STATE OF MICHIGAN
IN THE COURT OF APPEALS

MICHIGAN HOUSE OF REPRESENTATIVES and MICHIGAN SENATE, *Plaintiffs-Appellants / Cross-Appellees*, v GRETCHEN WHITMER, in her official capacity as Governor of the State of Michigan, *Defendant-Appellee / Cross-Appellant*.	Court of Appeals No. 353655 Court of Claims No. 20-000079-MZ **THE APPEAL INVOLVES A RULING THAT A PROVISION OF THE CONSTITUTION, A STATUTE, RULE OR REGULATION, OR OTHER STATE GOVERNMENTAL ACTION IS INVALID.**

BRIEF OF *AMICI CURIAE* MICHIGAN EPIDEMIOLOGISTS IN SUPPORT OF DEFENDANT-APPELLEE GOVERNOR GRETCHEN WHITMER

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STATEMENT OF QUESTIONS PRESENTED

Amici Curiae Michigan Epidemiologists adopt the Statement of Questions Presented contained in the Governor's brief on appeal.

STATEMENT OF FACTS AND PROCEEDINGS

Amici Curiae Michigan Epidemiologists adopt the Statement of Facts and Proceedings contained in the Governor's brief on appeal.

IDENTITY AND INTEREST OF *AMICI CURIAE*

Amici are renowned epidemiologists and public health scholars with professional expertise on the transmission of infectious diseases in Michigan. They include scientists who have served in both Republican and Democratic administrations in various public health roles. They have a strong interest in containing COVID-19 and reducing further community spread in Michigan. They submit this brief to offer the Court their scientific assessment of the Executive Orders that Governor Gretchen Whitmer issued in response to the current public health crisis in Michigan, and in support of the Governor's brief on appeal to affirm the Court of Claims' order denying the Legislature's motion for immediate declaratory judgment.

A full list of *amici* is attached as an appendix to this brief.[1]

[1] Pursuant to M.C.R. 7.212(H), *amici* state that this brief was not authored by counsel representing a party in this case in whole or in part, nor did such counsel or a party make a monetary contribution intended to fund the preparation or submission of this brief. Other than *amici curiae* and their counsel, no person made a monetary contribution to assist in preparation of this brief. The positions of *amici* presented in this brief are theirs alone. *Amici* do not purport to speak on behalf of their employers or any other organization or society with whom they are affiliated.

PRELIMINARY STATEMENT

Over the span of fifteen weeks, Michigan has seen confirmed cases of COVID-19 go from 1 to over 61,400. To date, 5,853 people have died in Michigan, making it the eighth highest state in the nation for COVID-related deaths. The COVID-19 outbreak presents a continuing, life-threatening emergency across the state. And the Governor's emergency measures—including EO 2020-67, EO 2020-68, EO 2020-77, and EO 2020-110—have already saved thousands of lives. Disease modeling reveals that approximately 28,000 more cases across the state would likely have occurred if those measures had not been implemented, resulting in approximately 3,500 lives saved. Were this Court to abruptly invalidate all of the Governor's emergency measures, including those focused on social distancing, the result might well be a resurgence of COVID-19, with peak disease rates potentially nearing or exceeding those experienced in the current outbreak. The Court can and should consider all this in assessing the scope of the Governor's authority and the legality of the Governor's Executive Orders, and in determining whether to affirm the Court of Claims' order denying the Legislature's motion for immediate declaratory judgment.

Amici do not purport to be experts in statutory or constitutional law. Nor are they political strategists with a political agenda. They are scientists who have devoted their professional lives to understanding population health, including the evolution and spread of infectious, communicable diseases. Like many families in Michigan, *amici* appreciate the devastating toll that certain emergency measures may have on Michigan's economy. But their epidemiological expertise makes one thing clear: swift, forceful, and nimble emergency government action based on high-quality data is the only defense that Michigan currently has against COVID-19. Lives will be lost if that shield is cast aside.

ARGUMENT

I. THE COURT SHOULD CONSIDER THE CONTEXT OF THE COVID-19 THREAT WHEN EVALUATING THE CHALLENGED EXECUTIVE ORDERS

Amici present a scientific perspective so that this Court may interpret the 1945 Emergency Powers of the Governor Act ("EPGA") and the 1976 Emergency Management Act ("EMA") within the broader context of the threat that COVID-19 poses to Michigan. Courts "do not exist in a vacuum," and "may take cognizance of facts and events surrounding the . . . purpose of legislation." *Wayne Co Republican Comm v Wayne Co Bd of Comm'rs*, 70 Mich App 620, 625; 247 NW2d 571, 573 (1976). Courts may also consider policy implications when construing a statute. *See Walsh v City of River Rouge*, 385 Mich 623, 634-35; 189 NW2d 318, 324 (1971) ("It is against this background of . . . policy considerations that we must resolve the legal question as to whether [the EPGA] embodies a legislative intent to lodge exclusive powers in the Governor."). Indeed, "[s]tatutes should be construed so as to prevent . . . prejudice to the public interest." *McAuley v Gen Motors Corp*, 457 Mich 513, 518; 578 NW2d 282, 285 (1998) (citing *Franges v General Motors Corp*, 404 Mich 590, 612; 274 NW2d 392 (1979)).

The EPGA and the EMA grant the Governor broad authority to respond to public crises, disasters, and emergencies. MCL 10.32; 30.417(d). With over 5,850 Michiganders dead over the span of fifteen weeks, we can think of no greater crisis facing Michigan in recent history than COVID-19 and the threat it poses to health and safety. "At this time, there is no known cure, no effective treatment, and no vaccine. Because people may be infected but asymptomatic, they may unwittingly infect others." *South Bay United Pentecostal Church v Newsom*, 590 US ___, slip op. at 1 (2020) (ROBERTS, C.J., concurring). The Court of Claims thus properly reasoned that the EPA and the EPGA *compelled* the Governor to take emergency action in those circumstances. *See Mich House of Representatives v Governor Gretchen Whitmer*, opinion of

the Court of Claims, issued May 21, 2020 (Docket No. 20-000079-MZ, p 10) ("The Governor's challenged actions—declaring states of disaster and emergency during a worldwide public health crisis—are required by the very statutes the Legislature drafted.").

As Chief Justice John G. Roberts, Jr. has observed, "The precise question of when restrictions on particular social activities should be lifted during the pandemic is a dynamic and fact-intensive matter subject to reasonable disagreement." *South Bay United Pentecostal Church*, 590 US ___, slip op. at 2 (ROBERTS, C.J., concurring). Particularly given the ongoing nature of the COVID-19 crisis, this "community has the right to protect itself against an epidemic of disease which threatens the safety of its members." *Jacobson v Massachusetts*, 197 US 11, 27 (1905). Under Michigan law, the Governor has the right to make tough judgments—based in science—about how best to achieve that goal. Accordingly, the Court can and should consider *amici*'s scientific assessment in this case.

II. COVID-19 POSES A DIRE THREAT TO THE HEALTH AND SAFETY OF MICHIGAN RESIDENTS

A. COVID-19 Is Deadly and Highly Infectious

The novel coronavirus, SARS-CoV-2, is causing a new and complex illness in humans that is not yet fully understood from a virology, epidemiological, or medical perspective. What is known, however, is that this virus has attributes that make it challenging to contain, including an incubation period during which people are infectious but may not show symptoms as well as the possibility of transmission to others while experiencing mild symptoms or none at all.[2]

[2] Xi He et al., *Temporal Dynamics in viral shedding and transmissibility of COVID-19*, *Nature Medicine*, 672-675 <https://www.nature.com/articles/s41591-020-0869-5> (accessed May 21, 2020); McIntocsh K., *Coronavirus Disease 2019 (COVID-19): Epidemiology, Virology, Diagnosis and Prevention* <https://www.uptodate.com/contents/coronavirus-disease-2019-

Only a small proportion of people who get COVID-19 will experience serious illness, hospitalization, or death. But the ratio of deaths to known COVID-19 cases—currently about one to ten—suggests a higher case-fatality rate than for many other infectious diseases.[3] And even among those who survive COVID-19, emergent clinical evidence suggests that many people are experiencing ongoing respiratory and vascular effects over an extended period.[4] The scientific community continues to gather and analyze data regarding higher-risk populations and communities, but it remains the case that both the geographic patterning and the clinical course of this new disease are not predictable. For example, while available scientific evidence suggests that individuals older than 65 are considered high risk for respiratory infections caused by COVID-19, the virus has also had significant health effects on adults of all ages, with approximately 60% of cases in Michigan under the age of 60.

Given all of the characteristics of this novel virus, we face an unprecedented emergency in which every single Michigander—all 10 million people living in all 83 counties—remains at risk of contracting COVID-19 and experiencing very serious illness or death. There is no way to predict exposure, infection, or severity of illness once infected. In fact, all communities in Michigan remain vulnerable to this devastating disease.

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covid-19-epidemiology-virology-clinical-features-diagnosis-and-prevention> (accessed May 21, 2020).

[3] Coronavirus, Michigan Data <https://www.michigan.gov/coronavirus/0,9753,7-406-98163_98173---,00.html> (accessed May 21, 2020).

[4] Lili Chan et al., *Acute Kidney Injury in Hospitalized Patients with COVID-19* <https://www.medrxiv.org/content/10.1101/2020.05.04.20090944v1> (accessed May 21, 2020); Lois Parshley, Vox, *The emerging long-term complications of Covid-19, explained* <https://www.vox.com/2020/5/8/21251899/ coronavirus-long-term-effects-symptoms> (accessed May 21, 2020); Yuhui Wang et al., Radiology, *Temporal Changes of CT Findings in 90 Patients with COVID-19 Pneumonia: a Longitudinal Study* <https://doi.org/10.1148/radiol.2020200843> (accessed May 21, 2020).

B. COVID-19 Has Ravaged the State of Michigan, Infecting Over 61,000 Michiganders and Killing Over 5,850

Michigan has endured a rapid expansion of confirmed COVID-19 cases, reaching high levels of community spread within a matter of days. The first case of COVID-19 in Michigan was reported on March 10, 2020. Each day in the weeks thereafter, over 100 new cases were diagnosed in southeast Michigan. By March 15, 2020, infections were found in every public health region in the state. In late March and early April, the epidemic grew and remained uncontained. By April 4, 2020, Michigan was experiencing 42 hospitalizations per 100,000 residents, over twice the rates seen in other states, including New York and Tennessee.[5] And by May 10, 2020, just two months after the first reported case, Michigan had nearly 48,000 reported cases and over 4,500 deaths.[6]

To date, the death toll in Michigan has exceeded 5,850, and even that figure is likely an underestimate. In Detroit alone, over 1,400 people have died, which means that COVID-19 has been forty times deadlier than influenza in that city. Other areas of Michigan have likewise experienced extensive illness and death: Macomb and Oakland counties combined have had 1,900 deaths, and Genesee County has lost over 250 residents to COVID-19. To put those figures in perspective, the total number of COVID-19 deaths in Michigan (less than halfway through 2020) has already surpassed the annual number of deaths in 2018 caused by influenza/pneumonia (1,871), suicide (1,547), kidney disease (1,943), Alzheimer's disease

[5] United States Centers for Disease Control and Prevention, *COVID-19 Hospitalizations* <https://gis.cdc.gov/grasp/covidnet/COVID19_3.html> (accessed May 21, 2020).

[6] Coronavirus, *Michigan Data* <https://www.michigan.gov/coronavirus/0,9753,7-406-98163_98173---,00.html> (accessed May 21, 2020).

(4,474), or diabetes (2,824).[7] Lurking behind those numbers is a troubling racial disparity. The current data indicate that the burden of illness and death fall disproportionately on communities of color, with Black residents accounting for over 40% of COVID-related deaths, but only 14% of Michigan's population.[8]

Michigan was one of the first states to be hit hard by the new coronavirus. By way of comparison, it is eighth in the nation in confirmed COVID-19 cases and eighth in the nation in deaths, despite being the eleventh most populous state. In April 2020, Wayne County (Michigan's most populous county) ranked eleventh among most impacted counties in the country and fifth in the country in COVID-related deaths.[9]

III. THE GOVERNOR'S STATEWIDE EXECUTIVE ORDERS ARE SUPPORTED BY SCIENCE AND HAVE SAVED THOUSANDS OF LIVES

A. The Governor Has Used Scientifically Proven Methods to Combat the Spread Of COVID-19

In a series of Executive Orders, Governor Gretchen Whitmer implemented a coordinated set of emergency public health interventions with a strong basis in epidemiological science. For example, Executive Order 2020-77 limited public gatherings, required non-essential workers to stay at home (subject to certain exceptions), closed non-essential physical business offices, required social distancing measures recommended by the CDC, and required face coverings for individuals walking in public. EO 2020-77(1)-(4); (15); *see also* EO 2020-69(1) (closing

[7] Michigan Department of Health and Human Services, *Michigan Cause of Death Information* <https://www.mdch.state.mi.us/pha/osr/deaths/causrankcnty.asp> (accessed May 21, 2020).

[8] Michigan State Government, Coronavirus Michigan Data <https://www.michigan.gov/coronavirus/0,9753,7-406-98163_98173---,00.html> (accessed May 21, 2020).

[9] Johns Hopkins University Coronavirus Resource Center, *COVID-19 United States Cases by County* <https://coronavirus.jhu.edu/us-map> (accessed May 21, 2020).

restaurants, bars, theatres, museums, and gymnasiums for immediate occupancy by the public); EO 2020-65 (closing K-12 schools for the remainder of the 2019-2020 school year); EO 2020-72 (temporarily restricting entry into health care facilities, residential care facilities, congregate care facilities, and juvenile justice facilities). For certain businesses and operations that remained open or reopened, such as construction, manufacturing, grocery, and pharmacy establishments, the Governor required establishments to provide handwashing and sanitizing stations for their employees, perform frequent cleaning and hygiene practices, allow for distance between employees, and limit overall entry and occupancy. EO 2020-77(10)-(11); *see also* EO 2020-71 (temporary safety measures for food-selling establishments and pharmacies); EO 2020-97 (safeguards and awareness plans to protect all Michigan workers who return to work).

While the Governor recently loosened some restrictions, allowing limited social gatherings and permitting restaurants and retail stores to open at limited capacity with safety precautions, EO 2020-110(5)-(6), (11), (13),[10] she kept social distancing requirements and has also continued to require all persons to wear face coverings in public. *Id.* (4); (12) (continuing restrictions on businesses that necessarily require close contact, such as gyms, indoor theatres, and tattoo salons).

The emergency interventions employed by Governor Whitmer are generally referred to as infectious disease "non-pharmaceutical interventions"—*i.e.*, interventions aimed at populations (rather than medical interventions given to individuals). Non-pharmaceutical interventions are designed to prevent the further spread of an infectious disease by quickly reducing potential exposure to the virus through improved hygiene measures and by decreasing the amount and

[10] EO 2020-77 was modified by EO 2020-92 on May 18, 2020, which was subsequently modified by EO 2020-96 on May 21, 2020. EO 2020-110 modified EO 2020-96 on June 1, 2020.

density of physical interaction between people.[11] Such interventions also seek to "flatten the curve" of the epidemic by reducing the peak number of cases of an infectious disease during the time period of a community outbreak.

According to the American Society for Microbiology, there is a long history and strong scientific basis for the use of social distancing.[12] Over the past century, interventions similar to those being used in Michigan have been implemented and studied as frontline responses to infectious disease outbreaks.[13] Public hygiene measures—including requirements regarding surface cleaning in businesses and wearing face masks in public—are proven, indispensable tools in reducing community spread.[14] Similarly, closures of businesses, facilities, and public spaces have been a frequent and fundamental strategy in responding to outbreaks.[15] There is

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[11] World Health Organization, *Non-Pharmaceutical Public Health Measures for Mitigating the Risk and Impact of Epidemic and Pandemic Influenza* <https://extranet.who.int/sph/docs/file/3848> (accessed May 21, 2020).

[12] American Society for Microbiology, *The Science of Social Distancing* <https://asm.org/Articles/2020/April/The-Science-of-Social-Distancing> (accessed May 30, 2020).

[13] Allison E. Aiello et al., American Journal of Infection Control, *Research findings from nonpharmaceutical intervention studies for pandemic influenza and current gaps in the research* <https://www.ajicjournal.org/article/S0196-6553(10)00039-8/fulltext> (accessed May 21, 2020); Richard Albert Stein, International Journal of Clinical Practice, *The 2019 coronavirus: Learning curves, lessons, and the weakest link* <https://doi.org/10.1111/ijcp.13488 > (accessed May 21, 2020) (surveying hygiene recommendations, social distancing practices, limitations on crowd sizes, school closures, workplace closures, and quarantine orders, among others, as effective tools for fighting pandemics).

[14] World Health Organization, *Non-Pharmaceutical Public Health Measures for Mitigating the Risk and Impact of Epidemic and Pandemic Influenza.* <https://extranet.who.int/sph/docs/file/3848> (accessed May 21, 2020); Allison E. Aiello et al., American Journal of Infection Control, *Research findings from nonpharmaceutical intervention studies for pandemic influenza and current gaps in the research* <https://www.ajicjournal.org/article/S0196-6553(10)00039-8/fulltext> (accessed May 21, 2020).

[15] Christopher I. Jarvis et al., BMC Medicine, *Quantifying the impact of physical distance measures on the transmission of COVID-19 in the UK*

strong historical evidence supporting the use of these measures. An analysis of 17 cities during the 1918 influenza pandemic found that death rates were 50% lower in cities that implemented multiple social distancing measures such as school, church, and business closures, as compared to cities that did not implement such emergency measures.[16]

To control a highly infectious disease like COVID-19, additional public health measures must be layered on top of the hygiene, physical/social distancing, stay-at-home, and closure interventions. States must also develop the infrastructure for extensive and rapid testing and contact tracing (a standard public health practice that involves following up with people who have come in contact with someone who has been diagnosed with COVID-19 so they can self-isolate and be tested). Emerging data and research suggest that several countries (including New Zealand, Greece, and Taiwan) have achieved remarkable success in their initial responses to COVID-19 by implementing emergency public health interventions and by adopting a cautious and gradual approach to lifting restrictions consistent with public health science and ongoing testing and tracing.[17]

COVID-19 has an unfortunate long lag time between infection and the first signs of disease, in stark contrast to many other respiratory viruses. Even though epidemiologists measure the ultimate impact of the disease in hospitalizations and death rates, these events occur

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<https://bmcmedicine.biomedcentral.com/articles/10.1186/s12916-020-01597-8> (accessed May 21, 2020).

[16] Richard J. Hatchett, Proceedings of the National Academy of Sciences, *Public health interventions and epidemic intensity during the 1918 influenza pandemic* <https://www.pnas.org/content/104/18/7582> (accessed May 21, 2020).

[17] C. Jason Wang et al., *Response to COVID-19 in Taiwan: Big Data Analytics, New Technology, and Proactive Testing* <https://jamanetwork.com/journals/jama/fullarticle/2762689> (accessed May 21, 2020); Sophie Cousins, The Lancet, *New Zealand Eliminates COVID-19* <https://www.thelancet.com/pdfs/journals/lancet/PIIS0140-6736(20)31097-7.pdf> (accessed May 21, 2020).

weeks or even a month after COVID-19 infection. In a quickly growing epidemic with high transmissibility, the size of the epidemic can double as many as six times before the first infected individual is identified. For this reason, the epidemiology of COVID-19 requires that public health interventions be proactive, responsive, and implemented (and reimplemented) as quickly as possible in response to even small changes in the incidence of new cases, without waiting for additional doubling times to pass and for even more cases and deaths to accrue. The nature of COVID-19 is such that responses and interventions are necessary before a new spike in infections is ever recorded. To limit the Governor's ability to respond to COVID-19 only after a new spike occurs could cost lives.

Multiple COVID-19 vaccines are currently undergoing accelerated development and testing, although it will be quite some time before a safe and effective vaccine is available.[18] Even if an effective vaccine is developed, states and municipalities would also need to establish a robust vaccine-delivery infrastructure, maintain sufficient rates of acceptance and uptake, and guarantee affordable access to all residents to establish population-level herd immunity. COVID-19 will continue to present a health emergency to the state of Michigan until a vaccine is developed and delivered to the vast majority of people of all ages. Given the attributes of the novel coronavirus and the fact that we do not yet have effective medical treatments or a vaccine, non-pharmaceutical interventions and emergency public health actions—like those adopted by Governor Whitmer—are the cornerstone of prevention and control of COVID-19 in Michigan.

[18] Nicole Lurie et al., New England Journal of Medicine, *Developing Covid-19 Vaccines at Pandemic Speed* <https://www.nejm.org/doi/full/10.1056/NEJMp2005630> (accessed May 21, 2020).

B. The Governor's Emergency Orders Have Saved an Estimated 3,500 Lives

Michigan's science-based approach to the COVID-19 pandemic mirrors the approach of other jurisdictions (including 43 other states) that have responsibly implemented stay-at-home and other emergency public health orders. A recently released national, peer-reviewed study reports that states' adoption of four fundamental social distancing measures in March and April—(1) large event bans; (2) school closures; (3) entertainment/restaurant/bar/gym closures; and (4) shelter-in-place orders—significantly reduced the daily growth rate of COVID-19: the rate of increase in cases was reduced by 5.4% after 1-5 days, 6.8% after 6-10 days, 8.2% after 11-15 days, and 9.1% after 16-20 days.[19] The results from this study also demonstrate that without the adoption of these four social distancing measures, the virus would have spread 35 times faster by April 27, 2020, with about 35 million more cases of the disease nationwide.

Two studies in the journal *Nature* also concluded that government-imposed "anti-contagion policies" such as school and business closures and other movement restrictions had a significant negative impact on the rate of growth of overall number of COVID-19 cases worldwide.[20] Public health emergency interventions in six countries (China, South Korea, Italy, Iran, France, United States) prevented or delayed a total of 62 million confirmed cases of COVID-19.[21] Moreover, a U.S. study compared the rate of increase in COVID-19 infections in Clarke County, Georgia—which implemented a local shelter-in-place order two weeks before a

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[19] Charles Courtemanche et al., Health Affairs, *Strong Social Distancing Measures in the United States Reduced the COVID-19 Growth Rate* <https://www.healthaffairs.org/doi/10.1377/hlthaff.2020.00608> (accessed May 21, 2020).

[20] Solomon Hsiang et al., Nature, *The Effect of Large-Scale Anti-Contagion Policies on the COVID-19 Pandemic* <https://www.nature.com/articles/s41586-020-2404-8> (accessed June 8, 2020); Seth Flaxman et al., Nature, *Estimating the effects of non-pharmaceutical interventions on COVID-19 in Europe* <https://doi.org/10.1038/s41586-020-2405-7> (accessed June 8, 2020).

[21] *Id.*

statewide order went into effect—to adjacent counties, revealing a 30% slower rate of growth and reduced total number of infections in Clarke County.[22]

Another recently published study analyzed the growth rate of COVID-19 cases in the 15 states (including DC) that implemented mandates regarding the use of face masks and coverings in public places between April 8, 2020 and May 15, 2020 (including Michigan). Controlling for population and other policy factors, this study found that emergency orders requiring people to wear face masks/coverings in public was associated with a significant decline in the daily COVID-19 growth rate. The impact was observed as quickly as in the first five days after the order was executed, with the strongest impact 21+ days later. Estimates suggest that by May 22, 2020, between 230,000 and 450,000 cases of COVID-19 were averted by mandating face masks/coverings in these 15 jurisdictions.[23]

Epidemiologic indicators of Michigan's COVID-19 outbreak have demonstrated a clear reduction in the growth of new cases following the implementation of social distancing and other emergency measures. Indeed, within just a couple weeks of the stay-at-home directive going into effect, the state saw marked reductions in new cases and deaths.[24] Sophisticated disease modeling of COVID-19 in Michigan, conducted by University of Michigan epidemiologists, has estimated that approximately 28,000 more cases and 3,500 deaths would likely have occurred in

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[22] Mark H. Ebell et al., American Journal of Preventive Medicine, *Mandatory Social Distancing Associated with Increased Doubling Time: An Example Using Hyperlocal Data* <https://www.ajpmonline.org/article/S0749-3797(20)30185-9/fulltext> (accessed May 30, 2020).

[23] Wei Lyu and George Wehby, Health Affairs, *Community Use of Face Masks and COVID-19: Evidence from a Natural Experiment of State Mandates in the U.S.* <doi.org/10.1377/hlthaff.2020.00818> (accessed June 21, 2020).

[24] Michigan COVID-19 Modeling Dashboard <https://epimath.github.io/covid-19-modeling/> (accessed June 2, 2020).

Michigan had the Governor not implemented her emergency measures.[25] Figure 1 below compares the actual course of new COVID-19 cases in Michigan to the projected incidence of new cases that would be expected absent the Governor's emergency measures focused on social distancing:

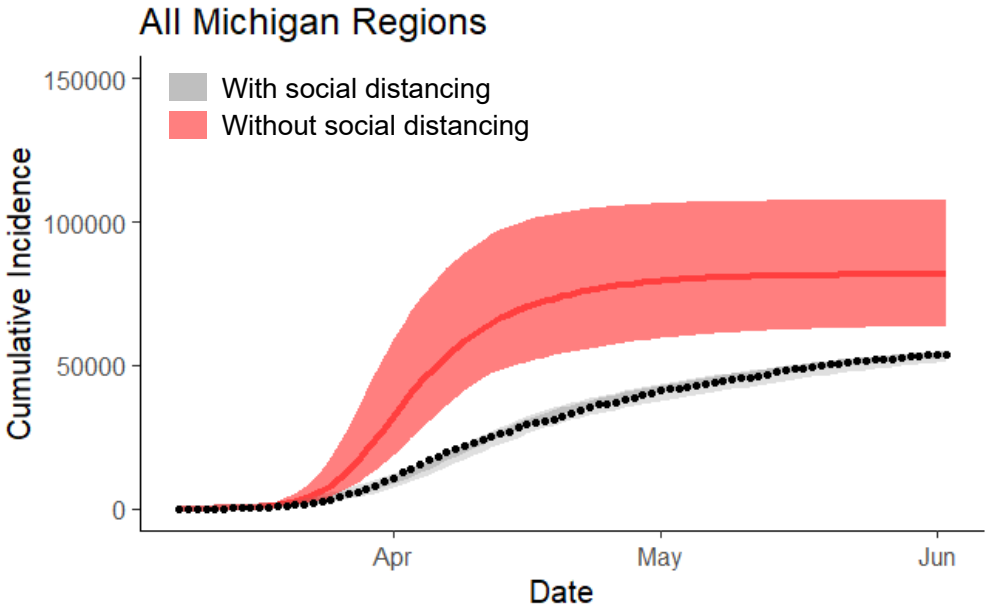

Figure 1. Disease Model Simulations With and Without Social Distancing Interventions. The black dots with grey shading represent the **actual** number of COVID-19 cases in Michigan with social distancing. The coral shading represents the range of **expected** cases without social distancing from different modeling simulations, with the median across the simulations shown as a solid line. Based on the median estimates, the model predicts that without emergency interventions, there would have been 28,000 more cases by June 1, 2020.

The median results from different modeling exercises estimate that by June 1, 2020 the difference between the actual number of COVID-19 cases in Michigan and the expected number without social distancing interventions is 28,000. This translates into an estimated 3,500 deaths from COVID-19 that were averted by June 1, 2020 because of the emergency orders. In addition, the Michigan COVID-19 modeling exercises estimate that the epidemiologic curve of COVID-19 was indeed flattened such that the peak number of cases seen in April would likely have been 2.7 times the actual number experienced in Michigan without the emergency orders. In the same vein, absent Governor Whitmer's executive orders, Michigan hospital systems would

[25] *Id.*

have exceeded their capacity for treating COVID-19 patients in mid- to late-April, leading to even more suffering and deaths due to COVID-19.[26]

C. The Governor's Statewide Implementation of Emergency Measures Was Necessary to Curtail Rapid Community Spread Of COVID-19

COVID-19 is an insidious disease that quietly infiltrates communities, goes undetected for days and weeks, and then explodes exponentially into an outbreak that can quickly overwhelm a community and its health care capacity. Governor Whitmer therefore had little choice but to adopt a statewide public health response to curb the spread of COVID-19.

Epidemiologists classify how contagious an infectious agent is by what is referred to as its "basic reproduction number" or R_0 (pronounced "R naught"). The R_0 value refers to how many other people, on average, a single person with the disease will infect. Once a virus hits a community, the rate of spread can be modeled based upon this reproduction number. Importantly, the reproduction number of an infectious agent needs to be below 1.0 for it to cease spreading within a population in the absence of a vaccine, thus eventually ending the epidemic.

Seasonal influenza typically has a basic reproduction number of 1.3, meaning that 3 people with influenza will on average infect 4 other people. By contrast, the basic reproduction number of the coronavirus is not yet fully understood, but appears to range somewhere between 2.2 and 5.7.[27] Even assuming a rate of only 3.0, the result is that a single person with COVID-19 will infect on average 3 other people, who in turn will infect 3 other people who themselves will infect 3 other people, and so on. In just 4 cycles of spread, one single person with COVID-19 in

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[26] *Id*.

[27] Steven Sanche et al., Emerging Infectious Diseases, *High Contagiousness and Rapid Spread of Severe Acute Respiratory Syndrome Coronavirus 2* <https://doi.org/10.3201/eid2607.200282> (accessed May 21, 2020).

a community could cause 81 other cases wherever she lives, works, shops, worships, or socializes.

This is consistent with developments in Michigan. Levels of hospitalization and death related to COVID-19 were remarkably high in southeast Michigan at the peak of the epidemic in April, though they have since trended downward. As southeast Michigan began to see a decrease in severe cases and death, other areas of Michigan continued on an upward trajectory which has only recently begun to slow. The Governor's statewide stay-at-home and other emergency measures went into place before areas in western and northern Michigan reached exponential levels of growth and high case levels, saving not only lives, but valuable resources and capacity at hospitals and in healthcare systems, especially those in rural regions. Thus, the statewide orders had the additional benefit of limiting the growth phase of the epidemic across the entire state, ultimately reducing the toll in the west and north. Early statewide intervention saved additional lives even in those regions that have seen fewer confirmed cases than the rest of the state.

A recent study by a large independent group of researchers at the Imperial College of London focusing on the global COVID-19 pandemic confirms that the aggressive actions implemented in Michigan and other U.S. states significantly lowered the transmission rates of the virus, thus reducing the number of cases and deaths.[28] This group concluded that the states that were the most successful in keeping people from interacting with others were also more successful in reducing the spread of the virus, including in Michigan. The research further revealed that after the Governor's emergency orders were implemented in March, the basic

[28] Imperial College of London, *Report 23: State-Level Tracking of COVID-19 in the United States.* <https://www.imperial.ac.uk/media/imperial-college/medicine/mrc-gida/2020-05-21-COVID19-Report-23.pdf> (accessed June 11, 2020).

reproduction or infection rate in Michigan decreased first to 2.5 people, then to 1.25 people, and then to 0.8 people in April. The emergency public health orders are what drove the basic reproduction rate below 1.0, which must happen if the epidemic of cases and deaths is to be contained and stopped.

IV. LIMITING THE GOVERNOR'S ABILITY TO IMPLEMENT, ENFORCE, REVISE, AND LIFT EMERGENCY ORDERS WOULD RISK FURTHER INFECTION AND DEATH THROUGHOUT MICHIGAN

Michigan's first battle with the novel coronavirus has been intense and devastating to both the health and economic welfare of the state. The good news is that, in early June 2020, all indicators—including the number of new cases, hospitalizations and deaths—suggest that the amount of virus circulating in Michigan communities has been significantly reduced. Even so, every sophisticated simulation model predicts further serious outbreaks of COVID-19 in the near future.[29] In fact, several states, including Arizona, Florida, North Carolina, Texas, and Utah, are currently experiencing a significant rise of COVID-19 cases after social distancing measures were quickly relaxed—resurgences that cannot be explained by increases in testing alone.

Based on our epidemiological expertise, the Governor's emergency measures have had a successful and positive impact on the safety and health of Michiganders. Lifting those measures all at once for the entire state, or removing her ability to quickly adopt, revise, refine, and lift certain measures if needed in the future, will likely result in increased cases of infection and death. The frontline emergency public health interventions must be implemented very fast, with targeted and decisive action without delay. A delay of just a few days to consider and debate action can make a significant difference in the level of spread and toll from the disease.

[29] Wu JT et al., The Lancet, *First-Wave COVID-19 Transmissibility and Severity in China Outside Hubei After Control Measures, and Second-Wave Scenario Planning: A Modeling Impact Assessment.* <https://doi.org/10.1016/S0140-6736(20)30746-7> (accessed June 7, 2020).

A. Michigan's Current Testing Infrastructure Alone Will Not Prevent and Control the Spread of COVID-19 without Emergency Measures

Accurate and reliable testing has always been a core countermeasure in tracking and controlling infectious diseases like COVID-19. Widespread, easily accessible testing allows public health officials to quickly ascertain who has COVID-19, to isolate such persons to limit further transmission, and to trace close contacts so that they can self-quarantine and get tested.[30] While the Governor has recently undertaken efforts to expand the state's testing infrastructure and contact-tracing abilities, *see* EO-2020-104, it will take additional time before the state reaches recommended testing and contact-tracing levels.

A research group from the Harvard Global Health Institute has developed estimates for the minimum daily number of tests needed for each state based on its population, the actual and projected numbers of infections, and the probable close contacts to cases. To achieve optimal contact tracing, they recommend that Michigan conduct at least 58,000 tests per day, which is significantly higher than Michigan's current capacity.[31]

Moreover, even if Michigan could consistently achieve a sufficiently high testing volume to enable contact tracing, more contact-tracing resources and personnel are needed. The National Association of County & City Health Officials estimates that there should be 30 contact tracers per 100,000 members of a population, translating to approximately 3,000 contact tracers needed in Michigan, also significantly higher than Michigan's current capacity.[32] The removal

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[30] Kent T. D. Eames et al., The Royal Society, *Contact Tracing and Disease Control* <https://royalsocietypublishing.org/doi/pdf/10.1098/rspb.2003.2554> (accessed May 21, 2020).

[31] Ashish K. Jah et al., Harvard Global Health Institute, Pandemics Explained, *HGHI and NPR Publish New State Testing Targets* <https://globalepidemics.org/2020/05/07/hghi-projected-tests-needed-may15/> (accessed May 11, 2020).

[32] National Association of County & City Health Officials, NACCH Position Statement, *Building COVID-19 Contact Tracing Capacity in Health Departments to Support Reopening American*

of emergency social distancing orders must be coordinated with the state's and local public health agencies' capacity to conduct high levels of testing and contact tracing.

B. The Governor's Executive Orders Remain Necessary to Avoid Further Outbreaks and Death

Given the need for expanded testing and contact tracing in Michigan, the Governor's emergency measures serve as a necessary tool in combating the continued spread of COVID-19. Prematurely lifting those measures or not being able to reinstate them quickly if the virus resurges would likely result in a rapid increase in infections and deaths.

History serves as a guide. A study of 23 U.S. cities in the 1918 influenza pandemic found that jurisdictions who lifted controls earlier had greater mortality and a higher peak during a second wave of infections as compared to those jurisdictions with controls in place for longer duration.[33] During a 1916 outbreak of polio in Oyster Bay, New York, the city initially banned children under 16 from attending public gatherings, but then removed these restrictions due to pressure from the local population. The result was a large citywide outbreak of polio with a rate of 9 per 1,000 members of the population compared to 0.6 per 1,000 in upstate New York, where restrictions remained in place.[34]

Society Safely <https://www.naccho.org/uploads/full-width-images/Contact-Tracing-Statement-4-16-2020.pdf> (accessed May 21, 2020); Selena Simmons-Duffin, National Public Radio, *States Nearly Doubled Plans for Contact Tracers Since NPR Surveyed Them 10 Days Ago* <https://www.npr.org/sections/health-shots/2020/04/28/846736937/we-asked-all-50-states-about-their-contact-tracing-capacity-heres-what-we-learned> (accessed May 21, 2020).

[33] Martin C. J. Bootsma et al., Proceedings of the National Academy of Sciences, *The Effect of Public Health Measures on the 1918 Influenza Pandemic in U.S. Cities* <https://pubmed.ncbi.nlm.nih.gov/17416677/> (accessed May 21, 2020).

[34] Guenter B. Risse, Transactions & Studies of the College of Physicians of Philadelphia, *Revolt against quarantine: community responses to the 1916 polio epidemic, Oyster Bay, New York* <https://www.researchgate.net/publication/21550198_Revolt_against_quarantine_community_responses_to_the_1916_polio_epidemic_Oyster_Bay_New_York> (accessed May 21, 2020).

What was true then remains true today. Public health interventions—including social distancing and restrictions on certain high-contact businesses, testing, and contact tracing—are essential in mitigating the health, economic, and social costs of an ongoing global pandemic. To be sure, such emergency measures may come with painful costs, but state and local governments cannot even begin to meaningfully assess or address those consequences without first getting the virus under control. Moreover, emerging cost-benefit analysis confirms that the social and economic value of the lives saved through emergency public health measures outweighs the near-term costs.[35]

Even under the most optimistic estimates, at least 90% of the Michigan population remains susceptible to COVID-19. We are far from the level of herd immunity required to slow the virus without population-based interventions. Abrupt and uncoordinated relaxation of restrictions will lead to increased virus circulation. Disease models demonstrate that if social distancing is abruptly stopped in Michigan, a second resurgence of COVID-19 would likely occur, with peak disease rates potentially nearing or exceeding levels experienced in the current outbreak.[36] If social distancing is lifted gradually over a longer period of time in a calibrated and coordinated manner with other public health interventions, as is happening in most states, the number of new cases could still increase, but worst-case scenario estimates from an abrupt opening up could be cut nearly in half.[37]

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[35] Linda Thunstrom et al., Journal of Benefit-Cost Analysis, *The Benefits and Costs of Using Social Distancing to Flatten the Curve for COVID-19* <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3561934> (accessed May 21, 2020).

[36] Michigan COVID-19 Modeling Dashboard <https://epimath.github.io/covid-19-modeling/> (accessed May 21, 2020).

[37] COVID Act Now Modeling Results for Michigan <https://covidactnow.org/us/mi?s=38532> (accessed May 31, 2020).

* * *

COVID-19 is a complex and dangerous disease. To date, it has taken the lives of more than 5,850 Michiganders over the span of less than three months since the first diagnosis. Until there is an effective and affordable vaccine with high enough uptake and infrastructure to create herd immunity, Michigan's only defense is forceful and nimble emergency action based on high-quality data and proven public health interventions.[38] *See South Bay United Pentecostal Church*, 590 US ___, slip op. at 1-3 (ROBERTS, C.J., concurring) (noting how COVID-19 is an "extraordinary health emergency" with "local officials actively shaping their response to changing facts on the ground"). Governor Whitmer's carefully tailored executive orders—and her ability to implement, change, rescind, and re-implement them quickly—remain crucial to containing COVID-19. The Governor's actions have saved thousands of lives. To lift these measures prematurely, or to impose rigid limitations on the Governor's ability to respond to COVID-19, would risk a public health disaster.

[38] David S Jones, New England Journal of Medicine, *History in a Crisis – Lessons for Covid-19* <https://pubmed.ncbi.nlm.nih.gov/32163699/> (accessed May 21, 2020).

CONCLUSION

For the foregoing reasons, *amici* respectfully submit that the Court should affirm the legality of Governor Whitmer's life-saving Executive Orders.

Dated: June 24, 2020

Respectfully submitted,

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PROOF OF SERVICE

I hereby certify that on June 24, 2020, I electronically filed and electronically served:

BRIEF OF *AMICI CURIAE* MICHIGAN EPIDEMIOLOGISTS IN SUPPORT OF DEFENDANT-APPELLEE GOVERNOR GRETCHEN WHITMER

with the Clerk of the Court using the MiFile system which will send notification of such filing to all attorneys of record.

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