Declaration of Joseph J. Amon, Ph.D. MSPH

I, Joseph J. Amon, declare as follows:

Background and Expertise

1. I am an infectious disease epidemiologist, Director of Global Health and Clinical Professor in the department of Community Health and Prevention at the Drexel Dornsife School of Public Health. I also hold an appointment as an Associate in the department of epidemiology of the Johns Hopkins University Bloomberg School of Public Health. My Ph.D. is from the Uniformed Services University of the Health Sciences in Bethesda, Maryland and my Master of Science in Public Health (MSPH) degree in Tropical Medicine is from the Tulane University School of Public Health and Tropical Medicine.

2. Prior to my current position, I have worked for a range of non-governmental organizations and as an epidemiologist in the Epidemic Intelligence Service of the US Centers for Disease Control and Prevention. Between 2010 and 2018, I was a Visiting Lecturer at Princeton University, teaching courses on epidemiology and global health. I currently serve on advisory boards for UNAIDS and the Global Fund against HIV, TB and Malaria and have previously served on advisory committees for the World Health Organization.

3. I have published 60 peer-reviewed journal articles and more than 100 book chapters, letters, commentaries and opinion articles on issues related to public health and health policy.

4. One of my main areas of research focus relates to infectious disease control, clinical care, and obligations of government related to individuals in detention settings, in which I have published a number of reports assessing health issues in prison and detention settings and more than a dozen peer-reviewed articles. In 2015-2016, I was a co-editor of a special issue of the British journal, “The Lancet,” on HIV, TB and hepatitis in prisons. I also serve on the editorial boards of two public health journals.

My resume is attached as Exhibit A.

Information on COVID-19 and Vulnerable Populations

5. COVID-19 is a coronavirus disease that has reached pandemic status. As of today (4/3), according to the World Health Organization 932,166 confirmed cases have been diagnosed in 205 countries or territories around the world and more than 46,764 deaths due to COVID-19 have been reported.¹ In the United States, which has the highest number of reported cases in the world, 245,573 confirmed cases have been reported with the disease and 6,058 people have died thus far,² though these numbers likely

² See https://coronavirus.jhu.edu/map.html accessed April 3, 2020
underreport the actual infections and deaths.³ In Pennsylvania, as of 12:00 pm on April 5, 2020, there were 11,510 confirmed cases and 150 deaths reported by the state department of health.⁴ Since March 6, there have been 1,072 individuals hospitalized due to COVID-19, with 98% of those cases occurring in individuals age 25 years or older.⁵ There has been an exponential increase in cases and deaths in Pennsylvania over the past three weeks with the number of people infected increasing, on average, by 32% every day⁶:

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<th>Deaths (cumulative)</th>
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<td>150</td>
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</table>

⁵ Ibid.
⁶ See http://91-divoc.com/pages/covid-visualization/ accessed April 5, 2020
6. COVID-19 is a serious disease, ranging from no symptoms or mild ones for people at low risk, to respiratory failure and death. There is no vaccine to prevent COVID-19. There is no known cure or anti-viral treatment for COVID-19 at this time. The specific mechanism of mortality of critically ill COVID-19 patients is uncertain but may be related to virus-induced acute lung injury, inflammatory response, multiple organ damage and secondary nosocomial infections.

7. The World Health Organization (WHO) identifies individuals at highest risk to include those over 60 years of age and those with cardiovascular disease, diabetes, chronic respiratory disease, and cancer. The WHO further states that the risk of severe disease increases with age starting from around 40 years.

8. The US CDC identifies “older adults [65 and older] and people of any age who have serious underlying medical conditions” as at higher risk of severe disease and death. The CDC identifies underlying medical conditions to include: blood disorders, chronic kidney or liver disease, compromised immune system, endocrine disorders, including diabetes, metabolic disorders, heart and lung disease (“including asthma or chronic obstructive pulmonary disease [chronic bronchitis or emphysema] or other chronic conditions associated with impaired lung function”), neurological and neurologic and neurodevelopmental conditions “[including disorders of the brain, spinal cord, peripheral nerve, and muscle such as cerebral palsy, epilepsy (seizure disorders), stroke, intellectual disability…”], and current or recent pregnancy. The CDC also identifies individuals with a body mass index (BMI) greater than 40 to be at higher risk for severe illness. Based upon reports of a high proportion of ICU patients with cerebrovascular disease and diabetes, some researchers have speculated that increased risk of severe illness may be associated with common medicines (ACE2-stimulating drugs) prescribed for hypertension and diabetes.

9. Data from US COVID-19 cases published by the CDC on March 19, 2020, found that hospitalization rates and intensive care unit (ICU) admission rates were nearly identical for individuals aged 45-54 and individuals aged 55-64 (between approximately 20-30% for both groups for hospitalization and between 5-11% for both

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11 See https://www.thelancet.com/journals/lancet/article/PIIS2213-2600(20)30116-8/fulltext?fbclid=IwAR2oRXHweQw3CLmgJuAh7q556SJ83lnw4m8_G9LK8GippeAPUtwGG1Fn9o accessed April 3, 2020
groups for ICU admission). This suggests that individuals >45 years could be considered high risk for severe disease while those ≥54 years could be considered high risk for severe disease and death.

Health profile of declarants

10. I have reviewed the declarations of the following individuals and/or the attorneys for the following individuals: Heather Connolly, Alexus Diggs, Larnell Jones, Terry Suggs, and Michael Graham.

11. Heather Connolly is a 48 year old woman who reports having hepatitis C, a viral infection of the liver commonly associated with liver disease. This conditions indicates that she is likely at heightened risk for severe illness and death from COVID-19. She also indicates current symptoms of fever and that her cellmate was ill with a high fever.

12. Alexus Diggs is a 24 year old woman who reports having high blood pressure. Hypertension is a form of cardiovascular disease and may be associated with other conditions such as atherosclerosis. Because of her hypertension, Ms. Diggs may be at increased risk of severe disease or death due to COVID-19.

13. Larnell Jones is a 45 year old man who reports having asthma and hypertension which indicates that his is likely at heightened risk for severe disease and death from COVID-19.

14. Terry Suggs is a 35 year old man who reports having asthma, hypertension, and diabetes, all of which likely puts him at heightened risk for severe disease and death from COVID-19.

15. Michael Graham is a 38 year old man who reports having hepatitis C and asthma, both of which likely puts him at heightened risk for severe disease and death from COVID-19.

Understanding of COVID-19 Transmission

16. According to the US CDC, the disease is transmitted mainly between people who are in close contact with one another (within about 6 feet) via respiratory droplets produced when an infected person coughs or sneezes. It may be possible that a person can get COVID-19 by touching a surface or object that has the virus on it and then touching their own mouth, nose, or possibly their eyes, but this is not thought to be the main way the virus spreads.

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12 See https://www.cdc.gov/mmwr/volumes/69/wr/mm6912e2.htm, accessed March 21, 2020
17. People are thought to be most contagious when they are most symptomatic (the sickest), however there is increasing evidence of asymptomatic\textsuperscript{15} and presymptomatic transmission. A recent report by the CDC of presymptomatic transmission in Singapore identified seven clusters of COVID-19 in which presymptomatic transmission likely occurred, accounting for 6.4% of locally acquired cases examined.\textsuperscript{16} These findings are similar to research outside of Hubei province, China, which found that 12.6% of transmissions could have occurred before symptom onset in the source patient.\textsuperscript{17} Speech and other vocal activities such as singing have been shown to generate air particles which could transmit the virus responsible for COVID-19, with the rate of emission corresponding to voice loudness. News outlets have reported that during a choir practice in Washington on March 10, presymptomatic transmission likely played a role in SARS-CoV-2 transmission to approximately 40 of 60 choir members.\textsuperscript{18}

18. The understanding of direct transmission as the most likely means of SARS-CoV-2 transmission combined with evidence of asymptomatic and presymptomatic transmission suggests that, while hand washing and disinfecting surfaces is advisable, the main strategy for limiting disease transmission is social distancing and that for such distancing to be effective it must occur before individuals display symptoms.

19. Recognizing the importance of social distancing, public health officials have recommended extraordinary measures to combat the spread of COVID-19. Schools, courts, collegiate and professional sports, theater and other congregate settings have been closed as part of risk mitigation strategy. 50 states, 7 territories, and the District of Columbia have taken some type of formal executive action in response to the COVID-19 outbreak.\textsuperscript{19} Through one form or another, these jurisdictions have declared, proclaimed, or ordered a state of emergency, public health emergency, or other preparedness and response activity for the outbreak. Earlier this month Pennsylvania Governor, Tom Wolf, declared a state of emergency, which he buttressed on March 19 with an order closing non-essential businesses.\textsuperscript{20} On April 1, Governor Wolf extended county-by-county stay at home orders to cover the entire state of Pennsylvania.\textsuperscript{21} These kinds of orders are quickly spreading nationwide, after beginning in California on March 19. As of April 2, at least 297 million people in at least 38 states, 48 counties, 14 cities, the District of Columbia, and Puerto Rico are being directed to stay home.\textsuperscript{22}


\textsuperscript{16}See \url{https://www.cdc.gov/mmwr/volumes/69/wr/mm6914e1.htm?s_cid=mm6914e1_w} accessed April 2, 2020

\textsuperscript{17}See \url{https://wwwnc.cdc.gov/eid/article/26/6/20-0357_article} accessed April 2, 2020

\textsuperscript{18}See \url{https://www.latimes.com/world-nation/story/2020-03-29/coronavirus-choir-outbreak} accessed April 2, 2020

\textsuperscript{19}See \url{https://www.astho.org/COVID-19/} accessed March 21, 2020


20. These public health measures aim to “flatten the curve” of the rates of infection so that those most vulnerable to serious complications from infection will be least likely to be exposed and, if they are the numbers of infected individuals will be low enough that medical facilities will have enough beds, masks, and ventilators for those who need them.

21. US cities are starting to see the level of COVID-19 cases seen in previous global hotspots. On Thursday, March 26, Governor Cuomo announced that 100 people had died of the coronavirus between Wednesday and Thursday morning. As of Friday, March 27, the cumulative death toll in the state stood at 450. In response, the city’s health commissioner again urged all New Yorkers to follow the stay at home order, emphasizing the impact on the city’s already strained health system. As of April 1, 2020, New York’s death toll had reached 1,374. Pennsylvania is roughly 10 days behind New York City, following a similar trendline of cases and deaths.

Risk of COVID-19 in Jail Facilities

22. The conditions of jail facilities pose a heightened public health risk to the spread of COVID-19, even greater than other non-carceral institutions.

23. Jails are enclosed environments. These kinds of enclosed environments, like cruise ships and nursing homes, have seen higher rates of COVID-19 infection than the general population. Jails have even greater risk of COVID-19 transmission than other enclosed environments because of crowding within the facility, and limited access to hygiene, and structural limitations. People in jails are housed in crowded spaces of limited size and are subjected to security measures that force them into close contact with guards. They cannot practice the “social distancing” necessary to effectively prevent the spread of COVID-19. Bathrooms facilities—toilets, showers, and sinks—and other common areas are shared, without adequate surface disinfection between users. Food preparation and distribution without proper precautions also presents a further site for the virus to spread. Infectious spread presents a particular challenge in these facilities where the population often is disproportionately vulnerable, while facilities provide limited

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medical care.  

24. CDC guidance on correctional and detention facilities,\(^{29}\) posted March 23, 2020, specifically recommends implementing social distancing strategies to increase the physical space between incarcerated/detained persons “ideally 6 feet between all individuals, regardless of the presence of symptoms” including: 1) increased space between individuals in holding cells, as well as in lines and waiting areas such as intake; stagger time in recreation spaces; restrict recreation space usage to a single housing unit per space; stagger meals; rearrange seating in the dining hall so that there is more space between individuals (e.g., remove every other chair and use only one side of the table); provide meals inside housing units or cells; limit the size of group activities; reassign bunks to provide more space between individuals, ideally 6 feet or more in all directions.

25. The CDC guidance also describes necessary disinfection procedures including to thoroughly clean and disinfect all areas where a confirmed or suspected COVID-19 case spent time.\(^{30}\)

26. Based upon the declarations I reviewed (paragraph 10 above), Allegheny County Jail (ACJ) does not appear to be adopting the procedures necessary to prevent COVID-19 transmission. The infrastructure and routine practice of Allegheny County Jail raise significant challenges to maintaining distancing between detainees in the facilities. These physical infrastructure and security challenges, which are typical of most detention centers, include:

- Individuals are held for extended periods of time in the intake area, typically with 10 or more people sharing a single toilet and sink. Only cursory medical screening is conducted.
- A significant number of people housed at ACJ are double-celled.
- Access to soap is a constant problem in ACJ as is, in some pods, access to personal hygiene and cleaning supplies.
- There are only a few showers per pod, with many people sharing the same shower area, without any sanitation between individual uses.
- Dining tables are small and fit four people, with one person on each side. A table is only four feet by four feet, at most, so no one can social distance from others during meal times.
- As is true in detention facilities generally, communal bathroom facilities pose a risk of transmission and it is not usually possible for an incarcerated person to move throughout ACJ without coming into contact with many other people. The use of elevators also poses a problem bringing individuals in close contact. If someone is housed in a special unit or restrictive housing, they must also be closely escorted everywhere in the facility and security incidents can put an


\(^{30}\) Ibid
incarcerated person into close contact with staff members.

- Access to medical care is inadequate at ACJ. There are extreme delays in individuals’ ability to access care, as well as huge staffing shortages.

27. Based upon the information provided to me, and my prior knowledge of detention facilities, I am concerned that the Alleghany County Jail does not have the ability to implement the critically important principle of social distancing, such as maintain six feet of separation at all times including meals and location of beds. Where detention facilities are housing detained individuals in small cells where they are bunked together and where they are crowded together to eat meals, they will not be able to prevent COVID-19 transmission once introduced into the jail.

28. Nor am I aware of the necessary measures being taken at the Alleghany County Jail to identify and properly isolate individuals at high risk, those with potential exposure (e.g., from work detail) or those with symptoms consistent with COVID-19. These steps are essential to preventing transmission of COVID-19.

29. Introduction of new people into detention facilities who have had contact with the community outside the facility—be it correctional officers and other staff, new individuals coming into custody, people on work release, or individuals serving intermediate sentences—creates a link from transmission occurring in the community to those who are detained. The possibility of asymptomatic transmission means that monitoring fever of staff or detainees is inadequate for identifying all who may be infected and preventing transmission. This is also true because not all individuals infected with COVID-19 report fever in early stages of infection.

30. The alternative is to test all staff and detainees entering the facility. However, this would require frequent (daily) tests, implemented at multiple times a day as staff and detainees entered the facility. In addition to the cost and labor required to implement this approach, the United States is currently facing a shortage of COVID-19 tests that make such a solution impracticable: In a survey of U.S. cities (that included Philadelphia, Pittsburgh, Erie, and Easton), 92.1% of cities reported that they do not have an adequate supply of test kits. Shortages are likely to become more severe over the next three to four weeks when there will be a major shortage of chemical reagents for COVID-19 testing and enormous increases in demand. Given the shortage of COVID-19 testing in the United States, it is likely that jails are and will continue to be unable to conduct aggressive, widespread testing to identify all positive cases of COVID-19. The lack of widespread testing in communities and the current presence of COVID-19 in all 50 states means that it is impractical to ask detainees about their travel history— all communities should be assumed to have community transmission which is why statewide and national restrictions on movement and gatherings have been put in place.

Heightened Rates of COVID-19 Infection and Spread Within Detention Facilities

31. The rates of spread in the facilities that have been testing for COVID-19 illustrates the dangers the conditions in these facilities pose to those who are detained there, and to the broader community. In Cook County Jail, Chicago in a matter of two days, the number of individuals infected jumped from 38 inmates to 89 inmates and 12 staff members. As of April 1, there were 167 confirmed cases among detained individuals, even after the jail released 400 individuals. At Rikers Island in New York, on Saturday March 21, a jail oversight agency indicated that 21 inmates and 17 employees tested positive. Four days later, on Wednesday, March 26, 75 inmates and 37 employees tested positive. As of Tuesday, March 31, 141 staff and 180 individuals in custody had tested positive at Rikers and city jails in New York City. The Legal Aid Society in New York recently reported that the infection rate for COVID-19 at local jails is more than seven times higher than the rate citywide and 87 times higher than the country at large.

32. The data above also confirms high rates of infection among correctional officers and other staff. These individuals all face an increased risk of COVID-19 exposure as they are less able to practice the recommended strategy of social distancing in carrying out their official duties. If corrections officers are significantly affected by COVID-19, whether through being infected, exposed by detainees, their fellow officers or in the community, large numbers will be unavailable to work due to self-quarantine or isolation, at the same time that large numbers of detainees who are potentially exposed will need to be put into individual isolation or transferred to advanced medical care, putting tremendous stress on detention facilities.

33. At least one detained individual from Pike County Correctional Facility and at least 3 staff and one contract employee have already tested positive for COVID-19. The detained individual was so ill that they had to be hospitalized for the infection. Pike County, as of April 1, 2020, has reported 57 cases and 1 death due to COVID-19. York has had 79 reported cases. These are likely underestimates. It is reasonable to expect

this kind of introduction of COVID-19 into the detention facilities from staff exposed in the community given the current local transmission of COVID-19 in Pennsylvania, reflecting the continued movement of people between specific locales.

**Infrastructure in Detention Facilities Will Likely Be Insufficient to Address Needs of COVID-19 Patients**

34. If COVID-19 enters into detention facilities, these facilities will likely be unable to address the infectious spread and the needs of infected individuals due to lack of testing and insufficient physical and medical infrastructure.

35. In cases where there are confirmed or suspected cases of COVID-19, the CDC recommends medical isolation, defined by the CDC confining the case “ideally to a single cell with solid walls and a solid door that closes” to prevent contact with others and to reduce the risk of transmission. Individuals in isolation should also be provided their own bathroom space.\(^{42}\)

36. Individuals in close contact of a confirmed or suspected COVID-19 case - defined by the CDC as having been within approximately 6 feet of the individual for a prolonged period of time or having had direct contact with secretions of a COVID-19 case (e.g., have been coughed on) – should be quarantined for a period of 14 days. The same precautions should be taken for housing someone in quarantine as for someone who is a confirmed or suspected COVID-19 case put in isolation.\(^{43}\)

37. The CDC guidance recognizes that housing detainees in isolation and quarantine individually, while “preferred”, may not be feasible in all county jail settings and discusses the practice of “cohorting” when individual space is limited. The term “cohorting” refers to the practice of isolating multiple laboratory-confirmed COVID-19 cases together as a group or quarantining close contacts of a particular case together as a group. The guidance states specifically that “Cohorting should only be practiced if there are no other available options” and exhorts correctional officials: “Do not cohort confirmed cases with suspected cases or case contacts.” [emphasis in original]. Individuals who are close contacts of different cases should also not be kept together.

38. The CDC guidance also says that detention facilities should “Ensure that cohorted cases wear face masks at all times.”\(^{44}\) This is critical because not all close contacts may be infected and those not infected must be protected from those who are if individuals are cohorted. However, it’s important to note that face masks are in short supply. In a joint letter to President Trump, the American Medical Association, the American Hospital Association, and the American Nurses Association called on the administration to “immediately use the Defense Production Act to increase the domestic production of medical supplies and equipment that hospitals, health, health systems, physicians, nurses

\(^{42}\) Ibid.

\(^{43}\) Ibid

\(^{44}\) Ibid
and all front line providers so desperately need." In a survey United States cities, 91.5% of the cities reported that they do not have an adequate supply of face masks for their first responders and medical personnel. There are also widespread shortages of personal protective equipment — particularly N-95 masks — sufficient to provide even for health care workers, in our nation’s hospitals, let alone medical providers and other individuals coming into contact with the virus in county jails. Many public health leaders are calling for masks to be reserved for health care staff, who face increased risk and are vitally needed to sustain emergency care. Hospitals in the New York City area, unable to access masks locally, are reportedly turning to a private distributor to airlift millions of protective masks out of China. Face masks are effective only when used in combination with frequent hand-cleaning with alcohol-based hand rub or soap and water. Detainees should be instructed in how to properly put on and take off masks, including cleaning their hands every time they touch the mask, covering the mouth and nose with the mask and making sure there are no gaps, avoiding touching the mask while using it; and replacing the mask with a new one if it becomes damp (e.g., from sneezing) and not to re-use single-use masks. There are times when detainees will necessarily not be able to wear masks, if available. For example, during meals. In these instances, detainees should eat individually or with proper distancing from others.

39. Where individual rooms are not available, the CDC guidance describes a hierarchy of next best options for cohorting, which in order from lesser risk to greater risk includes housing individuals under medical isolation: 1) in a large, well-ventilated cell with solid walls and a solid door that closes fully; 2) in a large, well-ventilated cell with solid walls but without a solid door; 3) in single cells without solid walls or solid doors (i.e., cells enclosed entirely with bars), preferably with an empty cell between occupied cells; 4) in multi-person cells without solid walls or solid doors (i.e., cells enclosed entirely with bars), preferably with an empty cell between occupied cells.

40. Many jails and prisons also lack adequate medical care infrastructure to address the spread of infectious disease and treatment of high-risk people in detention. As examples, jails often use practical nurses who practice beyond the scope of their licenses; have part-time physicians who have limited availability to be on-site; and facilities with no formal linkages with local health departments or hospitals.

41. Large numbers of ill detainees and corrections staff will also strain the limited medical infrastructure in the rural counties in which these detention facilities are located. If infection spreads throughout the detention center, overwhelming the center’s own limited resources, the burden of caring for these individuals will shift to local medical facilities. The few facilities will likely not be able to provide care to all infected.

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49 Ibid
individuals with serious cases, increasing the likelihood that these individuals will die.\textsuperscript{50}

Conclusions

42. CDC guidance on correctional and detention facilities,\textsuperscript{51} posted March 23, 2020 reiterates many of the points previously made in this declaration, including: 1) Incarcerated/detained persons are at “heightened” risk for COVID-19 infection once the virus is introduced; 2) There are many opportunities for COVID-19 to be introduced into a correctional or detention facility, including from staff and transfer of incarcerated/detained persons; 3) Options for medical isolation of COVID-19 cases are limited; 4) Incarcerated/detained persons and staff may have medical conditions that increase their risk of severe disease from COVID-19; 5) The ability of incarcerated/detained persons to exercise disease prevention measures (e.g., frequent handwashing) may be limited and many facilities restrict access to soap and paper towels and prohibit alcohol-based hand sanitizer and many disinfectants; and 6) Incarcerated persons may hesitate to report symptoms of COVID-19 or seek medical care due to co-pay requirements and fear of isolation.

43. The only viable public health strategy available is risk mitigation. Even with the best-laid plans to address the spread of COVID-19 in detention facilities, the release of individuals who can be considered at high-risk of severe disease if infected with COVID-19 is a key part of a risk mitigation strategy. In my opinion, the public health recommendation is to release high-risk people from detention, given the heightened risks to their health and safety, especially given the lack of a viable vaccine for prevention or effective treatment at this stage.

44. To the extent that vulnerable detainees have had exposure to known cases with laboratory-confirmed infection with the virus that causes COVID-19, they should be tested immediately in concert with the local health department. Those who test negative should be released to home quarantine for 14 days. Where there is not a suitable location for home quarantine available, these individuals could be released to housing identified by the county or state Department of Health.

45. Other individuals who may not be identified as high risk should also be considered for release. Reducing the overall number of individuals in detention facilities will facilitate social distancing for remaining detainees and lessen the burden of ensuring the safety of detainees and corrections officers.

46. Given the physical infrastructure of facilities, the challenges of providing security


without close contact, and the lack of proper equipment (such as masks) to prevent transmission, I do not believe detention facilities are equipped to ensure the safety of those in their custody. Releasing individuals at highest risk who can then self-isolate – either in their homes or in facilities arranged by the local department of health – provides a significantly better likelihood of preventing infection, disease spread and death, both in the facility and in the community at large.

Pursuant to 28 U.S.C. 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed this fifth day in April 2020 in Princeton, New Jersey.

[Signature]

Joseph J. Amon, PhD MSPH
DECLARATION OF DR. JONATHAN LOUIS GOLOB

I, Jonathan Louis Golob, declare as follows:

1. I am an Assistant Professor at the University of Michigan School of Medicine in Ann Arbor, Michigan, where I am a specialist in infectious diseases and internal medicine. I am also a member of the Physicians for Human Rights. At the University of Michigan School of Medicine, I am a practicing physician and a laboratory-based scientist. My primary subspecialization is for infections in immunocompromised patients, and my recent scientific publications focus on how microbes affect immunocompromised people. I obtained my medical degree and completed my residency at the University of Washington School of Medicine in Seattle, Washington, and also completed a Fellowship in Internal Medicine Infectious Disease at the University of Washington. I am actively involved in the planning and care for patients with COVID-19. Attached as Exhibit A is a copy of my curriculum vitae.

2. COVID-19 is an infection caused by a novel zoonotic coronavirus SARS-COV-2 that has been identified as the cause of a viral outbreak that originated in Wuhan, China in December 2019. The World Health Organization has declared that COVID-19 is causing a pandemic. As of April 2, 2020, there are over 800,000 confirmed cases of COVID-19 worldwide. COVID-19 has caused over 45,000 deaths, with exponentially growing outbreaks occurring at multiple sites worldwide, including within the United States in regions like New York, New Jersey, Louisiana, Michigan and Illinois.

3. COVID-19 makes certain populations of people severely ill. People over the age of fifty are at higher risk, with those over 70 at serious risk. As the Center for Disease Control and Prevention has advised, certain medical conditions increase the risk of serious COVID-19 for people of any age. These medical conditions include: those with lung disease, heart disease, diabetes, or immunocompromised (such as from cancer, HIV, autoimmune diseases), blood disorders (including sickle cell disease), chronic liver or kidney disease, inherited metabolic disorders, stroke, developmental delay, or pregnancy.

4. For all people, even in advanced countries with very effective health care systems such as the Republic of Korea, the case fatality rate of this infection is about ten fold higher than that observed from a severe seasonal influenza. In the more vulnerable groups, both the need for care, including intensive care, and death is much higher than we observe from influenza infection: In the highest risk populations, the case fatality rate is about 15%. For high risk patients who do not die from COVID-19, a prolonged recovery is expected to be required, including the need for extensive rehabilitation for profound
deconditioning, loss of digits, neurologic damage, and loss of respiratory capacity that can be expected from such a severe illness.

5. In most people, the virus causes fever, cough, and shortness of breath. In high-risk individuals as noted above, this shortness of breath can often be severe. Even in younger and healthier people, infection of this virus requires supportive care, which includes supplemental oxygen, positive pressure ventilation, and in extreme cases, extracorporeal mechanical oxygenation.

6. The incubation period (between infection and the development of symptoms) for COVID-19 is typically 5 days, but can vary from as short as two days to an infected individual never developing symptoms. There is evidence that transmission can occur before the development of infection and from infected individuals who never develop symptoms. Thus, only with aggressive testing for SARS-COV-2 can a lack of positive tests establish a lack of risk for COVID-19.

7. When a community or institution lacks a comprehensive and rigorous testing regime, a lack of proven cases of COVID-19 is functionally meaningless for determining if there is a risk for COVID-19 transmission in a community or institution.

8. Most people in the higher risk categories will require more advanced support: positive pressure ventilation, and in extreme cases, extracorporeal mechanical oxygenation. Such care requires highly specialized equipment in limited supply as well as an entire team of care providers, including but not limited to 1:1 or 1:2 nurse to patient ratios, respiratory therapists and intensive care physicians. This level of support can quickly exceed local health care resources.

9. COVID-19 can severely damage the lung tissue, requiring an extensive period of rehabilitation and in some cases a permanent loss of respiratory capacity. The virus also seems to target the heart muscle itself, causing a medical condition called myocarditis, or inflammation of the heart muscle. Myocarditis can affect the heart muscle and electrical system, which reduces the heart's ability to pump, leading to rapid or abnormal heart rhythms in the short term, and heart failure that limits exercise tolerance and the ability to work lifelong. There is emerging evidence that the virus can trigger an over-response by the immune system in infected people, further damaging tissues. This cytokine release syndrome can result in widespread damage to other organs, including permanent injury to the kidneys (leading to dialysis dependence) and neurologic injury.
10. There is no cure and vaccine for this infection. Unlike influenza, there is no known effective antiviral medication to prevent or treat infection from COVID-19. Experimental therapies are being attempted. The only known effective measures to reduce the risk for a vulnerable person from injury or death from COVID-19 are to prevent individuals from being infected with the COVID-19 virus. Social distancing, or remaining physically separated from known or potentially infected individuals, and hygiene, including washing with soap and water, are the only known effective measures for protecting vulnerable communities from COVID-19.

11. Nationally, without effective public health interventions, CDC projections indicate about 200 million people in the United States could be infected over the course of the epidemic, with as many as 1.5 million deaths in the most severe projections. Effective public health measures, including social distancing and hygiene for vulnerable populations, could reduce these numbers.

12. In early March, the highest known person-to-person transmission rates for COVID-19 were in a skilled nursing facility in Kirkland, Washington and on afflicted cruise ships in Japan and off the coast of California. More recently, the highest transmission rates have been recorded in the Rikers Island jail complex in New York City, which is over seven times the rate of transmission compared to the spread in New York City. To illustrate, the number of confirmed cases among inmates soared from one to nearly 200 in the matter of 12 days.

13. This is consistent with the spread of previous viruses in congregate settings. During the H1N1 influenza ("Swine Flu") epidemic in 2009, jails and prisons were sites of severe outbreaks of viral infection. Given the avid spread of COVID-19 in skilled nursing facilities and cruise ships, it is reasonable to expect COVID-19 will also readily spread in detention centers such as prisons and jails, particularly when residents cannot engage in social distancing measures, cannot practice proper hygiene, and cannot isolate themselves from infected residents or staff. With new individuals and staff coming into the detention centers who may be asymptomatic or not yet presenting symptoms, the risk of infection rises even with symptom screening measures.

14. This information provides many reasons to conclude that vulnerable people, people over the age of 50 and people of any age with lung disease, heart disease, diabetes, or immunocompromised (such as from cancer, HIV, autoimmune diseases), blood disorders (including sickle cell disease), chronic liver or kidney disease, inherited metabolic disorders, stroke, developmental delay, or pregnancy living in an institutional setting, such as a prison, or jail, or an immigration detention center, with limited access to
adequate hygiene facilities, limited ability to physically distance themselves from others, and exposure to potentially infected individuals from the community are at grave risk of severe illness and death from COVID-19.

Pursuant to 28 U.S.C. 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed this 3 day in April, 2020 in Ann Arbor, Michigan.

Dr. Jonathan Louis Golob
Jonathan Louis Golob, M.D. Ph.D.
Assistant Professor
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Education and Training
6/1997 – 6/2001 Bachelor of Science, Johns Hopkins University, Baltimore, MD
Dual degree in Biomedical Engineering and Computer Science conferred June 2001.

7/2001 – 6/2011 MSTP MD/PhD Combined Degree, University of Washington, Seattle, WA.
Ph.D. on the basic science of embryonic stem cells, specifically epigenetic regulation of differentiation
Ph.D. conferred in June 2009.
MD conferred in June 2011.

6/2011 – 6/2013 Internal Medicine Residency, University of Washington, Seattle, WA

6/2013 – 6/2017 Infectious Diseases Fellowship, University of Washington, Seattle, WA

Certifications and Licensure
Board Certifications
2014 Diplomate in Internal Medicine, American Board of Internal Medicine.
2016 Diplomate in Infectious Disease, American Board of Internal Medicine.

Current Medical Licenses to Practice
2013 Washington State Medical License, Physician, MD60394350
2018 Michigan State Medical License, Physician, 4301114297

Academic, Administrative, and Clinical Appointments
Academic
6/2014 – 6/2018 Senior Fellow, Vaccine and Infectious Disease Division, Fred Hutchinson Cancer Research Center, Seattle, WA

8/2016 – 6/2018 Joel Meyers Endowment Fellow, Vaccine and Infectious Disease Division, Fred Hutchinson Cancer Research Center, Seattle, WA

8/2017 – 6/2018 Research Associate, Vaccine and Infectious Disease Division, Fred Hutchinson Cancer Research Center, Seattle, WA

8/2017 – 6/2018 Acting Instructor, Division of Allergy and Infectious Diseases, Department of Medicine, University of Washington, Seattle, WA

8/2018 – Present Assistant Professor, Division of Infectious Diseases, Department of Medicine, University of Michigan, Ann Arbor, MI
Clinical

<table>
<thead>
<tr>
<th>Date</th>
<th>Position</th>
<th>Institution</th>
<th>Location</th>
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<tbody>
<tr>
<td>12/2015 – 12/2016</td>
<td><strong>Infectious Disease Locums Physician</strong>, Virginia Mason Medical Center</td>
<td>Seattle, WA</td>
<td>Seattle, WA</td>
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<tr>
<td>7/2017 – 6/2018</td>
<td><strong>Hospitalist Internal Medicine Physician</strong>, Virginia Mason Medical Center</td>
<td>Seattle, WA</td>
<td>Seattle, WA</td>
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<tr>
<td>8/2017 – 6/2018</td>
<td><strong>Attending Physician</strong>, Seattle Cancer Care Alliance</td>
<td>Seattle, WA</td>
<td>Seattle, WA</td>
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<tr>
<td>8/2017 – 6/2018</td>
<td><strong>Attending Physician</strong>, Division of Allergy and Infectious Diseases, Department of Medicine, University of Washington</td>
<td>Seattle, WA</td>
<td>Seattle, WA</td>
</tr>
<tr>
<td>8/2018 – Present</td>
<td><strong>Attending Physician</strong>, Division of Infectious Diseases, Department of Medicine, University of Michigan</td>
<td>Ann Arbor, MI</td>
<td>Ann Arbor, MI</td>
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Research Interests

1. I am primarily interested in understanding how the human gut microbiome mechanistically affects how patients respond to treatments. I have a particular focus on patients undergoing hematopoietic cell transplant, who are at risk for recurrence of their underlying disease, treatment-related colitis (from both conditioning and graft versus host disease), and infection. In human observational trials the human gut microbiome correlates with each of these aspects. My research program uses advanced stem-cell based in-vitro models of the human colonic mucosa to verify if the correlations in observational trials can cause similar effects in-vitro, and then determine by which pathways (e.g. receptors) and broad mechanisms (e.g. epigenetics) the microbes affect the host.

2. Host-microbiome interactions are contextual. A beneficial interaction in health can turn pathologic. For example, my ongoing work focused on the microbial metabolite butyrate. Butyrate enhances the health of healthy and intact colonic epithelium, acting as a substrate for cellular respiration and through receptor-mediate processes reduces cellular inflammation. However, butyrate also blocks the ability of colonic stem cells to differentiate into mature epithelium. Thus, in colitis that results in a loss of colonic crypts, an intact and butyrogenic gut microbiome results in colonic stem cells being exposed to butyrate and inhibits recovery. My ongoing work uses a primary stem-cell based model of the human colonic mucusa to establish how butyrate blocks the differentiation of colonic stem cell with a hope of generating new treatments for patients with steroid-refractory colitis.

3. I am interested in validating and improving computational tools for biological research. I have a computer science and biomedical engineering background that combined with my clinical and molecular biology training positions me optimally to understand both major aspects of computational biology: what are the needs to make biological inferences from big data, and how can tools specifically be improved to achieve such inferences.
Grants

Present and Active

**ASBMT New Investigator Award**  
J. Golob (PI)  
7/2018 – 7/2020  
Hematopoietic Cell Transplant Outcomes and Microbial Metabolism  
Role: PI  
$30,000/yr for up to two years

**NIH / NIAID R01**  
D. Fredricks (PI)  
11/2017 – 11/2021  
The Gut Microbiota and Graft versus Host Disease (GVHD), AI-134808  
Role: Senior / key personnel  
$823,701

**NIH P01**  
T. Schmidt (PI)  
Pending / Reviewed  
ENGINEERING MICROBIOMES AND THEIR MOLECULAR DETERMINANTS FOR PRODUCTION OF BUTYRATE AND SECONDARY BILE ACIDS FROM RESISTANT STARCH  
Role: Key Personnel

**NIH / NCI R21**  
J. Golob (PI)  
Pending / Submitted  
Establishing a physiologic human colonic stem/progenitor cells model of regimen-related colitis  
Role: PI

**NIH R21**  
J. Golob (PI)  
Pending / Submitted  
Manipulating Butyrate Production by the Gut Microbiome during Chronic HIV Infection  
Role: PI

Completed

**Joel Meyers Endowment Fellowship**  
6/2016 – 6/2018  
Role: Research Fellow  
$63,180

**DCDR Grant**  
R. Harrington (PI)  
6/2014 – 6/2018  
Support for data queries into the Deidentified Clinical Data Repository  
Role: PI  
$1000

**NIH T32 Institutional Training Grant**  
M. Boeckh (PI)  
1T32AI118690-01A1  
8/2016 – 8/2017  
Role: Post-Doc Trainee  
$315,972

**NIH T32 Institutional Training Grant**  
W. van Voorhis (PI)  
5T32AI007044  
7/1/14 – 6/30/16  
Role: Post-Doc Trainee  
$1,527,801

Honors and Awards

2001  
Tau Beta Pi Engineering Honor Society

2001  
Alpha Eta Mu Beta Biomedical Engineering Honor Society
2005 ARCS Fellowship
2015 Consultant of the Month Award. University of Washington Housestaff.
2016 Joel Meyer Endowment Fellow

Membership in Professional Societies
2013 Member, Infectious Diseases Society of America
2011 Member, American Board of Internal Medicine

Bibliography

Peer-Reviewed Journals and Publications


**Preprint publications**


**Other Publications**

2. Freelance contributor, Ars Technica, 2016 – Present.

**Abstracts (presenter underlined)**


**Invited Lectures**

3. “IRIS and TB”, Harborview Medical Center Housestaff Lunchtime Conference, Seattle, WA, Jun 9, 2014
4. “Complicated Enterococcal Endocarditis”, University of Washington Medical Center (UWMC) Chief of Medicine Conference, Seattle, WA, Jul 14, 2014
8. “CMV Ventriculitis”, Clinical Case Presentation to the Virology Working Group, Fred Hutchinson Cancer Research Center (Fred Hutch), Seattle, WA, Nov 2015
10. “Microbiome and GVHD”. Infectious Disease Sciences / Virology Symposium, Fred Hutch / UW, Seattle, WA, Jan 17 2017
12. “The Gut Microbiome Predicts GVHD. Can It Be Engineered to Protect?”. St Jude. February 18th 2019