Public Health
Prevent. Promote. Protect.

Santa Cruz County

COVID-19 Forecasts and Analyses For Santa Cruz County

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Objectives

- Communicable Disease Response
- General Disease Modeling
- Modeling the Epidemic in Santa Cruz County
- Additional Analyses

PROTECTING PUBLIC HEALTH

Santa Cruz County's Communicable Disease Unit [CDU] protects community health by investigating and responding to outbreaks and infectious diseases of public health concern.

A community member becomes ill with an infectious disease.

Following a medical visit, a health care provider diagnoses the person. A lab test and result are often needed to confirm the diagnosis.

REPORT

The law requires health care providers and labs to report certain diseases to the local health department.

CDU receives reports for the residents of Santa Cruz County.

CDU RESPONDS

1. INVESTIGATE

CDU Staff interview the sick person to learn more about where the person has been and who they were around while they were sick.

2. TAKE ACTION

Depending on the situation, the sick person may have to isolate by staying home from work or school.
CDU Staff help ensure the person gets the correct care and treatment.

3. EDUCATE

CDU Staff educate the sick person, their contacts, health care providers, and community members about the disease.

4. MONITOR

CDU Staff continue to watch for new cases by working with health care facilities and other partners. In some cases, a sick person's close contacts may be contacted and closely monitored for symptoms.

5. ANALYZE

CDU Staff also analyze the data they receive and report their findings to the California Department of Public Health. This helps our current and future work on disease outbreaks.

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Communicable Disease Response

Public Health Nurse Case Investigations

- Care and Follow-up for Known Cases
- Contact Tracing
- Exposure Risk Notifications and Education
- Outreach to Congregate Living and High-Risk Populations

General Surveillance

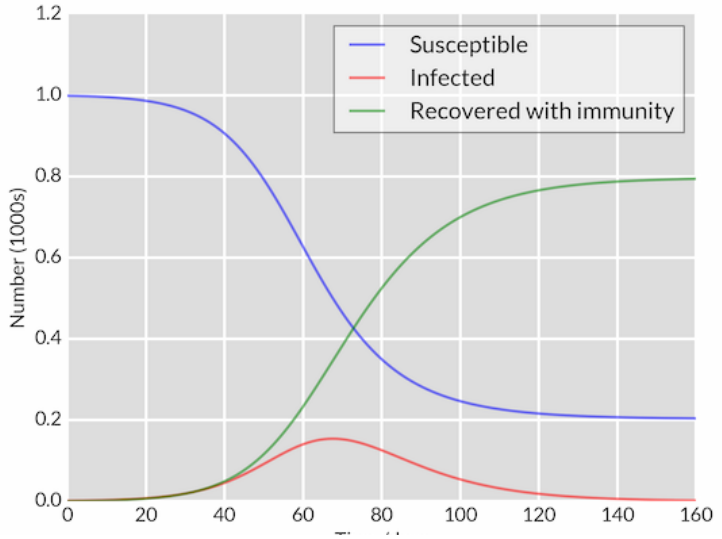
- Collaborate with the State, Public and Private Labs, and Medical Providers to Provide:
  - Data on Known Cases
  - Sources of Exposure
  - Age/Gender/Race Demographics

COVID-19 Forecast Modeling and Data Analyses

- County Hospitalized Cases Projections
- Estimate County Doubling-Time
- Comparing Confirmed Cases in California by County

Disease models…

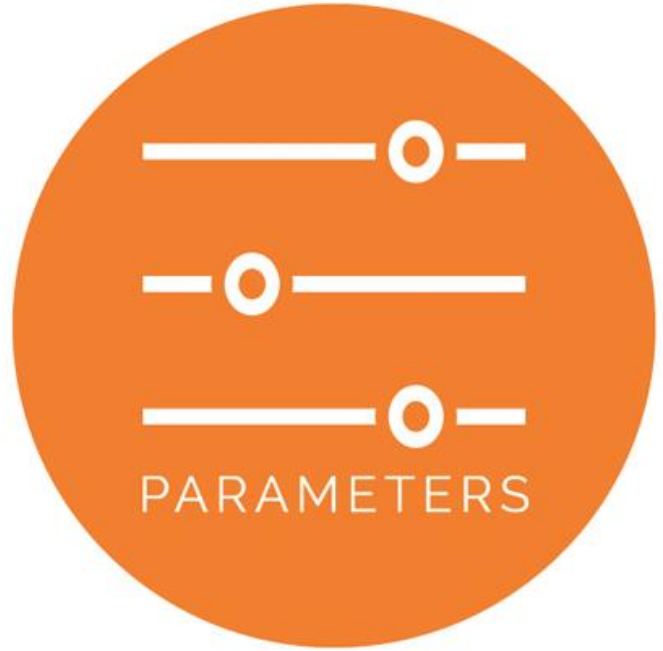
- Make projections during an outbreak
- Are based on parameters that reflect our knowledge about the disease and the population
- Show how the disease moves through a population



Disease models rely on parameters.

Parameters…

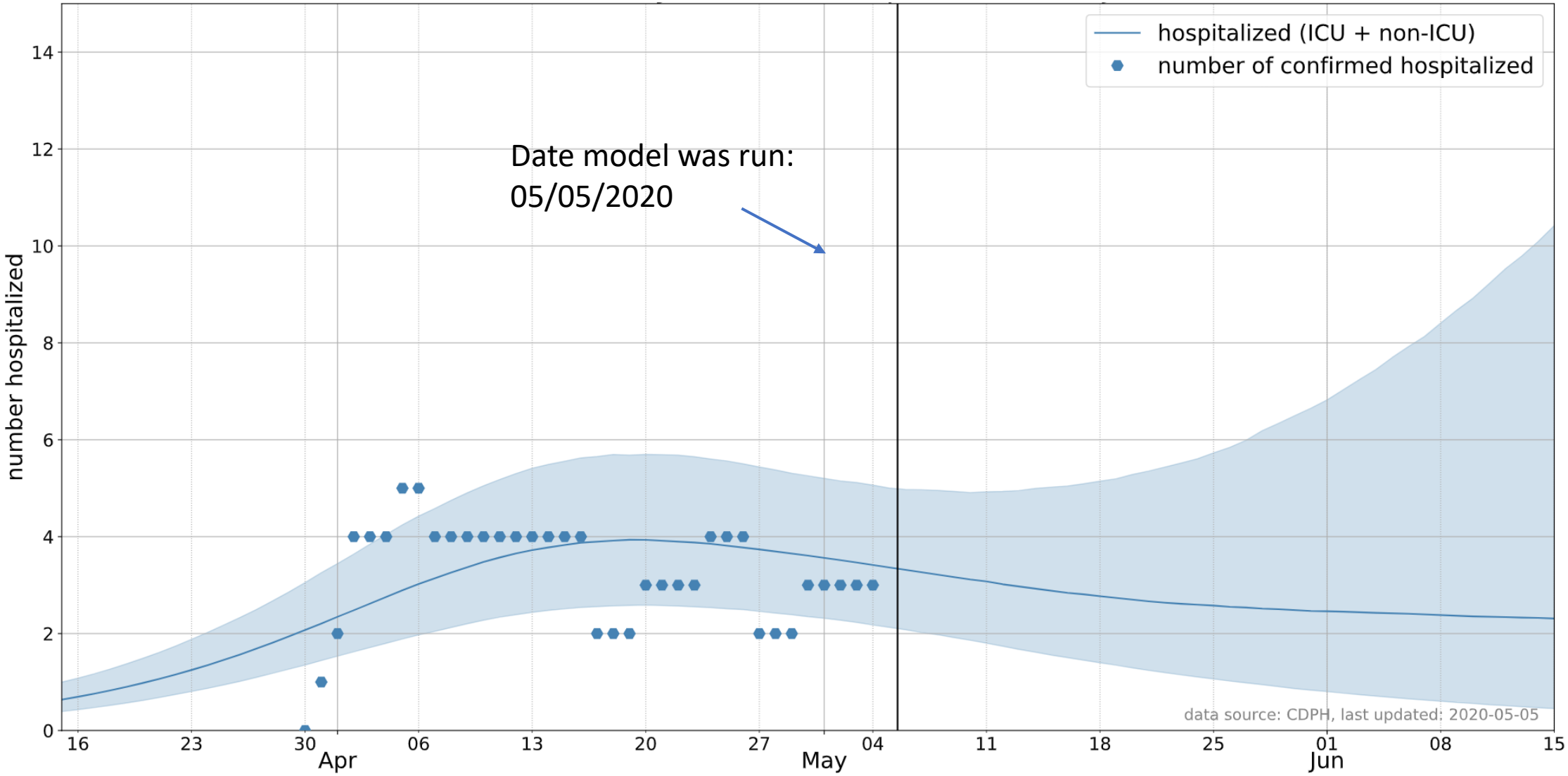
- Determine how the disease moves through the model population
- Initially come from research and can be updated by the model using local data
- Heavily influence the model's projections



How does it work?

- The model is built on:
  - Parameters
  - Equations
  - Local Data (laboratory confirmed cases, hospitalizations, and deaths)
- Runs 4,000 simulations using a statistical analysis program, Stan
- It then fine-tunes the parameters inputted using the local data
- Projects a range of different scenarios that fit the inputs provided

Santa Cruz County
COVID-19 Hospitalization Projections
(non-cumulative)



Santa Cruz County Model

Strengths

- Provides a median estimate and uncertainty around that estimate using credible intervals
- Provides a range of plausible outcomes based on current knowledge of COVID-19
- Fits to local data
- Helps us plan for hospital surge
- Projects based on current understanding of policy interventions and human behavior

Considerations

- Limited by our knowledge of the disease.
- Could drastically change if we were to get a cluster in a congregate setting
- It cannot account for major, future changes in planned policy interventions or human behavior.
- Does not predict the future

General Limitations of Disease Modeling

- Since every model is based on a set of assumptions and parameters, it is helpful to review other models to compare projections, trends, and methods. Each model will likely show different results.
- Models have wide levels of uncertainty and projections will change as new research and data about COVID-19 become available.
- Models do not “predict” the future and should be used with other resources for planning purposes.

Informing Planning Efforts

- Disease modeling can help us estimate the date and magnitude of a “surge”.
- However, it cannot give us all the answers.
- Given the limitations, additional data analyses and metrics are also used to inform planning efforts.

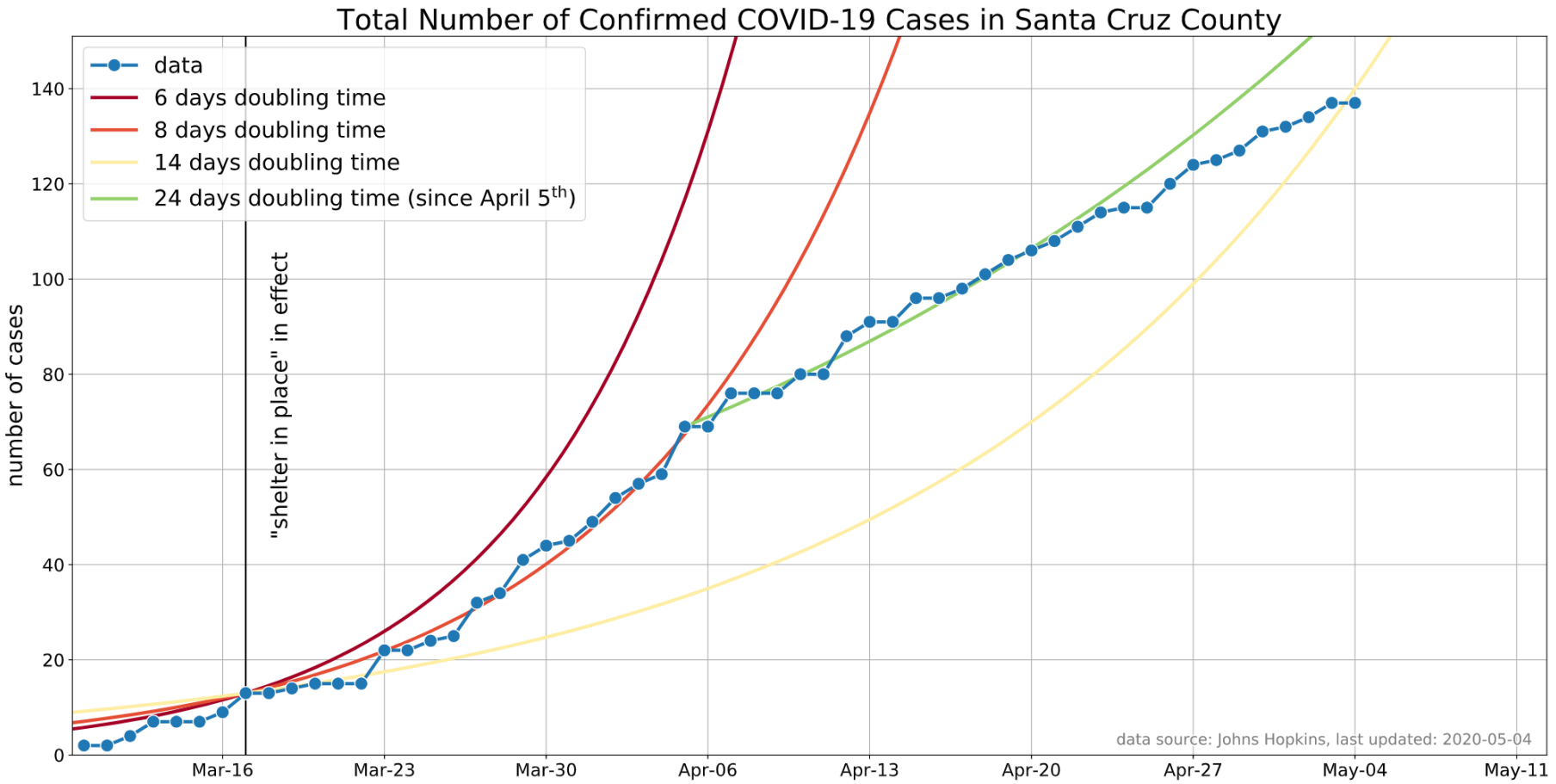
Doubling-Time Analysis

The time it takes for the cumulative case count to double

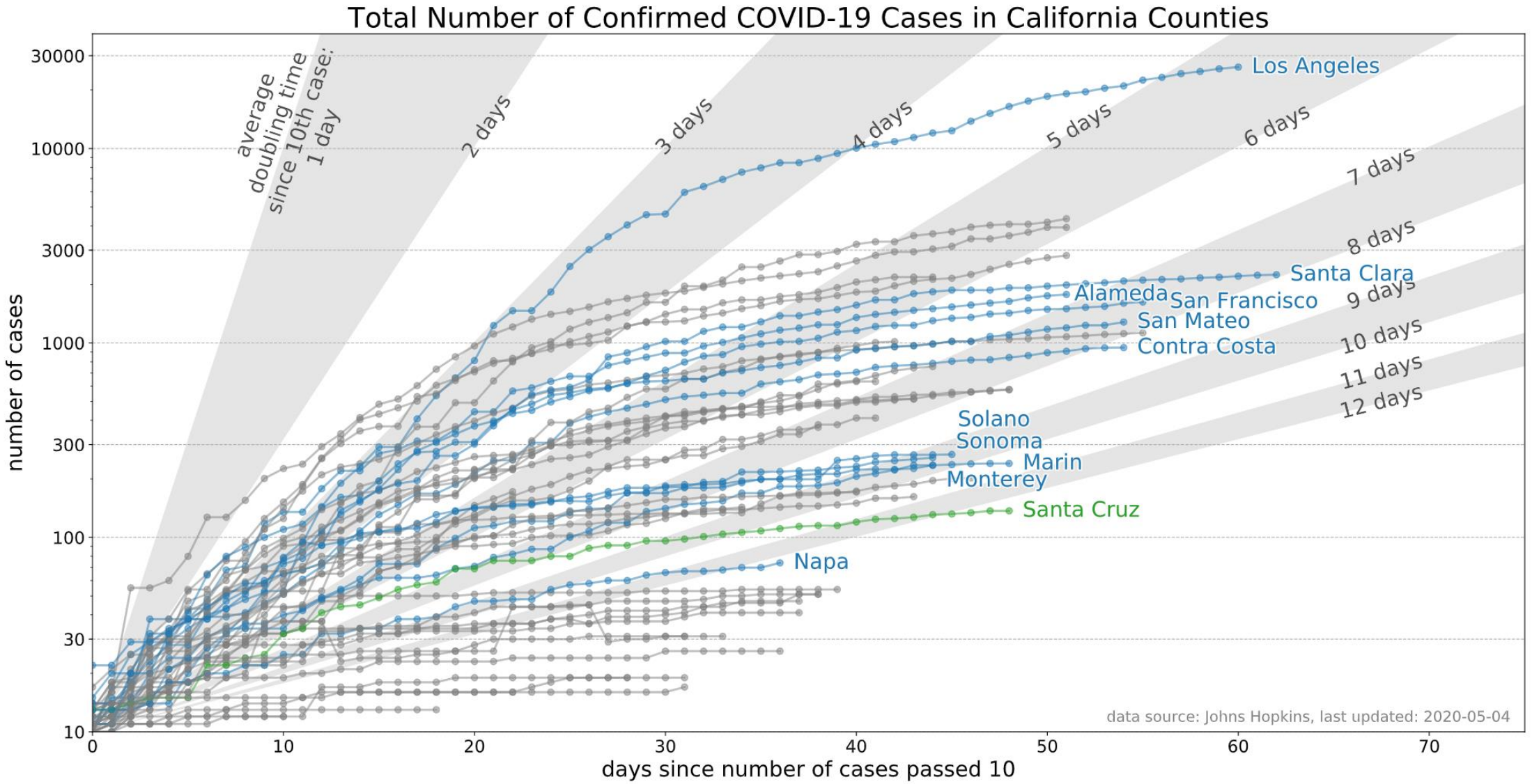
Indication of spread in our community

A higher doubling-time the better!

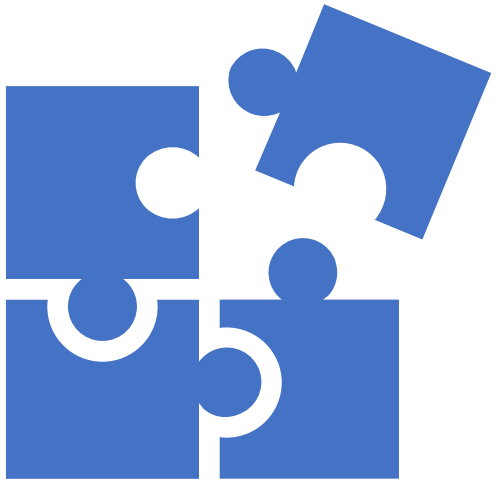
Santa Cruz County Average Doubling-Time



Comparing to California Counties



Modeling for Recovery



- Disease modeling is a guide for modifying Orders, but not the only factor.
- The Governor has **six** indicators for the Roadmap to Reopening.
- Order modifications are guided by equity and health risk.

Acknowledgements

- Paul Mattern, PhD, UC Santa Cruz
- Incident Command Post, Disease Investigation Branch

Questions?

For more information, see our website. The model is updated every Wednesday.