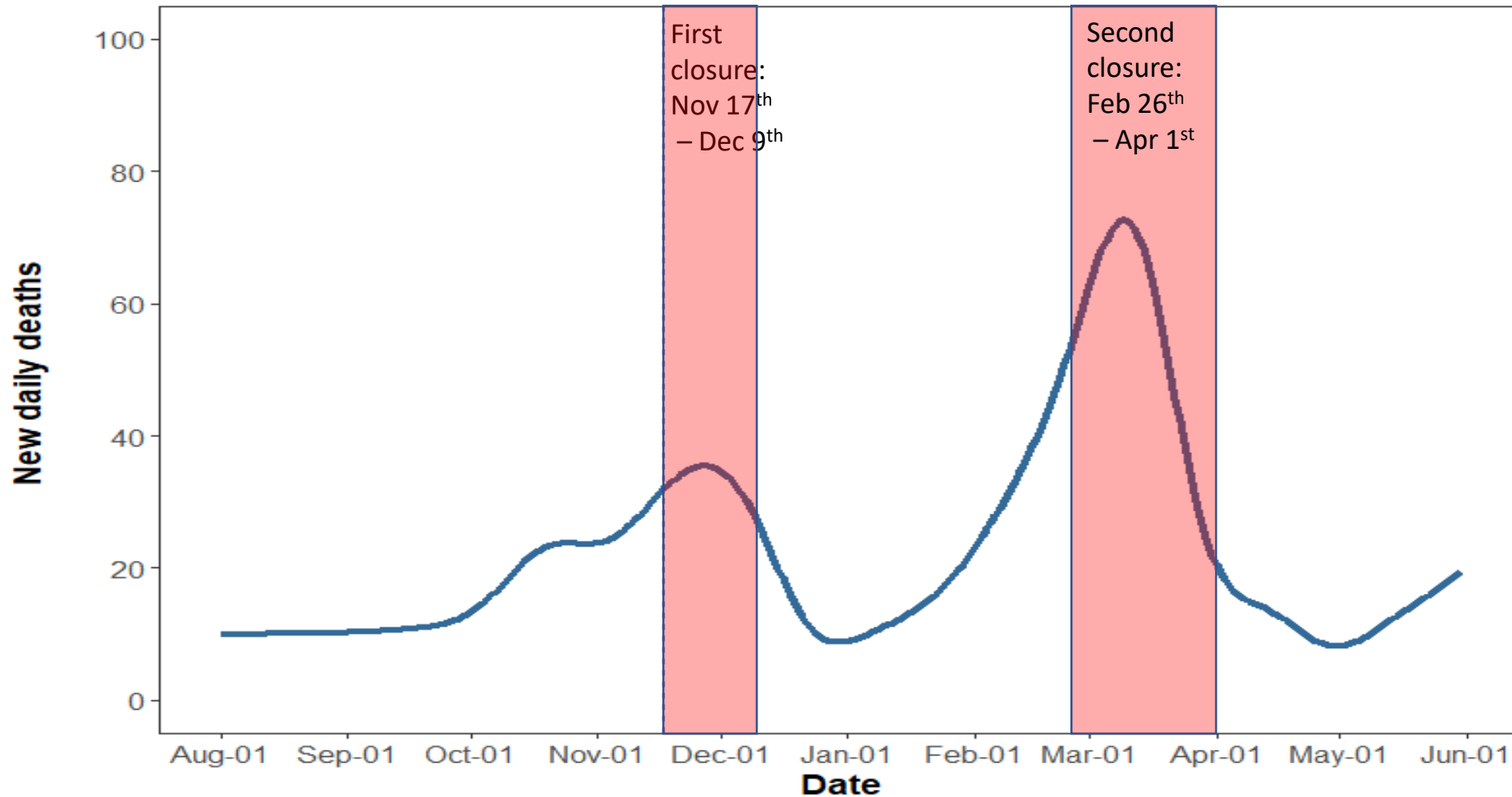


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# Could a time-limited shutdown to contain a second wave?

Daily Deaths in NYC



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# Conclusions

- A second wave appears likely without further intervention.
  - Daily deaths could peak at  $1/4^{\text{th}}$  to  $1/3^{\text{rd}}$  of first wave at current levels of testing and tracing
- A mass testing campaign, conducted over two weeks, could...
  - Suppress infections, hospitalizations, and deaths for 2 weeks if  $\geq 14$  million tests given
  - Delay and attenuate a second wave if  $\geq 50\%$  of contacts traced & quarantined 4 days after index's test
  - Avoid a second wave if  $\geq 50\%$  of contacts traced & quarantined  $\leq 2$  days after index's test
  - Bring the epidemic to low levels if  $\geq 70\%$  of contacts traced & quarantined  $\leq 2$  days after index's test
- The time until tracing and quarantine refers to time since the index was tested. It includes laboratory delays, interviewing the index, reaching the contact, and initiating quarantine.
- The percent of contacts refers to *all* contacts of *all* positive index cases, not just those who participate in contact tracing.
- Without mass testing or more rapid tracing, NYC would need to spend 29% of the winter and spring under lockdown to suppress a second wave.