

AMERICA

I am a scientist working to stop coronavirus. We should cancel all Masses.



Patrick O'Neill March 13, 2020



Police officers patrol an empty St. Peter's Square at the Vatican on Wednesday, March 11. (AP Photo/Andrew Medichini)

As is already clear from the sudden rash of closings, cancellations and diagnoses of prominent people, the coronavirus outbreak is spreading rapidly throughout the United States. In response, many bishops have taken the difficult but prudent step of dispensing the faithful from their Sunday Mass obligation. Those decisions are to be commended for the sake of public safety. Other bishops, however, have gone further. Some dioceses (including Seattle, Chicago, Newark and others) have suspended the public celebration of Masses altogether. If bishops wish to do their utmost to contain the spread of the outbreak, it is my sorrowful conclusion that they must

all take this extraordinary step and suspend Masses throughout the United States until the outbreak has been stabilized.

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Please let me be clear: I am not a theologian and do not pretend to possess the competence to make theological claims. I am only a computational biologist alarmed by the spread of the coronavirus. One week ago I took a leave of absence from my work to volunteer with the [New England Complex Systems Institute](#), which has rapidly assembled a global network of volunteers in science, technology and policy in order to help contain the outbreak. I am also a catechumen. But even as one only a few steps down the lifelong path of conversion, I am deeply concerned for the well-being of the Catholic faithful and am cognizant of the church's great potential influence to combat the spread of the infection. It is my lay understanding that the suspension of public Masses is a measure that bishops may take in the gravest of circumstances. I simply wish to explain the gravity of the present situation from a scientific point of view and explain how the continued celebration of public Masses makes them even graver.

In recent days, people with ordinary levels of scientific literacy may have heard uncertain and conflicting reports about the scope and gravity of the outbreak. As a scientist who has been involved in conversations among experts on this issue, I therefore wish to first summarize the best understanding of the epidemiological community.

What we know about the virus and outbreak

Covid-19 is the disease caused by SARS-nCoV-2, a novel coronavirus that emerged from Hubei, China, late last year and spread throughout the globe. As of this writing, there have been over 135,000 confirmed cases worldwide and over 5,000 deaths. In the United States, the numbers stand at almost 1,700 confirmed cases and at least 41 deaths. The true number of Covid-19 infections is unknown, due to the difficulties and limited availability of clinical testing. Several different estimates by different methods all suggest that the true case load is underestimated by a factor of 10 or 100. The true number of infections in the United States is therefore now between 17,000 and 170,000.

[\[Explore all of America's in-depth coverage of the coronavirus pandemic\]](#)

Covid-19 is not properly comparable to the flu, as is sometimes suggested. Hospitalization is required in 10 to 20 percent of cases. According to my best estimate (based on current data, calculating deaths as a percentage of confirmed cases), the mortality rate is 3.7 percent (almost 40 times that of the flu), and may rise to as much as 10 percent if hospital treatment is unavailable. Covid-19 is spreading rapidly in the United States, with the number of confirmed infections doubling approximately every three days. The U.S. has approximately one million hospital beds, of which perhaps 450,000 are free at any given time, and not all of those are equipped to treat the acute respiratory distress that Covid-19 can cause. At current rates, we will reach hospital capacity in less than three weeks. Due to the rapid doubling time, every day of

inaction at this stage of the outbreak could increase the total toll of the outbreak by roughly 25 percent.

The Covid-19 outbreak can be slowed and stabilized, as China's example shows. But we must also enact immediate and stringent measures as China did. Halting the outbreak in Wuhan required radical interventions: quarantining cities, disrupting daily life and restricting the movement of almost 800 million people. These measures were indeed draconian. However, because Covid-19 can only be combated by reducing opportunities for transmission, they were also necessary to avoid complete infection of the entire country.

How suspending public Masses can help contain the outbreak

Recently, the bishops of many U.S. dioceses have dispensed the obligation to assist at Mass. This is an excellent first step and they are to be commended for recognizing the severity of the situation. Other bishops have gone further, suspending the public celebration of Mass entirely. While a dispensation from the Sunday obligation, leaving the faithful free to decide whether to go to Mass, benefits Catholics who are anxious about exposure to Covid-19, it does not go far enough from an epidemiological perspective.

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Given what we know about this outbreak, any large gathering of even apparently healthy people still constitutes a grave public health risk. Already we are approaching the point where there is a non-negligible probability (about 7 percent, according to my estimates, and rapidly rising) that any gathering of 100 people will involve at least one person infected with Covid-19. Therefore, I argue, it is not enough that attendance at large public gatherings be made morally optional; there is a moral duty to avoid even holding large public gatherings whenever possible.

There are several reasons for this admittedly severe position. First, newly infected patients may take one to two weeks to develop symptoms, and many cases remain completely asymptomatic throughout. Such patients are still infectious for much of this time and may therefore transmit their infections unknowingly. Second, it must be said that a policy of voluntary self-quarantine for those with infections is only partially reliable, as we have already seen examples of patients knowingly violating self-quarantine for far more trivial reasons than to go to Mass. Patients in such a situation may be unaware of the full implications of their decision, but this does not mitigate the risk of their choices. Lastly, even if Catholics wish to endure extreme *personal* risks to attend Mass (a position with which I am sympathetic), they cannot physically do so without also imposing grave *social* risks on the public. In a statistical sense, the position of an asymptotically infected Catholic attending Mass today is analogous to someone driving to Mass by a route that will unknowingly take them through a crowded sidewalk, unintentionally but unavoidably imperiling the lives of passersby.

The Covid-19 outbreak will be a profound challenge for the church, and it must be fought along every front of an extremely complex battle. This challenge will require the deepest outpourings

of faith, hope and love, and the most rigorous exercises of justice, prudence, temperance and fortitude. In my scientific opinion, I regret to say, there is no prudent way for a Catholic in the United States to attend any large public gathering without aggravating the spread of the outbreak risking the lives of others. Suspension of public Masses is an extraordinary measure, but one that some U.S. bishops, as well as bishops in other affected countries including Italy, have already taken, and the entire U.S. church must follow suit. The church must respond with every ounce of intelligence, creativity, flexibility and compassion at its disposal in order to continue to feed the spiritual hunger of mankind without putting lives at risk.

Correction, March 14, 2020: Due to an editing error, the diocese of Providence and all dioceses in Pennsylvania were incorrectly described as having suspended the public celebration of Mass. Providence and the Pennsylvania dioceses have dispensed the faithful from their Sunday obligation, but at this time are not among the dioceses that have suspended the public celebration of Mass.

Patrick O'Neill, Ph.D., is a computational biologist, machine learning engineer and catechumen living in Somerville, Mass. He is currently volunteering with the New England Complex Systems Institute, at endcoronavirus.org, to fight the Covid-19 pandemic.