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A new analysis: Coronavirus death rate surged in Massachusetts locations that already faced challenges

Harvard analysis finds mortality rate surged higher in communities with more poverty, people of color, and crowded housing.

By [Andrew Ryan](#) and [Kay Lazar](#) Globe Staff, Updated May 9, 2020, 3:53 p.m.



People in need of food wait in line at the Salvation Army in Chelsea. A new type of analysis of deaths during the early weeks of the pandemic finds that the mortality rate surged higher in Massachusetts cities, towns, and ZIP codes with larger concentrations of poverty, economic segregation, people of color, and crowded housing. DAVID L. RYAN/GLOBE STAFF

Life can be cruel. Those already struggling are often the first to feel the brunt of new hardships and disparities.

But the coronavirus crisis has made this ugly truth inarguable.

A [new type of analysis of deaths](#) during the early weeks of the pandemic finds that the mortality rate surged higher in Massachusetts cities, towns, and ZIP codes with larger concentrations of poverty, economic segregation, people of color, and crowded housing.

The investigation by Harvard epidemiologists, underpinned by public health data obtained by the Globe, offers the most comprehensive look to date at the virus's uneven impact on communities across the state. Researchers examined the home addresses of more than 20,000 people who died of all causes in the first 15 weeks of 2020, categorizing the deceased by the socioeconomic, racial, and ethnic characteristics of where they lived.

The results were unambiguous: As the death rate increased across the state in early April, it surged nearly 40 percent higher in cities and towns with the largest concentrations of people of color compared to those with the least. The mortality rate increased nearly 14 percent more in municipalities with the most crowded housing compared to those with the least. And in cities and towns with the most poverty, the death rate increased 9 percent more than those with the least poverty.

No wonder a funeral home in the Latino stronghold of Lawrence saw its workload double in April. Or that deaths spiked in Springfield in the same places battered by the opioid epidemic. Or that burial permits doubled in Medford, a middle-class city with pockets of diversity, poverty, and crowded housing.

As the medical community tries to understand this new disease, scant testing and spotty data have made this sort of analysis difficult. Evidence has routinely [indicated a disproportionate impact](#) on people of color, and the town-by-town tally of known cases has suggested that infections are higher in those communities.

[Some studies](#) have calculated the raw number of [excess deaths](#), as a way [to estimate](#) what many public health experts believe is an undercount of COVID-19 victims.

But those studies have taken a broad look at the nation or individual states. This Harvard analysis measures the impact of the virus at a more granular level, examining death rates by socioeconomic and racial and ethnic groups.

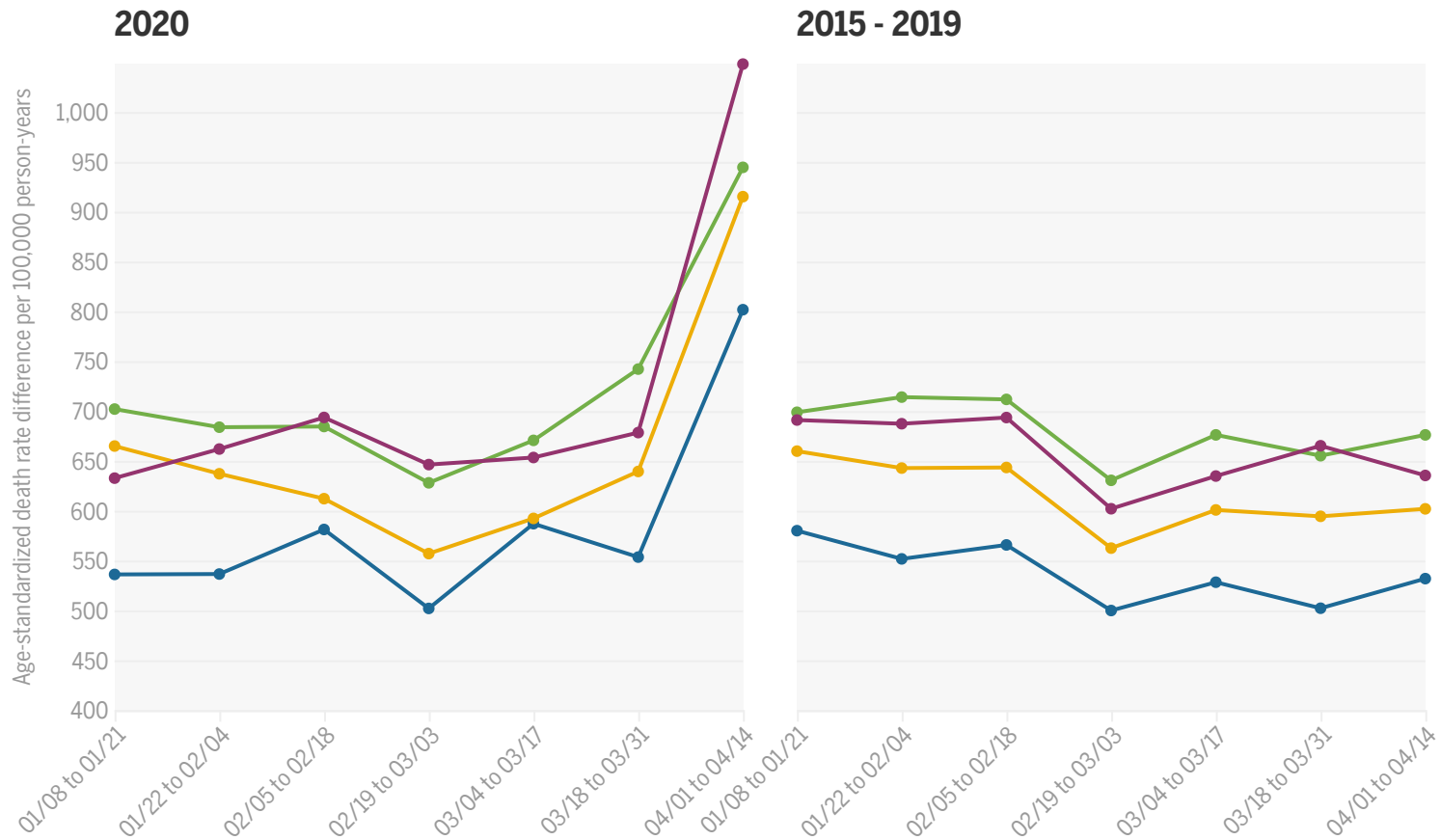
“It’s about understanding which communities have been most burdened and are going to be in need of all kinds of social support and economic support and resources,” said [Nancy Krieger](#), a professor of social epidemiology at the Harvard T.H. Chan School of Public Health who helped spearhead the effort.

Krieger and her colleagues determined how much the total death rates increased in all ZIP codes and municipalities across the state compared to the same time period the previous five years. Taking into account age, they calculated the rise in mortality rates and then analyzed the differences by where the deceased had lived, looking at race and ethnicity, poverty, the prevalence of crowded housing, and more.

“This kind of data should be a wake-up call,” said [Dr. Sandro Galea](#), a physician, epidemiologist, and dean of the Boston University School of Public Health. “It’s not enough to pay attention to the whole, but to pay attention to the fact that particular groups need particular help.”

Massachusetts city/town death rate differences by poverty

< 5 5 - 9.9 10 - 19.9 20 percent or more of population below poverty level



Source: Analysis of Massachusetts Department of Public Health and US Census data by a team from Harvard T.H. Chan School of Public Health

 A Flourish chart

Galea said state and local leaders could use the data to better target health messages and narrow health gaps — not just with COVID-19 but with so many other diseases that disproportionately affect lower-income neighborhoods and

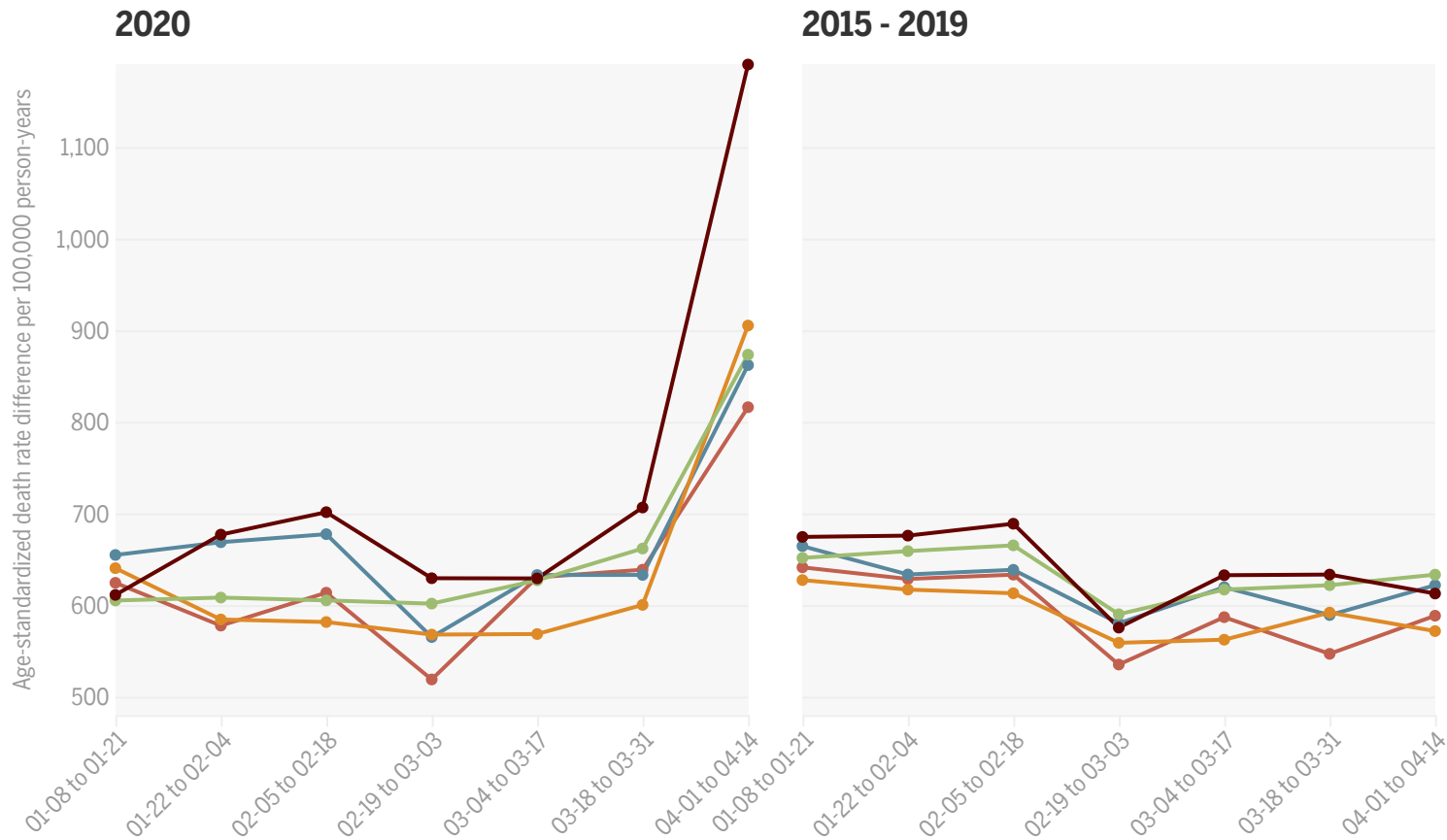
communities of color.

“This speaks to the fact that tending to health inequities is not discretionary. It’s not an act of charity. It’s essential to creating a healthy world,” Galea said. "Having some people left behind threatens not only their health but everyone’s health.”

As deaths surged across the state in the first half of April, public health officials noticed the virus was ravaging Chelsea and Brockton. The Harvard analysis found other spikes in Revere, Springfield, and the north side of Lawrence — places with crowded housing and large proportions of Black, Latino, and other residents of color.

Massachusetts city/town death rate differences by share of people of color

< 9.33 9.33 - 16.3 16.31 - 27.9 27.91 - 51.2 51.21 percent or more of population who are people of color



Source: Analysis of Massachusetts Department of Public Health and US Census data by a team from Harvard T.H. Chan School of Public Health

 A Flourish chart

“Everyone [here] has been touched in some way by this or knows somebody who’s undergoing it,” said Jessica Andors, executive director of [Lawrence CommunityWorks](#), who lives in what she describes as a vibrant city brimming with

hardworking people.

Andors ticked off four people connected to her organization who were sick or recovering from COVID-19 and noted that one of her staff had lost two family members to the virus. Waves of new residents from Puerto Rico, the Dominican Republic, and Guatemala have enriched Lawrence's cultural heritage, but language barriers and immigration status have also complicated outreach efforts during the crisis.

Harvard's analysis made clear that the pandemic has hit harder in Massachusetts communities already teetering on the margin, struggling with unaffordable rents, polluted air, and disparities in health care access. And the coronavirus may be amplifying those cruelties.

"We already live in a very unequal society and this is making those inequalities even worse," said [Jarvis Chen](#), a social epidemiologist who worked on the project with a team at the Harvard T.H. Chan School of Public Health. "These data are showing . . . the need to take immediate action to try to mitigate some of those harms."

For Milagros Barreto, the pandemic is omnipresent. Her 79-year-old mother died in mid-April in a nursing home in Everett, COVID-19 the suspected culprit.

Barreto, 49, survived tracheal cancer in 2012 and is afraid to venture out of her apartment in Lynn because of weakened lungs.

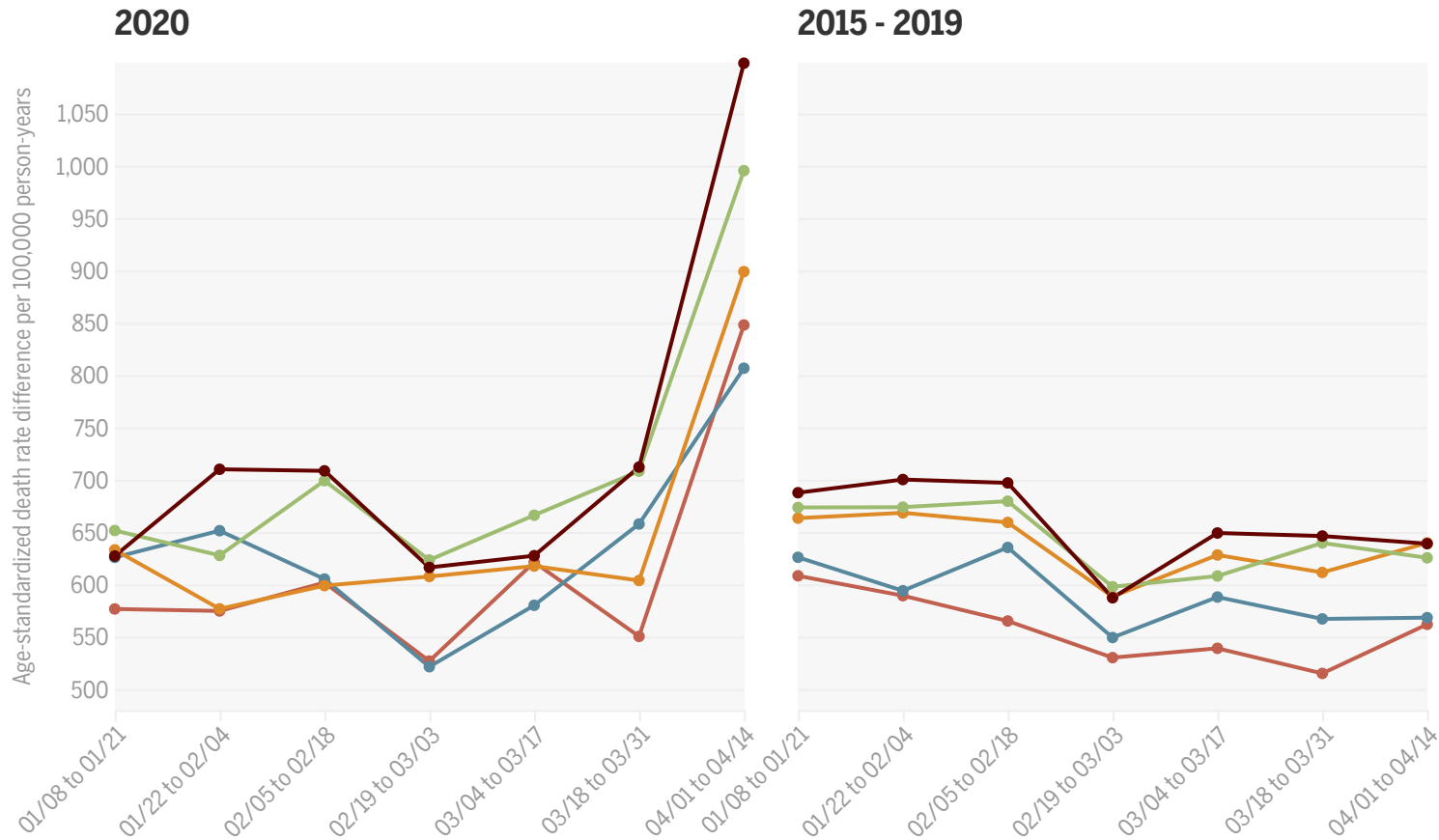
"I don't want to go out, I don't want my 19-year-old daughter to go out," Barreto said. "I am afraid of the future, of how this is going to be."

On her block, where Guatemalan families crowd five and six to an apartment to keep costs down, people whisper about

the virus, she said. But few will admit to feeling sick for fear of deportation.

Massachusetts city/town death rate differences by crowded housing

< 0.7 0.7 - 1.2 1.2 - 1.9 1.9 - 3.5 3.5 - 10 percent of population in crowded housing



Source: Analysis of Massachusetts Department of Public Health and US Census data by a team from Harvard T.H. Chan School of Public Health • Note: US Census defines crowding as the proportion of households with more than one person per room excluding bathrooms.

A Flourish chart

Barreto works at a nonprofit that advocates for workers’ rights and spends her days trying to convince immigrants to stay home from work if they have COVID-19 symptoms. But it’s a struggle, she said. Many are afraid of losing their jobs

and as undocumented workers, they don't qualify for unemployment.

Two months since the virus was [declared a global pandemic](#), public health experts continue to push for information about the virus's victims that they say could help guide the response and curb the disease's spread.

Massachusetts death certificates are public records and include information about a person's race and ethnicity, occupation, education level, and other indicators that can help public health experts track and respond to outbreaks in real time. However, [Governor Charlie Baker's administration](#) has withheld much of that granular detail, making it harder to analyze how the pandemic is unfolding.

After facing pressure for more transparency, state officials last month began releasing a town-by-town tally of cases, as well as a breakdown of deaths and infections by [race and ethnicity](#), although that data is largely incomplete.

State officials did provide the Globe access to individual death certificate information and a preliminary list of all deaths — regardless of cause — this year through mid April. But officials would provide few details beyond name, age, and address despite a state Superior Court ruling last year that the database is public record.

The Globe shared the limited data it obtained with the Harvard epidemiologists, who used it for their analysis.

In a statement, the Department of Public Health said it was “working every day to put equity at the forefront of our COVID-19 response.” The statement said the collection of race and ethnicity data for coronavirus cases has improved but it was not “yet where we want [it] to be.”

That next level of detail could help researchers do more than pinpoint deaths that should have been attributed to COVID-19. Public health experts could identify early trends to help calibrate the response, potentially highlighting

specific professions or socioeconomic groups at greater risk.

“These data are collected by the state, but they need to be made available in a way that allows people to analyze them . . . in real time,” said Chen, the Harvard epidemiologist.

Officials in some cities and towns have noticed mortality trends, but it has not been clear whether they were part of a broader pattern. In Springfield, the commissioner of health and human services, Helen Caulton-Harris, saw the disease hitting neighborhoods with crowded housing and plagued by health disparities.

“The ZIP codes impacted by COVID are the same ZIP codes where we saw opioid overdose deaths,” Caulton-Harris said.

In Medford, Board of Health Director MaryAnn O’Connor described her suburb of 59,000 as a diverse city with a large community of immigrants, several thousand residents living in public housing, and pockets of poverty.

The first two weeks of April, O’Connor counted more than double the typical number of burial permits — 21 instead of the 9 last year. What made it stand out more was that 12 of those people died at home and many listed cardiopulmonary causes for death, but she wonders if some were actually linked to COVID-19.

“There is something here that needs to be figured out,” O’Connor said.

Matt Rocheleau of the Globe staff contributed to this report.

Methodology

A team from Harvard T.H. Chan School of Public Health conducted [this analysis](#) to measure the impact of COVID-19

at a more granular level by examining death rates by social characteristics to pinpoint which communities have faced the greatest burden.

Working with data obtained by the Globe, the team analyzed the home addresses of more than 20,000 people who died of all causes in the first 15 weeks of 2020 and grouped people based on the socioeconomic and racial/ethnic characteristics of the ZIP codes and municipalities where they lived. They determined how much the total death rates increased in these areas across the state compared to the same period the previous five years.

Taking into account age, they calculated the rise in mortality rates and then analyzed the differences by race and ethnicity, poverty, crowded housing, and economic segregation. Other studies have calculated the raw number of excess deaths to estimate what many public health experts believe is an undercount of COVID-19 victims.

Instead of looking at excess deaths, this Harvard analysis calculated the change in death rates by looking at the number of deaths per 100,000 person-years. These death rates were “age-standardized” to take into account the age composition of the population. They computed these rates for municipalities and Zip codes in relation to their socioeconomic and racial and ethnic composition. They calculated the difference in death rates two ways: as a rate ratio and as a rate difference. The Harvard team consisted of Nancy Krieger, Jarvis Chen, and Pamela Waterman.

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