# Orange County coronavirus numbers parallel Italy, professors say

Data analysis by two UC Irvine professors shows strikingly similar trajectory.
Monday, March 30, 2020
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The OC Register

In their analysis, based on the number of case counts per 1 million people, colleagues Dominik Wodarz, who studies the dynamics of infectious diseases, and Natalia Komarova, a math professor, put Orange County about 20 days behind the date when Italy's hospital system became overwhelmed by the number of COVID-19 cases in that country.

That means if current trends hold, sometime in the next two weeks Orange County could be looking at a worst-case scenario similar to what has unfolded in Italy, Wodarz and Komarova said in an interview Monday, March 30. The U.S., only 15 days behind Italy in their projection, could be looking at swamped hospitals as soon as Wednesday, April 1.

The researchers noted that their work — based on reported cases, not deaths — includes some key assumptions, and that there is no certainty that Orange County's experience with the pandemic will match the situation in Italy.

Italy, a country of about 60 million people, is the epicenter of the coronavirus outbreak outside of China, with nearly 106,000 cases and about 12,500 fatalities as of Tuesday, March 31. Spain, population about 46.6 million, is second, with about 94,000 cases and more than 8,200 deaths. The death toll in China, which has seen few new cases in recent weeks, has been reported at close to 3,200, though news stories on Tuesday suggested China's reporting hasn't been complete.

The UCI researchers used the week of March 16, based on news accounts, as the tipping point in Italy, when reports began to emerge that health care providers at hospitals there were being forced to choose who should receive intensive treatment to save a life.

“The numbers were coming in on Orange County,” Wodarz said of the rise in Orange County cases last week, when expanded testing nearly tripled the Orange County Health Care Agency’s countywide total from 125 on Monday, March 23, to 321 by Friday, when the county also began releasing city-by-city counts.

“We just wondered, ‘How does this initial growth compare to other well-documented cases?”

They determined that a per capita analysis would provide a better perspective on the risk of infection than raw numbers, given that Orange County’s case load as of Monday was 464 and Italy’s had topped 101,000. (The US. is the world leader now, at more than 161,000 cases.)

Wodarz and Komarova developed an algorithm that allowed them to shift Orange County’s COVID-19 growth curve so that it synchronizes in time on their chart with the growth curve of Italy. A graph first posted March 27 on Twitter shows the projection of Orange County’s per capita case count for its population of about 3.2 million nearly exactly tracking Italy, which has a population of about 60 million.

> Orange County COVID19: We did a quick data analysis of per capita cases in OC & compared them to Italy. Cases in OC track what happened in Italy very closely. If this keeps going, we estimate that we are maximally 20 days behind Italy. @ochealth pic.twitter.com/vmmsHkYfFC
>
> — dwodarz (@dwodarz) March 27, 2020

They were taken aback by how closely the two curves matched up.

“It was a complete surprise,” Komarova said. “It was not something that we expected to see.”

Wodarz and Komarova, who presented their research to the UCI Program in Public Health, say they are not trying to create panic with wild predictions. Their intent is to help people guide their behavior based on objective information.

“There’s nothing that we made up about this curve,” Komarova said. “It’s the truth … the number of per capita cases in Orange County.”

An update of their analysis that included the number of local cases listed Monday morning by the Orange County Health Care Agency showed the latest plot point for Orange County slightly below that for Italy. But said Wodarz, “We will have to see what happens in the coming days. So far, O.C. has tracked Italy’s per capita COVID-19 case counts with remarkable accuracy.”

The professors say there are some unknowns that could affect their projection: They had no figures on the total number of hospital beds and available ventilators, which help people in respiratory distress continue to breathe, to compare between Italy and Orange County. Also, how many tests are being administered in both places can either speed up or push back the breaking point, if there is one.

The Register reported in previous stories, last updated March 24, that Orange County had 6,034 hospital beds, according to the California Department of Public Health. The researchers said factoring in the number of hospital beds and ventilators is a next step in their analysis.

If Orange County has more hospital beds than Italy, Wodarz said, “it will take longer to get into trouble; if we have less, it will take less time to get into trouble.” Also, mitigation measures undertaken in recent weeks — social distancing and stay-at-home guidelines — may yet flatten Orange County’s curve.

Wodarz and Komarova expect data over the next few days to provide a better picture on whether Orange County’s case count will slow or continue to skyrocket — and if their projection is accurate.

“If Orange County does not diverge from Italy as we go along, that means we have to do more social distancing,” Wodarz said.

Perhaps tougher enforcement of stay-at-home policies will be required, if present tactics don’t bend the curve.

“Make it a rule, rather than a suggestion,” Wodarz said.

Last week, Italy was looking at upping its fine for lockdown violations from 206 to 3,000 euros. (One euro equals $1.10.) Even in some places in California, stricter enforcement is a possibility. In San Jose, for example, officials have warned of

citations and sanctions for people who repeatedly violate stay-at-home orders.

Mostly, Wodarz and Komarova hope their analysis helps people take the pandemic seriously and change behavior. Recent crowded public gatherings, in Orange County and elsewhere, led officials to close some beaches, beach parking lots, regional parks and hiking trails.

“This is good for the public to see,” Wodarz said of the Italy-Orange County pattern.

“We know what is happening in Italy. Maybe that would make them think twice.”

Original Source
In the Media
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