COMMONWEALTH OF MASSACHUSETTS
SUPREME JUDICIAL COURT

Suffolk, ss. No. SJ-2020-757

COMMITTEE FOR PUBLIC COUNSEL SERVICES and
MASSACHUSETTS ASSOCIATION OF
CRIMINAL DEFENSE LAWYERS,
Plaintiffs,

v.

BARNSTABLE COUNTY SHERIFF'S OFFICE, BERKSHIRE COUNTY SHERIFF'S OFFICE, BRISTOL COUNTY SHERIFF'S OFFICE, DUKES COUNTY SHERIFF'S OFFICE, ESSEX COUNTY SHERIFF'S OFFICE, FRANKLIN COUNTY SHERIFF'S OFFICE, HAMPDEN COUNTY SHERIFF'S OFFICE, HAMSPHIRE COUNTY SHERIFF'S OFFICE, MIDDLESEX COUNTY SHERIFF'S OFFICE, NORFOLK COUNTY SHERIFF'S OFFICE, PLYMOUTH COUNTY SHERIFF'S OFFICE, SUFFOLK COUNTY SHERIFF'S OFFICE and WORCESTER COUNTY SHERIFF'S OFFICE
Defendants.

AFFIDAVIT OF
MONIK C. JIMÉNEZ (ScD, SM) AND TORI L. COWGER (B.S., MPH)

I, Dr. Monik C. Jiménez, and I, Tori L. Cowger, state that the following is a true and accurate statement to the best of our knowledge and belief:

Background (Monik Jiménez)

1. I, Monik C. Jiménez, am an Assistant Professor of Epidemiology at the Harvard T.H. Chan School of Public Health, an associate epidemiologist at Brigham and Women's Hospital (BWH), and an Assistant Professor of Medicine at Harvard Medical School. I received my SM and ScD, both in epidemiology, from the Harvard Chan School. I completed my post-doctoral research in cardiovascular epidemiology at BWH, prior to becoming faculty in 2013.

2. My research investigates factors that impact the cardiovascular health of patients who have experienced incarceration, identifies ways to support respectful patient-clinician communication about incarceration and inform future policy to support

health care equity. Additionally, I am engaged in work to track COVID-19 in US carceral facilities and have published on the impact of COVID-19 in Massachusetts prisons and jails. In partnership with community advocacy groups, I am the Principal Investigator of the INdividuals Speak: Incarcerated during the COVID-19 Epidemic (INSIDE) study to examine the lived experience of conditions of confinement experienced by those incarcerated or detained during COVID-19. I am also a collaborator of the Pregnancy In Prisons Statistics study to examine medical comorbidities of pregnant women experiencing incarceration. In addition, I was funded by the National Institutes of Health to examine the intersection of race/ethnicity and sex on inequities in stroke. I am the Course Director of "Mass Incarceration and Health in the US" and "Cardiovascular Epidemiology" at Harvard T.H. Chan School of Public Health.

3. I am the author of more than 40 peer-reviewed articles on the impact of COVID-19 on incarcerated populations, racial/ethnic and sex inequities in cardiovascular disease, cardiovascular disease, epidemiology, oral epidemiology, stroke, and oral health. Most recently, I am a senior author on the recent paper *Epidemiology of COVID-19 Among Incarcerated Individuals and Staff in Massachusetts Jails and Prisons*, which assessed the COVID-19 burden in Massachusetts prisons and jails.

4. A copy of my curriculum vitae is attached as Exhibit A.

Background (Tori Cowger)

5. I, Tori L. Cowger, am a PhD candidate in Population Health Sciences in the Department of Epidemiology at the Harvard T.H. Chan School of Public Health and a doctoral affiliate with the François-Xavier Bagnoud Center for Health and Human Rights at Harvard. Before my doctoral studies, I earned a B.S. in biochemistry from the University of Minnesota and an MPH in epidemiology at Emory University. I worked as an infectious disease epidemiologist at the U.S. Centers for Disease Control and Prevention (CDC). My research interests include social and structural determinants of infectious diseases and substance use related harms, health impacts of the criminal legal system and incarceration, geospatial methods, and social networks.

6. A copy of my curriculum vitae is attached as Exhibit B.

Prisons and jails are high-risk environments for COVID-19.

7. Compared to the general population, people who are held in prisons and jails are more vulnerable to contracting COVID-19 and more likely to become seriously ill or die from the virus.

8. The SARS-CoV-2 virus, which causes the disease COVID-19, spreads in three main ways.[1] People who live and work in prisons and jails are more susceptible to all three forms of transmission.

9. First, the virus primarily spreads through inhalation of respiratory droplets expelled when an infected person exhales, talks, coughs, or sneezes.[2] Because this form of transmission is most likely to occur when someone is physically close to the infectious person, generally within about six feet, people who live and work in congregate-living environments like prisons and jails are more likely to contract the virus.[3]

10. Second, under certain circumstances, the SARS-CoV-2 virus spreads through airborne transmission. Once expelled into the air, droplets containing the virus can remain suspended for hours.[4] Airborne transmission of SARS-CoV-2 is more likely to occur in closed environments and spaces with poor ventilation.[5] Because prisons and jails are enclosed, congregate spaces that often have poor airflow, people living and working in prisons and jails are likely at higher risk of airborne transmission of SARS-CoV-2 than the general population.

11. Third, COVID-19 spreads less commonly through contact with objects and surfaces contaminated with the virus.[6] Although there was initially a greater focus on the prevalence of contact transmission at the beginning of the pandemic, the CDC now explains, "spread from touching surfaces is not thought to be a common way that COVID-19 spreads."[7] Nevertheless, people living in congregate environments like

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[1] *See* Centers for Disease Control and Prevention, *How COVID-19 Spreads*, https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-covid-spreads.html (last visited Apr. 21, 2021).
[2] *See id.*
[3] *See* Centers for Disease Control and Prevention, *FAQs for Correctional and Detention Facilities*, https://www.cdc.gov/coronavirus/2019-ncov/community/correction-detention/faq.html (last visited Apr. 21, 2021).
[4] Dyani Lewis, *Mounting Evidence Suggests Coronavirus Is Airborne — But Health Advice Has Not Caught Up*, Nature (July 8, 2020), https://www.nature.com/articles/d41586-020-02058-1.
[5] *See* Centers for Disease Control and Prevention, *How COVID-19 Spreads*, https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-covid-spreads.html (last visited Apr. 21, 2020)*;* Centers for Disease Control and Prevention, *Scientific Brief: SARS-CoV-2 and Potential Airborne Transmission* (Oct. 5, 2020), https://www.cdc.gov/coronavirus/2019-ncov/more/scientific-brief-sars-cov-2.html (noting that airborne transmission appears to have occurred in enclosed spaces, with prolonged exposure to respiratory particles, and in spaces with inadequate ventilation).
[6] *See* Centers for Disease Control and Prevention, *How COVID-19 Spreads*, https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-covid-spreads.html (last visited Apr. 21, 2021).
[7] *Id.*

prisons and jails are more susceptible to contracting the virus from contaminated surfaces because they spend more time indoors and share spaces such as toilets, showers, cells, and eating areas.

12. Because the SARS-CoV-2 virus generally spreads person-to-person, physical distancing is the cornerstone of COVID-19 prevention. Thus, in environments where physical distancing is impossible without significant decreases in population, like prisons and jails, SARS-CoV-2 transmission is especially widespread.

13. The high risk of outbreaks in correctional settings is not merely theoretical; as of August 2020, 90 of the largest 100 cluster outbreaks in the United States had occurred in prisons and jails.[8] As of April 21, 2021, there have been 2,443 deaths of incarcerated individuals due to COVID-19 reported by state Departments of Corrections; the number of deaths among people across United States county correctional facilities has not been reported.[9]

14. A recent article in the *Annals of Epidemiology* provides the first estimate of the reproduction ratio of COVID-19 in a large jail.[10] The basic reproductive ratio, R_0, is defined as the expected number of secondary infections arising from a single individual during his or her entire infectious period. The study found that, in a large jail in the United States, the R_0 was 8.44, meaning a single infectious individual could be expected to spread the virus to more than eight additional people.[11] Notably, this R_0 is of higher magnitude than those reported for other congregate settings, such as the Diamond Princess cruise ship, despite the younger age of those incarcerated.[12]

15. What is more, there is evidence that incarcerated people are not only more susceptible to contracting COVID-19, but also more likely to die from the disease. As of August, the nationwide COVID-19-related death rate in the prison population was an estimated three times higher than in the U.S. population, adjusting for the fact that incarcerated people are younger on average than the general population.[13]

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[8] Nayanah Siva, *Experts Call to Include Prisons in COVID-19 Vaccine Plans*, The Lancet (Dec. 12, 2020), https://www.thelancet.com/action/showPdf?pii=*S0140*-6736%2820%2932663-5.

[9] *See* Homepage, The Covid Prison Project, https://covidprisonproject.com (last visited Apr. 21, 2021).

[10] Lisa B. Puglisi et al., *Estimation of COVID-19 basic reproduction ratio in a large urban jail in the United States*, 53 Annals of Epidemiology 103 (2021), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7480336/#:~:text=The%20basic%20reproduction%20ratio%20(R,the%20spread%20of%20infectious%20diseases.

[11] *See id.* at 104.

[12] *See id.* at 105.

[13] *See* Brendan Saloner et al., *COVID-19 Cases and Deaths in Federal and State Prisons*, JAMA (July 8, 2020), https://jamanetwork.com/journals/jama/fullarticle/2768249. National Academies of

16. Recent evidence on data from state prisons across the United States and the Federal Bureau of Prisons demonstrated that the age and sex adjusted mortality rate from COVID-19 among incarcerated people was nearly three times higher (standardized mortality rates=2.6 - 2.75) times higher than the general population.[14]

The new variants of SARS-CoV-2 heighten the risk to incarcerated people and prison staff.

17. Over the course of the pandemic several new variants of SARS-CoV-2 have been identified from across various geographic regions (B.1.1.7, B.1.351, B.1.1.28.1, B.1.427, and B.1.429). These variants have quickly proliferated in their respective regions and have been identified in the U.S.[15] Each of these variants has been associated with increased transmissibility and some have been associated with increased disease severity and reduced vaccine effectiveness.[16]

18. The B.1.1.7 variant originally identified in the United Kingdom has been demonstrated to be 43% to 82% more transmissible than preexisting variants in United Kingdom.[17] Moreover, it may be associated with an increased mortality rate

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Sciences, Engineering, and Medicine, *Decarcerating Correctional Facilities during COVID-19: Advancing Health, Equity, and Safety* (2020), 1-1 ["NASEM Report"], https://www.nap.edu/catalog/25945/decarcerating-correctional-facilities-during-covid-19-advancing-health-equity-and.

[14] *See* Kathryn M. Nowotny et al., *Disparities in COVID-19 Related Mortality in U.S. Prisons and the General Population*, medRxiv (Sept. 18, 2020), https://www.medrxiv.org/content/10.1101/2020.09.17.20183392v1; Robin L. Toblin and Liesl M. Hagan, C*OVID-19 Case and Mortality Rates in the Federal Bureau of Prisons*, American Journal of Preventive Medicine (Feb. 24, 2021), https://www.ajpmonline.org/article/S0749-3797(21)00119-7/fulltext.

[15] *See* Salil S. Abdool Karim and Tulio de Oliveira, *New SARS-CoV-2 Variants - Clinical, Public Health, and Vaccine Implication*, N. Engl. J. Med. (Mar. 24, 2021), https://www.nejm.org/doi/full/10.1056/NEJMc2100362.

[16] *See id.*; Muthukumar et al., *SARS-CoV-2 B.1.1.7 and B.1.351 Spike Variants Bind Human ACE2 with Increased Affinity*, bioRxiv (Feb. 22, 2021), https://www.biorxiv.org/content/10.1101/2021.02.22.432359v1; Wenjuan Zhang et al., *Emergence of a Novel SARS-CoV-2 Variant in Southern California*. JAMA (Feb. 11, 2021), https://jamanetwork.com/journals/jama/fullarticle/2776543#:~:text=A%20novel%20variant%20of%20SARS,as%20a%20subclade%20of%2020C; Ezgi Hacisuleyman et al., *Vaccine Breakthrough Infections with SARS-CoV-2 Variants*, JAMA (Apr. 21, 2021), https://www.nejm.org/doi/full/10.1056/NEJMoa2105000.

[17] *See* Karim, *supra* n.15; Muthukumar, *supra* n. 16.

compared to other variants in the same geographic region.[18] Similarly, the B.1.351 variant originally identified in South Africa has been estimated to be 50% more transmissible than other pre-existing variants in the region.[19] Moreover, both variants may be associated with reduced vaccine effectiveness and lower antibody neutralization.[20] Emerging data suggests that previous infection with another variant may only partially protect against infection from the B.1.351 variant.[21]

19. The introduction of variants in the incarcerated population is inevitable. The first documented case of a variant in a US carceral facility occurred in February 2021 when an infected correctional officer tested positive for the B.1.1.7 variant.[22] This further highlights the role of carceral staff in transmisson within carceral facilities.

20. The proportion of variants in any facility is expected to mirror that of the surrounding community. For example, in the Michigan Department of Corrections, nearly 40% of confirmed cases have tested positive for the B.1.1.7 variant which is comparable to the proportion of infected cases in the general population (44.7%, 95% CI: 41.8-47.5%).[23]

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[18] *See* Peter Hornby et al., *NERVTAG Paper on COVID-19 Variant of Concern B.1.1.7*, United Kingdom Department of Health & Social Care (Jan. 22, 2021), https://www.gov.uk/government/publications/nervtag-paper-on-covid-19-variant-of-concern-b117.

[19] *See* Carl AB Pearson et al., *Estimates of Severity and Transmissibility of Novel South Africa SARS-CoV-2 Variant 501Y.V2*, London: CMMID Repository (2021), https://cmmid.github.io/topics/covid19/reports/sa-novel-variant/2021_01_11_Transmissibility_and_severity_of_501Y_V2_in_SA.pdf.

[20] *See* Constantinos Kurt Wibmer et al., *SARS-Cov-2 501Y.V2 Escapes Neutralization by South African COVID-19 Donor Plasma*, Nature Med. (Mar. 2, 2021), https://www.nature.com/articles/s41591-021-01285-x; Vekata Viswanadh Edara, N*eutralizing Antibodies Against SARS-CoV-2 Variants After Infection and Vaccination*, JAMA (Mar. 19, 2021), https://jamanetwork.com/journals/jama/fullarticle/2777898; Shabir A. Madhi et al., Efficacy of the ChAdOx1 nCoV-19 Covid-19 Vaccine against the B.1.351 Variant, N. Engl. J. Med. (Mar. 16, 2021), https://www.nejm.org/doi/full/10.1056/NEJMoa2102214; Xiaoying Shen et al., *Neutralization of SARS-CoV-2 Variants B.1.429 and B.1.351*, N. Engl. J. Med (Apr. 7, 2021), https://www.nejm.org/doi/full/10.1056/NEJMc2103740.

[21] *See* Abdool, *supra* n.15; Delphine Planas, *Sensitivity of Infectious SARS-CoV-2 B.1.1.7 and B.1.351 Variants to Neutralizing Antibodies*, Nature Medicine (Mar. 26, 2021), https://www.nature.com/articles/s41591-021-01318-5.

[22] *See* Press Release, Mich. Dep't of Corrections, *COVID Variant Detected in MDOC Facility in Ionia*, https://www.michigan.gov/corrections/0,4551,7-119-1441_26969-551952--,00.html (last visited Apr. 23, 2021).

[23] *See* Sharon Dolovich and Poornima Rajeshwar, *SARS-CoV-2 Variants Go to Prison: What Now?*, UCLA Law COVID-19 Behind Bars Data Project, https://uclacovidbehindbars.org/blog/covid-variants-in-prison; CDC, *Variant Proportions*, COVID Data Tracker, https://covid.cdc.gov/covid-data-tracker/#variant-proportions (last visited Apr. 21, 2021).

21. The introduction of variants within Massachusetts HOCs may have a critical impact on the transmission of SARS-CoV-2 among incarcerated people and staff. Due to the low rates of vaccination among staff and incarcerated people, the inability to physically distance, limited and insufficient testing, and the high prevalence of chronic disease, variants with higher transmissibility may lead more easily to uncontrolled transmission and increased COVID-19 related morbidity and mortality in the HOCs.

Outbreaks of COVID-19 in prisons and jails can drive community transmission of the virus.

22. As the National Academies of Science, Engineering, and Medicine has reported, "because correctional facilities are not isolated settings—incarcerated individuals move between facility and community and staff return home at night—the outbreaks in correctional facilities are associated with community infection rates."[24]

23. Research has confirmed that jail and prison outbreaks are major drivers of community infection. A report from the Prison Policy Initiative and Professor Gregory Hooks estimates how prisons and jails added to COVID-19 caseloads on the county, state, and national levels. Hooks compared the population density of incarcerated people in U.S. counties to the growth in COVID-19 cases in those counties over the summer of 2020. To get a more direct measure of community spread across county lines, he also measured the impact on county caseloads from prison and jail populations held in nearby counties located within the same multi-county economic areas. The study concluded that over half a million COVID-19 cases last summer were directly linked to mass incarceration. The report concluded that "[i]f the cases linked to mass incarceration over the summer of 2020 were the reported caseload of a country, that country would rank 5th in the world."[25] Although these data were not collected at the individual level, they are among the most robust data to date on the impact of COVID-19 in carceral settings on the local community.

24. In another study conducted by Prof. Daniel L. Chen and Eric Reinhart, data from Cook County, Illinois, were used to examine the association between arrests and cases of COVID-19 at the community level based on ZIP code. As of late April 2020, cycling people through Cook County Jail was associated with an estimated 15.9% of COVID-19 cases in Chicago and 15.7% in the state as a whole.[26] The largest

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[24] *See* NASEM Report at S-1.

[25] *See* Gregory Hooks and Wendy Sawyer, *Mass Incarceration, COVID-19, and Community Spread*, Prison Policy Initiative (Dec. 15, 2020), https://www.prisonpolicy.org/reports/covidspread.html.

[26] *See generally* Eric Reinhart and Daniel L. Chen, *Incarceration and Its Disseminations: COVID-19 Pandemic Lessons From Chicago's Cook County Jail*, Health Affairs (June 4, 2020), https://www.healthaffairs.org/doi/full/10.1377/hlthaff.2020.00652.

proportion of the variability in case rates in zip codes across Chicago (55%) was explained by jail to community cycling (R^2=0.55) and such cycling explained 37% of the variability in case rates in zip codes across the state of Illinois (R^2=0.37). Moreover, jail cycling explained more of the variability in case rates than race (Chicago: 41%, Illinois: 30%), poverty (Chicago: 26%, Illinois: 9%), public transportation use (Chicago: 0.6%, Illinois: 26%), and population density (Chicago:4%, Illinois: 21%).[27] Although these data were not collected at the individual level, they are among the most robust data to date on the impact of COVID-19 in carceral settings on the local community.

Non-symptomatic testing is a necessary component of any effective strategy to curb COVID-19 infections in Massachusetts prisons and jails.

25. People with asymptomatic and pre-symptomatic infection are significant contributors to SARS-CoV-2 transmission.[28] According to current best estimates from the Centers for Disease Control and Prevention (CDC), 30% of COVID-19 cases are asymptomatic, or never show symptoms, but can still transmit the virus. Moreover, among symptomatic cases, 50% of transmissions occur before symptom onset.[29] Another review of the scientific literature suggests that nearly 62% of transmission is expected to occur prior to symptom onset.[30]

26. When a COVID-19 patient starts showing symptoms – which is typically an average of 5 days after exposure – they have already been infectious for upwards of 2 days.[31] This means that, in a congregate living environment, outbreaks of COVID-19 will occur even if symptomatic individuals are immediately isolated.

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[27] *See* Eric Reinhart and Daniel L. Chen, *Incarceration And Its Disseminations: COVID-19 Pandemic Lessons From Chicago's Cook County Jail*, Health Affairs (Aug. 2020), https://www.healthaffairs.org/doi/pdf/10.1377/hlthaff.2020.00652.

[28] *See* Centers for Disease Control and Prevention, *CDC Guidance for Expanded Screening Testing to Reduce Silent Spread of SARS-CoV-2,* (Mar. 17, 2021), https://www.cdc.gov/coronavirus/2019-ncov/php/open-america/expanded-screening-testing.html.

[29] Centers for Disease Control and Prevention, *COVID-19 Pandemic Planning Scenarios*, https://www.cdc.gov/coronavirus/2019-ncov/hcp/planning-scenarios.html (last visited Apr. 21, 2021); Michael A. Johansson et al., *SARS-CoV-2 Transmission From People Without COVID-19 Symptoms*, JAMA (Jan. 7, 2021), https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2774707.

[30] *See* W. Joost Wiersinga et al., *Pathophysiology, Transmission, Diagnosis, and Treatment of Coronavirus Disease 2019 (COVID-19)*, JAMA Network (July 10, 2020), https://jamanetwork.com/journals/jama/fullarticle/2768391.

[31] Centers for Disease Control and Prevention, *Clinical Questions about COVID-19: Questions and Answers: Infection Control*, https://www.cdc.gov/coronavirus/2019-ncov/hcp/faq.html (last visited Apr. 21, 2021).

27. Research demonstrates that, without frequent and comprehensive testing, many cases of COVID-19 go undetected in correctional facilities. In August 2020, the CDC published a report describing the results of broad-based testing events in sixteen correctional facilities between April and May of 2020.[32] The comprehensive testing resulted in a median 12.1-fold increase in the number of known infections among incarcerated people in these facilities. The study concluded that "[b]road-based testing can provide a more accurate assessment of prevalence and generate data to help control transmission."[33]

28. Because of the prevalence of asymptomatic and pre-symptomatic transmission, it is our expert opinion that, in congregate living environments like prisons and jails, any reasonable response to the COVID-19 pandemic includes routine, comprehensive testing of residents and staff without symptoms, which the CDC often refers to as serial screening testing.

29. Research shows that broad-based testing is a necessary part of any effective strategy to protect incarcerated people from COVID-19. A June 2020 study by Yale and Stanford researchers estimates the impact of various mitigation strategies on SARS-CoV-2 transmission in a U.S. jail.[34] The researchers started observing the facility when its mitigation efforts were limited to quarantining upon intake, screening for symptoms, and suspending visitations. They then estimated, among other things, the virus's transmission after three phased interventions: (1) the start of depopulation efforts, (2) increased single celling, and (3) large-scale asymptomatic testing of incarcerated individuals. Compared to the baseline, the transmission rate decreased by 56% after the initiation of depopulation strategies; an additional 51% after single celling; and an additional 73% after the adoption of large-scale testing of incarcerated individuals.

30. In a prison or jail, in order to be effective, a testing policy must be both comprehensive—meaning it includes non-symptomatic testing—and routine. That is because prisons and jails are not closed environments; staff members, contractors, and incarcerated people cycle in and out of correctional facilities, all potentially bringing SARS-CoV-2 in with them. As a result, a one-time test or a test offered every few months offers little information about whether someone will become infected after a potential exposure. Likewise, because individuals could be exposed to the virus after entering the facility, testing incarcerated people only upon intake

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[32] *See generally*, Liesl M. Hagan et al., *Mass Testing for SARS-CoV-2 in 16 Prisons and Jails — Six Jurisdictions, United States, April–May 2020*, Centers for Disease Control and Prevention Morbidity and Mortality Weekly Report (Aug. 21, 2020), https://www.cdc.gov/mmwr/volumes/69/wr/mm6933a3.htm#suggestedcitation.

[33] *Id.*

[34] Giovanni S.P. Malloy et al., *The Effectiveness of Interventions to Reduce COVID-19 Transmission in a Large Urban Jail* (June 18, 2020), https://doi.org/10.1101/2020.06.16.20133280.

is not sufficient. Instead, individuals in high-risk settings like prisons and jails must be tested frequently in order to detect infections and prevent spread.[35]

31. In order to mitigate outbreaks of COVID-19, correctional facilities must isolate infectious individuals and identify their close contacts.[36] But isolation and contact tracing are only possible once an individual has been identified as infected with COVID-19. As discussed above, without routine, comprehensive testing, prisons and jails cannot identify pre-symptomatic or asymptomatic individuals. Therefore, in prisons and jails, the efficacy of isolation and contact tracing depend upon the routine testing of staff and residents who are not yet experiencing symptoms.

32. It is our understanding that none of the Massachusetts Houses of Correction conduct routine, comprehensive SARS-CoV-2 testing of incarcerated people or staff members. It is our expert opinion that the Houses of Correction are not conducting the level of testing necessary to identify infected incarcerated people and staff, and therefore that the Houses of Correction are not taking the necessary steps to protect the people who live and work in their facilities.

The CDC recommends that carceral facilities should test non-symptomatic incarcerated people and staff with no known or suspected exposure to the virus.

33. On March 17, 2021, the CDC updated the interim guidelines for management of SARS CoV-2 testing within correctional or detention centers.[37] Overall, the updated recommendations provide strong guidance for comprehensive and frequent testing of incarcerated people and staff, including non-symptomatic people with no known or suspected exposure to infected individuals.

34. This is clear from the very start of the guidelines, whose key points emphasize (1) frequent testing is an important preventative measure in carceral settings, and (2) both diagnostic testing (defined as the testing of symptomatic individuals or of those with known or suspected exposure to infected individuals) and screening testing (defined as the testing of non-symptomatic individuals with no known or

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[35] Daniel B. Larremore et al., *Test Sensitivity Is Secondary to Frequency and Turnaround Time for COVID-19 Screening*, Science Advances (Dec. 12, 2020), https://pubmed.ncbi.nlm.nih.gov/33219112 (Simulations of a university setting showed that weekly testing with prompt return of results effectively controlled positive cases of COVID-19).

[36] *See generally* Centers for Disease Control and Prevention, *Interim Considerations for SARS-CoV-2 Testing in Correctional and Detention Facilities*, https://www.cdc.gov/coronavirus/2019-ncov/community/correction-detention/testing.html (last visited Apr. 21, 2021).

[37] For the subject matter discussed in paragraphs 33-52, *see* Centers for Disease Control and Prevention, *Interim Considerations for SARS-CoV-2 Testing in Correctional and Detention Facilities*, https://www.cdc.gov/coronavirus/2019-ncov/community/correction-detention/testing.html (last visited Apr. 21, 2021).

suspected exposure to infected individuals) are essential to stop SARS-CoV-2 transmission.

35. The guidelines continue to recommend diagnostic testing as one part of a multi-layered approach to prevent SARS-CoV-2 transmission in a carceral setting. However, in doing so, they also detail the limitations of this approach.

36. First, they acknowledge that symptoms checks, which can trigger symptoms-based testing, are not sufficient to prevent the transmission of SARS-CoV-2 since they do not identify people who are asymptomatic or pre-symptomatic.

37. Second, they acknowledge the challenges associated with conducting comprehensive contract tracing in a carceral setting, where close contact is defined as people who have been within six feet for a combined total of 15 minutes or more over the course of 24-hours and where "physical distancing is often impracticable."

38. Given these limitations of diagnostic testing, the guidance instructs that screening testing is a "key component" to prevent SARS-CoV-2 transmission, emphasizing that the testing of asymptomatic people without known or suspected exposure allows for the early detection and halting of transmission quickly and effectively, particularly in areas with moderate to high community transmission such as Massachusetts.

39. It is our understanding that the HOCs do not test non-symptomatic incarcerated people or staff unless they have been in close contact with a COVID-infected individual.

40. The CDC's March 17 guidelines recommend testing in at least four scenarios in which we understand that the HOCs are not currently conducting testing.

41. First, the CDC recommends expanded testing of staff and incarcerated people beyond individuals with known or suspected exposure if there is a single positive case in the facility, noting that in the context of a carceral setting, "[a] single new case of SARS-CoV-2 infection in any correctional and detention center staff or incarcerated/detained person should be considered an outbreak." The CDC recommends the scope of such expanded testing should be based on the movement of the staff and incarcerated people within the facility. Specifically, the guidelines recommend testing of all people within one unit if there has not been contact with other parts of the facility through the movement of staff or incarcerated people, and recommend testing throughout the facility if there has been such movement between units.

42. Second, the guidelines recommend the serial screening testing of all staff before entering the facility every 3-7 days. On top of this testing, the guidelines recommend targeted testing for new staff, those returning from prolonged absences or travel, and those who have other potential source of exposure. The guidelines expressly highlight the importance of regularly testing staff: "Because staff move between the facility and the community daily, the risks of introducing infection into the facility from the community and/or bringing infection from the facility back into the community is ongoing."

43. Third, the guidelines recommend screening testing of non-symptomatic incarcerated people based on their movements into, out of, and between facilities. This includes testing of all incarcerated people: at intake, prior to transfer to another facility, prior to reassignment within the same facility, and prior to community visits (e.g., clinic, court, programs) or release.

44. Fourth, the guidelines recommend serial screening testing for incarcerated people every 3-7 days. The CDC endorses two strategies for serial screening testing. The first is serial screening testing among all incarcerated people in the facility or a random sample of at least 25% of the incarcerated population. The second is serial screening testing that is targeted to high-risk facilities or high-risk populations within a single facility. Serial screening is recommended for facilities with high turnover, facilities in areas with high community transmission, and facilities that have previously identified a confirmed case of COVID-19. Because all Massachusetts counties have high levels of transmission, and all the HOCs house pretrial detainees and therefore have high turnover, it is our opinion that all HOCs would fall into this high-risk category. Moreover, given the high-risk nature of HOCs and the logistical challenges of targeted screening based on facility level or individual level factors alone, it is our opinion that serial screening conducted facility wide or based on a random sample of all people within the facility would be recommended.

45. The guidelines make clear that the effectiveness of a testing program depends upon the frequency of testing. Therefore, "[g]iven the incubation period for COVID-19 (up to 14 days), CDC recommends conducting screening testing every 3-7 days." The guidelines also acknowledge that screening testing any less frequently than once a week is unlikely to be effective in identifying recently infected asymptomatic people who need to be isolated.

46. In addition, the guidelines highlight that all people who are tested should be provided with detailed information regarding the test and how to understand the results for the specific test they were provided.

47. We have reviewed Dr. Wurcel's April 22, 2021 affidavit, including her statement that Robin MacGowan from the CDC told her that the March 17 guidelines do not mandate that correctional facilities conduct facility-wide repetitive SARS-CoV-2 testing of incarcerated people. This is in line with our understanding that the CDC issues recommendations rather than mandates to state correctional facilities. We are unaware of any instance in which the CDC has mandated that a state correctional facility institute a public health measure.

48. We have also reviewed Dr. Wurcel's statement that Robin MacGowan told her that the March 17 guidelines only state that facility-wide repetitive testing "may be considered." In fact, the guidelines never use the terms "may be considered" or "may consider." Instead, the guidelines repeatedly use the language "should," "should consider," "should strongly consider," and "is recommended." The CDC often uses these terms to denote strong recommendations. An example of this language appears in the COVID-19 biosafety guidelines, which state that precautions "should" be used when handling specimens that are either confirmed or expected to contain the SARS-CoV-2 virus.[38]

49. The March 17, 2021 guidelines are therefore the CDC's strong recommendation that correctional and detention facilities adopt a SARS-CoV-2 testing strategy that includes frequent testing of non-symptomatic incarcerated people and staff with no known or suspected exposure to the virus. Indeed, the guidelines state that such testing is "essential to stop the spread of COVID-19" in prisons and jails.

50. It is our expert opinion that facilities that only conduct diagnostic testing and do not conduct screening testing as described in paragraphs 41 to 44 above are completing only part of the testing strategy the CDC has identified as necessary to prevent SARS-CoV-2 transmission in carceral settings.

51. Our understanding is that the HOCs are not conducting screening testing as described in paragraphs 41 to 44 above and instead are conducting only diagnostic testing. Based on this understanding, it is our expert opinion that the HOCs are not in compliance with the CDC guidelines.

52. Based upon the CDC's guidance and the foregoing research, it is our expert opinion that testing in Massachusetts jails and prisons should happen at the very least weekly.

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[38] *See* CDC, *Interim Laboratory Biosafety Guidelines for Handling and Processing Specimens Associated with Coronavirus Disease 2019 (COVID-19)* (updated Jan. 6, 2021), https://www.cdc.gov/coronavirus/2019-ncov/lab/lab-biosafety-guidelines.html.

Decarceration is a necessary component of any effective strategy to curb COVID-19 infections in Massachusetts prisons and jails.

53. As discussed above, physical distancing is paramount to combating SARS-CoV-2 transmission. Reducing the incarcerated population is the only way to increase the ability of the remaining individuals to physically distance from one another. Thus, decarceration is a necessary component of any effective strategy to protect people who live and work in carceral settings from COVID-19.

54. Indeed, as discussed above, the research demonstrates that decarceration is a central part of an effective mitigation strategy. In a large U.S. jail, the transmission rate decreased by 56% after the jail employed decarceration strategies of reducing intakes and releasing incarcerated people, and another 51% when detained people were able to live in single-occupancy cells.[39] Depopulation efforts must therefore be a primary strategy for COVID-19 mitigation in jails, especially given that increasing access to single-occupancy cells will not be feasible without depopulation efforts.

55. After reviewing the research on the most effective COVID-19 mitigation measures in prisons and jails, a consensus report of the National Academies of Science, Engineering, and Medicine concluded that "decarceration is an appropriate and necessary mitigation strategy to include in the COVID-19 response in correctional facilities and would reduce risks of exposure to and transmission of the disease within correctional facilities."[40]

56. It is our expert opinion that decarceration is a necessary component of any reasonable strategy to combat the spread of SARS-CoV-2 in Massachusetts prisons and jails. If the Houses of Correction have not made meaningful use of the tools at their disposal to reduce their incarcerated populations, they have failed to take the reasonable steps necessary to protect the people who live and work in their facilities from COVID-19**.**

Prevention strategies such as decarceration and routine, comprehensive testing will continue to be necessary until the vast majority of people living and working in the HOCs are vaccinated.

57. Community immunity (colloquially referred to as "herd immunity") is "a situation in which a sufficient proportion of a population is immune to an infectious disease (through vaccination and/or prior illness) to make its spread from person to person

[39] *See* Giovanni S.P. Malloy et al., *The Effectiveness of Interventions to Reduce COVID-19 Transmission in a Large Urban Jail* (June 18, 2020), https://doi.org/10.1101/2020.06.16.20133280.
[40] *See* NASEM Report at S-2.

unlikely."[41] When a community has reached community immunity, "[e]ven individuals not vaccinated (such as newborns and those with chronic illnesses) are offered some protection because the disease has little opportunity to spread within the community."[42] Community immunity is therefore the end result of a successful vaccination campaign.

58. The number of individuals who need to be vaccinated to induce such indirect protection varies based on several factors, all of which are dependent upon the vaccine's ability to inhibit viral transmission, which has not yet been scientifically established. These factors include the real-world effectiveness of the vaccines to inhibit transmission of SARS-CoV-2; the extent of variability of effectiveness within sub-groups; the length of immunity provided by the vaccine and natural immunity, which impacts the number of susceptible people available for transmission; and the underlying transmission dynamics in the population.[43]

59. In the general non-incarcerated population, epidemiologists estimate that the vaccine coverage required to achieve community immunity is between 70% and 90%.[44]

60. Several of the factors influencing the community immunity threshold suggest that community immunity will require higher vaccine uptake in prisons and jails than in the general population.

61. First, the effectiveness of the vaccine in a carceral setting is likely to be lower than that observed in non-incarcerated populations due to high rates of infection, overcrowding, inconsistent access to best practices for masking, high levels of movement of incarcerated individuals and staff (movement within facilities, between facilities and between facilities and the local community), a high percentage of individuals with chronic disease, and a lack of proper sanitation.

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[41] *See* CDC, Vaccines & Immunizations, "Community immunity," https://www.cdc.gov/vaccines/terms/glossary.html (last visited Apr. 23, 2021).
[42] *See Id.*
[43] *See* A. David Paltiel et al., *Clinical Outcomes Of A COVID-19 Vaccine: Implementation Over Efficacy*, Health Affairs (Nov. 1, 2020), https://www.healthaffairs.org/doi/10.1377/hlthaff.2020.02054; Sarah M. Bartsch et al., *Vaccine Efficacy Needed for a COVID-19 Coronavirus Vaccine to Prevent or Stop an Epidemic as the Sole Intervention*, Am J Prev Med. (Oct. 2020); Paul Fine et al., *"Herd Immunity": a Rough Guide*, Clinical Infectious Diseases (Apr. 1, 2011).
[44] *See* Haley E. Randolph and Luis B. Barreiro, *Herd Immunity: Understanding COVID-19*, Immunity (May 19, 2020), https://www.sciencedirect.com/science/article/pii/S1074761320301709; Bartsch, *supra* n.43; Enahoro A. Iboi et al., *Will an Imperfect Vaccine Curtail the COVID-19 Pandemic in the U.S.?*, Infectious Disease Modeling (Aug. 6, 2020).

62. Second, and relatedly, available evidence indicates that SARS-CoV-2 transmission in the carceral setting is higher than in other settings, including other congregate settings.[45]

63. Due to the dynamics described above, estimates of vaccine coverage based on data from the general non-incarcerated population will underestimate the level of vaccine coverage needed within a carceral system. Moreover, infection dynamics which do not estimate the complex interactions within carceral settings—including the interactions between incarcerated people and staff who are entering the community and the facility on a daily basis—will further underestimate the transmission rates and the necessary vaccine coverage.

64. The presence of new variants in the HOCs also affect the vaccine coverage necessary to achieve community protection. As discussed above, some of the new variants are more transmissible and have reduced neutralization by previous infection or vaccine. The introduction of variants may therefore increase the threshold of vaccine coverage necessary to achieve community protection in the HOCs.

65. Given these factors, in our professional opinion, we anticipate that the required vaccine coverage in jails and prisons to achieve community immunity would at least be on the high end of the 70-90% range and may be even higher. In other words, the vast majority of the people living and working at the HOCs will have to be vaccinated before the HOCs achieve community immunity.

66. Vaccination and testing are two necessary tools to reduce infection in the carceral setting that must be used together. Until a facility has full vaccination coverage, robust testing is still necessary to help protect incarcerated people and staff. Especially given the increased presence of variants, routine, comprehensive testing of incarcerated people and staff will continue to be necessary until the vast majority of HOC staff and the people in HOC custody have been vaccinated.

Overview of response to HOCs' representations in the January 15th Memorandum of Law and Supporting Exhibits regarding COVID-19 in their facilities.

67. We have reviewed the HOCs' January 15th memorandum of law and supporting exhibits. That filing reported incomplete and misleading calculations characterizing the COVID-19 burden in the Houses of Correction (HOCs).

68. The HOCs highlighted the number of new COVID-19 cases per 100 population from a single reporting week between December 31, 2020 and January 6, 2021, when testing was low and true COVID-19 burden was likely underestimated. Def. Br. at

[45] *See* Puglisi, *supra* n.10, and accompanying text.

5. As reported, this is not a typical epidemiologic metric to measure the burden of an infectious disease.

69. Three key public health indicators that are often used to gain a better understanding of COVID-19 risks and burden within a given community are (1) average daily testing rate per 100,000 population, (2) average daily case rates per 100,000 population, and (3) percent test positivity, all measured over a period of time rather than a single time point.

70. We analyzed these three indicators in the seventeen weeks between October 1, 2020 and January 27, 2021 to give a more accurate picture of the COVID-19 burden in the HOCs. As detailed below, our analysis reveals several epidemiologic facts that in our professional opinion demonstrate a risk of substantial harm to persons incarcerated in the HOCs.

71. Our analysis of the HOCs' data also reveals that declines in the HOCs' incarcerated population have slowed or reversed since the first few months of the pandemic.

The HOCs' reliance on a single week of data misrepresents facility case rates.

72. In their affidavits, the HOCs report what they label COVID-19 "facility rates" or "positivity rates" for each HOC during a single week from December 31, 2020 to January 6, 2021, and use these rates to assert that "it can be determined that as of January 6, 2021, the county correctional facilities have low positivity rates." Def. Br. at 5.

73. This statement is misleading for several reasons.

74. First, the HOCs calculate their "facility rate" or "positivity rate" as cases per population. Def. Br. at 5 n.6. Their indicator, however, conflates two standard indicators used to measure COVID-19 burden – percent test positivity and COVID-19 case rates. The indicator calculated by the HOCs more closely resembles COVID-19 case rates than percent test positivity. However, this indicator is usually reported as the average daily number of COVID-19 cases per 100,000 population. As reported, the HOCs present their own calculation as a percent (*i.e.*, per 100) rather than the standard per 100,000. When compared to standard case rates which are measured per 100,000, this falsely gives the impression that COVID-19 case rates are lower in the HOCs.

75. Second, it is methodologically unsound to base epidemiological conclusions on a single measure from a single week of reported data, especially where – as here – there are months of data available.

76. Third, case rates are usually reported alongside the testing rates as well as percent test positivity. That is because, in the absence of adequate testing, low reported case rates cannot be interpreted as evidence of low COVID-19 burden. Because only

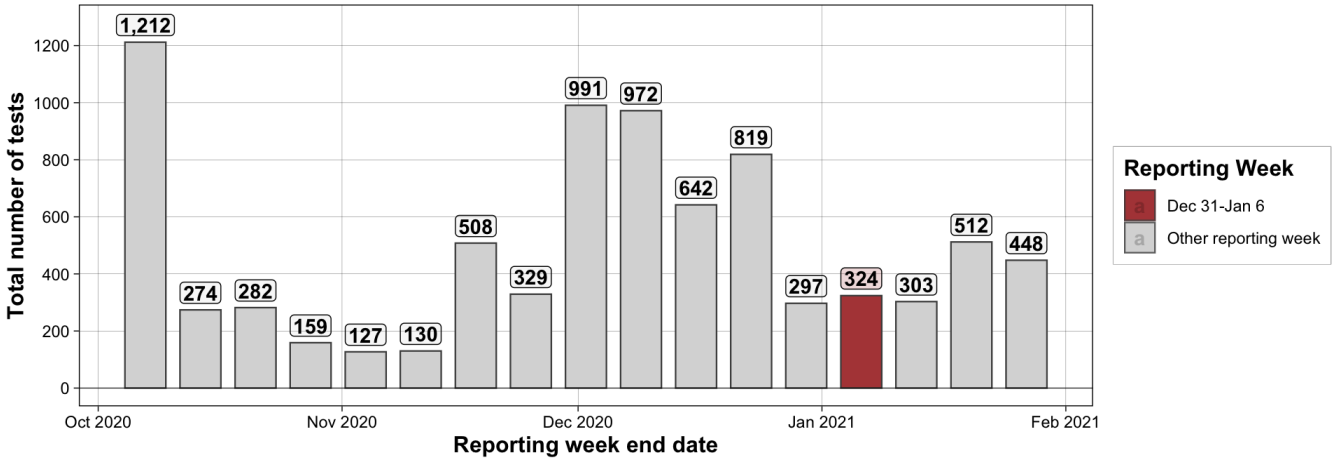
individuals tested and with a positive SARS-CoV-2 test result can be counted and reported as cases, lower testing rates and testing of only symptomatic individuals will underestimate the true burden of COVID-19.

77. In the week the HOCs selected to highlight, the HOCs performed only 324 tests among 6,209 incarcerated persons. This equates to an average daily testing rate of 746 tests per 100,000 persons.

78. Figure 1 presents the weekly number of SARS-CoV-2 tests reported across all HOCs from October 1, 2020, to January 27, 2021. The red bar represents the week the HOCs chose to report their facility rates. This week had one of the lowest number of tests since the beginning of December.

Figure 1.

Weekly number of SARS-CoV-2 tests reported across all HOCs, Oct 1, 2020 - Jan 27, 2021



79. The HOCs report a "0% positivity rate" for 7 HOCs the week reported. Def. Br. at 9. However, all 7 of these HOCs conducted 15 tests or fewer and two of these HOCs conducted no tests at all (Middlesex: 15 tests, Franklin: 14 tests, Berkshire: 6 tests, Hampshire: 5 tests, Dukes: 1 test, Norfolk: 0 tests, Barnstable: 0 tests).

80. Given the low testing rate during the selected week, it is unsurprising that few cases were reported, and it is likely that the true COVID-19 case rates are much higher.

From October 1, 2020 to January 27, 2021, the reported COVID-19 case rate in the HOCs was nearly three times the rate in Massachusetts overall.

81. In their January 15th brief, the HOCs assert that "[t]he objective, statistical evidence demonstrates that inmates confined to county correctional facilities in Massachusetts are as least as safe as they are in the community." Def. Br. at 9. This is not true. In fact, the objective, statistical evidence demonstrates that people

confined to county correctional facilities in Massachusetts are at far greater risk than people in the community.

82. As elaborated below, because the HOCs' testing rates are low, their reported case rates underestimate their true case rates. Nevertheless, even the HOCs' reported case rates are dramatically higher than the case rates in Massachusetts at large.

83. From October 1, 2020 to January 27, 2021, the HOCs reported 954 COVID-19 cases across an average daily population of 6,281 incarcerated individuals – a reported average daily rate of 127.6 cases per 100,000 persons.[46] This rate was 2.9 times the rate reported in Massachusetts for that period (daily average of 44.2 cases per 100,000 persons).[47]

84. In other words, even using the HOCs' reported data, which are almost certainly undercounts, the COVID-19 incidence rate among people living in Massachusetts county correctional facilities was almost three times that observed among people in the non-incarcerated community in Massachusetts.

Months of available data indicate that low testing rates obscure the true COVID-19 burden in the HOCs.

85. Without adequate testing, it is impossible to get an accurate picture of the COVID-19 burden within a given community.

86. An analysis of the HOCs' data from October 1, 2020 to January 27, 2021 reveals that the testing rate was lower in the HOCs combined than in Massachusetts overall. Strikingly, in most HOCs, the testing rate was *less than half* of that in Massachusetts.

87. Figure 2 represents the average daily testing rate per 100,000 population in the HOCs compared to Massachusetts between October 1, 2020 and Jan 27, 2021. Massachusetts' average daily testing rate is represented by top bar and the dotted line. The percentage next to the bars indicates the percentage difference of the HOCs' average daily testing compared to the Commonwealth as a whole.

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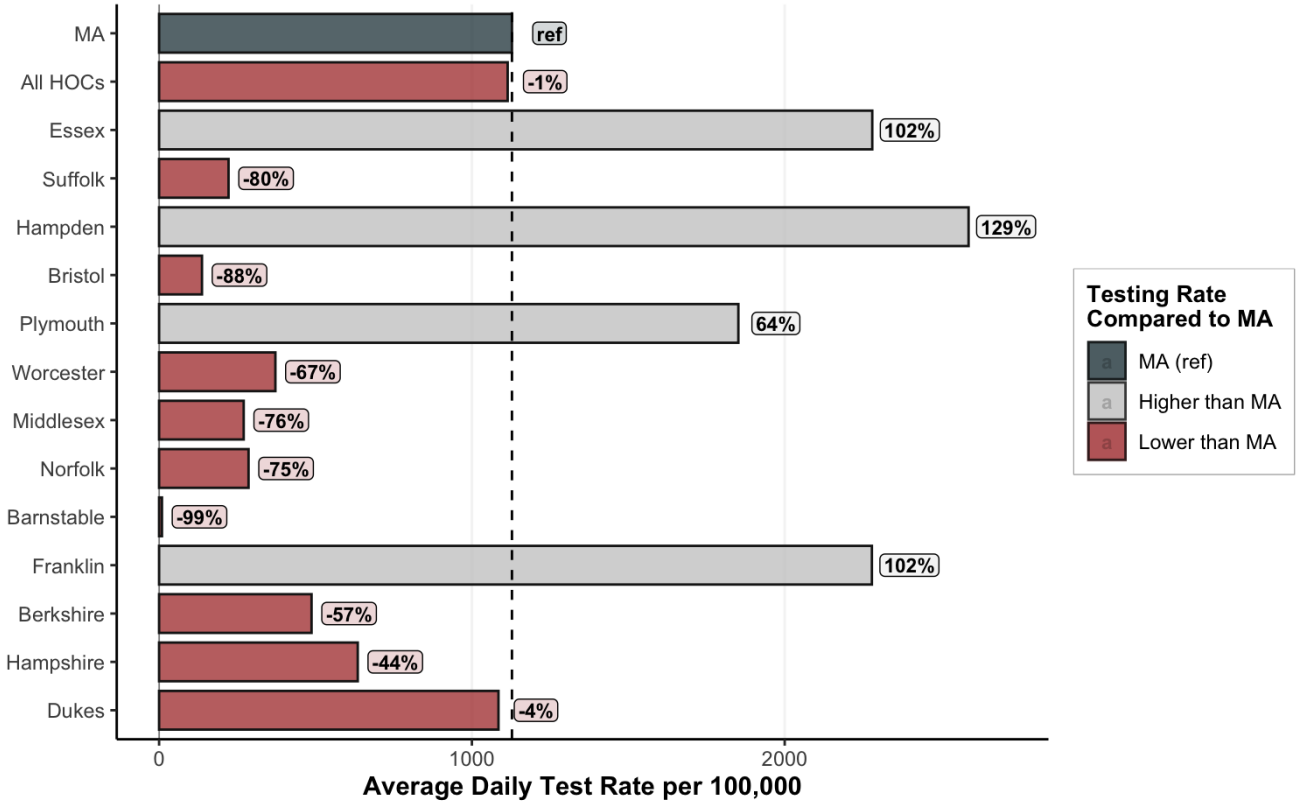
[46] The average daily COVID-19 case rate is calculated by dividing the total number of new COVID-19 cases over the total incarcerated "person-days," which is the reported incarcerated population multiplied by the number of days in the reporting period. It is standard epidemiologic practice to use "person-days" in such calculations, because this allows for accurate comparisons between jurisdictions with different reporting frequencies and comparisons across periods of different length.

[47] For the data used to calculate the Massachusetts average daily case rate, *see* Massachusetts DPH, *Weekly COVID-19 Public Health Report—Raw Data*, https://www.mass.gov/info-details/covid-19-response-reporting.

Figure 2.

Average daily SARS-CoV-2 testing rate per 100,000 population in HOCs compared to Massachusetts, Oct 1, 2020 - Jan 27, 2021



Bars are ordered by descending size of incarcerated population. The label over each bar represents the percent higher or lower the testing rate is for each HOC compared to Massachusetts, the reference group, depicted as the top bar & dotted line.

88. From October 1, 2020 through Jan 27, 2021, the HOCs conducted 8,329 SARS-CoV-2 tests across an average daily incarcerated population of 6,281 – an average daily testing rate of 1,114 tests per 100,000 persons. This was slightly lower than the average daily testing across Massachusetts during this period – 1,128 tests per 100,000 persons (9.25 million tests conducted across an estimated population of 6.89 million). See Figure 2; Appendix Table 1.

89. Importantly, the overall testing rate in the HOCs was driven largely by testing in just four facilities – Hampden, Essex, Franklin, and Plymouth – where the testing rate actually exceeded that of Massachusetts. Despite representing 42% of the incarcerated population (n=2,653 of 6,281), these four facilities accounted for 87% of all SARS-CoV-2 tests in the HOCs (n=7,217 of 8,329).

90. The remaining HOCs all had testing rates that were substantially lower than Massachusetts' rate. Indeed, eight HOCs had testing rates more than 40% lower than Massachusetts' general rate – Hampshire, Berkshire, Worcester, Norfolk, Middlesex, Suffolk, Bristol, and Barnstable. These HOCs represented 57% of the

incarcerated population yet accounted for just 13% of total tests in the HOCs (n=1,106 of 8,329).

91. As discussed above in paragraphs 25 to 31, testing in correctional facilities must be comprehensive and routine to identify COVID-19 cases and prevent spread. Alongside high test percent positivity, discussed below, the HOCs' low testing rates therefore indicate that the HOCs' reported cases underrepresent the true COVID-19 burden in those facilities.

From October 1, 2020 to January 27, 2021, test percent positivity was higher in the HOCs than in Massachusetts overall. Given their low testing rates and high test percent positivity, the true COVID-19 case rates in the HOCs are likely even higher than reported.

92. In addition to testing rate, another important indicator that provides insight into burden of COVID-19 in a given setting is test percent positivity. Test percent positivity is calculated as the total number of new positive tests (*i.e.*, cases) over the total number of tests conducted.[48] Test percent positivity is widely used and reported by state and local governments.

93. A high test percent positivity occurs when a high proportion of the tests administered in a given setting return positive results. Test percent positivity increases with higher case rates and generally decreases with higher testing rates. Thus, a high test percent positivity in a congregate setting can indicate two problems: (1) that a jurisdiction is not doing enough tests, and/or (2) widespread infections in the community tested.[49]

94. While the threshold varies between settings, many authorities agree that a test percent positivity of more than 5% indicates one or both of the two problems identified in the immediately preceding paragraph.

95. Figure 3 presents the test percent positivity in the HOCs from October 1, 2020 to January 27, 2021 compared with the test percent positivity in Massachusetts overall. Massachusetts' test percent positivity, 3.9%, is represented by the top dark bar and the dotted line. The number next to the bars is the percent difference

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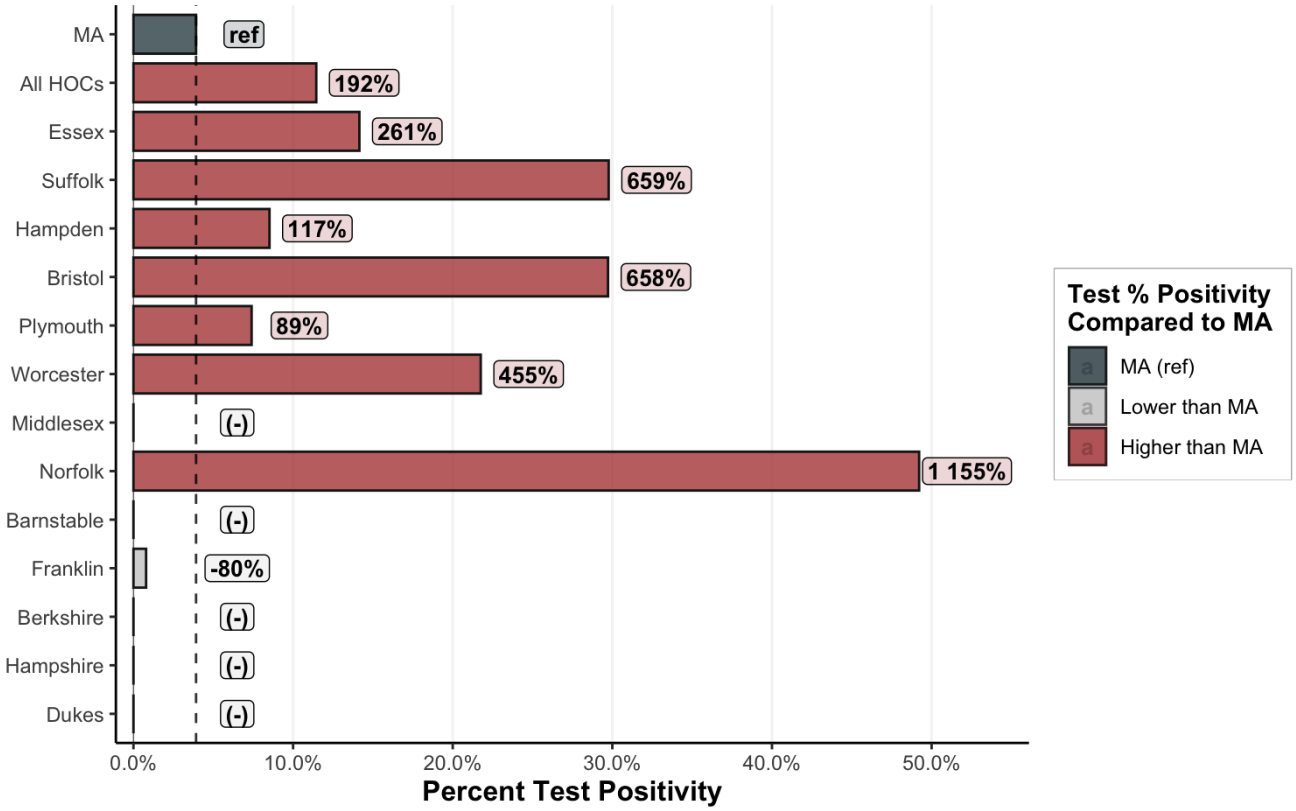
[48] There are several ways to calculate percent positivity. Here, we report the number of new positive tests (*i.e.*, cases) over the total number of tests so that numbers are comparable between HOCs and Massachusetts. *See* CDC, *Calculating Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Laboratory Test Percent Positivity: CDC Methods and Considerations for Comparisons and Interpretation* (Sept. 3, 2020), https://www.cdc.gov/coronavirus/2019-ncov/lab/resources/calculating-percent-positivity.html#:~:text=The%20formula%20for%20calculating%20percent,results%20and%20excludes%20indeterminate%20results.

[49] *See id.*

between the HOCs' test percent positivity and Massachusetts' test percent positivity.

Figure 3.

Test percent positivity in HOCs compared to Massachusetts, Oct 1, 2020 - Jan 27, 2021



Bars are ordered by descending size of incarcerated population. The label over each bar represents the percent higher or lower the test percent the reference group, depicted as the top bar & dotted line. HOCs with no positive tests for that interval are labelled (-)

96. From October 1, 2020 to January 27, 2021, the HOCs had a combined test percent positivity of 11.5% (954 cases, 8,329 tests). This was nearly 200% higher than in Massachusetts during the same period, where test percent positivity was 3.9% (362,836 cases, 9,252,689 tests), even though Massachusetts had only slightly higher testing rates than the HOCs combined.

97. Seven HOCs reported test percent positivity of greater than the 5% recommended threshold.

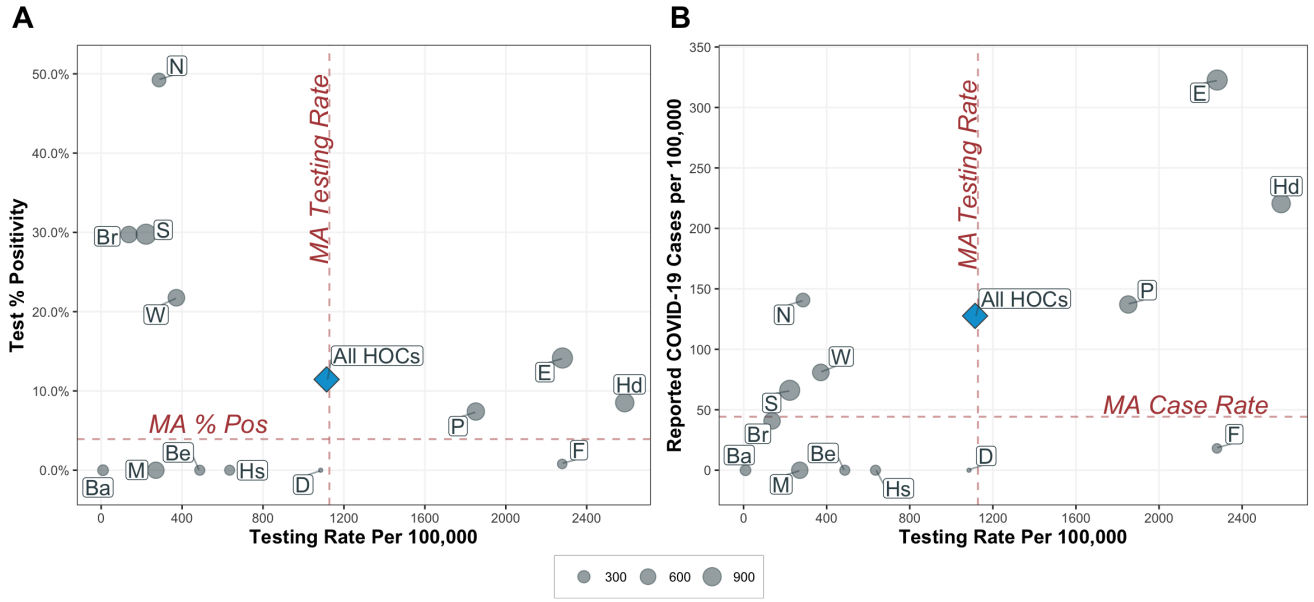
98. Four HOCs (Worcester, Bristol, Suffolk, and Norfolk) reported test percent positivity of 29% or higher. The highest test percent positivity was observed in Norfolk, where nearly half of all tests were positive (49.2% test percent positivity).

99. While test percent positivity is an informative factor on its own, it can yield even more information regarding the true COVID-19 burden in a facility when reported alongside testing rates and case rates.

100. Figure 4A shows the average daily testing rate and the test percent positivity in the HOCs and Massachusetts between October 1, 2020 and January 27, 2021, and Figure 4B shows the average daily testing rate and the average daily reported cases per 100,000 people in the HOCs and Massachusetts during the same period.

Figure 4.

Average daily testing rate per 100,000 persons vs. (A) percent test positivity and (B) average daily reported COVID-19 case rates per 100,000 persons in HOCs compared to Massachusetts, Oct 1, 2020 - Jan 27, 2021



Ba: Barnstable; Be: Berkshire; Br: Bristol; D: Dukes; DOC: Department of Corrections; E: Essex; F: Franklin; Hd: Hampden; Hs: Hampshire; M: Middlesex; N: Norfolk; P: Plymouth; S: Suffolk; W: Worcester

101. As discussed above, the lower the testing rates and the higher the test percent positivity, the more extreme the underestimation of the true COVID-19 burden in a jurisdiction. Conversely, the degree of underestimation is generally less severe the higher the testing rate and/or the lower the test positivity rate in a jurisdiction.

102. From October 1, 2020 to January 27, 2021, Bristol, Norfolk, Suffolk and Worcester all had significantly lower testing rates than Massachusetts and significantly higher test percent positivity. See Figure 4A. This suggests that the reported case rates substantially undercount the true COVID-19 burden in these four facilities.

103. At Barnstable, Berkshire, Hampshire, and Middlesex, the testing rates were too low to reliably interpret these counties' case rates and percent test positivity.[50]

104. Hampden, Franklin, Essex, and Plymouth had testing rates that exceeded that of Massachusetts and that were far higher than the testing rate at the other HOCs. See Figure 4A. These higher testing rates likely indicate that the degree of underestimation of the true case rates may be less severe at these four HOCs than at the others.[51]

105. Only one of these four facilities—Franklin—reported a lower case rate than Massachusetts. See Figure 4B. The three other facilities reported case rates that far exceeded those observed in Massachusetts. See Figure 4B. Specifically, Plymouth, Hampden, and Essex, reported COVID-19 case rates that were 3.1, 5.0, and 7.3 times the reported rate in Massachusetts, respectively. See Appendix Table 1.

106. Given these case rates at the facilities that likely have the lowest degree of underestimation, it is our expert opinion that the remaining HOCs' reported COVID-19 case rates may substantially undercount the true COVID-19 burden in the HOCs.

Declines in the HOCs' incarcerated population slowed or reversed between July 2020 and January 2021.

107. The HOCs' reported data also reveal that their incarcerated populations grew between July 2020 and January 2021.

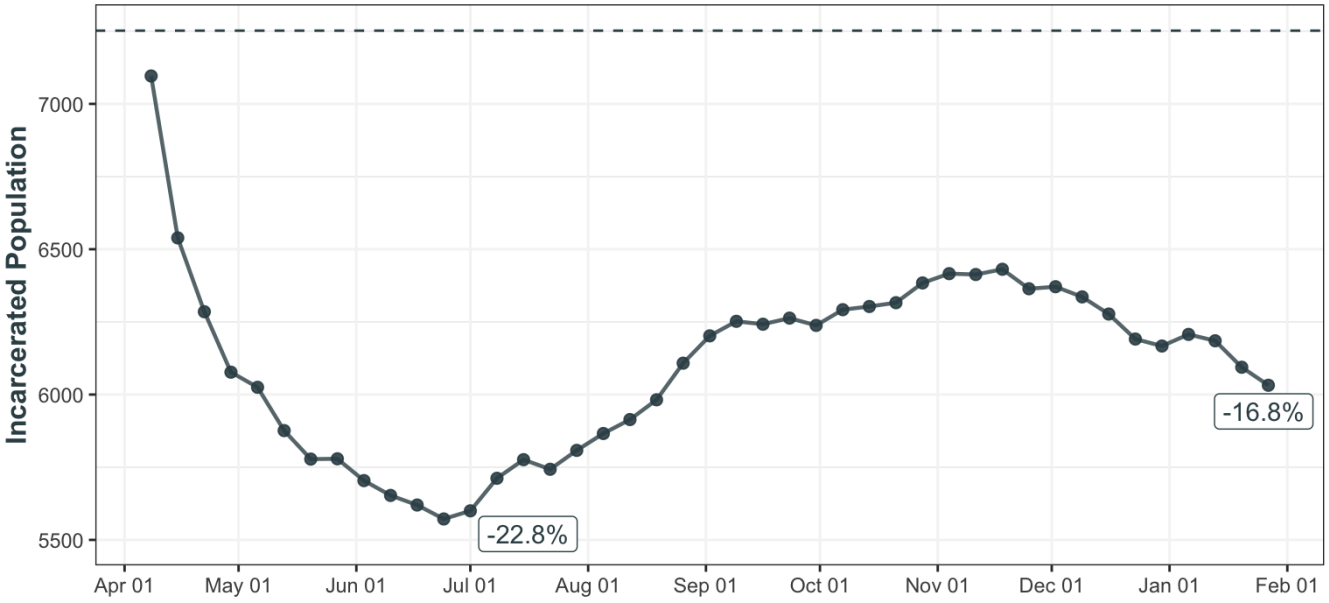
108. Figure 5 shows the combined incarcerated population at all of the HOCs since the beginning of April 2020. Across all of the HOCs, a total of 7,252 individuals were incarcerated at the beginning of April 2020. In the first months of the pandemic, the incarcerated population declined by 23% to 5,600 individuals on July 1, 2020. See Figure 5; Appendix Table 2. But after these initial population declines in the first months of the pandemic, the overall HOC incarcerated population increased.

[50] Similarly, Dukes' population was too low to reliably interpret its case rate and percent test positivity.

[51] In the HOCs with the highest testing rates—Hampden, Essex, and Plymouth—test percent positivity was still higher than in Massachusetts overall. These data suggest that even though testing rates in these facilities exceeded the testing rate in Massachusetts, their current testing levels may still be insufficient to capture the full extent of COVID-19 burden in these facilities.

Figure 5.

Weekly incarcerated population across all HOCs and percent change from baseline as of July 1, 2020 and January 27, 2021



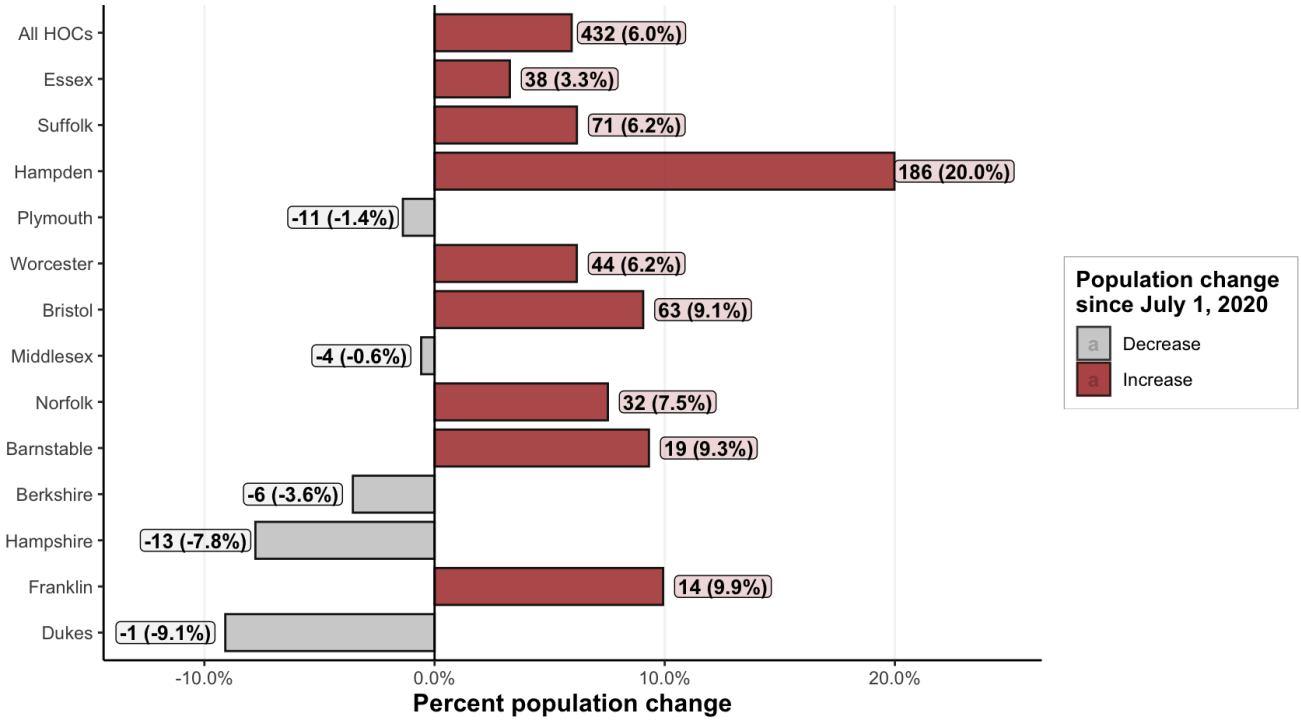
Dotted line represents the incarcerated population across all HOCs reported on April 5, 2021 (baseline), n=7,252

109. Figure 6 shows the change in incarcerated population between July 1, 2020, and January 27, 2021 for each HOC. As of January 27, 2021, only 5 of 13 facilities (Plymouth, Middlesex, Berkshire, Hampshire, Dukes) reported populations lower than those reported on July 1, 2020.

110. In contrast, most HOCs had substantially higher populations on January 27, 2021 than on July 1, 2020. Overall, the HOCs' population increased 6%; Bristol's, Barnstable's and Franklin's populations each increased by more than 9%; and Hampden's population was up 20%.

Figure 6.

Change in incarcerated population since July 1, 2020 as of January 27, 2021.



Bars are ordered by descending size of incarcerated population. Labels show the absolute number and percent change in incarcerated popuation as a percent of the baseline population for each HOC since July 1, 2020.

Appendix follows on next page.

Signed under the pains and penalties of perjury on April 23, 2021.

Monik C. Jiménez, ScD, SM

Signed under the pains and penalties of perjury on April 23, 2021.

Tori L. Cowger, B.S., MPH

APPENDIX

Table 1. COVID-19 testing and case indicators and comparisons to Massachusetts, October 1, 2020 to January 27, 2021

County	Average Daily Population	Number of Tests	Total Cases	Test Percent Positivity	Average Daily Testing Rate Per 100,000	Average Daily Case Rate per 100,000	Case Rate Ratio vs. MA	% Difference in Testing Rate v. MA	% Difference in Test positivity v. MA
Massachusetts	6,892,503	9,252,689	362,836	3.9%	1128.09	44.24	-	-	-
All HOCs	6,281	8329	954	11.5%	1114.32	127.63	2.89	-1.0%	192.0%
Essex	997	2706	383	14.2%	2279.98	322.70	7.29	102.0%	261.0%
Suffolk	991	262	78	29.8%	222.06	66.11	1.49	-80.0%	659.0%
Hampden	903	2781	237	8.5%	2587.84	220.54	4.99	129.0%	117.0%
Bristol	680	111	33	29.7%	137.11	40.76	0.92	-88.0%	658.0%
Plymouth	613	1351	100	7.4%	1851.85	137.07	3.10	64.0%	89.0%
Worcester	592	262	57	21.8%	371.79	80.89	1.83	-67.0%	455.0%
Middlesex	553	178	0	0.0%	270.46	0.00	0.00	-76.0%	-100.0%
Norfolk	376	128	63	49.2%	285.94	140.73	3.18	-75.0%	1155.0%

Barnstable	182	2	0	0.0%	9.22	0.00	0.00	-99.0%	-100.0%
Franklin	140	379	3	0.8%	2278.74	18.04	0.41	102.0%	-80.0%
Berkshire	138	80	0	0.0%	487.36	0.00	0.00	-57.0%	-100.0%
Hampshire	110	83	0	0.0%	635.09	0.00	0.00	-44.0%	-100.0%
Dukes	5	6	0	0.0%	1084.99	0.00	0.00	-4.0%	-100.0%

Table 2. Population incarcerated in the HOCs and change over time

	Total Incarcerated Population			Change in Population from Baseline		Change in Population since July 1	
	Baseline	July 1, 2020	January 27, 2021	n	%	n	%
All HOCs	7,252	5,600	6,032	-1,220	-16.8%	432	6.0%
Essex	1,162	958	996	-166	-14.3%	38	3.3%
Suffolk	1,148	866	937	-211	-18.4%	71	6.2%
Hampden	931	648	834	-97	-10.4%	186	20.0%
Plymouth	799	576	565	-234	-29.3%	-11	-1.4%
Worcester	712	511	555	-157	-22.1%	44	6.2%
Bristol	695	613	676	-19	-2.7%	63	9.1%
Middlesex	688	553	549	-139	-20.2%	-4	-0.6%
Norfolk	425	320	352	-73	-17.2%	32	7.5%
Barnstable	204	158	177	-27	-13.2%	19	9.3%
Berkshire	169	145	139	-30	-17.8%	-6	-3.6%
Hampshire	167	117	104	-63	-37.7%	-13	-7.8%
Franklin	141	127	141	0	0.0%	14	9.9%
Dukes	11	8	7	-4	-36.4%	-1	-9.1%

EXHIBIT A

Harvard Medical School
Curriculum Vitae

Date Prepared: **December 17, 2020**

Name: **Monik C. Jiménez**

Office Address: Division of Women's Health, Brigham and Women's Hospital
1620 Tremont St., 3-034
Boston, MA 02120

Home Address: 76 Old Palmer Rd, Brimfield, MA 01010

Work Phone: 617-525-7516

Work Email: mjimenez11@partners.org

Work FAX: 617-525-7746

Place of Birth: Los Angeles, CA

Education

2004	BA *(magna cum laude)*	Biology	Whittier College, Whittier, CA
2004-2009	Certificate	Oral Epidemiology	Harvard School of Dental Medicine, Boston, MA
2006	SM	Epidemiology	Harvard School of Public Health, Boston, MA (now Harvard T.H. Chan School of Public Health)
2009	ScD	Epidemiology Kaumudi Joshipura, BDS, SM, ScD	Harvard School of Public Health

Postdoctoral Training

12/09-6/13	Research Fellow	Cardiovascular Epidemiology Kathryn M. Rexrode, MD, MPH	Brigham and Women's Hospital, Boston, MA

Faculty Academic Appointments

09/09-	Adjunct Teaching Associate (no voting privileges)	Graduate Studies	Forsyth School of Dental Hygiene, Massachusetts College of Pharmacy and Health Sciences, Boston, MA
02/11-	Adjunct Lecturer (no voting privileges)	Department of Nursing	Simmons College, School of Nursing and Health Sciences, Boston, MA
07/13-9/17	Instructor in Medicine	Department of Medicine	Harvard Medical School, Boston, MA
10/17-	Assistant Professor	Department of Medicine	Harvard Medical School

10/19-	Assistant Professor	Department of Epidemiology	Harvard T.H. Chan School of Public Health

Appointments at Hospitals/Affiliated Institutions

2013-	Associate Epidemiologist	Department of Medicine	Brigham and Women's Hospital

Other Professional Positions

2000-2003	Undergraduate Intern	Harvard School of Dental Medicine Harvard T.H. Chan School of Public Health
2004-2005	Research Assistant	Harvard School of Dental Medicine
2005	Research Assistant	Harvard T.H. Chan School of Public Health
2006-2010	Research Assistant	Boston University Henry M. Goldman School of Dental Medicine, Boston, MA
2007-2009	Investigator	University of Puerto Rico, School of Dentistry, San Juan, Puerto Rico
2008-2009	Research Assistant	Beth Israel Deaconess Medical Center, Boston, MA
2009-2011	Consultant	University of Michigan, Ann Arbor, MI
2010-2015	Consultant	Colgate Oral Care Report, Boston, MA
2011-2013	Summer Fellow	National Heart, Lung, and Blood Institute Programs to Increase Diversity among Individuals Engaged in Health-Related Research (NHLBI PRIDE) Summer Institute on Mentoring Researchers in Latino Health Disparities, San Diego State University, San Diego, CA (sole compensation was payment of travel expenses).
2015-2016	Summer Fellow	New York University School of Medicine, Center for Stroke Disparities Solutions Training and Mentoring Institute, New York, NY (sole compensation was payment of travel expenses).
2018-	Board Member	Partakers – College Behind Bars, Newton, MA
2020-	Faculty Director	BWH STARS, Brigham and Women's Hospital

Major Administrative Leadership Positions

Local

2009-2013 Co-director, Advanced Graduate Education (AGE) Course in Biostatistics
Harvard School of Dental Medicine

2014-2016 Co-director, Peer Networking
Division of Preventive Medicine

Regional

2009- Co-director, Biostatistics
Forsyth School of Dental Hygiene, Massachusetts College of Pharmacy and Health Sciences

Committee Service

Local

2009-2014 Member, Curriculum Advisory Board
Clinical Epidemiology & Population Health (AC511.0)
First-year medical students

2013-2016 Alumni Representative, Dean's Advisory Committee on Diversity and Inclusion
Harvard T.H. Chan School of Public Health

2018- Member, Health Equity Committee
Department of Medicine, Brigham and Women's Hospital

2018- Wellness Champion
Department of Medicine, Brigham and Women's Hospital

2019- Member, Health Equity Data Committee
Department of Medicine, Brigham and Women's Hospital

Professional Societies

2004-2010 International Association for Dental Research

2004-2010 American Association for Dental Research

2005-2010 Society for the Advancement of Chicanos/Hispanics and Native Americans in Science
2005-2006 Chapter President

2008-2011 Society for Epidemiology Research

2009- American Heart Association (AHA)
- 2010- Member, Epidemiology Council
- 2014- Appointed Member, AHA Epidemiology Council
  Early Career Committee
  Program Committee
- 2014- Appointed Member, AHA Stroke Statistics Committee
- 2017- Chair, AHA Epidemiology Council Early Career Committee
- 2019- Appointed Member, AHA, Council Operations Committee
- 2019- Appointed Member, AHA Epidemiology Council Social Determinants of Health Committee
- 2020- Chair, AHA Council Operations Committee, Mid-Career Committee

Editorial Activities

***Ad hoc* Reviewer**

Circulation
Diabetes Care
European Journal of Epidemiology
Hypertension
Journal of Dental Public Health Dentistry
Neurology
PLoS
Social Science & Medicine
Stroke

Honors and Prizes

2002-2004	John Greenleaf Whittier Merit Scholarship, Whittier College
2002-2004	Whittier College Dean's List, Whittier College
2004	John Stauffer Trust Science Scholarship, Whittier College
2004	Outstanding Biology Major, Whittier College
2004-2006	Presidential Scholar, Harvard T.H. Chan School of Public Health
2006	Honorable Mention, Harvard School of Public Health Student Research Day Harvard T.H. Chan School of Public Health
2006	Outstanding Student Abstract Award, International Association for Dental Research
2006-2008, 2009	Conference Travel Award, American Association for Dental Research
2010	Travel Award to 36th Ten-Day Seminar on the Epidemiology and Prevention of Cardiovascular Disease, Centers for Disease Control and Prevention
2012	Epidemiology and Prevention Minority Travel Grant, American Heart Association Travel award to Cardiovascular Disease Epidemiology & Prevention Scientific Sessions 2012
2013	Award for Excellence in Tutoring, Harvard Medical School
2014	Selected participant for the Research Leadership Program, Brigham and Women's Hospital
2014	Selected for participation in the Grant Review and Support Program, The Harvard Clinical and Translational Science Center (Harvard Catalyst)
2015	Chair's Research Award, Brigham and Women's Hospital, Department of Medicine
2018	PRIDE Peer Mentorship Program, New York University School of Medicine

2018 Elected Fellow of the American Heart Association, Council on Epidemiology and Prevention

2020 Mentoring Award, Harvard T.H. Chan School of Public Health

REPORT OF FUNDED AND UNFUNDED PROJECTS

Funding Information

Past

2009-2013 National Institutes of Health (NIH)/National Heart, Lung, and Blood Institute (NHLBI) 3R01HL088521-S1
Diversity Supplement to Risk Factors for Ischemic Stroke in Women
Postdoctoral Research Fellow (PI: Kathryn M. Rexrode)
This study evaluated the association between adipokines, sex hormones, and risk of stroke among women. Furthermore, it provided career development support to progress towards an independent research career as a cardiovascular epidemiologist.

2010 (Award declined) NIH/National Institute of Dental and Craniofacial Research (NIDCR) 1F32DE020227
Metabolic Syndrome as a Predictor of Periodontitis and Tooth Loss
PI ($152,982)
This study evaluated the association between metabolic syndrome and its components in relation to incident tooth loss. This award was declined to pursue expanded cardiovascular post-doctoral training.

2011-2013 NIH Loan Repayment Program Recipient
Award recipient
This award provided student loan repayment for individuals engaged in research-oriented careers.

2013-2014 NIH/NHLBI R01 HL102122-S1
Diversity Supplement to Effect of Vitamin D and Omega-3 Fatty Acids on Blood Pressure and Hypertension
Investigator trainee (PI: Howard D. Sesso)
This innovative diversity supplement examined racial/ethnic and sex disparities in HTN by testing their differential impact on the effects of randomized vitamin D and omega-3 fatty acid (ω-3 FA) interventions on HTN incidence, 2-year changes in 24-hour ambulatory blood pressure (ABP) and sex steroid hormones, and the validity of self-reported HTN measures.

2014-2015 Brigham and Women's Hospital Faculty Career Development Award
PI
Assessing the influence of cardiovascular risk factors and gender on risk of stroke among hypertensives
This project will examine the role of clinical and lifestyle risk factors that influence stroke risk among both pre-hypertensive and hypertensive men and women of the Physicians' Health Study II and the Women's Health Study. (***Note:*** The Women's Health Study was a clinical trial randomizing 39,876 female health professionals aged ≥45 years starting in 1992; whereas the Women's Health Initiative, mentioned elsewhere in the CV, is an ongoing prospective study of 161,808 multi-ethnic postmenopausal women aged 50-79 years starting in 1994, consisting of clinical trials and an observational study.)

2014-2019 Brigham and Women's Hospital Minority Faculty Career Development Award
Examining the role of social and biologic determinants of sex and racial/ethnic disparities in stroke
PI ($100,000)
This award will provide career development and research support to facilitate the transition to independence.

2014-2019 NIH/NHLBI 1K01HL124391
Examining Racial Disparities in Stroke
PI ($650,430)
This mentored career development award will examine stroke disparities in three large cohort studies, the Women's Health Initiative, the Southern Community Cohort Study and the Reasons for Geographic and Racial Differences in Stroke Study by evaluating the contribution of traditional and non-traditional cardiovascular risk factors for stroke among white and black populations. Furthermore, the performance of existing stroke prediction scores will be compared in blacks and whites, with a new score developed to optimize prediction in black individuals.

Current

2019-2021 Nesson Fellowship Brigham and Women's Hospital Center for Community Health and Health Equity
Examining the cardiovascular implications of incarceration
PI ($180,000)
This award provides career development support to examine factors that impact the cardiovascular health of patients who have experienced incarceration, identify ways to support respectful patient-clinician communication about such experiences and inform future policy to support health care equity.

2019-2020 Brigham and Women's Hospital Department of Medicine Health Equity Grant
Engaging patients and health care providers in communication regarding history of incarceration
PI ($20,000)
This award provides research support to interview patients through qualitative methods and survey provides regarding patient preferences in discussing history of incarceration.

REPORT OF LOCAL TEACHING AND TRAINING

Teaching of Students in Courses

HMS/HSDM/DMS courses

Harvard School of Dental Medicine

2007-2008	Teaching Assistant	20 two-hour lab sessions/year
	Outcomes of Treatment (OTx Block)	2 two–hour lectures
	3rd year dental students	

Harvard Medical School

2009	Tutorial leader	1 two-hour session
	Clinical Epidemiology & Population Health (AC511.0)	
	First-year medical students	
2011-2017	Tutorial leader	7 two-hour sessions/year
	Clinical Epidemiology & Population Health (AC511.0)	
	First-year medical students	

	Tutorial leader	
2019	Clinical Epidemiology & Population Health (AC511.0) First-year medical students	6 two-hour sessions/year
2020	Learning Studio Instructor and Tutorial leader Clinical Epidemiology & Population Health (AC511.0) First-year medical students	8 two-hour sessions/year
2020	Tutorial Leader Essentials of the Profession II (PWY120) Fourth-year medical students	6 one-hour sessions
2020	The Criminal Punishment System and Health in the US Social Medicine Fourth-year medical students	1 two-hour session

Other Harvard University Courses

Harvard T.H. Chan School of Public Health

2007	Teaching Assistant Introduction to Epidemiology (Epi 201) First-year master's students	16 two-hour sessions
2009	Teaching Assistant Introduction to Epidemiology (Epi 500) First-year year master's students	20 one-hour sessions/year
2013-2014	DHEAS and risk of cardiovascular disease Oral presentation for undergraduate summer students Summer Program in Epidemiology and Fostering Advancement & Careers through Enrichment Training in Science (FACETS), Office of Diversity and Inclusion	1 two-hour session/year
2014	DHEAS and risk of cardiovascular disease Oral presentation for undergraduate summer students Summer Program in Quantitative Sciences, Department of Biostatistics	1 two-hour session
2019-	Course Director Cardiovascular Disease Epidemiology (Epi 223) Master's and doctoral students	16 hour and half sessions
2020	Course Director Mass Incarceration and Health (SBS 502) Master's and doctoral students	16 hour and half sessions

Other Teaching during Harvard Fellowship and Faculty Appointments

Massachusetts College of Pharmacy and Health Sciences

2009-2012	Adjunct Lecturer Biostatistics (DHY714) First-year master's students	14 one-hour online sessions/year
2012-2018	Adjunct Lecturer Statistics (MAT261) Undergraduate students	14 one-hour online sessions/year
2013-2019	Adjunct Lecturer Research Methods in Oral Health (DHY 714) First-year master's students	14 one-hour online sessions/year

Simmons College

2011	Adjunct Instructor Research Methods (PT 610) Pre-doctoral physical therapy students	14 two-hour sessions/year
2012-2020	Adjunct Instructor Research Methods (SNHS 410) Nursing students (various levels)	14 three-hour sessions/year

Formal Teaching of Residents, Clinical Fellows and Research Fellows (post-docs)

2006-2009, 2012	Lecturer, Harvard School of Dental Medicine Advanced Graduate Education Course in Biostatistics (OHPE 751.BIO) First-year post-doctoral residents	5 two-hour lectures

Laboratory and Other Research Supervisory and Training Responsibilities

2009-	Statistical advisor / peer-mentor, post-doctoral research fellows and visiting scholars	8 hours per month

Mentored Trainees and Faculty

2015-2019 Marcia Pescador Jiménez, MS, PhD candidate, Brown School of Public Health, Providence, RI

Mentor – Conducting the analysis and literature review for a manuscript to examine the validity of the Framingham Risk Score across racial/ethnic groups.

2018- Nicolette Cassarino, ABL, Intern, Division of Women's Health, BWH

Mentor – Conducting the analysis examining the association between social engagement and incarceration among a representative sample of men and women incarcerated in state correctional facilities.

2019- Lin Yuan, BS, Intern, Division of Women's Health, BWH

Mentor- Conducting analysis to support ongoing work examining the association between social engagement and incarceration among a representative sample of men and women incarcerated in state correctional facilities. In addition, she is preparing a proposal to examine the prevalence of cancer among incarcerated populations.

2020- Mimi Yen Li, 4th year medical student, Harvard Medical School

Mentor- Conducting data abstraction to track COVID-19 in US carceral facilities and questionnaire development of a community-based questionnaire to survey the conditions of confinement in US carceral facilities among adults incarcerated during the COVID-19 pandemic.

2020- Abdullah Hamad, MS student, Harvard T.H. Chan School of Public Health

Research Mentor – Conduction data analysis of prediction of atrial fibrillation among patients with cryptogenic strokes.

Formal Teaching of Peers/Harvard Medical School CME Courses

No presentations below were sponsored by outside entities.

2007	Lecturer, David Rockefeller Center for Latin American Studies, Harvard University First Symposium on Health Research Methods of University Faculty Members and Researchers for Latin America & Spain Practicing clinicians	2-hour lecture

Local Invited Presentations

No presentations below were sponsored by outside entities.

2010 Alcohol consumption and risk of stroke among women
Conference series for faculty and trainees
Brigham and Women's Hospital, Division of Preventive Medicine

2010 Alcohol consumption and risk of stroke among women
Oral presentation and discussion
Channing Laboratory of Network Medicine, Boston, MA

2011 DHEAS and risk of stroke
Cardiovascular Epidemiology Seminar, Department of Nutrition
Harvard T.H. Chan School of Public Health

2011 Fetuin-A and risk of stroke among women
Division of Preventive Medicine conference series for faculty and trainees
Brigham and Women's Hospital, Division of Preventive Medicine

2011 Cardiovascular risk factors associated with low dehydroepiandrosterone sulfate
Cardiovascular Epidemiology Seminar, Department of Nutrition
Harvard T.H. Chan School of Public Health

2014 High-sensitivity C-reactive Protein (hsCRP) and risk of stroke by hypertension status
Cardiovascular Epidemiology Seminar, Department of Nutrition
Harvard T.H. Chan School of Public Health

2015, 2016, 2017, 2018 Disparities in cardiovascular disease and cardiovascular disease research
Invited speaker, Cardiovascular Disease Epidemiology
Harvard T.H. Chan School of Public Health

2016 Disparities in Cardiovascular Disease
Invited speaker, Forum on Population Health Equity
Harvard T.H. Chan School of Public Health

2016 NIH Funding for Students of Color
Office of Diversity and Inclusion
Harvard T.H. Chan School of Public Health

2016, 2017, 2018, 2019 Dirty Little Secrets of Navigating Academia
Invited speaker, Summer Program in Epidemiology and Fostering Advancement & Careers through Enrichment Training in Science (FACETS), Office of Diversity and Inclusion
Harvard T.H. Chan School of Public Health

2016, 2017, 2018, 2019, 2020 Imposter Syndrome
Office of Diversity and Inclusion
Harvard T.H. Chan School of Public Health

2019 Racial Inequities in Stroke Risk among Older Adults in the Southern Community Cohort Study
Women in Medicine and Science Symposium
Brigham and Women's Hospital

2020 My Career in Epidemiology and Social Justice
Global Health Fridays and Fireside Chats
Harvard Global Health Institute
Harvard Medical School

2020 My Career in Epidemiology and Social Justice
Summer Jobs Program
Massachusetts General Hospital

2020 Overcoming Imposter Syndrome
Program in Graduate Education
Harvard Medical School

2020 Using Epidemiology to Address Community Needs
Policy and Advocacy Seminar
Division of Women's Health / Department of Medicine
Brigham and Women's Hospital

2020 Confronting Racism and Structural Inequities using Health Equity Research
Panelist
Health Equity Summit
Brigham and Women's Hospital

2020 Attempts to Achieve Health Equity: Successes, Failures, and Lessons Learned: The Impact of COVID-19 on Incarcerated Populations
Department of Medicine, Research Seminar Series
Brigham and Women's Hospital

REPORT OF REGIONAL, NATIONAL and INTERNATIONAL TEACHING AND PRESENTATIONS

Invited Presentations and Courses

Regional

No presentations below were sponsored by outside entities.

2011, 2012 Epidemiology of Stroke
Invited speaker, Chronic Disease Epidemiology
Brown University, School of Public Health, Providence, RI

2019 Engaging patients and health care providers in communication regarding history of incarceration
Invited speaker, Health Justice Lab
Yale School of Medicine, New Haven, CT

2020 Using a citizen's science approach to understand conditions of confinement among incarcerated individuals the INdividuals Speak: Incarcerated During the COVID-19 Epidemic (INSIDE) study
Yale School of Medicine, New Haven, CT

National

No presentations below were sponsored by outside entities.

2005 Can racial disparities in oral disease be reduced?
Oral presentation and discussion
Centers for Disease Control and Prevention,
Division of Oral Health, Atlanta, GA

2006 Disparities in Oral Health: Racial/ethnic variations in tooth loss
Oral presentation and discussion
University of Puerto Rico, School of Dentistry

2014 Examining Racial Disparities in Stroke
Invited Speaker, Annual Meeting
Programs to Increase Diversity (PRIDE), Bethesda, MD

2014, 2015 The strength of non-traditional talents
Keynote Speaker, 2014 Midwestern Pre-Health Conference
Bowling Green State University, Bowling Green, OH

2015 Top 10 ideas for surviving academia (and maintaining sanity)
American Heart Association-Scientific Sessions Orlando, FL

2015 Examining Racial Disparities in Stroke
Invited Speaker, Center for Stroke Disparities Solutions
New York University School of Medicine

2017 Funding Hacks for Researchers
Invited Speaker, Elsevier Publishing Campus, Online

2019 Inequities in Stroke among Women of Color in the Women's Health Initiative
Invited Speaker, Women's Health Initiative Investigator's Meeting, Bethesda, MA

Abstract Oral Presentations

2010 Alcohol Consumption and risk of stroke in women
Oral abstract presentation
American Heart Association-Scientific Sessions, Chicago, IL

2010 Alcohol Consumption and risk of stroke in women
Oral abstract presentation
NHLBI Trainee Session, American Heart Association-Scientific Sessions, Chicago, IL

2011 DHEAS is associated with decreased risk of ischemic stroke
Moderated poster presentation
American Heart Association-Cardiovascular Disease Epidemiology and Prevention, Atlanta, GA

2011 Total adiponectin and risk of ischemic stroke among women
Moderated poster presentation
American Heart Association-Cardiovascular Disease Epidemiology and Prevention, Atlanta, GA

2012 Fetuin-A and risk of ischemic stroke among women
Moderated poster presentation
American Heart Association-Cardiovascular Disease Epidemiology and Prevention, San Diego, CA

2012 Fetuin-A and risk of ischemic stroke among women
Oral abstract presentation
NHLBI PRIDE Annual Meeting, Rockville, MD

International

No presentations below were sponsored by outside entities.

2010 Obesity, diabetes and risk of periodontitis and tooth loss
Invited lecture and discussion
University of Birmingham, School of Dental Medicine, Birmingham, United Kingdom

Abstract Oral Presentations

2005 Can Racial Disparities in Oral Disease be reduced?
Oral abstract presentation
International Association for Dental Research, Baltimore, MD

2006 Impact of socio-economic factors on residuals of tooth loss independent of dental disease
Oral abstract presentation
International Association for Dental Research, Orlando, FL

2007 Periodontitis and risk of cerebrovascular disease in men
Oral abstract presentation
International Association for Dental Research, New Orleans, LA

2008 Smoking history and incidence of tooth loss
Oral abstract presentation
International Association for Dental Research, Toronto, Canada

2009 Is there a prospective association between obesity and periodontal disease?
Oral abstract presentation
International Association for Dental Research, Miami, FL

2010 Diabetes and risk of periodontitis and tooth loss: 20-year study
Oral abstract presentation
International Association for Dental Research, Barcelona, Spain

REPORT OF EDUCATION OF PATIENTS AND SERVICE TO THE COMMUNITY

No activities or presentations below were sponsored by outside entities.

2005-2006 Harvard Medical School Martha Eliot After School Program, Mentor
Jamaica Plain, MA
Mentored junior high students through weekly meetings, encouraging healthy behaviors and pursuit of higher education and future careers in the biomedical sciences.

2005-2010 Society for the Advancement of Chicanos and Native Americans in Science, Member, mentor, Former Chapter President
Encouraged under-represented minorities and supported resiliency in academia, including establishing a culturally welcoming environment at Harvard T.H. Chan School of Public Health for Latino and Native American students.

2012 Academic Careers in Health Disparities: A PhD perspective
Latino Medical Student Association, Harvard Medical School
Presentation to undergraduate-level students interested in medical or graduate school.

2013 My life as an epidemiologist
Wellesley High School, Wellesley, MA
Presentation to high school-level students as part of their career exploration series.

2014, 2016 Finding your career path in the biomedical sciences
Bunker Hill Community College, Charlestown, MA
Presentation to undergraduate-level students interested in biomedical sciences careers.

2018- Partakers Organization, Board Member and Mentor
Auburndale, MA
Provide leadership and fundraising service to support mentorship of currently incarcerated adults in Massachusetts enrolled in higher education degree programs. Serve as a mentor to incarcerated and formerly incarcerated individuals who are current or former students of the Partakers program.

2019- All-Inclusive Support Services (previously After Incarceration Support Systems) – Hampden County Sheriff's Department, Mentor
Springfield, MA
Serve as a mentor, through weekly meetings, to women who are currently in custody or formerly incarcerated. Lead group re-entry classes once a month at the Western Massachusetts Women's Correctional Center in Chicopee, MA.

2020 American Hear Association
Hispanic Heritage Month – Know your numbers campaign
National television and radio
Conducted media tour in English and Spanish to raise awareness of acute symptoms of myocardial infarction and stroke in women.

REPORT OF SCHOLARSHIP

Peer reviewed publications in print or other media
Research investigations

1. Dietrich T, **Jimenez M**, Krall Kaye EA, Vokonas PS, Garcia RI. Age-dependent associations between chronic periodontitis/edentulism and risk of coronary heart disease. Circulation 2008; 117(13):1668-74. PMCID: PMC2582144.

2. Saeed S, **Jimenez M**, Howell H, Karimbux N, Sukotjo C. Which factors influence students' selection of advanced graduate programs? One institution's experience. J Dent Educ. 2008;72(6):688-97. PMID: 18519599.

3. Blissett R, Lee MC, **Jimenez M**, Sukotjo C. Differential factors that influence applicant selection of a prosthodontic residency program. J Prosthodont. 2009;18(3):283-8. PMID: 19141048.

4. **Jimenez M**, Dietrich T, Shih MC, Li Y, Joshipura KJ. Racial/ethnic variations in associations between socioeconomic factors and tooth loss. Community Dent Oral Epidemiol. 2009;37(3):267-75. PMCID: PMC2758161.

5. Schrott AR, **Jimenez M**, Hwang JW, Fiorellini J, Weber HP. Five-year evaluation of the influence of keratinized mucosa on peri-implant soft-tissue health and stability around implants supporting full-arch mandibular fixed prostheses. Clin Oral Implants Res. 2009;20(10):1170-7. PMID: 19719741.

6. **Jimenez M**, Krall EA, Garcia RI, Vokonas PS, Dietrich T. Periodontitis and incidence of cerebrovascular disease in men. Ann Neurol. 2009;66(4):505-12. PMCID: PMC2783821.

7. **Jimenez M**, Hu FB, Marino M, Li Y, Joshipura KJ. Prospective Associations between Measures of Adiposity and Periodontal Disease. Obesity (Silver Spring). 2012 Aug;20(8):1718-25. PMCID: PMC3727227.

8. **Jimenez M**, Hu FB, Li Y, Joshipura KJ. Type 2 diabetes mellitus and 20 year incidence of periodontitis and tooth loss. Diabetes Research and Clinical Practice. 2012; 98(3):494-500. PMCID: PMC3551264.

9. **Jimenez M**, Chiuve SE, Glynn RJ, Stampfer MJ, Camargo CA, Willett WC, Manson JE, Rexrode KM. Alcohol consumption and risk of stroke in women. Stroke. 2012;43(4):939-45. PMCID: PMC3350838.

10. Sandhu R, **Jimenez M**, Chiuve SE, Kenfield SA, Tedrow UB, Albert CM. Smoking, Smoking Cessation and Risk of Sudden Cardiac Death in Women. Circulation: Arrhythmia and Electrophysiology. 2012;5:1091-97. PMCID: PMC4025959.

11. **Jimenez M**, Sun Q, Schürks M, Chiuve SE, Hu FB, Manson JE, Rexrode KM. Low dehydroepiandrosterone sulphate is associated with increased risk of ischemic stroke among women. Stroke. 2013; 44: 1770-74. PMCID: PMC3811081.

12. **Jimenez M**, Giovannucci E, Krall EK, Dietrich T. Predicted vitamin D status and incidence of tooth loss. Public Health Nutr. 2014 Apr;17(4):844-52. PMID: 23469936.

13. Muñoz Torres FJ, **Jiménez M**, Rivas-Tumanyan S, Joshipura KJ. Associations between measures of central adiposity and periodontitis among older adults. Community Dent Oral Epidemiol. 2014 Apr;42(2):170-7. PMCID: PMC3949210.

14. Ley SH, Sun Q, **Jiménez M**, Rexrode KM, Manson JE, Jensen MK, Rimm EB, Hu FB. Alcohol consumption, plasma fetuin-A and risk of type 2 diabetes in women. Diabetologia. 2014 Jan;57(1):93-101. PMCID: PMC3858443.

15. **Jiménez M**, Sun Q, Schürks M, Hu FB, Manson JE, Rexrode KM. Circulating fetuin-A and risk of ischemic stroke in women. Clin Chem. 2014 Jan;60(1):165-73. PMCID: PMC3971644.

16. Sun Q, **Jiménez MC**, Townsend MK, Rimm EB, Manson JE, Albert CM, Rexrode KM. Plasma levels of fetuin-A and risk of coronary heart disease in US women: the Nurses' Health Study. J Am Heart Assoc. 2014 Jun;3(3):e000939. PMCID: PMC4309097.

17. Sanders A, Campbell SM, Mauriello SM, Beck JD, **Jiménez M**, Kaste LM, Singer RH, Beaver SM, Finlayson TL, Badner VM. Heterogeneity in periodontitis prevalence in the Hispanic Community Health Study/Study of Latinos. Ann Epidemiol. 2014 Jun;24(6):455-62. PMCID: PMC4050972.

18. **Jiménez MC**, Sanders AE, Mauriello SM, Kaste LM, Beck JD. Prevalence of periodontitis according to Hispanic or Latino background among study participants of the Hispanic Community Health Study/Study of Latinos. J Am Dent Assoc. 2014 Aug;145(8):805-16. PMID: 25082929.

19. Akarolo-Anthony SN, **Jiménez MC**, Chiuve SE, Spiegelman D, Willett WC, Rexrode KM. Plasma Magnesium and Risk of Ischemic Stroke Among Women. Stroke. 2014 Oct;45(10):2881-6. PMCID: PMC4175301.

20. Sanders AE, Essick GK, Beck JD, Cai J, Beaver S, Finlayson TL, Zee PC, Loredo J, Ramos AR, Singer RH, **Jiménez MC**, Redline S. Periodontitis and sleep disordered breathing in the Hispanic Community Health Study/ Study of Latinos. Sleep. 2015 Aug 1;38(8):1195-203. PMCID: PMC4507724.

21. **Jiménez MC**, Rexrode KM, Glynn R, Ridker P, Gaziano JM, Sesso HD. Association between high sensitivity C-reactive protein and total stroke by hypertensive status among men. J Am Heart Assoc. 2015 Sep 21; 4(9):e002073. PMCID: PMC4599494.

22. Sesso HD, **Jiménez MC**, Wang L, Ridker P, Buring J, Gaziano JM. Plasma Inflammatory markers and the risk of developing hypertension. J Am Heart Assoc. 2015. Sep 21; 4(9):e001802. PMCID: PMC4599490.

23. **Jiménez MC**, Curhan G, Choi H, Forman J. Plasma Uric Acid Concentrations and Risk of Ischemic Stroke. Eur J Neurol. 2016 Jul; 23(7):1158-1164. PMCID: PMC4899277.

24. **Jiménez MC**, Rexrode KM, Kotler G, Everett BM, Glynn RJ, Lee IM, Buring JE, Ridker PM, Sesso HD. Association between markers of inflammation and total stroke by hypertensive status among women. Am J Hypertens. 2016 Sep; 29(9):1117-1124. Epub ahead of print 2016 May 28. PMCID: 4978228.

25. **Jiménez MC**. Response to comment on plasma uric acid and risk of ischaemic stroke in women. European journal of neurology. 2017 January;24(1):e2. PMCID: PMC5178970.

26. Rist PM, **Jiménez MC**, Tworoger SS, Hu FB, Manson JE, Sun Q, Rexrode KM. Plasma retinol-binding protein 4 levels and the risk of ischemic stroke among women. J Stroke Cerebrovasc Dis. 2017 88(23): 2176-2182. PMCID: PMC5467954.

27. Rist PM, **Jiménez MC**, Rexrode KM. Prospective association between beta2-microglobulin levels and ischemic stroke risk among women. Neurology. 2017;88:2176-2182. PMCID: PMC5467954.

28. Gall S, Phan H, Madsen TE, Reeves M, Rist P, **Jimenez M**, Lichtman J, Dong L, Lisabeth LD. Focused update of sex differences in patient reported outcome measures after stroke. Stroke. 2018;49:531-535. PMID: 294438078.

29. Madsen TE, Howard VJ, **Jiménez M**, Rexrode KM, Acelajado MC, Kleindorfer D, Chaturvedi S. Impact of conventional stroke risk factors on stroke in women: An update. Stroke. 2018;49:536-542. PMCID: PMC5828997.

30. Bushnell CD, Chaturvedi S, Gage KR, Herson PS, Hurn PD, **Jiménez MC**, Kittner SJ, Madsen TE, McCullough LD, McDermott M, Reeves MJ, Rundek T, and the PROWESS Group. Sex Differences in Stroke: Challenges and Opportunities. J Cereb Blood Flow Metab. 2018 Dec; 38(12): 2179-2191. PMCID: PMC6282222.

31. **Jiménez MC**, Wang L, Buring JE, Manson JE, Forman JP, Sesso HD. Association between sex hormones and ambulatory blood pressure. J Hypertens. J Hypertens. 2018 Nov; 36(11):2237-2244. PMID: 29927841.

32. **Jiménez MC,** Tucker KL, Rodriguez F, Porneala BC, Meigs JB, López L. Cardiovascular risk factors and dehydroepiandrosterone sulfate among Latinos in the Boston Puerto Rican Health Study. J Endo Society. 2018 Dec; 3(1):291-303. PMID: 30623167.

33. **Jiménez MC**, Manson JE, Cook NR, Kawachi I, Wassertheil-Smoller S, Haring B, Nassir R, Rhee JJ, Seally-Jefferson S, Rexrode KM. Racial variation in stroke risk among women by stroke risk factors. Stroke. 2019; 50: 797-804. PMID: 30869565.

34. Hu J, Lin JH, **Jiménez MC**, Manson JE, Hankinson SE, Rexrode KM. Plasma Estradiol and Testosterone Levels and Ischemic Stroke in Postmenopausal Women. *Stroke.* 2020: STROKEAHA119028588 (*In press*).

35. Stanford FC, Cena H, Biino G, Umoren O**, Jiménez M,** Freeman MP, Shadyab AH, Wild RA, Womack CR, Banack HR, Manson JE. The association between weight promoting medication use and weight gain in postmenopausal women: findings from the Women's Health Initiative. *Menopause.* July 13, 2020 - Volume Publish Ahead of Print - Issue - doi: 10.1097/GME.0000000000001589

36. **Jiménez MC**, Cowger TL, Simon LE, Behn M, Cassarino N, Bassett MT. Epidemiology of COVID-19 Among Incarcerated Individuals and Staff in Massachusetts Jails and Prisons. *JAMA Netw Open.* 2020;3(8):e2018851. doi:10.1001/jamanetworkopen.2020.18851

37. Cushman M, Shay CM, Howard VJ, **Jiménez MC**, Lewey J, McSweeney JC, Newby LK, Poudel R, Reynolds HR, Rexrode KM, Sims M, Mosca LJ; American Heart Association. Ten-Year Differences in Women's Awareness Related to Coronary Heart Disease: Results of the 2019 American Heart Association National Survey: A Special Report From the American Heart Association. Circulation. 2020 Sep 21:CIR0000000000000907. doi:10.1161/CIR.0000000000000907. Epub ahead of print. PMID: 32954796.

Non-peer reviewed scientific or medical publications/materials in print or other media

Reviews, chapters, monographs and editorials

1. **Jimenez M**, Dietrich T. Regression models in periodontal epidemiology: purpose, approach and interpretation. Periodontol 2000. 2012;58(1):121-33. PMID: 22133371.

2. Douglass CW**, Jimenez M.** Our Current Geriatric Population: Demographic and Oral Health Care Utilization. Dent Clin North Am. 2014 Oct;58(4):717-28.

Clinical Guidelines and Reports

1. Mozaffarian D, Benjamin EJ, Go AS, Arnett DK, Blaha MJ, Cushman M, Das SR, de Ferranti S, Despres JP, Fullerton HJ, Howard VJ, Huffman MD, Isasi CR, **Jiménez MC,** Judd SE, Kissela BM, Lichtman JH, Lisabeth LD, Liu S, Mackey RH, Magid DJ, McGuire DK, Mohler ER, 3rd, Moy CS, Muntner P, Mussolino ME, Nasir K, Neumar RW, Nichol G, Palaniappan L, Pandey DK, Reeves MJ, Rodriguez CJ, Rosamond W, Sorlie PD, Stein J, Towfighi A, Turan TN, Virani SS, Woo D, Yeh RW, Turner MB: Heart disease and stroke statistics-2016 update: A report from the American Heart Association. Circulation. 2016;133:e38-e360. PMID: 26811276.

2. Benjamin EJ, Blaha MJ, Chiuve SE, Cushman M, Das SR, Deo R, de Ferranti SD, Floyd J, Fornage M, Gillespie C, Isasi CR, **Jiménez MC,** Jordan LC, Judd SE, Lackland D, Lichtman JH, Lisabeth L, Liu S, Longenecker CT, Mackey RH, Matsushita K, Mozaffarian D, Mussolino ME, Nasir K, Neumar RW, Palaniappan L, Pandey DK, Thiagarajan RR, Reeves MJ, Ritchey M, Rodriguez CJ, Roth GA, Rosamond WD, Sasson C, Towfighi A, Tsao CW, Turner MB, Virani SS, Voeks JH, Willey JZ, Wilkins JT, Wu JH, Alger HM, Wong SS, Muntner P; American Heart Association Statistics Committee and Stroke Statistics Subcommittee. Heart Disease and Stroke Statistics-2017 Update: A Report From the American Heart Association. Circulation. 2017 Mar 7;135(10):e146-e603. PMCID: PMC5408160.

3. Benjamin EJ, Virani SS, Callaway CW, Chang AR, Cheng S, Chiuve SE, Cushman M, Delling FN, Deo R, de Ferranti SD, Ferguson JF, Fornage M, Gillespie C, Isasi CR, **Jiménez MC**, Jordan LC, Judd SE, Lackland D, Lichtman JH, Lisabeth L, Liu S, Longenecker CT, Lutsey PL, Matchar DB, Matsushita K, Mussolino ME, Nasir K, O'Flaherty M, Palaniappan LP, Pandey DK, Reeves MJ, Ritchey MD, Rodriguez CJ, Roth GA, Rosamond WD, Sampson UKA, Satou GM, Shah SH, Spartano NL, Tirschwell DL, Tsao CW, Voeks JH, Willey JZ, Wilkins JT, Wu JH, Alger HM, Wong SS, Muntner P. Heart disease and stroke statistics-2018 update: A report from the American Heart Association. Circulation. 2018;137(12): e67-e492. PMID: 29386200.

Thesis

Jimenez MC. Disparities in periodontitis and tooth loss: The roles of SES, obesity & diabetes [dissertation]. Boston, MA. Harvard Univer.: 2009.

Abstracts, Poster Presentations and Exhibits Presented at Professional Meetings

1. **Jiménez MC,** Tucker K, Rodriguez F, López L. Variable associations of dehydroepiandrosterone with cardiovascular risk factors in the Boston Puerto Rican Health Study. Circulation. 2014; 129: AP355.

2. **Jiménez MC**, Rexrode KM, Kotler G, Everett BM, Glynn RJ, Lee I, Buring JE, Ridker PM, Sesso HD. Association Between markers of inflammation and total stroke by hypertensive status among women. Circulation. 2016.133: AP018.

3. Adebamowo SN, Pai JK, **Jiménez MC**, Rexrode KM. Hemoglobin A1c (HbA1c) and the risk of ischemic stroke among women. Circulation. 2016.133: AP021.

4. Rist P, **Jiménez KM**, Rexrode KM. Prospective association between beta-2 microglobulin and the risk of ischemic stroke in women. Circulation. 2016.133: AP319.

5. **Jiménez MC**, Manson JE, Cook N, Kawachi I, Wassertheil-Smoller S, Haring B, Nassir R, Rhee J, Sealy-Jefferson S, Rexrode KM. Racial Variation in Stroke Risk by Stroke Risk Factors. NIH K-to-R01 Investigators Meeting. Bethesda, MD 2016

6. **Jiménez MC**, Wang L, Buring JE, Manson JE, Forman JP, Sesso HD. Association Between Sex Hormones and Ambulatory Blood Pressure. Circulation. 2016; 134: A20644.

7. **Jiménez MC**, Manson JE, Cook N, Kawachi I, Wassertheil-Smoller S, Haring B, Nassir R, Rhee JJ, Sealy-Jefferson S, Rexrode KM. Racial variation in stroke risk by stroke risk factors. American Heart Association Epidemiology and Prevention, Lifestyle and Cardiometabolic Health 2017 Scientific Sessions. Portland, OR. P084.

8. Wang L, Forman JP, Gold DR, Heike G, Rautiainen S, **Jiménez MC**, Buring JE, Manson JE, Sesso HD. Self-reported blood pressure is comparable to measured blood pressure in a study of general population participants. American Heart Association Epidemiology and Prevention, Lifestyle and Cardiometabolic Health 2017 Scientific Sessions. Portland, OR, P177.

9. **Jiménez MC**, Blot WJ, Manson JE, Cook N, Rexrode KM. Racial disparities in stroke risk among older adults in the Southern Community Cohort Study**.** International Stroke Conference 2019. Honolulu, Hawaii. WP247.

10. Cassarino NR, Rexrode KM, **Jiménez MC**. Associations between social engagement and cardiovascular disease conditions among adults incarcerated in state correctional facilities. New England Science Symposium 2019. Boston, MA.

11. **Jiménez MC**, López L, Rexrode KM. Greater Burden of Cardiovascular Disease Among Incarcerated Women of Color Compared to Whites. American Heart Association Epidemiology and Prevention, Lifestyle and Cardiometabolic Health 2019 Scientific Sessions. Houston, TX. P134.

12. Yen Li, M.*, Grebbin, S.*, Cassarino, N., Dabbara, H., Grandhi, U., Patil, A., White, S., **Jiménez, MC**. COVID-1 Inequities by Sex Between US Carceral Facilities and General Population: Lessons on Data Collection from Investigative Journalism. Discover Brigham 2020. Boston, MA.

13. Cassarino, N.*, Dabbara, H.*, Bennett, D., Bembury, A., Credle, L., Lee, J.V., Patil, A., White, S., Yen Li, M., **Jiménez, MC**. Examining Conditions of Confinement During the COVID-19 Pandemic: Individuals Speak – Incarcerated During the COVID Epidemic (INSIDE). Discover Brigham 2020. Boston, MA.

EXHIBIT B

TORI COWGER

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EDUCATION

Harvard T.H. Chan School of Public Health, Harvard University, Boston, MA

Ph.D in Social Epidemiology – Expected August 2021

Dissertation Title: Social and Political Geographies of Health Equity and Criminal Justice in the U.S. Overdose Crisis
Adviser: Dr. Lisa Berkman
Dissertation Committee: Dr. Rachel Nethery, Professor Leo Beletsky, and Dr. Mary T. Bassett

Rollins School of Public Health, Emory University, Atlanta, GA

Masters of Public Health in Epidemiology

University of Minnesota, Minneapolis, MN

Bachelors of Science in Biochemistry

PROFESSIONAL & RESEARCH EXPERIENCE

Harvard FXB Center for Health and Human Rights **Boston, MA, USA**

Doctoral Scholar *Oct 2019 – Present*

- Conducted research to systematically describe inequities in drug overdose deaths, to assess exposure to the criminal justice system as a structural driver of these inequities, and to explore mechanisms by which systemic racism in the criminal justice system may impact substance use-related harms
- Worked with an interdisciplinary team of doctoral students and faculty to conduct research to evaluate the availability, quality, and reporting methods for COVID-19 outcomes across U.S. state and federal public health agencies and to develop theoretical framework for understanding and eliminating racial and ethnic and socioeconomic inequities COVID-19 exposure, infection, and mortality.

Centers for Disease Control and Prevention (CDC), Global Tuberculosis Branch **Atlanta, GA, USA**

Epidemiologist *Oct 2013 – Aug 2017*

- Worked with collaborators to plan and conduct research to understand and address TB and HIV in high-risk populations through a variety of study designs and diverse data sources including clinical trials, prospective and retrospective cohort studies, implementation science research, molecular and laboratory data, population surveys and censuses, geospatial data, disease registries, and surveillance data
- Cleaned, analyzed and summarized research data into accurate and concise tables, figures, scientific presentations, and publications and disseminated scientific findings to domestic and international partners including leadership from international Ministries of Health and scientific audiences
- Provided technical assistance to international governments and non-governmental organizations on TB care and treatment in vulnerable and hard-to-reach populations, outbreak investigation, TB epidemiology and surveillance, and implementation of international and national guidelines
- Served as co-principal investigator on a study in Mozambique to introduce novel diagnostics for childhood TB and electronic tools through a community health worker model to improve TB and HIV case-finding activities and linkage to appropriate care

CDC, Emergency Operations Center, Ebola Response **Port Loko District, Sierra Leone**

Field Epidemiologist *Dec 2015 – Feb 2016*

- Deployed to Sierra Leone as a field epidemiologist for the Ebola response
- Analyzed and interpreted used epidemiologic data to drive decision making for public health activities for Ebola prevention in Port Loko District

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PROFESSIONAL & RESEARCH EXPERIENCE (2)

CDC, Emergency Operations Center, Ebola Response (2) — **Port Loko District, Sierra Leone**

Field Epidemiologist — *Dec 2015 – Feb 2016*

- Conducted and supported the implementation of contact tracing, case investigation and infection prevention and control efforts to support and coordination between governmental and NGO partners
- Provided technical assistance and training to the staff at Lungi International Airport in Sierra Leone on border health activities and screening programs for travelers and airport employees
- Conducted training and oversight of Sierra Leone Ministry of Health staff in epidemiology of Ebola, contact listing, contact tracing and case investigations.

CDC, Division of Preparedness and Emerging Infections — **Pago Pago, American Samoa**

Graduate Research Assistant — *May 2013 – Aug 2013*

- Led team of multidisciplinary team to investigate a typhoid outbreak by interviewing cases and their household contacts, sending samples to the CDC headquarters for testing, corresponding with the local media, and implementing strategies for prevention of further cases
- Enhanced epidemiological capacity for timely detection of outbreaks through enhancement of syndromic surveillance systems and strategic infectious disease mapping and monitoring
- Coordinated collaboration between department of health and local health organizations to establish standardized protocol, reporting instruments and databases for nationally notifiable diseases

Georgia Department of Public Health - Emerging Infections Program — **Atlanta, GA, USA**

Graduate Research Assistant — *Oct 2012- May 2013*

- Collected and analyzed large amounts of foodborne disease surveillance data through routine surveillance interviews, case-control study interviews and laboratory reports to inform foodborne disease preparedness and prevention campaigns
- Entered, cleaned, and analyzed exposure data in SAS and Excel from hundreds foodborne illness surveys for descriptive analysis of disease burden of E. coli non-O157 in Georgia

CDC, Bioterrorism Rapid Response and Advanced Technology Lab — **Atlanta, GA, USA**

Graduate Research Assistant — *Oct 2012- May 2013*

- Bolstered preparedness capacity through optimization of portable pathogen detection assays for minimal energy usage to mimic field response situations
- Compared sensitivity and specificity of portable Bacillus anthracis detection assays to standard Laboratory Response Network (LRN) methods for use in outbreak situations

Emory University Student Outbreak and Response Team (SORT) — **Atlanta, GA, USA**

Response Team Member — *Sep 2012- May 2014*

- Assisted with outbreak response and preparedness activities such as CDC's fungal meningitis outbreak response, Middle East Respiratory Syndrome (MERS-CoV) response, and Emory University's drive-through immunization clinic
- Completed FEMA's Incident Command System and CDC's Emergency Operation Center's trainings in preparation for emergency response activities

United States Agency for International Development (USAID) Kenya — **Nairobi, Kenya**

HIV Program Intern — *Jan 2011 – May 2011*

- Worked with Kenyan public health officials to build local public health capacity in the field under the AIDS, Population, and Health Integrated Assistance (APHIA) initiative
- Assisted with organization mapping and program design during the transition through funding periods to ensure cost-effectiveness, equitable access and sustainable initiatives

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PROFESSIONAL & RESEARCH EXPERIENCE(3)

Kenyan Medical Research Institute **Nairobi, Kenya**

Undergraduate Research Assistant *Jan 2011 - May 2011*

- Collaborated with an epidemiologist on a study to examine utilization of voluntary HIV testing centers in both rural and urban settings in Kenya to help improve centers' effectiveness
- Created data collection instrument and subsequently conducted interviews of more than 300 Kenyans and compiled, entered and analyzed survey data

University of Minnesota Center for Infectious Disease and Translational Research **Minneapolis, MN USA**

Undergraduate Laboratory Assistant *Apr 2012- Sep 2012*

- Collaborated on a clinical trial with investigators at the University of Cape Town, South Africa to improve sensitivity and specificity of the Lateral Flow Assay (LFA), a Rapid Detection Test (RDT) for Tuberculosis using thermal contrast
- Researched antibody chemistry and lateral flow sensitivity and specificity for multiple infectious diseases including tuberculosis, malaria and cryptococcal meningitis.

Minnesota AIDS Project **Minneapolis, MN, USA**

Red Cross Certified HIV Educator *May 2011 - Aug 2012*

- Provided in-person, group-level trainings that educate employers, persons recovering from substance use disorders, service organizations, and civic groups who work with those affected by HIV

TEACHING EXPERIENCE

Harvard T.H. Chan School of Public Health

Fall 2019	Head Graduate Teaching Fellow, Core Principles of Biostatistics and Epidemiology for Public Health Practice (ID 201), Professors: Dr. Kim Gauvreau and Dr. Elizabeth Mostofsky
Fall 2020 & 2018	Graduate Teaching Fellow, Core Principles of Biostatistics and Epidemiology for Public Health Practice (ID 201), Professors: Dr. Kim Gauvreau and Dr. Elizabeth Mostofsky

Emory University Rollins School of Public Health

Spring 2014	Graduate Teaching Assistant, Epidemiologic Methods II (EPI 534), Professor: Dr. Harland Austin
Fall 2013	Graduate Teaching Assistant, Epidemiologic Methods I (EPI 530), Professor: Dr. Michael Goodman

PEER-REVIEWED PUBLICATIONS

Published

Jiménez MC, **Cowger TL,** Simon LE, Behn M, Cassarino N, & Bassett MT (2020). Epidemiology of COVID-19 Among Incarcerated Individuals and Staff in Massachusetts Jails and Prisons. *JAMA Network Open*, *3*(8), e2018851–e2018851. https://doi.org/10.1001/jamanetworkopen.2020.18851

Cowger TL, Davis BA, Etkins OS, Makofane K, Lawrence JA, Bassett MT, & Krieger N (2020). Comparison of Weighted and Unweighted Population Data to Assess Inequities in Coronavirus Disease 2019 Deaths by Race/Ethnicity Reported by the US Centers for Disease Control and Prevention. *JAMA Network Open*, 3(7), e2016933–e2016933. https://doi.org/10.1001/jamanetworkopen.2020.16933

Cowger TL, Wortham JM, & Burton DC (2019). Epidemiology of tuberculosis among children and adolescents in the USA, 2007–17: an analysis of national surveillance data. *The Lancet Public Health*, 0(0). https://doi.org/10.1016/S2468-2667(19)30134-3

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PEER-REVIEWED PUBLICATIONS (2)

Published

Cowger TL, Thai LH, Duong BD, Danyuttapolchai J, Kittimunkong S, Nhung NV, Nhan DT, Monkongdee P, Thoa CK, Khanh VT, Nateniyom S, Yen NTB, Ngoc DV, Thinh T, Whitehead S, & Pevzner ES (2017). Programmatic Evaluation of an Algorithm for Intensified Tuberculosis Case Finding and Isoniazid Preventive Therapy for People Living With HIV in Thailand and Vietnam. *JAIDS Journal of Acquired Immune Deficiency Syndromes*, *76*(5), 512. https://doi.org/10.1097/QAI.0000000000001551

Cowger TL, Burns CC, Sharif S, Gary HE, Iber J, Henderson E, Malik F, Zahoor Zaidi SS, Shaukat S, Rehman L, Pallansch MA, & Orenstein WA (2017). The role of supplementary environmental surveillance to complement acute flaccid paralysis surveillance for wild poliovirus in Pakistan – 2011–2013. *PLOS ONE*, *12*(7), e0180608. https://doi.org/10.1371/journal.pone.0180608

Zetola NM, Modongo C, Moonan PK, Click E, Oeltmann JE, Shepherd J, & Finlay A, *Collaborators:* Basotli J, Bile E, Boyd R, Dima M, Fane O, Shin SS, Surie D, **Cowger TL**, Katlholo T, Radisowa K, Kwaadira K, Matsire O, Posey J, Serumola C and Tobias J. (2016) *"Protocol for a Population-Based Molecular Epidemiology Study of Tuberculosis Transmission in a High HIV-Burden Setting: The Botswana Kopanyo Study." BMJ Open*.

In Preparation

Pevzner ES, **Cowger TL,** Thai LH, Duong BD, Nhung NV, Nhan DT, Thoa CK, Khanh VT, Thinh T, Dung NH, Yen NTB, Ngoc DV, McConnell M, Whitehead S *"Yield and impact of repeated TB screening and isoniazid preventive therapy for tuberculosis among people living with HIV in Vietnam"*

PRESENTATIONS

Cowger TL, Wortham J, Burton D "*Contribution of global tuberculosis to the burden of childhood TB in the United States, 2007-2015*" 47th World Conference on Lung Health. International Union Against Tuberculosis and Lung Disease. 29 Oct 2016. Oral Presentation.

Cowger TL, Finlay A *"CDC's Ebola Response and Global Health Security."* 21st Annual Regional Security Conference. International Security Management Association and the Overseas Security Advisory Council, Gaborone, Botswana. 16 Sept 2015.

Cowger, TL et al. *"Yield and impact of intensified case finding and isoniazid preventive therapy for tuberculosis among people living with HIV in Vietnam"* 46th World Conference on Lung Health. International Union Against Tuberculosis and Lung Disease. 2 Dec 2015. Oral Presentation.

Cowger TL, Pevzner E *"From Research to Practice: Finding, Treating, and Preventing Tuberculosis among People Living with HIV in Vietnam*." Division of Global HIV and Tuberculosis Annual Meeting. Atlanta, GA. 3 June 2015.

Burns CC and **Cowger TL** "*Environmental Surveillance for Poliovirus in Pakistan."* World Health Organization Polio Research Committee Meeting. Geneva, Switzerland. 26 Sept 2014. Oral Presentation.

Cowger TL, Burns CC, and Orenstein WA. "*The Role of Supplementary Environmental Surveillance to Complement Acute Flaccid Paralysis Surveillance for Wild Poliovirus in Pakistan*." CDC's Global Immunization Division Polio Technical Seminar. U.S. Centers for Disease Control and Prevention, Atlanta, Georgia. 12 June 2014. Oral Presentation.

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AWARDS & RECOGNITION

2013 **Delta Omega Honor Society**

Nominated and selected by Emory University faculty based on scholastic performance, dedication to public health, and commitment to health in all populations

2013 **Emory Global Health Field Scholar**

Grant proposal for innovative global health program chosen from a pool of more than 200 applicants to receive additional funding

2014 **University of Minnesota's College of Biological Sciences "20-under-30" Award**

Selected as one of 20 alumni under 30 years old making a difference in their respective disciplines

PROGRAMMING LANGUAGES

R · SAS · Python · Stata · LaTeX