The Coronavirus Pandemic:
How is Alameda County Doing?

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Quest's mission is to inspire and nurture everyday exploration for lifelong engagement with science and technology. One goal is to help people understand the science behind current events. Here we explain how science helps us understand how the pandemic is increasing in Alameda County. The data is updated daily.

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Authors Note: May 7, 2020 will be the last update of this article. All data reported here is now available on the web, including both per capita data and trend lines down to the county level. New hospitalization data (both confirmed and suspected cases) and new deaths per day are good indicators of whether things are getting better or worse. Hospitalization data for all CA counties can be found here. Alameda County has a good dashboard that shows hospitalizations.

The San Francisco Chronicle Coronavirus Tracker shows trend lines of new cases per day for all CA counties and is a good resource for latest developments out of Governor Newsom's office.   The New York Times is a good resource for the country and also includes data on a county level. Finally, Worldometer provides the most comprehensive global data and is expanding to include per capita and new cases. All other links reported at the end of this article are still good references for additional information.

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More specifics and data at the local level are becoming available. New Chart 3 showing trending of new cases for Alameda has been added. Santa Clara County shows a clear drop in new cases.   Alameda County is better than the state average but the trend line is not moving down substantially. This could be due to the increased testing now available. The total number of COVID patients in Bay Area hospitals, a good measure of the pandemic, is down 20% from a month ago and is continuing to drop.

Let's start with some questions you're probably asking...

- How does the incidence of COVID cases for Alameda County compare with other places? Are we above or below average?

- Is the California "Stay at Home" directive having any effect? When will we know?

- When will the number of new infections start to level off and eventually go down?

Sound familiar?

Is there data that can help us understand what is going on?

Yes and more is emerging everyday. Good starting points for relevant data are [worldometer](#) (country and state data), [SF Chronicle](#) (Bay Area county data), and [Politico](#) (testing data). We can't yet answer all of the questions posed above but we can definitely get started by understanding what data we need. Then we can all compare what is going on in Alameda County with other locations. Click on any of the blue underlined links in this article for more information.

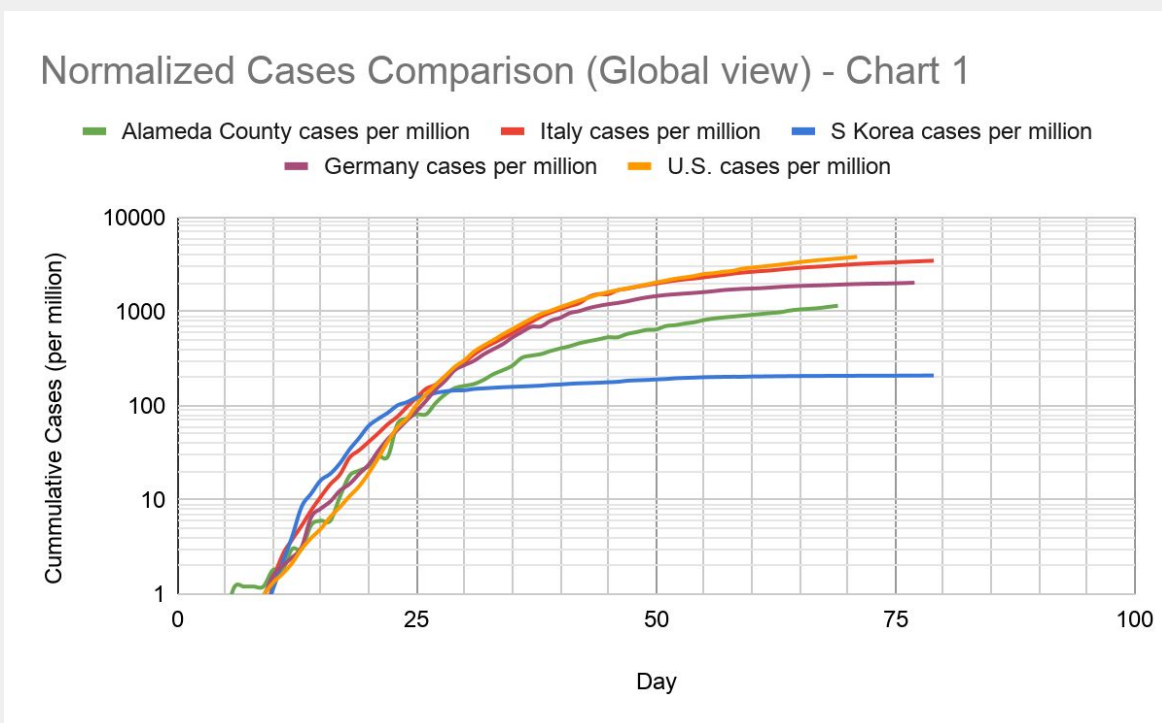## Normalizing the data is a key first step!

Up to this point, many reports of infections around the world have been simple tabulations of the number of cases reported to date without any kind of correction factor to take into account the differences in population for each country or region. We can't compare different regions unless we first normalize by dividing the data by the population size for each location, which is what we've done here.   Second, it's difficult to say much about how a region is doing unless we actually make a graph of the data as a function of time. Only then can we begin to see trends that signify whether the situation is worsening or that the measures taken are working and things are getting better.

Who should we compare Alameda County to and why?

To understand how Alameda County is doing we've chosen to compare our local data with countries representative of worst case (Italy), best case (S. Korea), and one similar to us (Germany) all of whom are significantly further along in the pandemic. Clearly there are other countries of interest as well but this is a good starting point. We are also looking at data from the state of California as a whole and a few other Bay Area counties.

Now let's look at the graphs.

In the graphs below the logarithm of the normalized cases is shown as a function of time. Plotted this way, exponential growth should appear linear early in the pandemic. Each graph shows Alameda County data (while Berkeley reports separately from the rest of Alameda County, their numbers are included in our graph) along with other places as a function of days into the pandemic. The data for each location has been shifted so that they coincide around day 10 (prior to this the numbers are very small). In Chart 1 Alameda County data (in green) is plotted next to data from the four countries labeled at the top of the chart. You can see in the color code legend that Italy is red, South Korea is blue, Germany is purple and the U.S. is orange. In Chart 2 we've plotted three local Bay Area counties along with CA to show a comparison locally.

Normalized Cases Comparison (Global view) - Chart 1

Perhaps the first thing that is interesting to notice in Chart 1 is that all the curves follow the same general trend for the first 10 -15 days (from day 10 to day 25). Yes there are

some variations but the similarity is striking. Next, can you see when the data from South Korea (blue line) begins to hint that the situation there is changing, for the better? It is remarkable how the early containment measures they took resulted in drastic improvement that shows up around day 25 (or roughly 15 days into the pandemic). Their cases quickly begin to level off above 100 cases per million people. Beyond that they are not adding as many new cases as the curve flattens out. Unfortunately the story for Italy (the red curve) shows that normalized cases are still on the rise.   What you will also notice is that the U.S is still following the Italy curve trend and doesn't appear to be flattening like South Korea did.

What about Alameda County?

The numbers for Alameda county are small compared to the others in this plot but the data show that in the first 15 days we were on the same path as the U.S., Germany, and Italy. Beginning in early March, Alameda County was on about the same case growth trajectory as everybody else - normalized cases were growing exponentially and at approximately the same rate as other countries and our local Bay Area counties. We are now seeing the positive effects of the early California stay-at-home intervention. Alameda County's rate of rise is no longer exponential and has flattened. Our normalized cases are three times lower than the U.S. average and we are lower than other Bay Area counties except for Contra Costa. Alameda County's new cases per day has not started a clear downward trend. The shift is not as dramatic as S. Korea's cases and while the rate of rise has not completely flattened, it is steadily decreasing. For reference Governor Newsom made the announcement (March 19 or at about Day 20 in Chart 1.)

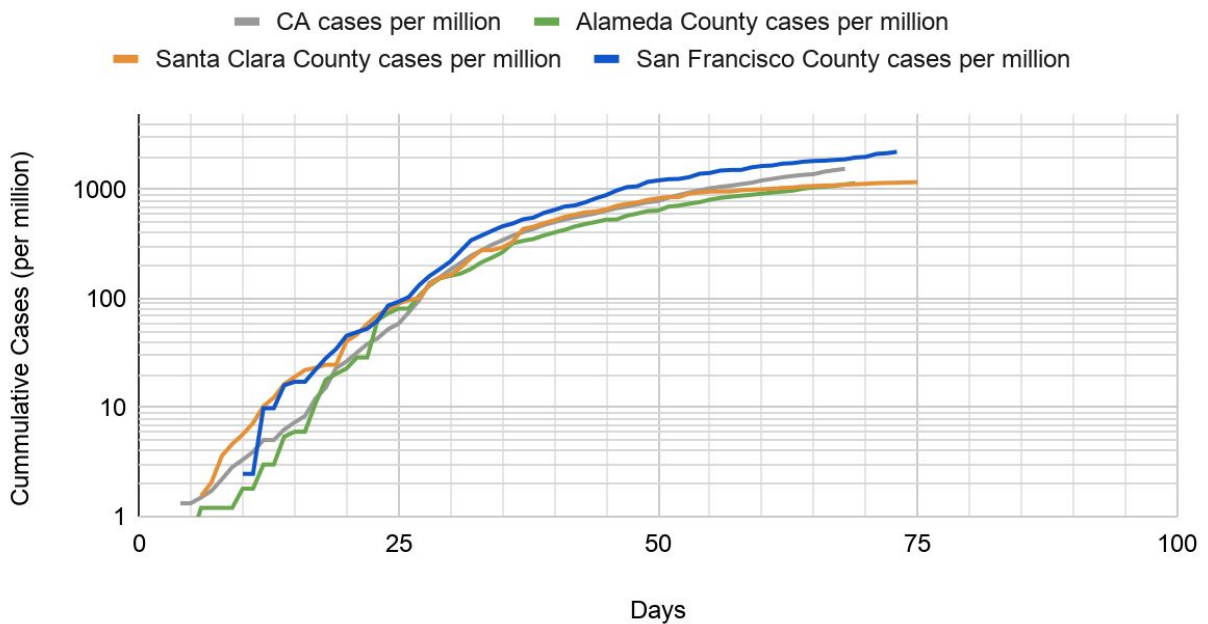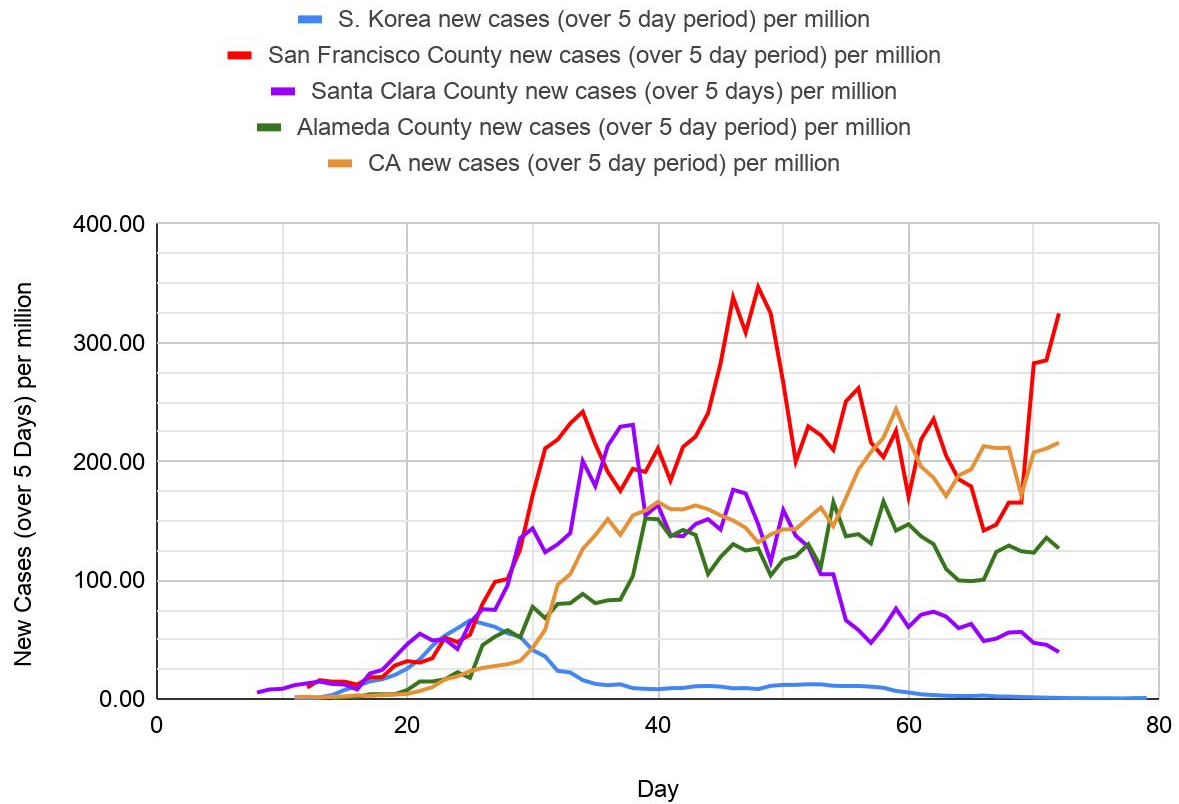Normalized Cases Comparison (Bay Area View) - Chart 2

Chart 2 above adds in the data for Santa Clara County (orange curve) and CA (gray curve) and San Francisco (blue curve). Of these Alameda County has the lowest value. Limiting contact is the best way to slow the course of the pandemic. There is some new data using cell phone mobility that is now being used to create a social distancing scoreboard for the entire country. Look at it if you want to see how people in Alameda county are responding.

Chart 3 below shows the number of new cases over a 5 day period (divide the numbers by 5 to get a daily rate). At this point in the pandemic the curves in this chart give some of the best evidence of whether we are beating the infection. The first thing to notice is that these are not smoothly varying curves - there is plenty of day to day variation. All curves have shown some flattening but with noise. Santa Clara in purple shows the clearest decreasing trend. CA (orange curve) was dropping slightly and is now increasing partly due to increased testing. These are all plotted normalized to their population so you can compare one region with another. Alameda County (in green) is doing better in new cases than the CA average but its trend line is not doing as well as Santa Clara county.

Chart 3 - New Cases (over 5 day period) per million

Legend:
- S. Korea new cases (over 5 day period) per million
- San Francisco County new cases (over 5 day period) per million
- Santa Clara County new cases (over 5 days) per million
- Alameda County new cases (over 5 day period) per million
- CA new cases (over 5 day period) per million

Y-axis: New Cases (over 5 Days) per million
X-axis: Day

How does the COVID death rate in Alameda County compare to other places?

While the number of deaths in Alameda County is small we felt it important to provide some comparison. They will increase with time. The table below shows data for a few places of interest. The number of deaths per million population in Alameda county is significantly lower than the CA average and roughly 5 times smaller than the U.S. average.   These numbers will get larger as long as the total number of cases continues to rise. Germany which is geographically close to Italy has a significantly lower death rate than its neighbor. Researchers have ideas why this may be the case but it is probably too soon to understand the whole story. South Korea, which acted quickly with testing, tracking and quarantine strategies, has already passed well beyond their peak new daily case rate and is now in something of a stabilization stage. Cases are still increasing there but only slowly and the number of new cases per day is going

down. This shows dramatically how early action leads to significantly reduced fatalities in the long run.

Location	Population in millions	COVID deaths per million people (5/7/2020)
California	40.0	63.6
Alameda County	1.7	39.4
South Korea	51.5	5.0
Germany	82.9	89.2
United States	330.6	228.9
New York State	19.5	1352.1
Italy	60.5	495.2

Come Back!

We will continue updating these graphs and analysis on a daily basis. As the data improves we'll be adding some more graphs. The date of the last refresh will always be noted at the top of the article so you can tell whether there is new information to look at. Sources that have been used to gather this data are listed at the end of this article in case you want to explore further. We encourage you to do so. We are continuing to add key links about the pandemic specific to CA and our counties.

Start Questing with us

Quest Science Center's vision is to connect everyone to the value of science. We hope that the discussion here sparks your curiosity and prompts more questions that you'd like to explore. We call this type of journey "questing" and look forward to engaging our region in exploring topics of relevance and meaning. Come back and check out the charts in this post and you may be among the first to see the Alameda County curve begin to flatten out.

Please click here on **FEEDBACK** so we can improve and hear what you are interested in. (takes less than a minute)

Sources

1. FAQs from CNN results from a poll by CNN of what people want to know

2. Worldometer Extensive worldwide data by country and region

3. San Francisco Chronicle Coronavirus tracker Data for counties in California and Bay Area

4. Politico Includes all state testing results (both positive and negative) by date

5. Los Angeles Times   Data for counties including some demographics

6. SFist Bay Area Bay Area counties by day showing graph and historical data

7. Guidance Documents from the California Department of Health. This is a broad list of helpful links and resources for everyone in California.

8. Daily Numbers California Department of Public Health report of high level demographic data

9. COVID data by local regions/counties California Department of Public Health searchable index for state cities and counties

10. Germany death rate analysis New York Times opinion piece on why Germany's death rate appears to be low.

11. Alameda County COVID-19 dashboard. Includes number of cases in various cities located in Alameda County and demographic data such as cases by gender, age, and ethnicity/race.

12. City of Berkeley Public Health information - official website

13. CalMatters Hospitalization data by county for all counties in California. Includes total suspected and confirmed cases as well as ICU suspected and confirmed patients. Does not include data for cities. Has some graphs that are helpful to see trending as a function of time at the state level.

14. CA Hospital Easy to use Hospitalization dashboard of confirmed and suspected COVID-19 data for all counties in California. No graphs to show trends but does include % changes from the previous day.

15. IHME Covid -19 Hospital This is where you go to get projected cases and deaths as a function of time at the state level across the U.S. and elsewhere in the world. Models updated daily. Includes projected bed shortages by state.

16. [Johns Hopkins University](#) Coronavirus COVID-19 Global Cases by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU). Good dashboard for seeing the global picture and also able to drill down to the country and state level (of the U.S.). Includes total cases, number of deaths and number of recovered patients. Has trending graphs for countries.

17. [R_t, for all U.S. States](#) These are up-to-date values for R_t, a key measure of how fast the virus is growing. It's the average number of people who become infected by an infectious person. If R_t is above 1.0, the virus will spread quickly. When R_t is below 1.0, the virus will stop spreading.

18. [New York Times Tracking for CA](#).   Well curated site for CA data including per capita analysis at the county level.

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