A crisis of undertesting: how inadequate COVID-19 detection skews the data and costs lives

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Introduction

Earlier this month, our team co-authored an article in the Journal of the American Medical Association on our findings that, during the first year of the pandemic, the COVID-19 infection rate for people incarcerated in state and federal prisons was 3.3 times higher than the rate for the U.S. population as a whole, and the COVID-19 death rate was 2.5 times higher.

These disparities are stark but not surprising — in an earlier study, we found that, in the first months of the pandemic, incarcerated people faced even more disproportionate infection and death rates.

There is reason to believe, however, that actual outcomes have been far worse than these data reveal. That is because calculating infection rates that reflect the true prevalence of COVID-19 requires adequate testing. If tests are not widely administered in prisons and jails, and, by many accounts, they have not been, then infections will go undetected. As a result, infection and death rates will appear lower than they actually are.

Public health experts have noted that frequent and widespread testing is critical to containing outbreaks — especially in congregate facilities where just one case can quickly spread throughout a facility. In these settings, quickly identifying and isolating positive cases is necessary to prevent outbreaks from erupting. This requires testing individuals who are first entering facilities (upon intake or transfer) and individuals who are presenting symptoms, but it also requires regular surveillance testing of asymptomatic individuals and those who may have been in contact with someone who tested positive.

For this reason, regular testing is and has been routine in other congregate settings, even where the risk of transmission is much lower than behind bars. Federal workplace safety regulations will soon require unvaccinated workers of major private employers to face weekly testing. The Centers for Disease Control and Prevention has issued guidance recommending testing "at least weekly" of unvaccinated, asymptomatic employees of all workplaces, even those without known or suspected exposures. Even before vaccines became available, many schools, universities, nursing homes, and other workplaces mandated weekly — or even daily — testing.

In nearly all jails and prisons, however, officials have been conducting orders of magnitude fewer tests than congregate settings with much lower risks of transmission. This provides strong evidence that more testing behind bars would reveal many more infections.

Similarly, COVID-19 deaths are often only recorded as such if individuals test positive before dying. Because undertesting for COVID-19 results in many infections going undetected, it also increases the likelihood that individuals in prison may have died of COVID-19 without the cause of death being accurately recorded. As a result, the true number of people who died from COVID-19 behind bars may be higher than the figures officially reported.

In the following pages, we break down three important public health metrics — testing rates, test positivity rates, and case fatality rates — that provide critical context to officially reported infection and death data and reveal just how unreliable reported infection and death data may be. These three metrics suggest that, in many places, true infection and death numbers may be much higher than those officially reported.

Testing Rates

On average, how often was each incarcerated person tested for COVID-19?

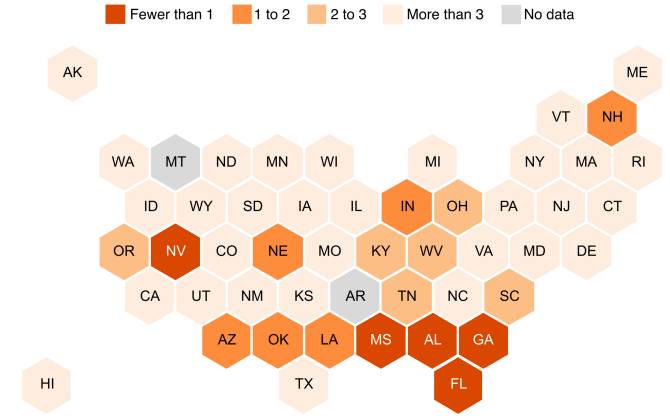
Testing rates (the cumulative number of tests administered divided by the total incarcerated population) across state prison systems provide an estimate of, on average, how many times each incarcerated person has been tested.

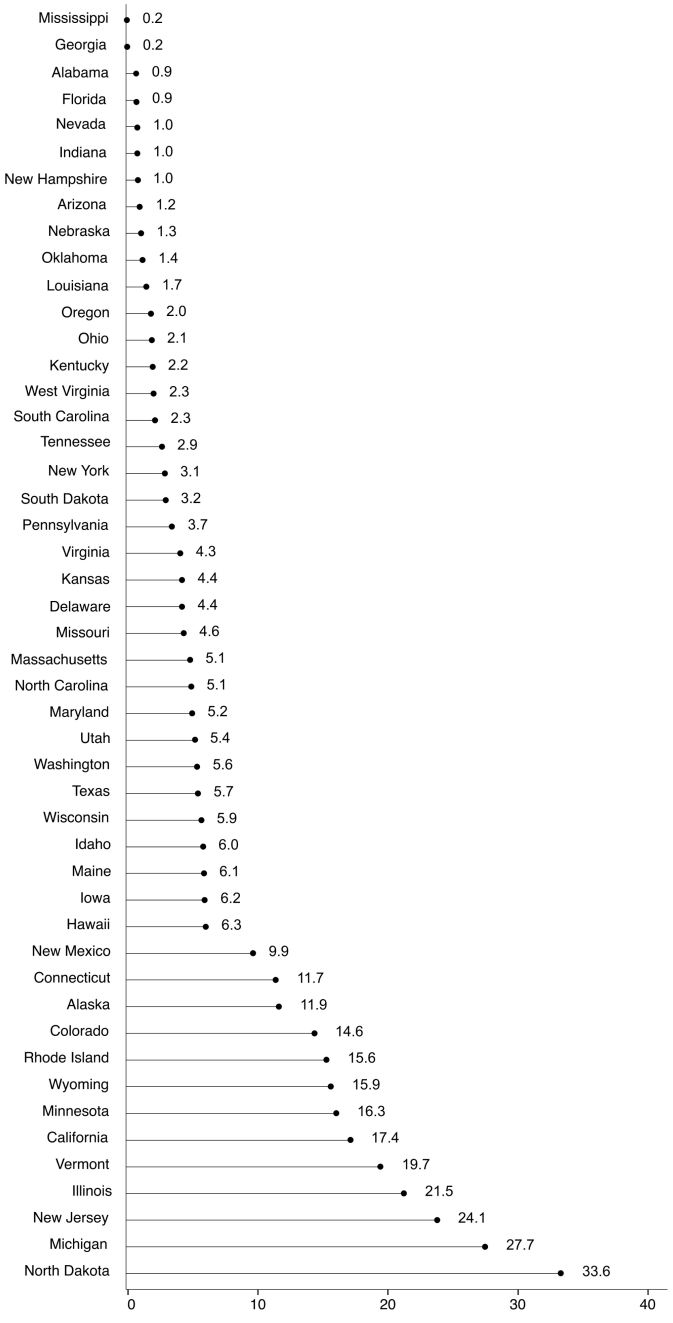
In Mississippi, Georgia, Alabama, and Florida, agencies report that the total number of COVID-19 tests ever administered in their prisons is lower than the total prison population. In other words, prison officials have not even tested every incarcerated person once in these states over the course of the pandemic. In 11 states, each incarcerated person has been tested, on average, fewer than twice since the start of the pandemic. In these states, more frequent and widespread testing would likely lead to much higher reported infection rates.

Even in the states that have administered the most tests inside their prisons (such as Michigan, New Jersey, or Illinois, where widespread testing was implemented in response to outbreaks), incarcerated people have still been tested fewer than 30 times on average during the first 18 months of the pandemic. This, still, is far less frequent than people in other congregate settings who have been tested on a weekly or daily basis throughout the pandemic.

Several state prison systems report rarely testing incarcerated people

Number of COVID-19 tests reported per person incarcerated in state prisons





Test Positivity Rates

What percentage of COVID-19 tests administered returned positive?

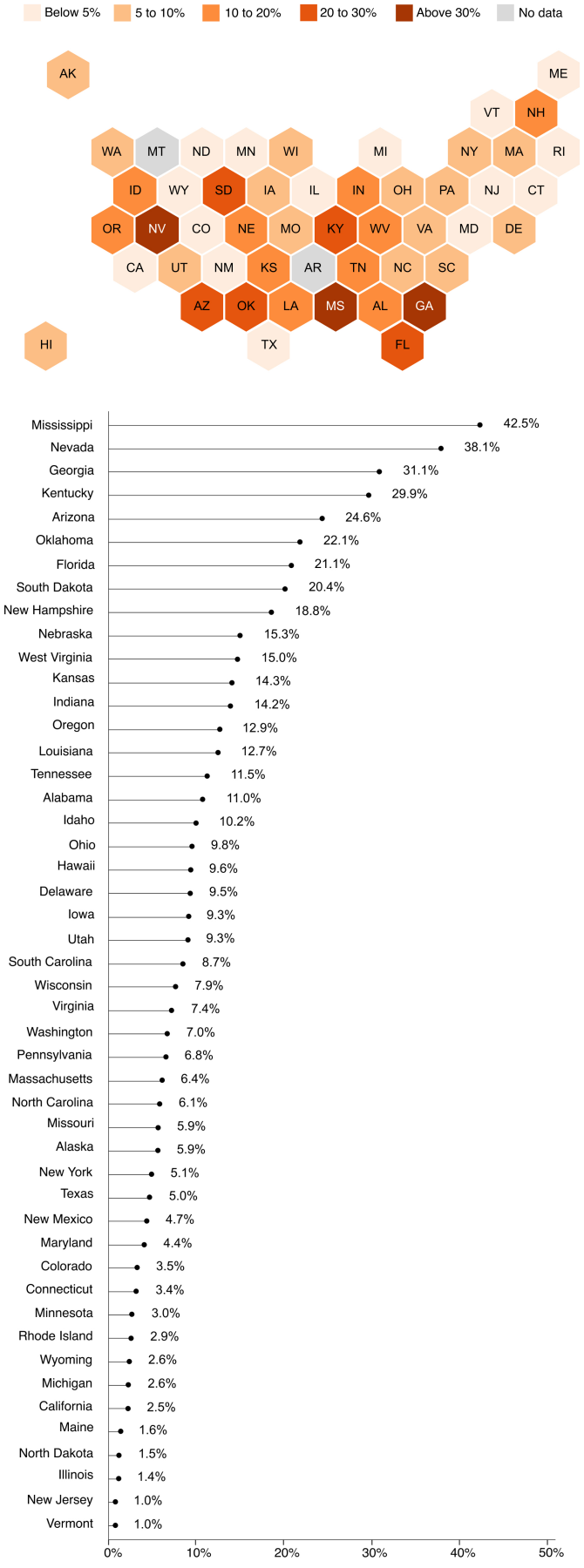
Test positivity rates (TPRs) measure the percentage of tests administered that return positive. Agencies with low TPRs typically have more robust testing protocols: if an agency tests people regularly, including people who are not already suspected to have a COVID-19 infection, it is more likely that the percentage of tests that come back positive will be lower than for an agency that only tests individuals who show symptoms. Conversely, a high TPR suggests less comprehensive testing protocols and a high likelihood that asymptomatic, presymptomatic, and mild cases of COVID-19 are going undetected.

The World Health Organization has suggested a TPR of 3-12% as a benchmark for adequate testing. Other public health experts have recommended that positivity rates stay below 3% to adequately control epidemics. In 10 states, the reported positivity rate among incarcerated people has been higher than 15%. In Nevada and Georgia, the TPR is higher than 30%. In Mississippi state prisons, more than 40% of tests have returned positive.

That prisons in Georgia, Mississippi, and Nevada have such high TPRs in addition to suspiciously low infection rates suggests that their official COVID-19 infection data reveal only the tip of the iceberg of infections. It is likely that these states would find many more infections — and report a higher infection rate — if they expanded testing. They would also then likely report lower TPRs, because expanded testing would result in more tests returning negative.

10 state prison systems have reported test positivity rates above 15%

Test positivity rates among incarcerated people in state prisons



Case Fatality Rates

What percentage of people who tested positive for COVID-19 subsequently died of the virus?

Case fatality rates (CFRs) represent the total number of people who have died of COVID-19 divided by the total number who have ever tested positive. This metric differs from a mortality rate, because the CFR denominator includes only people who have tested positive for COVID-19 — not the total population.

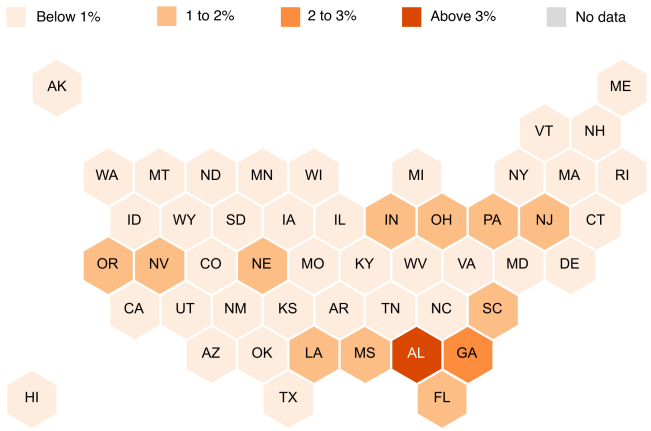
A high CFR can mean that the relevant population is especially vulnerable and disproportionately likely to die of the virus (and thus the numerator — the number of deaths — is higher relative to the total number of people who were infected). This may be seen in a population that is older or in which many individuals have comorbidities that exacerbate the risk of severe illness from COVID-19. This may also be seen in settings where people are given inadequate medical care, in this context if effective treatment for COVID-19 is not available or is administered too late.

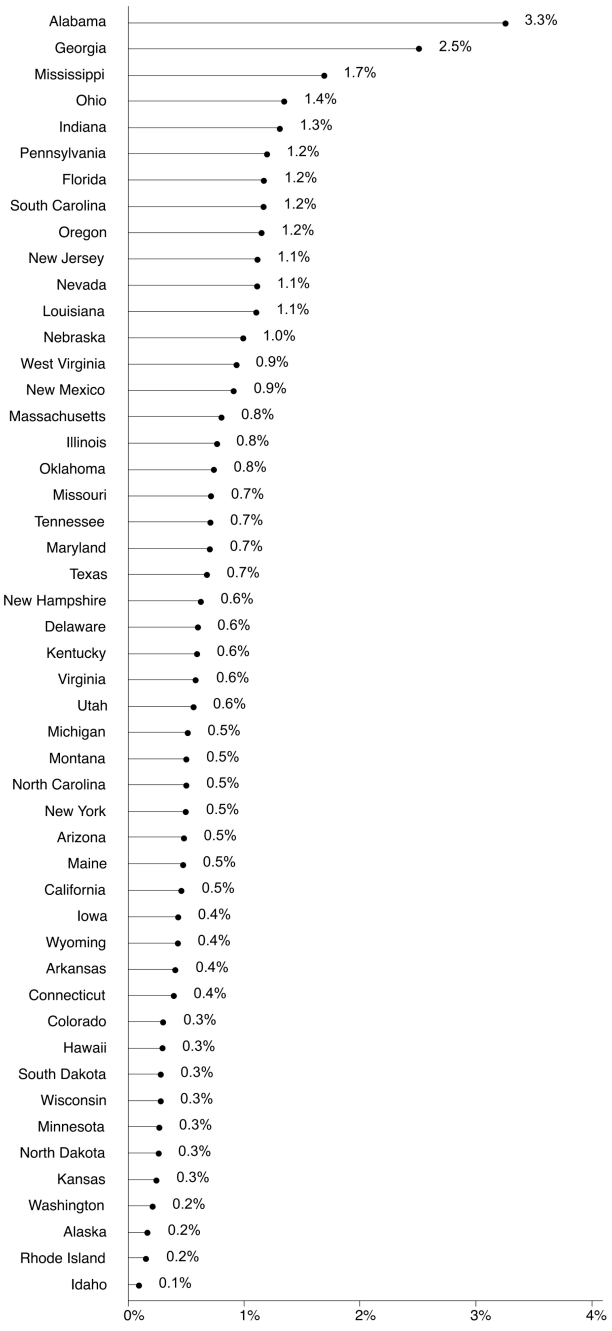
A high CFR can also, however, signal insufficient testing. Similar to a TPR, states may report a high CFR if they are testing only those who are exhibiting severe symptoms and are thus excluding from the denominator more mild infections.

Across the U.S. population as a whole, the COVID-19 CFR has been 1.6%. To compare this number to CFRs in prisons, it is important to note that people incarcerated in prisons skew younger than the overall population. Given how much deadlier COVID-19 is for older people, we would expect CFRs among incarcerated people to be much lower than the 1.6% CFR among the U.S. population as a whole.

Alabama state prisons have reported a case fatality rate above 3%

Case fatality rates among incarcerated people in state prisons





In Alabama state prisons, however, the reported CFR is 3.3% — more than double. The incarcerated population in Alabama is much younger than the overall U.S. population: while 23% of the U.S. population is over 60 years old, less than 9% of Alabama's prison population is. Similarly, the CFR among incarcerated people in Georgia prisons is 2.5%, even though only 8% of incarcerated people in Georgia are older than 60 years old. And in Mississippi state prisons, the CFR is 1.7%, even though fewer than 7% of people in these prisons are older than 60 years old.

Conclusion

The three measures discussed in this report reveal a core problem in many state prison systems: severe undertesting. Low testing rates, high TPRs, and high CFRs all lead to the inevitable conclusion that countless COVID-19 cases — and COVID-19 deaths — have been and are being undetected inside prisons, and reported infection and death rates are significant underestimates.

For example, Mississippi, Georgia, and Alabama have reported the lowest infection rates among state prison systems throughout the pandemic. But these three agencies have also reported some of the lowest testing rates and the highest test positivity and case fatality rates. This suggests that the true infection rates among incarcerated people in these states are likely much higher than what agencies have reported, and that the infection rates only appear low because the agencies have conducted so few tests.

Our analysis provides a clear warning to researchers, journalists, or anyone looking into the scope of the pandemic behind bars or comparing reported data across state prison systems: do not trust infection or death rates alone. COVID-19 outcomes reported by prison agencies are only as accurate as collection practices allow, and the extent of undertesting evident in many state prison systems reveals deeply troubling flaws with their publicly reported information.

Detecting COVID-19 cases in prisons is necessary to tracking outbreaks and reporting the prevalence of the virus to the broader public. But even more importantly, frequent and widespread testing can prevent outbreaks and save lives. First-person accounts from those inside describe not only the troubling lack of access to tests, but also to dangerous practices — such as neglected quarantine protocols and individuals being denied medical treatment — that have led to needless illness and deaths inside jails and prisons throughout the pandemic. More widespread testing would not negate the harms of these practices, which are themselves extreme public health dangers that must be curtailed, but more testing is a crucial step to at least help slow viral transmission.

Data

The UCLA Law COVID Behind Bars Data Project has collected the below data from agency websites, through public records requests, or via The Marshall Project or The New York Times. The figures are the latest reported as of October 15, 2021, reflecting around 18 months of cumulative COVID-19 data.

State	Cases	Deaths	Tests	Population	Testing Rate	Test Positivity Rate	Case Fatality Rate
Alabama	2,077	68	18,889	21,114	0.9	11.0%	3.3%
Alaska	3,339	6	56,779	4,776	11.9	5.9%	0.2%
Arizona	12,398	61	50,459	42,360	1.2	24.6%	0.5%
Arkansas	12,333	52	--	17,501	--	--	0.4%
California	51,010	241	2,044,825	117,639	17.4	2.5%	0.5%
Colorado	9,084	29	256,920	17,585	14.6	3.5%	0.3%
Connecticut	4,931	20	143,190	12,290	11.7	3.4%	0.4%
Delaware	2,134	13	22,349	5,042	4.4	9.5%	0.6%
Florida	18,491	220	87,677	93,764	0.9	21.1%	1.2%
Georgia	3,717	94	11,947	55,019	0.2	31.1%	2.5%
Hawaii	2,919	9	30,363	4,836	6.3	9.6%	0.3%
Idaho	4,826	5	47,223	7,816	6.0	10.2%	0.1%
Illinois	11,348	88	794,459	36,931	21.5	1.4%	0.8%
Indiana	3,850	51	27,176	26,936	1.0	14.2%	1.3%
Iowa	4,933	22	52,843	8,533	6.2	9.3%	0.4%
Kansas	6,202	16	43,391	9,804	4.4	14.3%	0.3%
Kentucky	7,898	48	26,433	12,162	2.2	29.9%	0.6%
Louisiana	3,210	36	25,208	15,066	1.7	12.7%	1.1%
Maine	207	1	13,113	2,138	6.1	1.6%	0.5%
Maryland	4,593	33	105,386	20,314	5.2	4.4%	0.7%
Massachusetts	2,574	21	40,333	7,969	5.1	6.4%	0.8%
Michigan	27,078	143	1,058,946	38,176	27.7	2.6%	0.5%
Minnesota	4,312	12	145,149	8,904	16.3	3.0%	0.3%
Mississippi	1,467	25	3,448	17,667	0.2	42.5%	1.7%
Missouri	6,994	51	117,612	25,740	4.6	5.9%	0.7%
Montana	1,159	6	--	4,508	--	--	0.5%
Nebraska	1,093	11	7,148	5,621	1.3	15.3%	1.0%
Nevada	4,714	53	12,368	12,384	1.0	38.1%	1.1%
New Hampshire	470	3	2,495	2,433	1.0	18.8%	0.6%
New Jersey	4,604	52	443,471	18,439	24.1	1.0%	1.1%
New Mexico	3,030	28	65,013	6,573	9.9	4.7%	0.9%
New York	6,815	35	132,547	42,784	3.1	5.1%	0.5%
North Carolina	10,637	55	175,242	34,256	5.1	6.1%	0.5%
North Dakota	743	2	51,031	1,519	33.6	1.5%	0.3%
Ohio	9,994	136	102,315	48,765	2.1	9.8%	1.4%
Oklahoma	7,706	58	34,915	24,956	1.4	22.1%	0.8%
Oregon	3,781	44	29,319	14,459	2.0	12.9%	1.2%
Pennsylvania	11,640	141	171,462	46,559	3.7	6.8%	1.2%
Rhode Island	1,194	2	41,623	2,674	15.6	2.9%	0.2%
South Carolina	3,708	44	42,437	18,113	2.3	8.7%	1.2%
South Dakota	2,382	7	11,685	3,701	3.2	20.4%	0.3%
Tennessee	7,194	52	62,539	21,616	2.9	11.5%	0.7%
Texas	39,339	271	793,787	140,124	5.7	5.0%	0.7%
Utah	3,474	20	37,499	6,900	5.4	9.3%	0.6%
Vermont	335	0	32,650	1,656	19.7	1.0%	0.0%
Virginia	9,329	56	125,330	29,161	4.3	7.4%	0.6%
Washington	6,704	15	96,452	17,263	5.6	7.0%	0.2%
West Virginia	2,013	19	13,418	5,952	2.3	15.0%	0.9%
Wisconsin	11,020	32	139,366	23,591	5.9	7.9%	0.3%
Wyoming	905	4	34,195	2,156	15.9	2.6%	0.4%

1. Correctional departments in the following states do not publicly report data on the number of COVID-19 tests administered to incarcerated people: Florida, Georgia, Kansas, Kentucky, Nevada, and Rhode Island. As a result, data for these states come from information reported by The New York Times as of March 2021.
2. Population denominators reflect state prison populations as of March 2021.
3. Alaska, Connecticut, Delaware, Hawaii, Rhode Island, and Vermont have unified jail and prison systems. As a result, data for those states include both pretrial detainees and people who have been sentenced.