BEHIND THE CURVE

The Extreme Severity of New York City's First Pandemic Wave

by Bill Hammond

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EMPIRE CENTER

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WHAT YOU WILL LEARN IN THIS REPORT

- New York City's first wave of the coronavirus pandemic remains one of the deadliest in the world, having killed almost 23,000 residents, or 0.3 percent of the city's population, in just three months.
- During its worst 12 weeks, from March 19 to June 10, 2020, the city reached a higher Covid-19 mortality rate than 85 percent of countries have reported for the entire three-and-a-half years of the pandemic.
- Among 415 countries and sub-regions worldwide, the city's peak 12-week mortality rate was the second highest, just behind Mexico City.
- Among 3,140 U.S. counties, the Bronx's peak 12-week pandemic death rate was in the 99th percentile, Manhattan was in the 98th, Queens and Brooklyn were in the 97th, and Staten Island was in the 96th.
- New York's first wave began weeks earlier than recognized at the time, and its infection rate likely peaked in mid-March.

At a pandemic briefing in late June 2020, then-Governor Andrew Cuomo unveiled a memorable prop: a polystyrene mountain shaped to match the curve of New York's rising and falling case count.

It was Cuomo's way of marking the end of the state's first coronavirus wave, which had been harrowing. Heavily concentrated in New York City and its surrounding suburbs, the outbreak had killed thousands, swamped hospitals, crippled the economy and brought normal life to a standstill.

"This was the trajectory of Covid in our state," Cuomo said.[1] "We don't want to climb this mountain again."

Three years later, the catastrophe symbolized by Cuomo's mountain can be put into sharper perspective – and it turns out to have been worse than anyone knew at the time.

With the benefit of hindsight, it's now clear that New York's outbreak began a month or more earlier and spiked six times higher than shown by the available testing data, which was scarce in those early days.

The infection rate likely peaked around March 19, three weeks earlier than previously believed – an insight that might have significantly changed how officials handled the crisis.

Hindsight also reveals that the outbreak in New York City was among the very deadliest of the entire pandemic so far – not just in the United States, but globally.

Compared to the worst 12-week periods for population centers around the world, the city's mortality rate in the spring of 2020 ranks as the second highest, just behind Mexico City in the winter of 2020-21.

These updated understandings confirm beyond doubt that New York was both acutely vulnerable to the emerging virus and frightfully ill-prepared to defend itself. By the yardstick that matters most – the number of lives lost – New York's response was not merely sub-par or below average, but among the least effective in the world.

This makes it all the more urgent for the city's and state's leaders to study what went wrong and to rebuild New York's public health system in light of what they find.

RETHINKING THE PANDEMIC MOUNTAIN

Cuomo's model mountain was based on the count of cases confirmed by laboratory testing – the same information he shared in his daily briefings. Because such testing was scarce at first and became more widely available over time, these data gave a distorted view of how the first wave progressed.

Retrospective modeling by the University of Washington's Institute for Health Metrics and Evaluation (IHME) provides a more accurate picture.

As seen in Figure 1, the state's outbreak likely began by early February, a full month before its first laboratory-confirmed case.[2] The

Figure 1: New York State's first wave of Covid-19

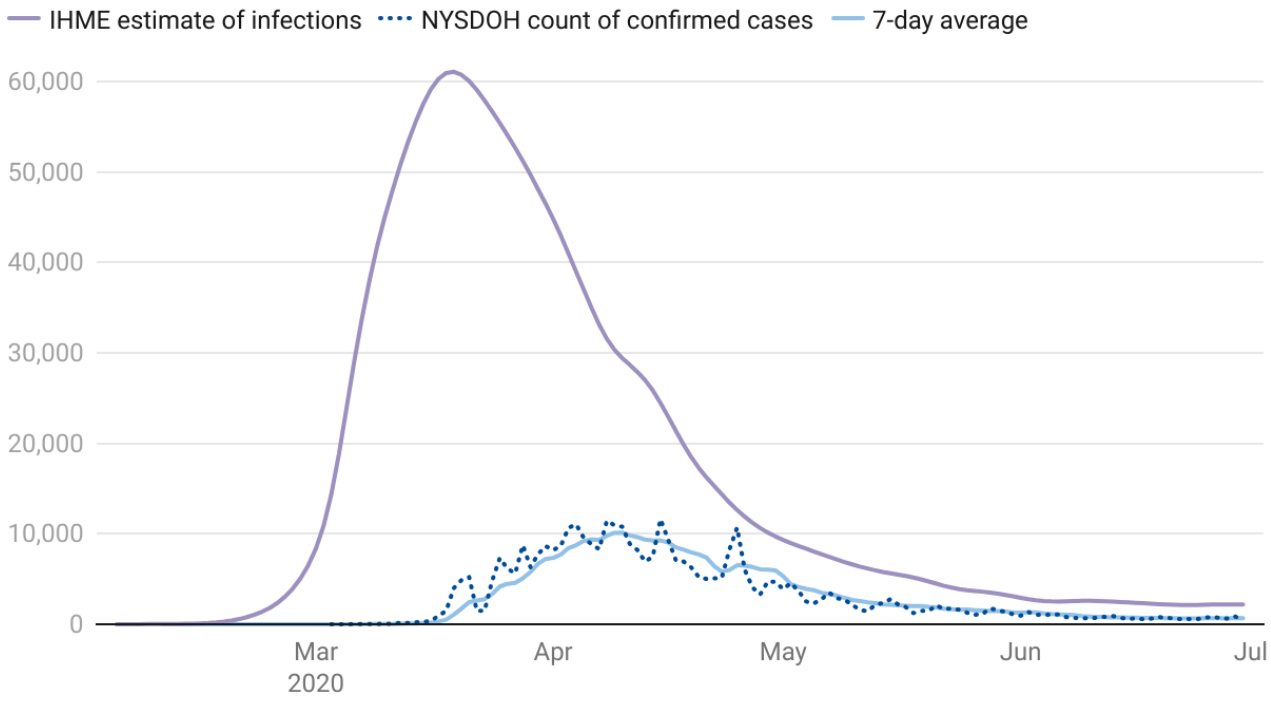

Chart: Empire Center • Source: Institute for Health Metrics and Evaluation

estimated number of infections soared to more than 60,000 per day on March 19, which was six times higher and three weeks earlier than shown by the state's testing data.

A second attempt to model the first wave of New York's pandemic estimated that it began on Jan. 19 and reached a peak infection rate of almost 100,000 per day on March 24.[3] These estimates indicate that the curve had already begun to bend – that is, the rate of increase had begun to slow – before Cuomo issued his stay-at-home order effective March 22 – likely because individuals and businesses were spontaneously limiting their activities in reaction to official warnings and news coverage.

The timing of the state's earliest Covid fatality, initially thought to be on March 14, has also shifted. Records gathered later from nursing homes showed 14 resident deaths before that date – the earliest on March 2, at the Island Nursing and Rehab Center in Suffolk County.[4] According to the CDC's tabulation, which is based on a review of death certificates, New York State's first pandemic death occurred during the week ending Jan. 25, 2020, in Rockland County. The CDC recorded at least four additional Covid deaths during February 2020 in Nassau, Suffolk and Westchester counties.[5]

The virus's rapid spread in February and early March of 2020 shows the importance of detecting outbreaks early and responding quickly. If officials had become aware of this surge even a week or two sooner – and notified the public – they almost certainly could have avoided swamping hospitals and saved thousands of lives.

If they had merely known when the wave reached its peak, they might have avoided mistakes in late March.

For example, Cuomo and his administration would have had less cause to worry about a looming shortage of hospital capacity. They could have avoided spending time and money to build emergency hospital facilities that went largely unused. And they might never have issued the March 25 directive transferring Covid-positive patients into nursing homes – a decision that likely added to the high death rate in those facilities and contributed to Cuomo's political downfall.[6]

PUTTING NEW YORK'S WAVE IN CONTEXT

In its immediate aftermath, New York City's initial outbreak appeared to be one of the worst the world had seen. However, the pandemic was in its early stages. It seemed likely, as the virus continued to spread, that it would hit other places as hard or harder, and New York would become less of an outlier.

That has not happened. Even now, the city's first wave stands out for its level of intensity – which is what pushed the city's health-care system to the brink of collapse and drove its mortality rate so high. The importance of avoiding such explosive outbreaks is why epidemiologists emphasize "bending the curve" and keeping the rate of spread in check.

The wave gripped the city from mid-March to mid-June. During that time, city officials recorded almost 23,000 deaths from Covid-19 – equating to a mortality rate of 261 per 100,000 for the 12-week period.[7]

To put that figure in perspective, the Empire Center used publicly available data to calculate the highest 12-week death rates for 415 countries and national subdivisions, as well as the 50 states and 3,140 counties of the U.S. In each context, New York's initial outbreak ranked at or near the top.

The international comparison was based on a data set compiled by the IHME, which covered 415 jurisdictions through the end of 2022.[8]

Compared to that group, New York City's worst 12 weeks ranked No. 2 in the world, just behind Mexico City's peak 12-week rate of 263 per 100,000.

New York City and Mexico City were set apart from everywhere else – rich or poor, technologically advanced or under-developed. The third highest rate, in the Valle d'Aosta region of Italy, was 26 percent lower than New York's at 193 per 100,000 (see Figure 2). The median peak mortality rate in this data set was 53 per 100,000.

Within the U.S. – based on data compiled by the CDC – New York City's peak rate was 64 percent higher than the comparable rate for any state, and 63 percent higher than for any of the 50 largest cities (see Figure 3).[9]

Among 3,140 counties nationwide, the Bronx's peak 12-week death rate ranked in the 99th percentile, Manhattan in the 98th, Queens and Brooklyn in the 97th, and Staten Island in the 96th.

Among the 50 largest counties, the seven highest 12-week Covid mortality rates were in New York City and its surrounding suburbs: the Bronx, Manhattan, Nassau, Queens, Brooklyn, Westchester and Suffolk.

New York City's mortality for the entire pandemic also ranks among the worst – largely due to its first wave. In those 12 weeks alone, it lost a greater share of its population than 85 percent of the population centers in the IHME data set lost in three years.

Its cumulative mortality rate through December 2022 – at 496 deaths per 100,000 population – outstripped all 50 states and

every country but Peru, the Russian Federation, Bulgaria and Hungary.[10]

These comparisons are of course imperfect. The quality of data gathering and reporting varies from place to place, and some countries might understate their death tolls for political reasons.

Still, the available evidence makes clear that New York was both unusually vulnerable to an emerging virus and ill-prepared to defend itself.

LEARNING FROM EXPERIENCE

Officials have pointed to many possible reasons why New York City's numbers spiked so high.

Characteristics of the city that are normally considered strengths – heavy tourism and international commerce, bustling streets and restaurants, crowded theaters and arenas and a well-used mass transit system – became risk factors when a dangerous new virus was afoot.

Those hallmarks of city life likely help to explain why New York was hit relatively early, before the dangers of Covid-19 were well understood, and how the virus spread so fast.

Meanwhile, the federal government was slow to screen passengers at airports and botched its roll-out of test kits, blinding local officials to the scale of the outbreak. Shortages of basic infection-control supplies compounded the crisis – and the loss of life.

These and other factors may explain New York's poor performance during the first wave, but they do not excuse it. A well-functioning public health system should have foreseen such risks – and developed systems and backup plans to mitigate them – well before the threat emerged in Wuhan, China.

Nearly every other city in the world – many of which faced the same disadvantages – managed the crisis better than New York.

This stark reality should be a wake-up call for the city's and state's leaders. The next novel pathogen could emerge at any time, and it might well be more virulent than SARS-CoV-2.

Unfortunately, the city's and state's leaders have shown little interest in learning from the experience of 2020.

A basic first step would be to conduct a close review of the state's pandemic response, which should be routine after disasters large and small.

Such a review should put a special focus on the earliest stages of the outbreak, in January and February, when official actions could have had the greatest preventive impact.

One topic to be explored would be public health surveillance. What resources did officials have for detecting and tracking the outbreak in the absence of laboratory testing? Should the Department of Health routinely gather more information from emergency rooms and other front-line medical providers? Is large-scale testing of sewage a practical early-warning system for new viruses?

The review should also rethink how the state stockpiles emergency supplies, coordinates with local public health agencies, communicates with the public, ensures proper infection control in nursing homes and other institutional settings, and handles predictable contingencies, such as shortages of hospital beds and personnel – among many other areas of inquiry.[11]

To date, the state's only effort in this vein consists of a study by a consulting firm.[12] Hired by the Hochul administration late last year, the firm lacks the power to subpoena witnesses or documents and has no mandate to conduct hearings. By contract, it reports to the commissioner of the state Division of Homeland Security and Emergency Services rather than directly to the public or the Legislature.

As one of the worst natural disasters in state history, the coronavirus pandemic warrants something more. A coalition of government watchdog groups, including the Empire Center, has called for the establishment of a special commission to investigate the pandemic response. It would consist of independent experts with full subpoena power, and they would have a mandate to conduct public hearings and produce detailed reports on their findings and recommended reforms.[13]

Legislation to establish such a panel was introduced in April by Assemblymember Jessica González-Rojas of Queens, but the bill did not advance during this year's legislative session.[14]

Given the stark realities of New York's pandemic experience – and the manifest shortcomings of its response – preparing for the next infectious disease outbreak should be a first priority in Albany. New York can either dramatically improve its public health defenses, or it can expect to climb more pandemic mountains in the future.

Figure 1a: New York's First Covid Wave

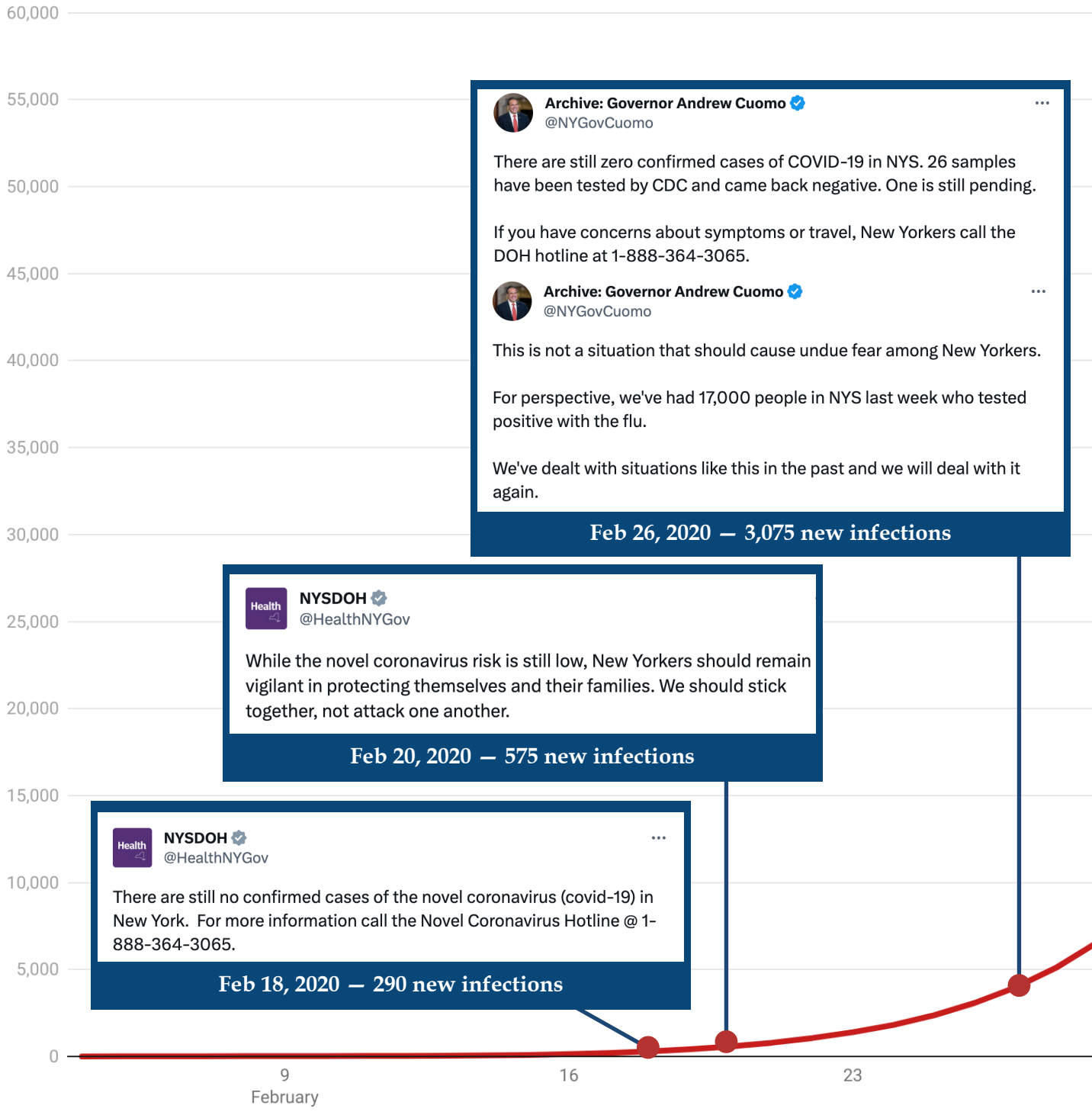

Chart: Empire Center • Source: Institute for Health Metrics and Evaluation

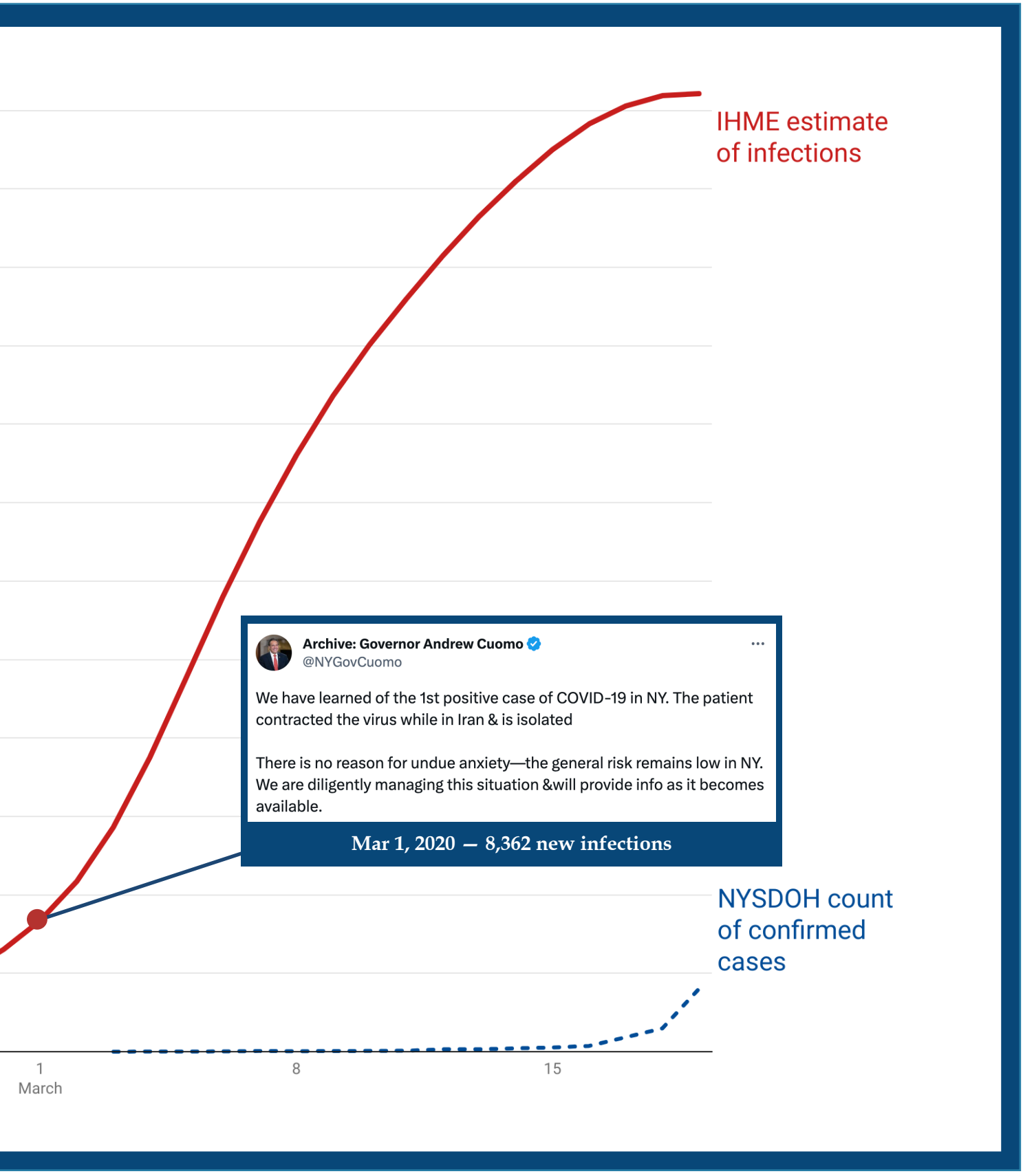
IHME estimate of infections
Archive: Governor Andrew Cuomo
@NYGovCuomo
We have learned of the 1st positive case of COVID-19 in NY. The patient contracted the virus while in Iran & is isolated
There is no reason for undue anxiety—the general risk remains low in NY. We are diligently managing this situation &will provide info as it becomes available.
Mar 1, 2020 — 8,362 new infections
NYSDOH count of confirmed cases
1
March
8
15

Figure 2: Highest 12-week Covid death rates worldwide (Deaths per 100,000)

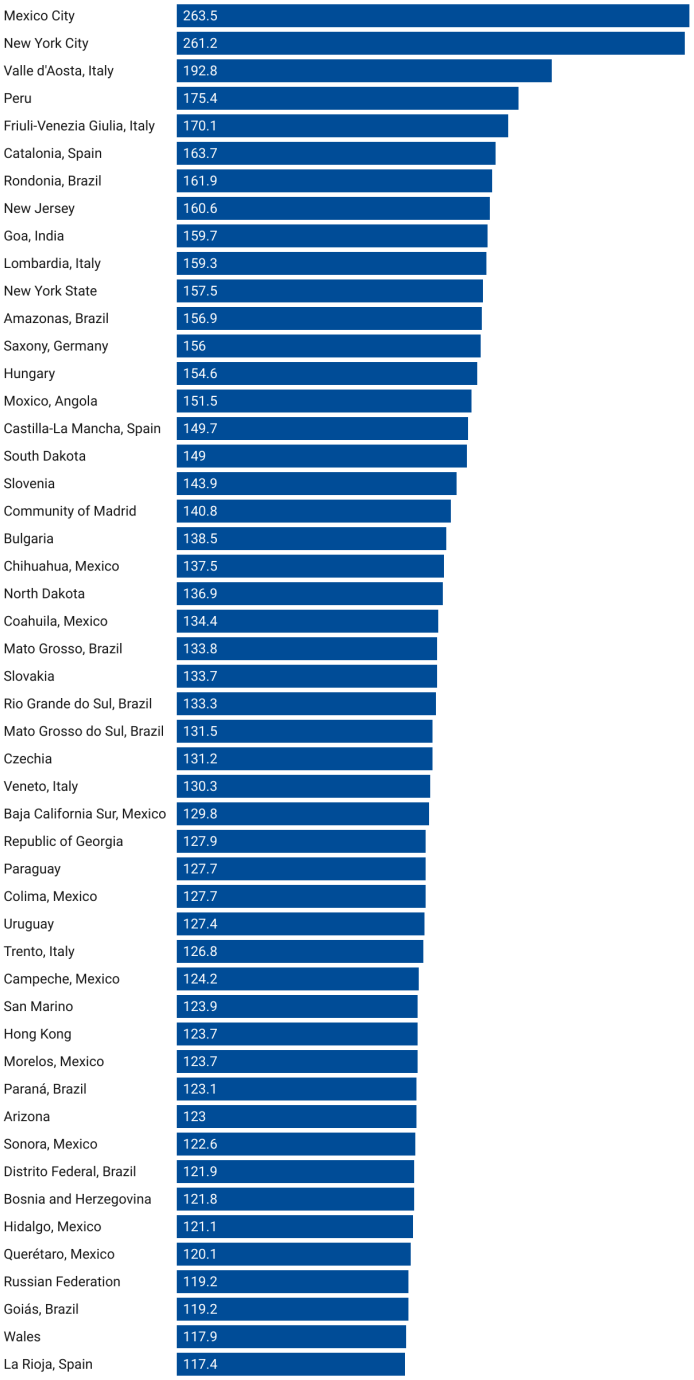

Chart: Empire Center • Source: Institute for Health Metrics and Evaluation

Figure 3: 12-week Covid-19 death rates in major U.S. cities (Deaths per 100,000)

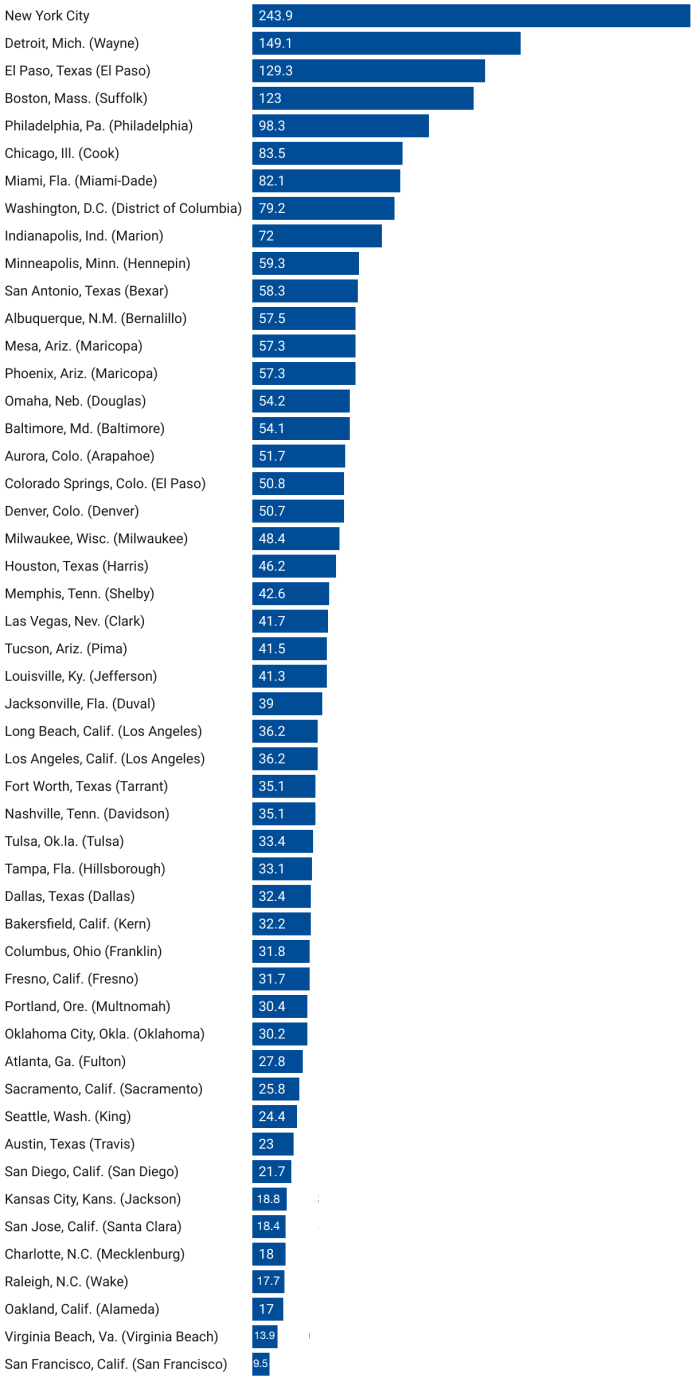

Chart: Empire Center • Source: CDC

ENDNOTES

[1] Transcript of a press conference by former Governor Andrew Cuomo held June 29, 2020. https://www.rev.com/blog/transcripts/ny-governor-andrew-cuomo-june-29-press-conference-transcript

[2] https://www.healthdata.org/covid/data-downloads

[3] David García-García et al., "Identification of the first COVID-19 infections in the US using a retrospective analysis (REMEDID)," Spatial and Spatio-temporal Epidemiology, Vol. 42, August 2022. https://www.sciencedirect.com/science/article/pii/S1877584522000405#fig0001

[4] Health Department data released to the Empire Center under the Freedom of Information Law. https://www.empirecenter.org/publications/covid-nursing-home-data/ The department delayed providing the information until February 2021, after the Empire Center won a court order. https://www.empirecenter.org/publications/cuomo-administration-releases-foil-requested-nursing-homes-data/

[5] "Provisional COVID-19 Death Counts by Week Ending Date and State," Centers for Disease Control and Prevention. N.B.: Because the CDC redacts numbers smaller than 10, the earliest deaths in these and other counties are indicated by blanks in the data set. https://data.cdc.gov/NCHS/Provisional-COVID-19-Death-Counts-by-Week-Ending-D/r8kw-7aab

[6] For more on the Cuomo administration's handling of the pandemic in nursing homes, see the Empire Center's August 2021 report, " 'Like Fire Through Dry Grass': Documenting the Cuomo Administration's Cover-up of a Nursing Home Nightmare." https://www.empirecenter.org/publications/like-fire-through-dry-grass/

[7] Author's analysis of Covid-19 data compiled by the New York City Department of Health and Mental Hygiene. Downloaded from https://github.com/nychealth/coronavirus-data

[8] Author's analysis of international Covid-19 data compiled by the Institute for Health Metrics and Evaluation at the University of Washington. Downloaded from https://www.healthdata.org/covid/data-downloads

[9] Author's analysis of Covid-19 data compiled by the U.S. Centers for Disease Control and Prevention. N.B.: The CDC data shows a slightly lower death toll than recorded by New York City's Department of Health and Mental Hygiene. Downloaded from https://data.cdc.gov/NCHS/AH-COVID-19-Death-Counts-by-County-and-Week-2020-p/ite7-j2w7/data

[10] The IHME reports significantly higher death counts for the Russian Federation than other sources. See for example, https://www.nytimes.com/interactive/2021/world/covid-cases.html and https://www.worldometers.info/coronavirus/country/russia/

[11] For a more detailed discussion of the state's pandemic response and how it could be improved, see the Empire Center's June 2021 report, "2020 Hindsight: Rebuilding New York's Pandemic Defenses After the Coronavirus Pandemic." https://www.empirecenter.org/publications/2020-hindsight/

[12] Kate Lisa, "Emergency management consulting firm to lead New York's $4.3 million pandemic review," Spectrum News, Nov. 2, 2022. https://spectrumlocalnews.com/nys/central-ny/politics/2022/11/03/emergency-management-consulting-firm-to-lead-ny-s--4-3m-pandemic-review

[13] Open letter to Governor Hochul from Common Cause New York, Reinvent Albany, the Empire Center, the League of Women of New York and the New York Public Interest Research Group, Aug. 2, 2022. https://reinventalbany.org/2022/08/watchdogs-ask-governor-again-for-independent-look-at-covid-response/

[14] Assembly Bill No. 6153. https://assembly.state.ny.us/leg/?bn=A06153&term=2023

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