COVID-19 in Custody

The Relationship Between COVID-19 and United States Federal and State Prisons

Zoë Edwards
Urban and Environmental Policy
Occidental College
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ABSTRACT

Correctional reform is an issue that the United States has been facing for decades. American inmates often live-in poor, overcrowded, and unsanitary conditions. This issue is a public health concern the COVID-19 pandemic has exacerbated. As of January 15th, 2021, United States federal and state inmates experienced confirmed rates of COVID-19 that were almost four times the rate calculated for the United States general population. This study examines the relationship between United States federal and state prison characteristics and rates of COVID-19. Through data collection and statistical analysis, this research found specific prison characteristics, including but not limited to the presence of certain health care staff and prison level, to be directly related to higher rates of COVID-19. Significant statistical relationships between race and COVID-19 in state prisons were also identified. Findings concerning the 747-prison dataset led to the development of recommendations for federal and state prisons across the United States. The recommendations aim to help confront public health emergencies such as COVID-19 within correctional and other shared living facilities both now and in the future.

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1.0: INTRODUCTION

The United States incarcerates more people than any other nation in the world (Eisen & Grawert et. al, 2020). This American pattern of incarceration is described as mass incarceration. Since the 1970s, mass incarceration has resulted in prison overcrowding. In 2018, the American incarceration system was operating at 103.9 percent of its capacity (McCarthy, 2018). While this number has decreased slightly since then to 99.8 percent, many of those incarcerated are still living in cramped, crowded conditions (n.a., World Prison Brief, 2020). As of 2020, the federal prison system and many state prison systems, however, continued to operate at over 100 percent of their capacities (Carson, 2020). Such close quarters turn prisons into breeding grounds for infectious diseases, including HIV/AIDS, tuberculosis, and hepatitis C, all of which are deadly medical conditions (Delgado & Humm-Delgado, 2009). While federal and state governments are required to ensure that their inmate populations receive appropriate health care, these conditions make it difficult for correctional facilities to deliver on this guarantee.

American inmates' access to adequate health care in prisons was poor pre-COVID-19. Whether it be their mental or physical health, inmates with compromised health often have their needs ignored (Delgado & Humm-Delgado, 2009). As a result, their health deteriorates while in prison. Moreover, hygiene in prisons is rarely a priority, and inadequate access to doctors and health professionals adds another layer of insufficient health care for inmates.

The COVID-19 pandemic has simply underscored the shortcomings of inmate health care systems, particularly preventative health care delivery. COVID-19 rates in American state and federal prisons are remarkably higher than COVID-19 rates among America's general population (Christensen & Lin, 2020).

The United States recorded the first laboratory-confirmed case of COVID-19 on January 20, 2020. As of August 2020, 74 percent of the inmates held in Texas' Seagoville Federal Correctional Institute had tested positive for COVID-19 (Black & Griffin, 2020). In April 2020, a state correctional facility in Marion, Ohio suffered a similar COVID-19 outbreak. In a prison with over 2,200 inmates, originally built to hold 1,500 inmates, nearly 80 percent of inmates at the Marion facility tested positive for COVID-19 as of August 4, 2020 (Lind, 2020). In New Jersey, the Special Treatment Unit, a state-correctional facility that provides treatment for repeated sex offenders, recorded 70 positive test results out of the 440 inmates (Smith et. al., 2020). In comparison, as of January 15, 2021, 6.97 percent of the American population has tested positive for COVID-19 (WHO COVID-19 Dashboard, 2021). These three examples in relation to the general population showcase the problem trend at hand, the inadequate facility conditions and health care access associated with American prisons.

Given research asserting that crises like COVID-19 have the potential of becoming more frequent, the avenue in which prisons deal with infectious disease is a pertinent issue. Additionally, literature suggests that high rates of COVID-19 are occurring in prisons because: 1) those incarcerated "are at heightened risk of contracting the coronavirus because of . . . poor health conditions" (Smith et. al., 2020); and 2) the nature of prison environments makes them ideal locations for infectious disease outbreaks. Unhygienic prison conditions are unacceptable. Such conditions present a public health threat to the inmate population, facility employees and facilities' surrounding communities; a public health threat that needs to be addressed. Thus, with COVID-19 having exacerbated the need for United States correctional reform, this research intends to establish the relationship between federal and state prisons characteristics and COVID-19 rates. Identifying certain prison characteristics associated with COVID-19 has the

potential to help facilities take preventative action which, in turn would enable facilities to better deal with infectious diseases in the future.

A quantitative method approach was conducted to address the research question: What characteristics of United States federal and state prisons are correlated with having COVID-19 outbreaks? Prison characteristics identified for this study include, but are not limited to, inmate population size, percent capacity of prisons, security level, housing type, number of prison employees, and health care accessibility. This research extensively investigated the relationship between prison environments and other characteristics, and infectious diseases. The paper concludes with potential policies to address both how prisons can better confront pandemics and suggestions for improving prison conditions to positively impact the inmate population's health and well-being.

2.0: BACKGROUND

This study intended to identify which characteristics of federal and state correctional facilities in the United States are associated with having / not having higher rates of COVID-19. However, to understand the dynamics of the federal and state prison systems and their relationship with infectious diseases, it is essential to have knowledge regarding the various types and levels of correctional facilities, how they are funded, and inmate access to health care. Thus, this section will provide information on the structure and organization of state and federal correctional facilities in the United States.

The following subsection (2.1) describes the general differences between state and federal prisons in the United States. It details topics including, the types of crimes inmates

commit, various security levels and what they mean, and the different types of housing arrangements for inmates.

2.1 Federal and State Prisons

This study focused solely on United States federal and state prisons. Local and county jails were not included in this study because there is a lack of COVID-19 related data for those facilities.

2.11 Federal Prisons

The United States has 122 government federal prisons, and 12 privately run federal prisons; contracted with private corporations. The 134 facilities are all under the jurisdiction of the Federal Bureau of Prison (BOP) (n.a., BOP Locations, 2020). The BOP contracts with private corporations to operate some prisons. The BOP is responsible for ensuring "that federal offenders serve their sentences in facilities that are safe, humane, cost-efficient and appropriately secure" (n.a., About Agency, 2020). Federal prisons house inmates who have committed federal crimes. Federal crimes include, but are not limited to, drug trafficking, identity theft, child pornography, and tax fraud (Brooks, 2019). The BOP has seven types of facilities that are outlined in Table 1.

Facility Type	Acronym
Federal Prison Camps	FPC
Federal Correctional Institution	FCI
Private Correctional Institution	CI
United States Penitentiary	USP

Federal Detention Center	FDC
Metropolitan Correctional Center	MCC
Metropolitan Detention Center	MDC

Table 1 (Above): BOP facilities and acronyms

The BOP facilities in Table 1 are associated with different security levels or missions; 1) Minimum-security institutions are FPCs. The inmates in FPCs live in dormitories with limited perimeter security. 2) Low-security institutions are FCIs and CIs. FCIs and CIs have dormitories and doubled lined perimeters. CIs are privately run facilities. 3) Medium-security institutions include FCIs or USPs. These institutions have mostly cell-type housing, electronic detection systems, and double-lined perimeters. 4) High-security institutions are strictly USPs. These facilities are high-security prisons lined with walls, fences, and electronic perimeters. Inmates live in either single- or multiple-occupant cells. Note that USPs can be Medium- or High-security facilities. 5) Administrative facilities are institutions such as FDCs, MCCs, or MDCs. Administrative Facilities have specific missions, such as the detention of pretrial offenders, medical treatment for inmates with serious health problems, or containment of extremely dangerous inmates (n.a., BOP About Facilities, 2020). Additionally, the BOP has 14 prison campuses characterized as Federal Correctional Complexes (FCCs) FCCs are multiple institutions with various security levels located adjacent to each other (n.a., BOP Locations, 2020). An example of this is Allenwood FCC in Pennsylvania. Allenwood FCC is made up of FCI Allenwood Low, FCI Allenwood Medium, and USP Allenwood. The various types of facilities have different characteristics. Such characteristics include proximity to other facilities, housing type, and security level. The only type of federal facility that is not included in this study is CI's.

BOP facilities have a number of inmate programs. In most facilities, inmates are required to work, except for inmates who are medically unable. Inmates are employed within the institution. The type of work ranges from food services, plumbing services, painting services to grounds maintenance. Inmates are not allowed off of the facility campus for community work opportunities. Inmates have access to education programs and can take literacy, parenting, and wellness classes. BOP also has a Religious Services Branch to ensure that inmates can practice their religion (n.a., BOP About Facilities, 2020). The various types of facilities have different levels of inmate interaction, day-to-day inmate activities and offer differing inmate programs that align with the programs discussed above.

2.12 State Prisons

State prisons house inmates who have committed state crimes. State crimes include offenses such as assault, robbery, arson or homicide. State prisons are operated, maintained, and generally funded by state governments. Each state has a government entity responsible for the state prisons. Similar to BOP, state prisons can be both publicly and also privately run. For example, in California, the California Department of Corrections (CDRC) is responsible for the 35 state prisons (n.a., CDRC Facility Locator, 2020). The CDRC has plays role in the operation of the 11 federal prisons within the state of California. Additionally, some states operate out of state prisons.

Akin to the federal prison system, state prison systems have various facility security levels ranging from minimum security to maximum security (n.a., US Legal Inc, 2020). The housing type varies based on facility and includes dormitories, double-occupancy cells, and

single cells. Each state has different rules and regulations regarding its prison system, and the differences from state-to-state can be broad (Brooks, 2019).

2.13 Prisons Included in this Study

Level	State	Federal	Total
# of Facilities	692	55	747
Total Population	861,592	63,305	944,897
Total % Capacity	97.65	97.61	97.62

Table 2 (Above): Number of facilities included in this study by level, total population for each facility and average percent capacity for each facility.

692 public or private state prisons across 40 states were included in the dataset. The total population for all state prisons used in this data set is 944,897 inmates. Fifty-five publicly run BOP facilities across 20 states were included; private BOP facilities were not included due to inaccessibility of data. BOP facilities included in this study had a total inmate population total of 63,305 inmates. Based on a 2019 report, this study makes up 64.64% of the total inmate population under the jurisdiction of federal or state correctional departments (Carson, 2020). The population was based on facilities' population count as of February 1, 2020. Facilities were left out of this study due to data limitations. A number of federal-, state- and privately-run correctional facilities did not have publicly available COVID-19 data on their inmate populations.

2.2 Funding for State and Federal Prisons

This section details funding allocations for state and federal prison facilities. Facilities' funding levels are an important factor when analyzing the COVID-19 outbreaks in correctional

facilities. Funding feeds directly into health care spending, which impacts the inmate population's health and well-being as it affects inmates' access to health care. Conceptualizing differences in correctional funding is key to understanding the differences between federal and state prison systems.

2.21 Federal Prison Funding

Federal prisons receive their funding from the BOP yearly budget which is a component of the Department of Justice's budget. BOP's proposed budget for the 2019-2020 fiscal year (FY) was 7.14 billion dollars (n.a., Federal Prison System FY Budget, 2020). 37.8 percent of the 2019-2020 FY budget went towards "Inmate Care and Programs" (n.a., Federal Prison System FY Budget, 2020). Medical care falls under the "Inmate Care and Programs Budget." The FY 2019-2020 budget allocated $1.223 billion towards medical care, and just under $73 million for psychological services (n.a., Federal Prison System FY Budget, 2020).

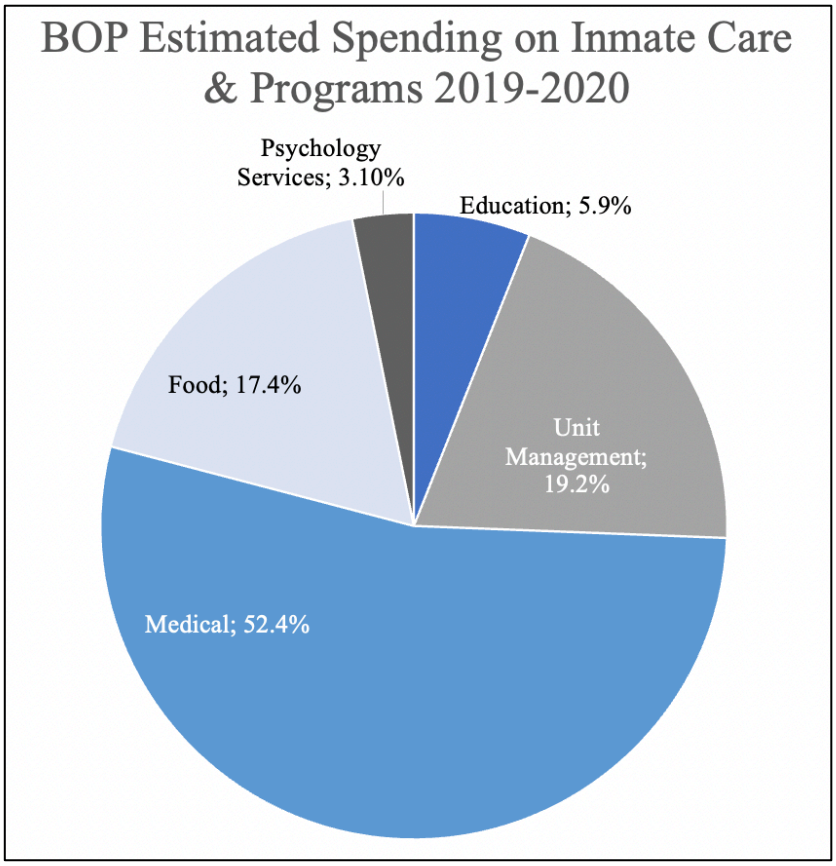

Figure 1 (Left): Breakdown of BOP estimated spending for Inmate Care and Programs. Medical services section is the most expensive. Note: this estimated BOP budget was pre-COVID-19 (n.a., Federal Prison System FY Budget, 2020).

2.22 State Prison Funding

State prisons are funded through state tax revenue (n.a., US Legal Inc, 2020). To allocate the money, each year funds are appropriated in the overall state budget for states' correctional department budget. Funds from the department's budget are distributed to the different branches of the correctional department. These branches typically cover legal services, juvenile operations and programs, adult corrections, parole operations, rehabilitative programs, etc.

States maintain total control over their correctional department budget. This means that some states have higher per-capita budgets than other states. In most states, the adult corrections department receives the largest portion of the budget. In the Fiscal Year 2019-2020 budget, California's state budget allocated 15.8 billion dollars towards funding the CDCR (n.a.,

California Ebudget, 2019). From that 15.8 billion dollars, the CDCR directed 12.7 billion dollars, about 80 percent of its budget, towards its state (adult and juvenile) prison system (Graves, 2019). Similarly, in the Texas Department of Criminal Justice Fiscal Year 2019-2020 proposed budget, over 80 percent of the over its 3-billion-dollar budget went towards the incarceration of felons (TDCJ, 2019). State correctional budgets also include spending on food, clothes, education, work and religious programs, and medical care for their inmate population. Lastly, a portion of corrections budget also goes towards paying the salaries of state correctional department employees (TDCJ, 2019).

2.3 Prisons Overcrowding

Federal and state prisons in the United States have a history of overcrowding starting in the 1970s (Eisen & Grawert & et. al., 2020). This surge in inmates or mass incarceration is a byproduct of America's "War On drugs" and "Tough on Crime" campaigns (Eisen & Grawert et. al., 2020). Overcrowding in federal and state prisons hit its peak in 2008 (Eisen & Grawert et. al., 2020). Prison population of BOP prisons has decreased, however even still, at the start of January 2018, BOP prisons were at 114% of their design capacity (Bronson & Carson, 2019).

Many state correctional systems also operate at over 100 percent of their capacity. At the start of January 2018, almost half of state correctional systems were at or above 100 percent of the design capacity (Bronson & Carson, 2019). Alabama state prisons were the most overcrowded at 167.8 percent of capacity (Bronson & Carson, 2019). New Mexico state prisons were the least crowded at 57.4 percent capacity (Bronson & Carson, 2019). The average percent capacity across the 48 state correction departments that reported was 103.03 (Bronson & Carson, 2019). These numbers only include prisons under jurisdiction of states.

Overcrowded prisons present several problems that negatively impact the inmate population as well as prison employees. Over capacity prisons decrease the staff to inmate ratio, which is harmful to the employees and other inmates because there is a higher likelihood of inmate misconduct (n.a., US GAO, 2012). The lower staff to inmate ratio prevents prison officers from maintaining "interpersonal" communication with inmates (n.a., US GAO, 2012). More significantly, overcrowded prisons have a direct effect on the health of the inmate population. Prisons operating over capacity make it more difficult for facilities to meet basic inmate needs such as health care (n.a., Penal Reform Int, 2020). Overcrowding can cause cramped bathroom and living spaces which degrades prison sanitation levels, all of which result in negative health outcomes for inmates (n.a., ACLU, 2020).

2.4 Health Care Delivery and Access

While inmates often experience unsanitary and overcrowded conditions, all inmates have the right to adequate medical care while incarcerated (Estelle v. Gamble, 1976). This does not mean that every inmate receives equal access to health care. Equal access for all inmates is challenging to attain, given the many entities that oversee state and federal prisons. Furthermore, while inmates are constitutionally granted the right to health care, prison health systems are underfunded. This means that the care inmates are provided is often insufficient and the caliber of health care in state and federal prisons varies.

2.41 Health Care in Federal Prisons

Federal inmates receive medical, dental, and mental health care. The BOP ensures that each facility has medical staff and physicians on call every day. Emergency medical care is

available 24 hours a day, seven days a week (n.a., BOP Custody & Care, 2020). The BOP has ambulatory care units and medical referral centers that provide care for inmates with acute/chronic medical conditions.

Within the BOP, inmates are classified and assigned to facilities based on the BOP's Medical Care Levels. Different BOP facilities tend to various Levels. The medical care levels are outlined in Table 3 (below).

Medical Care Level	Classification
Level 1	Healthy inmates under the age of 70 with limited medical needs. Examples: diet-controlled diabetes, stable HIV patients, mild asthma
Level 2	Inmates that need at least one quarterly clinician evaluation. Examples: epilepsy and medication-controlled diabetes
Level 3	Inmates who require access to clinicians frequently or inmates who need non-clinician assistance with daily activities. Inmates classified under this level may require hospitalization to attain medical or mental stabilization. Examples: cancer patients in remission less than 12 months and inmates suffering from mental illness than requires medication
Level 4	Inmates that may require daily assistance from nurses or other clinicians. Examples: active cancer patients, high-risk pregnancy patients and major surgical patients

Table 3 (Above): Levels of care within the BOP (BOP Care Levels, 2017)

The BOP operates six Level 4 facilities, all of which are included in this study. The following facilities provide inmates with Level 4 care:

1. MCFP Springfield, Missouri
2. FMC Rochester Minnesota
3. FMC Lexington, Kentucky

4. FMC Devens, Massachusetts
5. FMC Butner, North Carolina
6. FMC Carswell, Texas

The federal correctional system has mandated health care guidelines that must be followed by all federal correctional facilities. Additionally, the BOP suggests that all federal facilities have health care administrators/managers/directors. These employees are important as they are responsible for the smooth delivery of health care within the facilities and for developing the health policy and procedures of the facilities.

2.42 Health Care in State Prisons

State correctional entities are responsible for providing their inmates with adequate health care. Each state has a separate set of health care delivery guidelines that their facilities must follow. The guidelines are similar to that of the BOP, and the Department of Justice suggests that these facilities also have health care administrators/managers/directors to ensure smooth delivery and a healthy inmate population. The majority of health care services provided to state inmates are delivered onsite (n.a., PEW Charitable Trusts, 2018). State correction entities use one of four models to provide onsite care to inmates. The various models are outlined in Table 4. Over 50 percent of states use Direct or Contracted models to provide inmates with onsite health services (n.a., PEW Charitable Trusts, 2018).

Model	Definition
Direct Model	Clinicians and doctors employed by the state corrections department provide most, if not all onsite health services
Contracted Model	Privately employed clinicians and doctors from one or more companies deliver most, if

	not all onsite health services
State University Model	Medical schools affiliated with the state's public university delivery most, if not all onsite care
Hybrid Model	On-site health care delivery is some combination of the models above.

Table 4 (Above): Health care delivery models used by state correction departments (n.a., PEW Charitable Trusts, 2018).

Certain health care services, such as acute or specialized care, require the hospitalization of inmates (n.a., PEW Charitable Trusts, 2018). Examples of this type of care includes, but is not limited to, radiology, dialysis, surgical or life-threatening emergency services. Hospitalization for the US non-prison population is already costly. Hospitalizing inmates brings another set of challenges, such as secure transportation and the presence of guards. In 2015, 23 percent of the New York State Department of Corrections and Community Supervision's health budget went towards offsite and hospitalization care (n.a., PEW Charitable Trusts, 2018). The Virginia Department of Corrections spent 27 percent of its health care budget on hospital care (n.a., PEW Charitable Trusts, 2018). These offsite care and hospitalization costs make up a significant portion of states' spending on correctional services.

As stated in this section, state facilities have certain health and health care standards that must be met. However, many state correctional facilities have a history of neglecting the health of their inmate populations. In the past decade, California inmate rights advocates have filed lawsuits against correctional facilities at the state and county level. The lawsuits generally claimed that jails and prisons in California subject their inmates to "cruel and unusual punishment for denying them adequate mental and medical health care" (Flynn, 2017). Alabama inmates sued the Alabama Department of Corrections in 2014, claiming inadequate mental

health care. The judge later ruled that Alabama state inmate access to mental health care was "horrendously inadequate" (Lyman, 2020). In the same year, Texas inmates filed suit against the Texas Department of Criminal Justice with claims of cruel and unusual punishment associated with dangerously hot living conditions (McCullough, 2020). The California, Alabama and Texas legal highlight that proper health care access and prison living conditions are two factors that impact the health of the prison population. Health care access and living conditions are two characteristics that vary among the state and federal prisons included in this study.

2.5 Background Summary

This section has provided information regarding differences and similarities between state and federal prison systems. It underscores key differences in funding, health care access and delivery, security level and housing between the various facilities. These factors are essential in understanding possible explanations and factors that impact COVID-19 outbreaks in America's prisons. The following section will build on this information. It will highlight conclusions drawn in published literature on the relationship between infectious diseases and prisons. It will explain the nature of COVID-19, focusing on how it is transmitted. The section will also present occurrences of infectious disease outbreaks in correctional facilities across the country.

3.0: LITERATURE REVIEW

To recognize the impact COVID-19 is having on the incarcerated population in United States prisons, established knowledge on 1) the nature of infectious diseases in prisons pre-COVID-19, 2) COVID-19 and its transmission, and 3) COVID-19 presence in prisons across the United States, is important. This literature review will provide a comprehensive explanation and

description of existing research surrounding the relationship between prisons and infectious diseases. This review will also include recent studies and analyses done on COVID-19.

3.1 Infectious Diseases in Prisons Pre-COVID-19

To contextualize the spread of COVID-19 in prisons, it is necessary to recognize that correctional facilities have confronted other infectious disease outbreaks in the past. In 1918, San Quentin, a California state prison, experienced three outbreaks of the 1918 Influenza Pandemic (Stanley, 1919). An estimated 50% of the 1,900 inmates contracted the virus. Pre-COVID-19, epidemiologists, and researchers have identified a strong correlation between prisons and high levels of infectious diseases.

In "Dynamic Models of Infectious Disease Transmission in Prisons and the General Population," the authors, Martial L. Ndeffo-Mbah et al., assert that "incarcerated populations experience elevated burdens of infectious diseases" (Ndeffo-Mbah et al., 2018, 40). The study focused on the spread of diseases in correctional facilities and the impact on the general population. The world inmate population faces higher rates of human immunodeficiency virus (HIV), viral hepatitis, tuberculosis (TB), and sexually transmitted diseases (Ndeffo-Mbah et al., 2018). The researchers noted that such rates of infectious diseases are not a result of an increased infection rate associated with incoming inmates. Instead, the prevalence is a consequence of prison characteristics that boost disease transmission risk between inmates. These factors include, but are not limited to, overcrowding, lack of diagnosis/treatment, and low sanitation levels.

A systematic review of infectious diseases in correctional settings by Martial L. Ndeffo-Mbah et al. established that high reincarceration[1] rates play a fundamental role in spreading infectious diseases within prison systems. Ndeffo-Mbah et al. highlighted that decreasing rates of reincarceration by "50% was predicted to reduce the prevalence" of infectious diseases by 25% (Ndeffo-Mbah et al., 2018, 52). Similarly, Michael Massoglia's study, "Incarceration as Exposure: The Prison, Infection Disease, and Other Stress-Related Illnesses," found that shared hygiene facilities, residential crowding, and high levels of inmate contact turn correctional facilities into a "fertile ground for illness transmission" (Massoglia, 2008, 57).

Literature about infectious diseases and prisons underscores the notion that the average incidence of infectious diseases in prisons is significantly larger than that of the general population. While Ndeffo-Mbah et al. focused on multiple infectious diseases and infections in the study, the disease most relevant to COVID-19 in prisons is the authors' investigation and discussion of tuberculosis (TB). This is because the other diseases discussed are spread through shared needles and sexual actions, while TB can be contracted through the air, similar to COVID-19. The evidence to support the notion that correctional facilities spread infectious diseases is further highlighted by Paul Farmer's work, "The House of the Dead: Tuberculosis and Incarceration." Farmer found that due to high rates of TB infections prevalent in prisons, "several of the worst outbreaks of tuberculosis documented in the United States have their roots in prisons and jails" (Farmer, 2002, 239). Research conducted by Ndeffo-Mbah et al. found that the rate of infection for tuberculosis is 23 times higher than the incidence rate of the general population (Ndeffo-Mbah et al., 2018). This is likely a result of prison hygiene and lack of prison health care.

[1] Reincarceration is the incarceration of someone who had been previously incarcerated and released.

Data provided by the Bureau of Justice Statistics support that infection rate data collected by Massoglia and Ndeffo-Mbah et. al. In 2011-2012, 21 percent of state and federal prisoners in the United States "reported ever having an infectious disease" (Berzofsky & Maruschak, 2015, 1). In contrast, the general population reported a rate of 4.8 percent (Berzofsky & Maruschak, 2015). From this data, we can infer that "incarceration exposes inmates to infectious disease" Massoglia, 2008, 65). Previously incarcerated individuals are "almost four times more likely than non-inmates to report urinary tract infections, hepatitis, and tuberculosis" (Massoglia, 2008, 65). The reviewed literature indicates that a driving factor behind the large-scale spread of infectious diseases in prisons is the living conditions.

Historical events and peer-reviewed literature establish that the physical environment of correctional facilities both worldwide and in the United States creates suitable settings for the spread of infectious diseases, including TB, HIV, viral hepatitis, and sexually transmitted infections. However, the studies fail to explicitly identify what factors of prison environments impact the spread of infectious diseases more than others.

3.2 COVID-19 Transmission and Prevention

COVID-19 is a highly infectious disease. The literature described above highlights that such diseases are easily transmittable in prison settings due to their environment. It is necessary to discern the nature of COVID-19, how it spreads, and prevention strategies to better identify the relationship between COVID-19 and prisons. While the virus has only been impacting the United States on a large scale since March 2020, many epidemiologic studies have been conducted in pursuit of gaining a comprehensive understanding of the virus.

COVID-19, frequently referred to as the "Coronavirus," is the name of the infectious disease. Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) is the name of the virus that causes the disease. As of April 5th, 2021, 131.02 million people worldwide have tested positive for COVID-19 and 2.85 million have died (WHO COVID-19 Dashboard, 2021). The United States alone has recorded 30.37 million cases and over 550,000 deaths (WHO COVID-19 Dashboard, 2021). The World Health Organization (WHO) categorizes COVID-19 as an infectious disease and the current global outbreak as a pandemic. People infected with COVID-19 generally experience mild to moderate respiratory symptoms, including fever, dry cough, tiredness, chest tightness and loss of taste and smell (WHO COVID-19 Dashboard, 2021). When someone contracts COVID-19, it can take anywhere between 5-14 days for symptoms to show (WHO COVID-19 Dashboard, 2021).

The rapid spread of COVID-19 is a factor that has resulted in the pandemic. The virus spreads through respiratory droplets resulting from coughing or sneezing. Studies, including "Presymptomatic SARS-CoV-2 Infections and Transmission in a Skilled Nursing Facility," indicate that presymptomatic and asymptomatic patients can transmit the disease. The study, conducted in a skilled nursing facility, attempted to understand COVID-19 transmission. Their results showed that 23 days after the first resident tested positive, 57 out of the 89 residents also tested positive. Twenty-seven residents were asymptomatic at the time of testing yet "most likely contributed to transmission" of the virus (Arons et al., 2020, 2081). Similarly, Wycliffe E. Wei et al. investigated 243 cases of COVID-19 in Singapore between January and March 2020 (Wei et al., 2020). They found that presymptomatic transmission was the most plausible explanation for seven clusters[2] of cases (Wei et al., 2020). Therefore, when someone contracts the disease, they

[2] "Clusters" are records of infections that were epidemiologically linked.

can go five days without knowing they have contracted it while transmitting it to others. The asymptomatic and presymptomatic cases of COVID-19 "support the likelihood that viral shedding can occur in the absence of symptoms and before symptom onset" (Wei et al., 2020, 415). This enables the virus to transmit at a rapid rate, resulting in the widespread infection the United States has seen since March 2020 (Gandhi & Yokoe et. al., 2020).

Literature suggests that asymptomatic and presymptomatic transmission of COVID-19 makes symptom-based strategies largely ineffective in transmission prevention. Researchers have identified ways to combat COVID-19 and control the spread: highly effective contact tracing, case isolation, mass-scale testing, and personal prevention. Hellwell et al. conducted research to assess the effectiveness of contact tracing and case isolation. The study found that case isolation and contact tracing are "sufficient to control a new COVID-19 outbreak" (Hellwell, 2020, e494). However, the two strategies must be employed in conjunction with one another. Hellewell et al. also found that "case isolation alone would be unlikely to control transmission" (Hellwell, 2020, e494). Wide-scale testing to identify presymptomatic and asymptomatic COVID-19 carriers is also crucial in halting the spread of COVID-19. According to the National Institutes of Health, "widespread testing is necessary [and] important" (n.a., NIH, 2020), in slowing the spread of COVID-19. Making testing widely available would help identify presymptomatic or asymptomatic cases and allow people to isolate themselves, reducing the chances they further transmit the virus to others. Another way to stop the spread of COVID-19 is personal prevention (n.a., NIH, 2020). The Centers for Disease Control (CDC) has outlined actions people can personally take to slow the rate of transmission. The CDC advises washing hands often, covering coughs and sneezes, avoiding close contact, and wearing masks in public. Above all, the CDC recommends practicing social distancing as crucial in limiting the

transmission of the virus. This means maintaining 6 feet between yourself and others (n.a., CDC COVID-19, 2021). Additionally, wearing a mask in public is critical in preventing transmission.

Research shows that COVID-19 transmission is similar to tuberculosis transmission; this is addressed in section 3.1. However, recent studies suggest that COVID-19 is significantly more infectious than diseases that prisons have had to confront. Understanding how COVID-19 is transmitted and recognizing prevention avenues helps understand the risk that COVID-19 poses to prison systems. Furthermore, this knowledge can help correctional facilities identify and implement preventive measures before the virus enters the facility.

3.3 COVID-19 in Prison

The relationship between prisons and infectious diseases identified in section 3.1 and characteristics of COVID-19, i.e., transmission, symptoms, and prevention, outlined in 3.2, suggest a strong connection between COVID-19 and prison facilities. Recent research on COVID-19 in prisons aligns with conclusions drawn based on studies related to other infectious diseases in prisons and COVID-19 transmission. Reports and studies have identified prisons as COVID-19 "super spreaders," places or persons who transmit a virus or bacteria to a vast number of people.

There have been many cases of enormous COVID-19 outbreaks in prisons across the United States. On April 14, 2020, the Federal Bureau of Prisons recorded 446 total cases among the inmate population. In just one month, that number climbed from 446 cases to 1,919 total recorded cases (Solis et al., 2020). Over 100 inmates and employees have died from COVID-19 within the Ohio state prison system alone (Zuckerman, 2020). The site of the largest COVID-19 outbreak in Ohio was in a state-run prison, Marion Correctional Institution. As of April 20, 2020,

80% of the inmates, over 2,000 people, had been infected with COVID-19 (Castle, 2020). Similar infection rates occurred at Muskegon Correctional Facility in Michigan. On July 31, 2020, the Michigan prison, Muskegon started testing all of its inmates, and by the end of September, 997 inmates had been infected. That is more than 75% of those in custody (Cantú, 2020). California's San Quentin Prison has also experienced massive COVID-19 outbreaks. As of August 10, 2020, the state prison has experienced more than 2,200 COVID-19 cases and 25 deaths within a population of more than 3,260 inmates. If California experienced the same death rate as San Quentin Prison, there would be 300,000 deaths statewide. Nationally, this would translate to 2.5 million deaths (Christensen & Lin, 2020). As of December 1, 2020, 2.5 million deaths are approximately ten times the United States' death rate which was just over 250,000. (n.a., WHO COVID-19 Dashboard, 2021).

An epidemiological study has confirmed the high rates of COVID-19 in Ohio, Michigan, and California prisons are not particular to those facilities or their operations. Brendon Saloner et. al. compiled counts of COVID-19 cases and deaths among the inmate population. The data was collected daily from March 31, 2020, to June 6, 2020. The data included statistics from the Federal Bureau of Prisons and all state prisons. Saloner et al. calculated the COVID-19 infection and death rate for the prison population and compared it to the overall population. The researchers found that the case rate among 1,295,285 inmates was 3,251 infections per 100,000 prisoners (Saloner et al., 2020). Thus, the COVID-19 rate for inmates in federal and state prisons is five-and-a-half times higher than the COVID-19 infection rate for the general population in the United States (Saloner et al., 2020). Furthermore, during the same time frame, the average daily infection increase within prisons and jails was 8.3%, while the average infection increase per day for the US population was 3.4% (Saloner et al., 2020).

Prison environments are clearly more vulnerable to COVID-19 outbreaks. The results and discussions of studies and papers analyzing the impact of COVID-19 on prisons all agree that the accelerated spread of COVID-19 is a byproduct of the general prison environment and day to day operations. An analysis of the link between COVID-19 and prisons published by Hawks et al. asserted that the "infrastructure of most prisons and jails" turns prisons into COVID-19 super spreader environments (Hawks & Mccormick et. al., 2020, 1041). Another study conducted by the CDC identified characteristics that result in the rapid spread of COVID-19. The characteristics identified were:

"crowded dormitories, shared lavatories, limited medical and isolation resources, daily entry and exit of staff members and visitors, continuous introduction of newly incarcerated or detained persons and transport of incarcerated or detained persons in multi-person vehicles for court-related, medical, or security reasons" (n.a., CDC COVID-19 Correctional Facilities, 2020).

Additionally, an article written by Burki in *The Lancet* addressed that some low-security prisons are "semiopen" (Burki, 2020, 1412). This means that inmates are authorized to leave the prison during the day for work or classes and come back at night, and potentially bring the virus with them.

Section 3.2 established ways to limit the spread of COVID-19: through social distancing, washing hands, and restricting interaction with other people. This confirms that many variables associated with prisons can easily set off COVID-19 outbreaks. Therefore, the circumstances of prison make the CDC's COVID-19 prevention guidelines "impossible to achieve" (Burki, 2020, 1411). Limited person-to-person interaction and social distancing are unattainable in some

prisons, particularly low-medium security level prisons. Often, inmates in those facilities are housed in dormitories and are permitted to interact in dining halls and other communal locations. The daily in-and-out movement of employees, inmates and those newly incarcerated within correctional facilities further increases the risk of COVID-19 transmission in prisons. This is because they can bring the virus into the prison, unknowingly if they are presymptomatic or asymptomatic.

While literature identifies many characteristics that result in the rapid spread of COVID-19 in prisons, researchers have not successfully pinpointed which explicit characteristics have stronger associations with the spread of COVID-19 in prison facilities. As such, this research aims to single out which prison characteristics are more likely to trigger COVID-19 outbreaks.

3.4 Literature Review Summary

This section reviewed literature on the topic of infectious diseases in prisons, the nature of COVID-19 and the presence of COVID-19 in prisons across the United States. Thus, this literature review helped identify characteristics of prisons including housing type, security level, inmate interaction, inmate activities etc. that influence COVID-19 outbreaks in prisons.

4.0: METHODOLOGY

This study aimed to understand what prison characteristics are correlated with infectious disease outbreaks by addressing the following question: Which characteristics of federal and state prisons in the United States make facilities more vulnerable to COVID-19 outbreaks? The study used quantitative methods to conduct statistical analyses to find the correlation between various prison characteristics and COVID-19 infection rate. Based on the varying characteristics

of prisons identified in the Background and Literature Review of this paper, these characteristics include facility location, inmate sex, population size, percent occupied, security level, housing type, number of daily staff, access to onsite health care and emergency care. The independent variables measured were analyzed in relation to the number of confirmed COVID-19 cases per 100 inmates. This study examined prisons overseen by state-government entities and the Federal Government, all of which are capable of housing inmates for more than 24 hours. Excluded from this study were community rehabilitation centers and facilities that cannot house inmates for more than 24 hours. These prisons were excluded from the study because they do not maintain the same living environment that long-term holding facilities have.

The dependent variables in this study were: 1) the percent of the prison population that contracted COVID-19 and 2) the number of COVID-19 related deaths per prison. The independent variables were the characteristics: prison level (state, federal), sex (male, female, male/female), percent occupation, type (public, private), security level (low, medium, high, administrative), housing type (cells, dormitories, combination), number of adjacent facilities, number of daily employees with inmate contact, presence of health care administrator. The characteristics chosen were largely influenced by variables identified in the Background and Literature Review sections of this paper, that are known or assumed to influence infectious disease outbreaks within prisons. Variables including, whiteness of state, state poverty level and median income were also chosen in an attempt to find further correlations between prison characteristics and COVID-19 cases and deaths.

This research focused on a review and statistical analysis of United States federal and state prisons. A large data set was compiled consisting of 747 federal and state prisons across the country and the corresponding prison characteristics. The COVID-19 and population data for this

study was obtained through the "UCLA COVID-19 Behind Bars Data Project" (Dolovich, 2020), a dataset being collected by Professor Sharon Dolovich from the University of California, Los Angeles. Data concerning characteristics was collected from mandatory Prison Rape Elimination Act Facility Audit Reports.

The raw data was sorted in Excel. Descriptive statistics were calculated in Excel. The data was then imported into STATA where ANOVA tests and T-tests were run to identify any initial statistical significance. Regression analyses and bivariate correlations were also conducted in STATA to fully understand the role certain characteristics have in impacting the number of confirmed COVID-19 cases per 100 inmates. The regression analysis analyzed the entirety of the dataset to estimate the relationship between COVID-19 outbreaks and the independent variables. Bivariate correlations were used to determine the existence of any specific relationships between the independent and dependent variables. There were multiple bivariate correlations completed. The correlations were performed on variables deemed statistically significant in the t-Tests, ANOVA tests or regression analysis. Statistical significance was determined based on the p-values and a 0.05 significance level. Note that for characteristics with smaller sample sizes, p-value were interpreted at a 0.1 significance level. The goal of these statistical analyses was to identify any significant correlations between COVID-19 outbreaks and incarceration facilities' characteristics.

4.1 Operationalizing the Explanatory Variables

Explanatory variable data was extracted directly from the most recent cycle (2017-2020) of Prison Rape Elimination Act (PREA) reports released by the individual facilities and the facility websites. The reports have information on the type of prisons (public or private), the

designated capacity, security level, housing type, number of employees with contacts with inmates, whether or not the facility has a health care administrator, and inmates' ability, or inability to leave the facility for community engagement (work programs or community service).

To measure designated capacity and number of employees with inmate contact, the raw number was extracted from the PREA reports. To measure security level, the security level was extracted from the reports, and a scale was created in Excel. The scale was made up of four security levels low, made up of minimum and low security levels, medium, made up of medium security levels, high, made up of high and maximum-security levels and administrative, made up of facilities with "special missions" such as medical treatment facilities and pretrial offender detention facilities. Housing data was extracted from the PREA reports and another scale was made in Excel. The scale consisted of dormitories/open, made up of facilities with open bay housing, dormitories, or multi-person rooms, cells, made up of facilities with single and multi-person cells and combo, made up of facilities with both cells and dormitories/open housing. Health care administrator/director data was measured on a scale of "yes," meaning there is one or "no" meaning there is not one. Ideally, the level of onsite health care would have been a variable however the information publicly available was not sufficient to be able to collect this. Finally, community engagement was also measured on a "yes" or "no" scale. If there was mention in the report of inmates engaging in work release programs or off-site community service activities, then this variable was reported as "yes." If there was no mention, then the variable was reported "no."

5.0: RESULTS

5.1 Preliminary Results

Based on the sample inmate population used in this study, as of January 15, 2021, there were, on average 25.79 confirmed COVID-19 cases per 100 inmates. That average is almost four times the number of people who have tested positive for COVID-19 among the United States' general population (6.97 positive tests per 100 inmates). This study's results align with results of other research including that of the Council of State Governments Justice Center (Gunter & Callahan, 2021). The higher rates of COVID-19 among the inmate population than among the general population are shown in Figure 2.

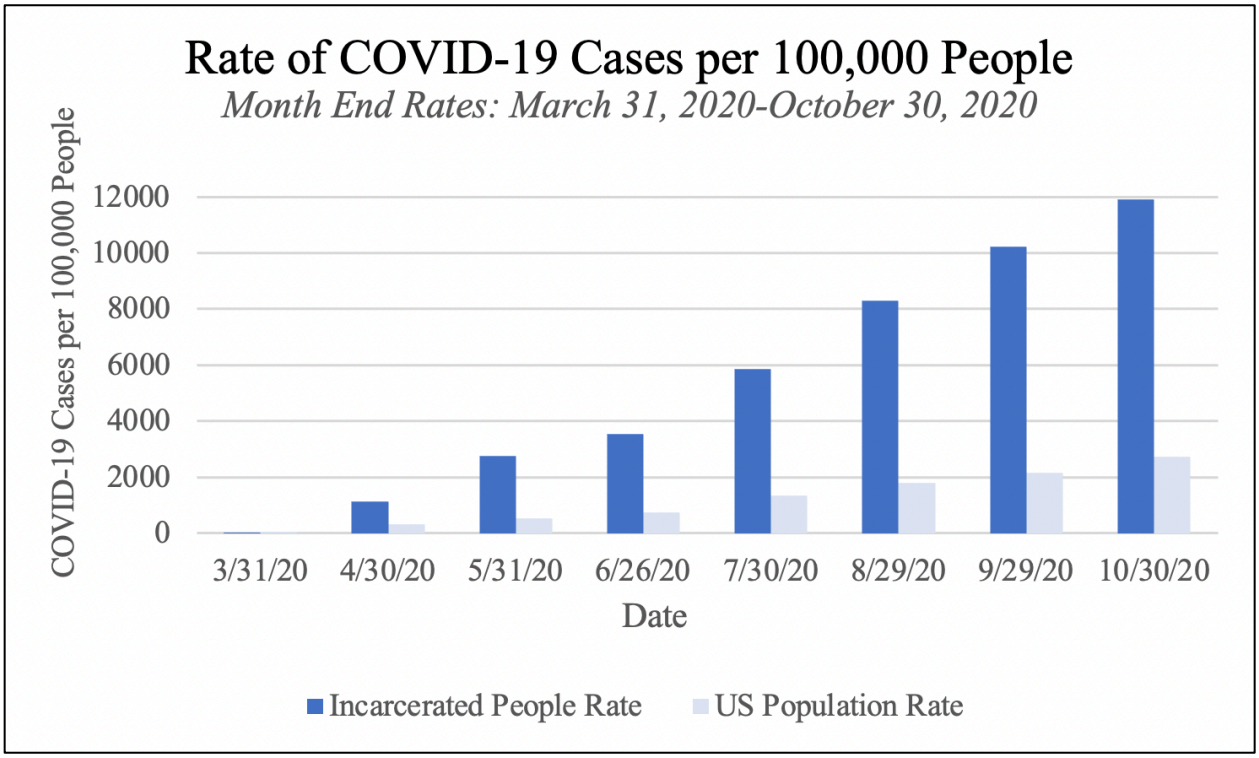

Figure 2 (Above): COVID-19 rates for inmate population compared to inmate population (Gunter & Callahan, 2021)

The data for this study is not distributed normally. Figure 3 shows, the dataset is right-skewed. With the data being right-skewed, it is important to also examine the median as it provides another measure of the center and the mean can often be heavily influenced by skewed data and outliers. The median is 17.75 confirmed COVID-19 cases per 100 inmates, which is still almost three times the general population rate. As of January 15, 2021, the COVID-19 death rate for the inmate population among state and federal facilities that reported COVID-19 related deaths, included in this study, that reported was 1.43 percent. This rate is lower than the morbidity rate of the general population (1.67%). This differences in morbidity rates between the inmate population and the general population could be a result of the lack of reporting and transparency by facilities and correctional departments. Only 48.3 percent of facilities reported on the number of COVID-19 related deaths.

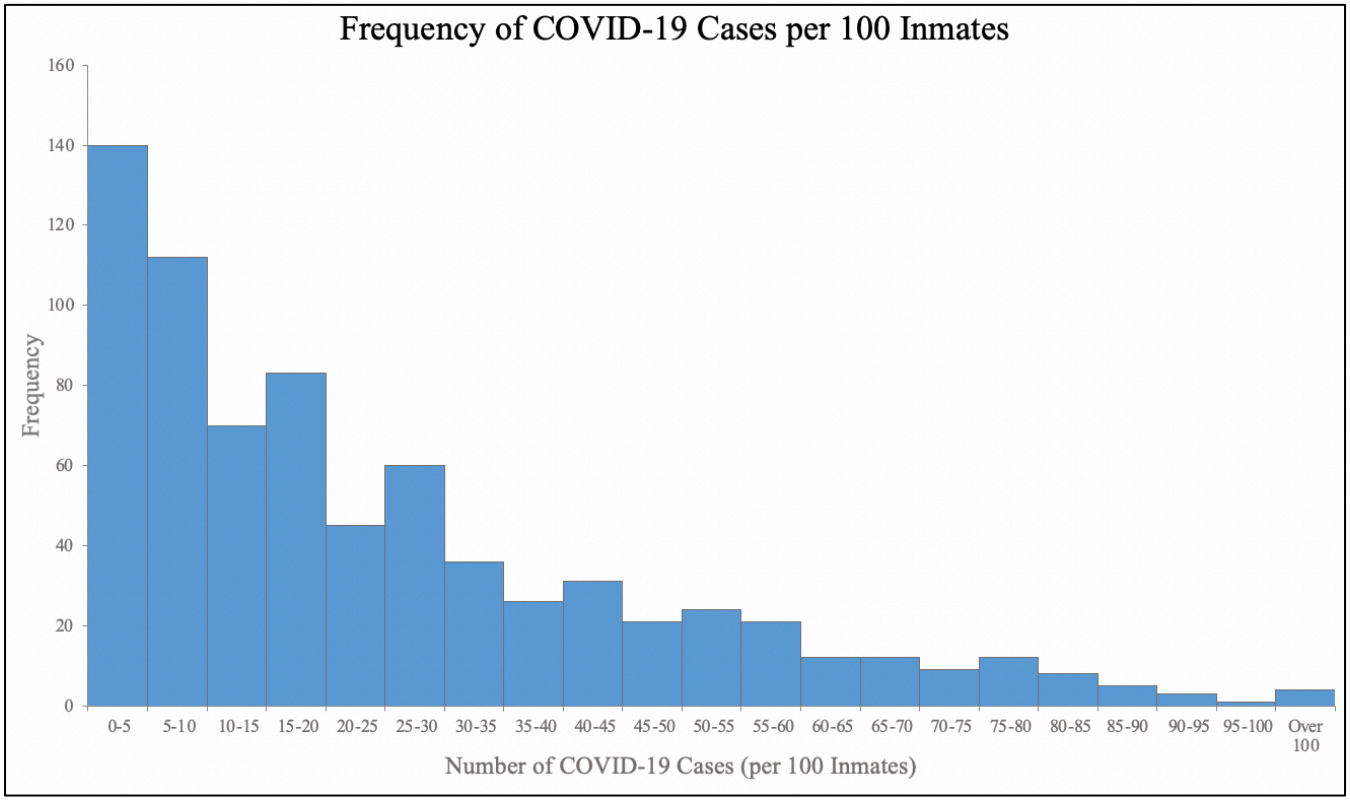

Figure 3 (Above): Histogram showing distribution of COVID-19 cases per 100 inmates

Figure 4 (below) shows the rate of positive tests per 100 inmates by state. Michigan correctional facilities experienced the highest rates of COVID-19 with 59.56 confirmed cases per 100 inmates. It is important to note that one Michigan facility reported approximately 179 confirmed COVID-19 cases per 100 inmates. This likely resulted from the facility being an intake/processing facility, thus having a continually changing population size.

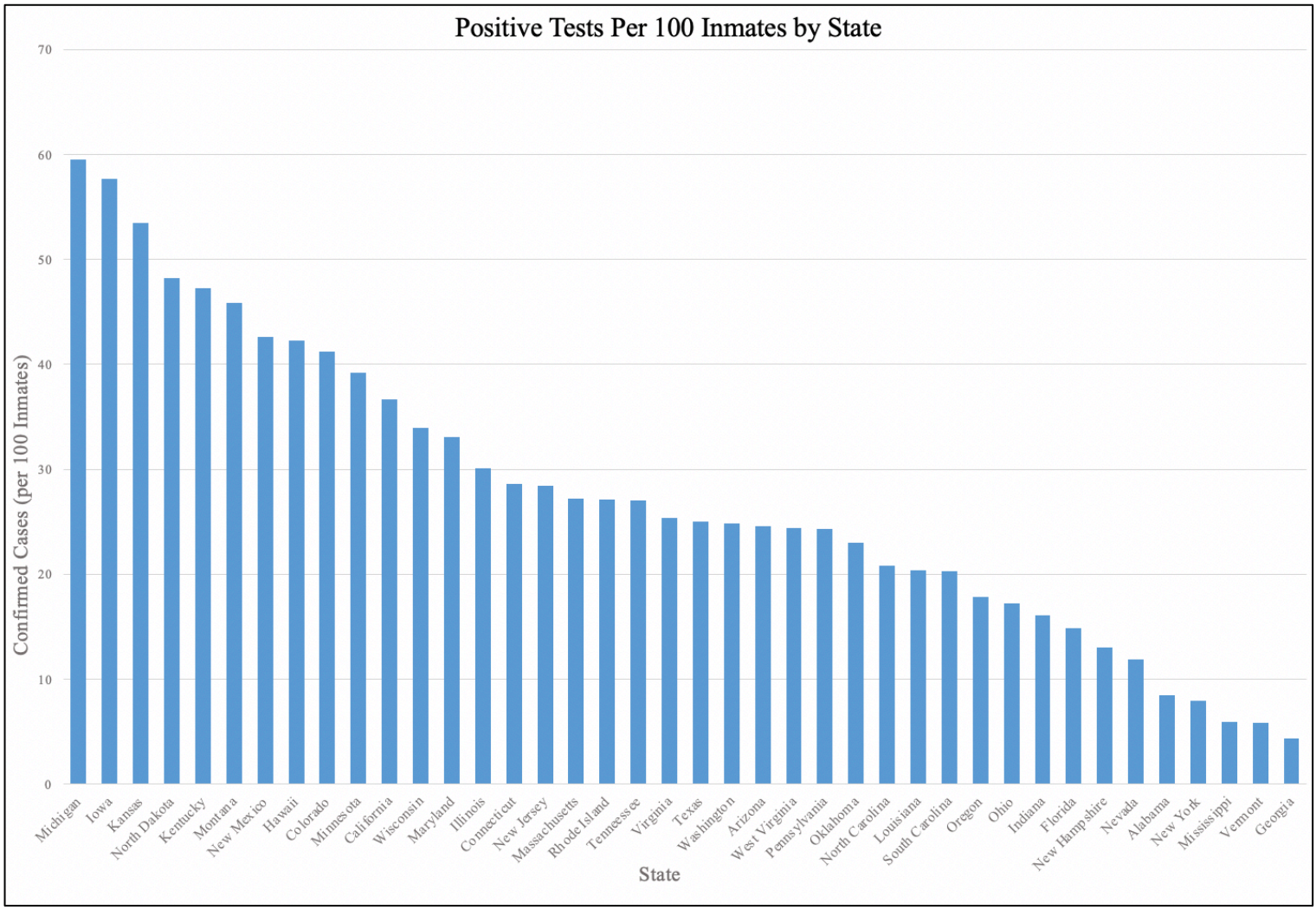

Figure 4 (Above): Confirmed COVID-19 cases per 100 inmates in federal and state prisons broken down by state.

5.11 COVID-19 Testing

Understanding the number of tests administered is necessary to evaluate this data to the fullest extent. Only 44% of the facilities, 14 state correctional departments reported the number of tests that had been administered. Additionally, BOP facilities did not report on testing. Among the 47% of facilities that reported on testing, there was an average of 259.85 tests per 100 inmates. On average, for every one confirmed COVID-19 case, there were approximately 24 administered tests. The facilities that reported above average rates of COVID-19 generally had above average rates of testing. Facilities that reported over 100 tests per 100 inmates indicate that inmates were tested multiple times. The states with the lowest rate of confirmed cases per 100 inmates, Mississippi, Vermont, and Georgia, shown in Figure 4, did not report the number of administered tests.

5.12 Facility Characteristics

The characteristics and frequency of the 747 correctional facilities included in this study are shown in Table 5. The majority of facilities are state-run male correctional facilities. Table 5 also summarizes the prison characteristics and the number of confirmed cases per 100 inmates. There was a difference of less than two confirmed cases per 100 inmates across security level case rate. Low/Minimum security had the highest average confirmed COVID-19 case rate and High/Maximum security facilities had the lowest. A more significant difference in positive cases per 100 inmates was found when comparing the different housing types. Dormitory/open housing had 21.45 confirmed cases per 100 inmates compared to 26.26 confirmed cases per 100 inmates in cell housing. Additionally, there was a marginal difference between the rate of positive tests per 100 inmates among female facilities (19.58 confirmed cases per 100 inmates),

male facilities (25.8 confirmed cases per 100 inmates), and male/female facilities (28.35 confirmed cases per 100 inmates). Finally, the percent of inmates that tested positive in publicly run prisons was 4.48 cases higher than the confirmed case rate in private facilities. It is important to note that the dataset includes significantly more public facilities than private. This rate per 100 inmates may not be as reliable as the COVID-19 rates calculated for the other prison characteristics.

Characteristic		Number of Prisons	Average Pre-COVID-19 Population	Confirmed Cases per 100 Inmates	Percent of with outbreak
Level	Federal	55	1,151	30.91	10.9%
	State	692	1,245	24.86	9.8%
Type	Public	714	1,234	25.51	9.9%
	Private	33	1,323	21.02	8.8%
Sex	Male	649	1,284	25.8	10.6%
	Female	71	868	19.58	2.8%
	Male/Female	27	1,106	28.35	11.1%
Security Level	High/Maximum	275	1,565	24.82	8.4%
	Medium	278	1,292	25.07	10.1%
	Low/Minimum	159	651	26.93	13.8%
	Administrative	20	984	24.32	0.0%
	N/A	15	806	22.58	6.6%
Housing	Cells	168	1,099	26.92	12.5%
	Combination	383	1,467	25.86	9.1%
	Dormitories/Open	130	810	21.45	7.7%
	N/A	66	1,104	25.54	12.1%
Community Engagement	Yes	240	941	21.98	13.3%
	No	334	1,525	28.65	18.26%
	N/A	173	1,097	23.46	10.4%

Health care Administrator	Yes	489	1,400	26.33	10.8%
	No	108	913	19.68	6.4%
	N/A	150	945	25.30	9.3%

Table 5 (Above): Summary of COVID-19 rate associated with characteristics and percentage of facilities that experienced an outbreak by characteristic

5.13 Facility Outbreaks

For the purpose of this study, an outbreak was defined as 60.5 confirmed COVID-19 cases per 100 inmates. This number was calculated based on the number of confirmed cases per 100 inmates for the top 10 percent of facilities. Of the facilities included in this dataset, 74 of them experienced a COVID-19 outbreak. The percent of facilities with a COVID-19 outbreak was calculated to see if it revealed more about facility characteristics and their relationship to COVID-19 rates.

Table 5 shows that Facility characteristics with higher rates of confirmed COVID-19 cases per 100 inmates were also more likely to experience a COVID-19 outbreak. Low/Minimum security facilities had the highest rate of outbreaks, with 13.3 percent of facilities experiencing a COVID-19 outbreak. Not one administrative facility experienced a COVID-19 outbreak.

5.2 Statistical Analysis

5.21 Categorical Data

The statistical software STATA was used to analyze the data. A preliminary multivariate regression was performed on all of the characteristics for which data was collected. Table 6 (page 37) shows the output of the multivariate regression. The significant p-values are highlighted in red. The p-value associated with federal facilities was significant at the 0.05 level.

The regression suggests that if a facility is federally run, then cases per 100 inmates increase by approximately 11, relative to state-run prisons. The p-value associated with Low/Minimum security facilities and facilities with Dormitories is significant at the 0.05 level. Relative to High/Maximum security facilities, Low/Minimum security facilities were connected to an increase of approximately ten confirmed COVID-19 cases per 100 inmates. Furthermore, relative to facilities with Combination housing (both Dormitories and Cells), Dormitory housing decreased the number of confirmed COVID-19 cases per 100 inmates by approximately eight cases. Lastly, the p-value associated with the presence of a health care administrator is statistically significant at the 0.05 level, suggesting that the presence of a health care administrator increases confirmed COVID-19 cases per 100 inmates by approximately six cases. The community engagement variable was not included in this regression because federal prison do not allow inmates to leave facility grounds.

	Coefficients	***Standard Error***	***t Stat***	***P-value***	***Lower 95%***	***Upper 95%***
Intercept	21.1092	4.1940	5.0331	0.0000	12.8700	29.3484
Federal	**11.2693**	4.9755	2.2650	**0.0239**	1.4949	21.0436
Female	-5.5108	3.3653	-1.6375	0.1021	-12.1220	1.1003
Percent Occupied	-4.3844	2.6982	-1.6249	0.1048	-9.6850	0.9162
Private	-8.1387	4.8101	-1.6920	0.0912	-17.5880	1.3107
Low/Minimum	**9.5853**	3.0933	3.0987	**0.0020**	3.5085	15.6621
Medium	2.6202	2.3570	1.1116	0.2668	-2.0102	7.2505
Administrative	-5.6017	7.9168	-0.7076	0.4795	-21.1543	9.9509
Cells	2.2974	2.4541	0.9361	0.3496	-2.5237	7.1186
Dormitories/Open	**-7.6315**	3.0833	-2.4752	**0.0136**	-13.6886	-1.5745
Adjacent Facilities	-0.6290	2.1991	-0.2860	0.7750	-4.9491	3.6912
Health Care Administrator	**5.7027**	2.6524	2.1500	**0.0320**	0.4921	10.9133
Number of Staff with Contact	0.0050	0.0029	1.6880	0.0920	-0.0008	0.0107

Table 6 (Above): Multivariate regression output; relationship between all facility characteristics and confirmed COVID-19 cases per 100 inmates. Significant values are highlighted.

Further statistical analysis was done by way of t-tests and ANOVA tests. T-tests were run on the level and type of prison and presence of a health care administrator. ANOVA tests were run on security level, housing type, and inmate sex. The tests were run to identify any statistical correlation between the variables listed above and the number of confirmed cases per 100 inmates. Based on the f and f-critical values produced from all of the ANOVA tests, there was no statistical significance as f-critical was greater than f, and the p-values were all greater than 0.05. The t-test showed no statistically significant relationship between the type of prison (private or public) and the rate of confirmed COVID-19 cases per 100 inmates as the p-value of 0.14 is not statistically significant at an alpha level of 0.05.

A p-value of 0.029, calculated through a t-test run on prison level (state or federal) asserts statistical significance at an alpha level of 0.05. A bivariate linear regression model associated with the prison level was run to investigate the < 0.05 p-values calculated in Table 6 (page 37) and from the t-test.

	Coefficients	***Standard Error***	***t Stat***	***P-value***	***Lower 95%***	***Upper 95%***
Intercept	24.8586	0.8935	27.8204	2.303E-117	23.1044	26.6127
Federal	**6.047**	3.2930	1.8364	**0.0667**	-0.4174	12.5119

Table 7 (Above): Bivariate regression relationship between type of prison and COVID-19 case rate per 100 inmates. Significant values are highlighted.

The following linear regression equation was created based on Table 7, where *b*=1 if the facility is federal:

Confirmed Cases per 100 inmates = 24.86 + 6.05 b

This regression indicates that federal prisons have 6.05 more confirmed cases per 100 inmates than state prisons. The calculated p-value carries no statistical significance at the 0.05 significance level. With such a small sample size, increasing alpha was warranted. Thus, the p-

value of 0.0667 is significant at the 0.10 significance level, suggesting that federal prisons have about six more COVID-19 cases per 100 inmates than the state prisons.

Furthermore, a p-value of 0.003 was calculated through the t-test run on the presence of health care administrator. This was statistically significance at an alpha level of 0.05. A bivariate linear regression model associated with the presence of a health care administrator was also run to further investigate the < 0.05 p-values calculated in both Table 6 and the t-test.

	Coefficients	***Standard Error***	***t Stat***	***P-value***	***Lower 95%***	***Upper 95%***
Intercept	19.6756	2.1983	8.9505	0.0000	15.3583	23.9929
Presence of Health Care Administrator	**6.6506**	2.4289	2.7381	**0.0064**	1.8803	11.4209

Table 8 (Above): Bivariate regression relationship between presence of health care administrator/manger and COVID-19 case rate per 100 inmates. Significant values are highlighted.

The following linear regression equation was created based on Table 8, where *b*=1 if there is a health care administrator/manger present:

Confirmed Cases per 100 inmates = 19.68 + 6.65 b

This regression suggests that correctional facilities with a health care administrator/manager on staff have 6.65 more confirmed cases per 100 inmates than state prisons. The calculated p-value was statistically significance at the 0.05 significance level.

A p-value of less than 0.0001 was calculated through the t-test run on the community engagement variable. This was significant at an alpha level of 0.05. A p-value of 0.007 was calculated through a bivariate linear regression run on inmate community engagement in state prisons.

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	28.6454142	1.26837096	22.5844135	3.2018E-81	26.1541815	31.1366469
Community Engagement	-6.6640523	1.9615375	-3.3973616	**0.00072768**	-10.516747	-2.8113573

Table 9 (Above): Bivariate regression relationship between community engagement in state prisons and COVID-19 case rate per 100 inmates. Significant values are highlighted.

The following linear regression equation was created based on Table 8, where *b*=1 if inmates have the ability to engage with the community:

Confirmed Cases per 100 inmates = 28.65 - 6.66 b

The regression suggests that if inmates have the ability to engage with the community either through off-site work or community service programs, the number of COVID-19 cases per 100 inmates decreases by approximately 7 cases.

It is important to note that given the significant p-values associated with Dormitory/Open housing and Low/Minimum security levels, a regression analysis was performed for housing type and security level (see Appendix Tables). However, significance was not found at the 0.05 significance level for any level. Alpha was not increased because the sample size was large.

5.22 Quantitative Data

Bivariate regressions run to identify statistically significant relationships among staff to inmate ratio, designated capacity or percent occupied and the number of confirmed positive cases per 100 inmates found no statistically significant relationship between the variables. The p-values associated with those variables were all greater than 0.05.

A multivariate linear regression was run to identify linear correlations among median household income, percent of residents at or below poverty level (by state), percent of state that identifies as white and confirmed COVID-19 cases per 100 inmates within state-run facilities

(see Table 10). Two state facilities were removed from the data for the purpose of the regression because they were significant outliers; both facilities are intake centers and experienced rates of over 140 confirmed cases per 100 inmates.

	Coefficients	***Standard Error***	***t Stat***	***P-value***	***Lower 95%***	***Upper 95%***
Intercept	-71.6261	26.0671	-2.7478	0.00616	-122.8071	-20.4450
Median Household Income	**0.0004**	0.0002	2.5674	**0.0105**	0.0001	0.0008
Percent of State Residents at or Below Poverty	91.6618	77.8859	1.1769	0.2397	-61.2624	244.5861
Percent of State identifies as white	**74.6044**	11.0032	6.7803	**2.5953E -11**	53.0003	96.2085

Table 10 (Above): Multivariate regression output; relationship between median household income of state resident, percent of residents at or below poverty level, percent white of state residents and confirmed COVID-19 case rate per 100 inmates. Significant values are highlighted.

The following multivariate regression was computed where b_1 = median household income of state residents (USD); b_2 = percent of state residents at or below poverty level; b_3 = percent of white state residents:

$$\textit{Confirmed Cases per 100 Inmates} = -71.626 + 0.0004(b_1) + 91.6618\ (b_2) + 74.604\ (b_3)$$

The correlation coefficient associated with b1 suggests that as median state household income increases by one USD, confirmed COVID-19 cases per 100 inmates increase by 0.0004. This means that as state median household income included in the study increases by $10,000, cases per 100 inmates increase by approximately four cases. This coefficient is statistically significant as the p-value of 0.01 is less than alpha (0.05). The coefficient correlated with states' percent of residents identifying as white is also statistically significant with a p-value of less than

0.0001. The coefficient suggests that as the percentage of white increases by one percent, the number of COVID-19 cases per 100 inmates increases by approximately 75. Lastly, the coefficient associated with b_2 suggests that as the percent of residents at or below poverty level increases by one percent, confirmed COVID-19 cases per 100 inmates increases by 91.6618 cases. However, this relationship is not statistically significant at the 0.05 significance level as the p-value of 0.24 associated with the percent of residents at or below poverty level is 0.24.

A similar multivariate regression was run to identify correlations between the explanatory variables and administered tests per 100 inmates. Less than half of the total facilities in this study were included in this regression as only 326 facilities reported the number of tests administered.

	Coefficients	***Standard Error***	***t Stat***	***P-value***	***Lower 95%***	***Upper 95%***
Intercept	10.6466	553.4949	0.0192	0.9847	-1078.2763	1099.5695
Median Household Income	0.0057	0.0037	1.5263	0.1279	-0.0016	0.0130
Percent of the State Residents at or Below Poverty Level	**-3726.9303**	1545.7597	-2.41117	**0.0165**	-6767.994	-685.8667
Percent of State Residents that identify as white	471.4640	252.3645	1.8682	0.0626	-25.0276	967.9555

Table 11 (Above): Regression output for relationship between testing rate per 100 inmates and median household income, percent of residents at or below poverty level and percent of state residents that are white. Significant values are highlighted.

The following multivariate regression was calculated to identify any relationship between poverty, race, household income, and the average number of tests administered per 100 inmates, where b_1 = median household income of state residents; b_2 = percent of state residents at or below the poverty level; b_3 = percent of white state residents:

$$\textit{Tests administered per 100 Inmates} = 10.647 + 0.001(b_1) - 3726.930\,(b_2) + 471.464\,(b_3)$$

The correlation coefficients associated with b_1 and b_3 carry no statistical significance as the p-value is larger than alpha (0.05). In contrast, the p-value associated with b_2 is 0.01, meaning the correlation coefficient connected to b_2 is statistically significant at 0.05 alpha. Thus, as the percent of residents at or below poverty level increases, the number of administered tests decreases by approximately 3,727 tests. This relationship is further explained in section 6.2.

6.0: DISCUSSION & ANALYSIS

6.1 Preliminary Findings

Overall, the results presented in section 5.1 of this paper exposed the differences in case rates among facilities by state and characteristic. The right-skewed data distribution can be explained in large part by two facilities, one in Michigan and one in Maryland, which reported over 140 confirmed cases per 100 inmates. The facilities are intake facilities, which suggests that the facilities' population is constantly changing and might not align with the facility population on February 1, 2020. While the facility in Michigan reported 179 confirmed cases per 100 inmates, removing this facility from the Michigan average only decreased the average by approximately four cases per 100 inmates (from 59.56 to 54.75). Thus, Michigan remained among the states with the highest rates of COVID-19 among the inmate population.

The data showed lower COVID-19 case rates among the inmate population in states such as Mississippi and Georgia. The lower rates of confirmed COVID-19 cases per 100 inmates are likely connected to lack of testing. Recent news reports exhibit that both Georgia and Mississippi correctional departments are underreporting COVID-19 cases within the states' correctional facilities. Although Mississippi reported some of the lowest COVID-19 infection rates among the state inmate population, "the state's rate of testing is also among the lowest" (Griesbach & Turcotte, 2021). In Georgia, there have been eye-witness accounts of COVID-19 "cases not reported on the Georgia Department of Corrections website," (Lindsay, 2020). The findings show the importance of analyzing COVID-19 rates in conjunction with testing rates.

In explaining the difference between male and female facilities, one plausible explanation is that those female facilities were less occupied than the male facilities. Higher rates of COVID-19 in Low/Minimum security prisons were likely a byproduct of the increased inmate freedom and inmate-to-inmate interaction compared to the other security levels. When understanding higher rates of confirmed COVID-19 cases among facilities with cell housing, it is important to think about the transmission of the virus; the virus is easily transmitted in enclosed spaces with the inability to social distance. It is almost impossible to social distance in cells, as cells are not solely single-person cells. Cell housing often consists of multi-person cells with two to four people in one cell, i.e., a small space with little airflow and distancing. Based on the nature of multi-cell housing and previous literature on COVID-19, multi-cell housing is a catalyst for the transmission of COVID-19.

6.2 Statistically Significant Findings

The bivariate regression associated with prison level showed statistical significance at the 0.10 level, meaning that federal facilities have higher rates of COVID-19. The T-test run on prison level asserted the same finding. High confirmed cases of COVID-19 among federal facilities could be a result of funding allocation. Many state correctional departments spend more money on a per-inmate basis than the federal prison system does. For example, in 2015, the average per-year-cost of a federal inmate was $31,978 (Bureau of Prisons, 2016). In the same year, 22 state correctional facilities spent at least $1,000 more on a per-inmate basis, and the average per-year-cost of an inmate across all state correctional departments was $33,274 (Vera Institute, 2016). This means that increased funding is connected to better health outcomes among the inmate population.

Additionally, the bivariate regression produced from the relationship between the presence of a health care administrator and COVID-19 rates per 100 inmates highlights statistical significance. This finding can be explained through testing availability. With health care administrators being responsible for health-related facility policies, health care delivery, and ensuring the health and well-being of the inmate population, a health care administrator's presence means more widely available testing for the inmates.

The statistical significance correlated with the community engagement variable can be explained in thinking about the types of facilities that allow inmates to engage with the community. Looking back at Table 6, we see that Open/Dormitory housing facilities have significant p-values associated with lower COVID-19 cases. Generally, facilities with Open/Dormitory housing allow inmates to leave facility premises: 52 percent of Dormitory/Open housing facilities had community engagement programs, 33 percent of Combo housing facilities

had community engagement programs and 17 percent of Cell housing facilities had community engagement programs. The environment of facilities with Open/Dormitory housing is more open and spread out than facilities with cell housing. Thus, such facilities have greater ability to social distance, one of the recommendations laid out by the CDC that helps in halting the spread of COVID-19. The two characteristics (Dormitory/Open housing and community engagement) often go hand-in-hand and the lower rates of COVID-19 associated with community engagement programs can be explained by the built environment of certain facilities.

No other statistical significance was identified between prison characteristics and confirmed COVID-19 cases per 100 inmates, indicating that no other characteristics directly result in higher rates of COVID-19 among the inmate population. The lack of statistical significance among the other independent variables proposes that the higher rates of COVID-19 in relation to the United States general population are connected to the average living conditions produced by all United States federal and state prisons. The unjust structure of the United States correctional system is not conducive to maintaining the health and well-being of the inmate population.

Findings linking higher percentages of white residents to higher rates of confirmed COVID-19 cases among the inmate population can be explained by thinking about the relationship between the white population and the inmate population. In states such as Vermont and Iowa, the resident populations are over 90 percent white, while the Black-to-white incarceration ratios are over 10:1 (Sentencing Project, 2020). This relationship is highlighted in Figures 5 and 6 (page 47).

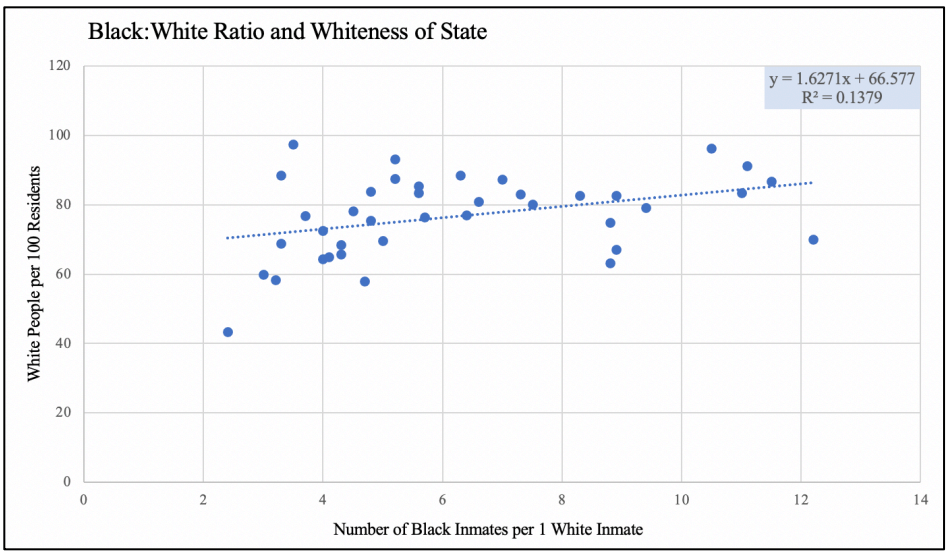

Figure 5 (Left): Highlights the relationship between the number of Black inmates to 1 white inmate (Sentencing Project, 2020) and number of white people per 100 residents (US Census Bureau, 2019).

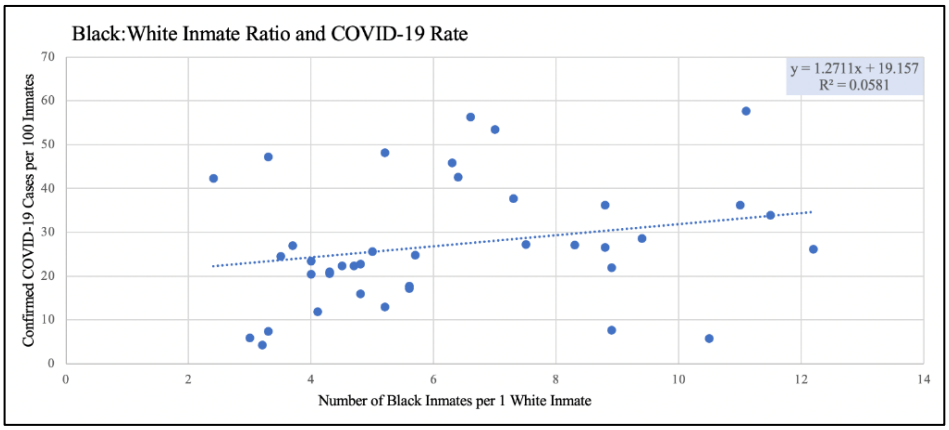

Figure 6 (Left): Relationship between number of Black inmates to 1 white inmate and the number of COVID-19 cases per 100 inmates.

Figure 5 highlights that as the number of Black inmates to one white inmate increases, the number of white residents per 100 residents also increases. A similar linear relationship is seen in Figure 6; as the number of Black inmates to one white inmate increases, the number of COVID-19 cases per 100 inmates also increases. The two figures together expose the racial tensions and injustice ingrained in the United States' underlying systems, including the criminal justice system. This exposes that 1) whiter states are incarcerating more Black people, and 2) whiter states are correlated with higher rates of COVID-19 among the inmate population. From this, the conclusion that whiter states do not prioritize the health and well-being of their predominantly Black inmate population can be drawn.

The statistical significance between median household income and COVID-19 rates among the inmate population suggests a negative relationship between wealthier people and the incarcerated population. This implies that wealthier people are less likely to prioritize the inmate population. Finally, there are a number of explanations for the notable relationship between the number of COVID-19 tests administered to the inmate population and state poverty level. First, it could be due to some states having less money to fund proper health care for the inmate population. This relationship could also be a result of state correctional departments simply not wanting to expose the extent to which COVID-19 has spread in their facilities, so departments administer less tests; thus, they are able to report less cases.

7.0 LIMITATIONS

One limitation was that states including Alaska, Arkansas, Delaware, Idaho, Maine, Missouri, Nebraska, Utah, and Wyoming did not provide enough available data on either COVID-19 within its facilities or population sizes, resulting in the inability to include those states in the study. This means that all 50 states were not represented in the dataset. Many private facilities also did not have all the necessary data on characteristics or data on COVID-19. The community engagement variable was omitted from the first multivariate regression (Table 6, pp. 35) because federal facilities do not allow inmates to leave facility premises. Additionally, Florida State Correctional Department did not report COVID-19 numbers on a per-facility basis. Therefore, only BOP Florida facilities were included in the study.

The dataset also had different sample sizes for the different characteristics. When looking at the data collection surrounding prison characteristics, the frequency of some characteristics in

the dataset were significantly higher than the characteristics' counterpart. For example, 692 state facilities were included in the dataset, while only 55 BOP facilities were included (see Table 5 for other characteristics). There were 33 private prisons and 714 public prisons; this made some characteristics more challenging to analyze and interpret.

Another limitation to this study was that the data relies on states and the BOP to accurately report on COVID-19 cases; many states conducted limited testing meaning that the COVID-19 rates among the inmate population were deflated. While section 6.0 presents an explanation for why federal facilities experienced higher rates of COVID-19 compared to state facilities, another explanation is connected to the limitation that states were underreporting COVID-19 cases.

The PREA reports used to collect data on characteristics also presented a limitation as the format of the reports differed from state to state. Some reports were very clear, while others were missing data or were not as direct.

Finally, there were limitations regarding the timing of the data collection. The dataset is centered around COVID-19 cases/deaths. To keep the data in this study consistent, COVID-19 and prison population counts were collected from the same times; the time period selected for COVID-19 case count and death count is all COVID-19 data collected from the start of the pandemic up until January 15, 2021. This time period was selected because this COVID-19 focused research has a limited timeframe, and COVID-19 cases and related deaths are continuously changing. This presented a challenge given that the COVID-19 data was based on data collected on or before January 15, 2021. It was not based on the entirety of the COVID-19 pandemic, as the pandemic persists to date.

8.0 RECOMMENDATIONS

The findings of this study show the United States' incarcerated population is at increased risk of contracting an infectious disease during a public health crisis like the COVID-19 pandemic. The general environment created within correctional facilities amplifies the spread of diseases particularly, airborne diseases.

8.1 Increased Transparency

The limitations to this research unveil the lack of transparency and disconnect between prisons and the general public. At the time of this study, data on COVID-19 cases and death within prisons was not reported for every state correctional department. Some state correctional departments had very low rates of testing. Data on BOP facility COVID-19 deaths was also unavailable. Additionally, very few private prisons were included in this study as private prisons were even less likely to report COVID-19 confirmed cases. The lack of data and information posed a limitation to this study. The lack of data also poses a public health hazard to correctional facility employees and surrounding facility communities as people living and working in and around the correctional facilities were and continue to be unaware of the rate of COVID-19 in their community.

Lack of transparency from prisons and correctional facilities was common among many correctional departments even before the COVID-19 pandemic. A 2020 Special Report on the California Department of Corrections by the Inspector General further exhibits the lack of transparency that prisons facilities, "found weaknesses in the department's collection and tracking of . . . data" (Wesley, 2021), which resulted in severe undercounting of staff misconduct. Thus, COVID-19 has extensively uncovered the need for proper health related data

tracking within correctional departments. Therefore, increased transparency through federal policy could seal the gap between prison facilities and their communities. Ideally, the policy would require prisons and other correctional facilities to report COVID-19 and other infectious disease data, including but not limited to case rate, the total number of cases, age, race, ethnicity and sex of inmates that contracted the virus. It is important to note that this data would not infringe upon individual inmates' privacy as the data would not be connected to inmate identities. It would allow the community to members and employees to understand the risk COVID-19 and other infectious disease pose to them. People have the right to know about the health and well-being of their community. Increased transparency would also enable possible research discussed in 9.1 to be completed thoroughly. In-turn, this would enable correctional departments to better their approaches to disease outbreaks.

General transparency on the health care delivery within individual facilities is also important. The prison characteristic data for this study was acquired from Prison Rape Elimination Act reports (PREA Reports). The PREA reports require audits of incarceration facilities every three years and have information on the designated capacity, security level, number of staff etc. The goal of the audits is the ensure the facilities are adhering to policy put in place by the Prison Rape Elimination Act. A number of the PREA reports also included information on access to health care. In many cases, however there was little to no mention of the state of health care access. Additionally, while many states "set minimum standards for the operation of detention facilities," (LOA, 2021) it is clearly not enforced. Thus, this policy recommendation can take a step further by implementing a second federal policy that requiring inspection of prisons, similar to that of the PREA audits. The law would ensure that facilities adhere to proper health and health care delivery standards. This policy would assist in

addressing the disconnect between prison health and health care and the public. The law would also outline any revised standards for prisons and aim to eliminate any health care delivery misconduct through bi- or tri-yearly facility inspections. An inspection and audit of this form would hold facilities accountable for providing proper preventative and reactive health care to their inmate populations.

8.2 Shared Emergency Response Plan

The assumption that correctional facilities were unprepared to deal with a highly contagious virus can be made solely based on the rate of COVID-19 across the facilities included in this research. It is important that correctional facilities have emergency response plans that can be carried out in the case a virus like COVID-19 spreads again. The development of a shared emergency health response plan by the BOP, state correctional departments in conjunction with the Center for Disease Control would be a proactive step in preventing the unjust and extreme spread of viruses such as COVID-19 among the inmate population. The shared emergency response plan would provide a set of guidelines for correctional facilities to follow if there is another public health emergency. The guidelines would be based on the experiences of the facilities during COVID-19.

A shared plan would allow correctional departments to come together with groups such as the CDC and put all their COVID-19 experiences together to identify policies and precautions that are both successful in combating the spread of an infectious disease and realistic in terms of implementation. The plan would develop prevention strategies such as how to ensure the immediate enactment of social distancing and termination of in-person visits, identification of quarantine cells, employment of testing and quarantining programs for all inmates entering

facilities, implementation of testing plan for staff and inmates and recognizing the percent of the emergency budget needed to successfully implement the response plan.

One component that is in the control of correctional facilities is understanding where they went wrong, learning from the mistakes and fixing it for the next time the facility must deal with the outbreak of an infectious disease. The development of a shared emergency response plan based on experiences and data would better equip correctional facilities to confront pandemics and other contagious disease outbreaks in the future, which would protect the already vulnerable inmate population.

8.3 Vaccination Plan

Since mid-December 2020 the United States has been working on efficiently rolling out the COVID-19 vaccine. The roll-out plan looks to prioritize Americans who are most at risk of exposure to COVID-19 and also distribute it in a timely fashion. State vaccination plans have prioritized vaccinating the inmate population. The following states have inmates in the first phase of the vaccination plan: Alabama, Alaska, Arizona, California, Connecticut, Delaware, Iowa, Kansas, Mississippi, Montana, Massachusetts, Maryland, Nebraska, New Jersey, New Mexico, North Carolina, North Dakota, Oklahoma, Virginia, Washington and Oregon (Tolbert, Kates, & Michaud, 2021). The prioritization of inmates in state vaccination plans is a response to the extraordinarily high rates of COVID-19 among the inmate population, which are further exposed by the results of this study.

One of the characteristics analyzed in this study was inmate ability to leave facility premises and engage with the community through community work programs or community service. The statistical significance associated with the community engagement variable shows

that inmate ability to engage with the community does not increase the rates of COVID-19. This suggests that inmates are not the ones bringing the virus into the facilities. Instead, people, including employees and volunteers and other facility personnel who come in and out of the facilities daily are bringing the virus into the facilities. Thus, based on the community engagement variable, prison staff and other incarceration facility personnel should be prioritized in vaccine roll-out plans.

Prioritizing incarceration facility staff in the vaccine roll-out plans would not only protect the frontline employees, but it would also protect inmates. This is not to say that inmates should not be in phase one or phase two of state vaccine roll-out plans. The recommendation simply suggests vaccinating prison facility employees first, which will subsequently protect the inmate population's health. This recommendation is an immediate recommendation, and if implemented, there would be a direct impact on the health and well-being of the current federal and state inmate population.

9.0 CONCLUSION

As researchers continue to conduct studies to understand both short and long-term public health impacts of COVID-19, inequities in relation to the health and well-being of marginalized populations will continue to be revealed. In researching the question: *Which characteristics of United States federal and state prisons make them more prone to high rates of COVID-19 among the inmate population?,* this research aimed to identify particular prison characteristics that were directly connected to higher rates of confirmed COVID-19 cases among the inmate population, in comparison to the general population. Data was collected from a variety of sources including

individual PREA reports, UCLA COVID-19 Behind Bars Prison Project and the most recent US Census.

Statistical significance regarding rates of confirmed COVID-19 cases was found in relation to prison level, the presence of a health care administrator, inmate ability to engage with the community, black-to-white inmate ratio of a state and state median household income. The higher rates of COVID-19 in federal prisons can be explained through lower per-inmate funding. Another plausible explanation for this is state correctional departments' lack of COVID-19 reporting. The increased rate of COVID-19 cases among correctional facilities with a health care administrator on staff is likely a result of more accessible testing programs within those facilities. The lower rates of COVID-19 associated with the community engagement variable are likely a result of the environment created by the type of facilities that allow inmates to leave the premises.

There was little statistical significance found between confirmed COVID-19 rates and the other prison characteristics investigated. This highlights that the current conditions average American inmates living in, regardless of security, type, etc., are not conducive to maintaining one's health. Moreover, it brings to light the fact that while constitutionally speaking all inmates have the right to health care, the state and federal inmate population's health and well-being is not prioritized by the United States.

Additional data added to the dataset to understand the relationship between state and prison demographics, and COVID-19 rates exposed that the whiteness of the state is directly correlated to higher incarceration rates of Black people and also higher COVID-19 rates among the inmate population. The main findings of this study underscore the notion that the United

States does not prioritize the health of marginalized populations including that of the inmate population and more specifically the predominantly Black inmate populations.

9.1 Future Research

This study is merely the start of research surrounding COVID-19 and prisons, and more broadly, research focusing on COVID-19 and group living facilities. While the focal point of this research is centered on the relationship between incarceration facility characteristics and COVID-19, it did not analyze the differing impacts that policies and regulations implemented by prisons, with a goal of curbing the spread of COVID-19, had on COVID-19 infection rate within the facilities. Further research can be done to understand what regulations did and did not help in limiting the spread of COVID-19 among inmates. Additionally, the Bureau of Justice Statistics could conduct qualitative research to understand the inmate experience during the pandemic with the goal of improving incarceration facilities' response to public health crises. While all inmates have the right the health care, it would be useful to understand the level of health care access inmates received during the pandemic and also hear health care concerns of the inmate population. Similarly, researching different health care delivery models within the prison facilities to see if there is any correlation between a certain model of health care delivery and COVID-19 case rate would be just another avenue of further research. The research recommendations above would aid the Federal Bureau of Prisons and state correctional departments when confronting and preparing for infectious disease outbreaks and public health crises in the future.

Finally, this study also investigated the relationship between state prison demographics and COVID-19. To better understand the correlations between the COVID-19 and

race, acquiring the demographics, of the individual facilities, and demographics of inmates who contracted COVID-19 would enable a deeper understanding of any correlation between COVID-19 and certain demographics. An analysis of per-inmate spending for individual facilities and COVID-19 confirmed cases would highlight the relationship between inmate spending and COVID-19 infection rate. Research focusing on the racial demographics and facility spending per-inmate spending could expose injustices within state and federal prisons systems. It is important for the public to understand and be exposed to these correlations as such studies can be catalysts for correctional reform in the United States.

As data on COVID-19 and rates among marginalized populations, such as the inmate population becomes more widely available, it is crucial that academics use such data to disclose health care inequities that continue to endure in the United States.

10.0 APPENDIX

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	26.1554	1.3931	18.7744	0.0000	23.4174	28.8934
Dormitories/Open	-5.7448	3.0407	-1.8893	0.0595	-11.7208	0.2312
Cells	1.2055	2.6547	0.4541	0.6500	-4.0118	6.4228

Table 12 (Above): Regression output for analysis of housing. This was not evaluated at the 0.10 significance level because the sample size was large.

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	24.1412	1.6884	14.2983	0.0000	20.8229	27.4595
Low/Minimum	2.9378	2.8692	1.0239	0.3064	-2.7011	8.5766
Medium	2.3975	2.4793	0.9670	0.3341	-2.4752	7.2701
Administrative	-20.8741	13.3657	-1.5618	0.1191	-47.1424	5.3942

Table 13 (Above): Regression output for analysis of security level relative to High/Maximum security facilitates

11.0 BIBLIOGRAPHY

A Review of State Standards and Inspections for Local Detention Facilities (Publication). (2021). CA: Legislative Analyst Office.

ACLU. (n.d.). Overcrowding and other threats to health and safety. Retrieved February 17, 2021, from https://www.aclu.org/issues/prisoners-rights/cruel-inhuman-and-degrading-conditions/overcrowding-and-other-threats-health.

Arons, M. M., Hatfield, K. M., Reddy, S. C., Kimball, A., James, A., Jacobs, J. R., . . . Jernigan, J. A. (2020). Presymptomatic sars-cov-2 infections and transmission in a skilled nursing facility. *New England Journal of Medicine, 382*(22), 2081-2090. doi:10.1056/nejmoa2008457.

Black, N., & Griffin, D. (2020, August 08). This Texas federal prison has been the Hardest-hit by Covid-19. Retrieved February 17, 2021, from https://www.cnn.com/2020/08/08/us/federal-prison-coronavirus-outbreak-invs/index.html.

BOP Medical Care Levels. (2017, May 17). Retrieved from https://cic.dc.gov/sites/default/files/dc/sites/cic/page_content/attachments/BOP%20Medical%20Care%20Levels%205.17.17.pdf.

Bronson, J., & E, A. (2019, April). Prisoners in 2017. Retrieved from https://www.bjs.gov/content/pub/pdf/p17.pdf.

Brooks, A. (2019, June 17). Breaking down the different types of prisons in America. Retrieved February 17, 2021, from https://www.rasmussen.edu/degrees/justice-studies/blog/different-types-of-prisons/.

Burki, T. (2020). Prisons are "In no Way equipped" to deal with covid-19. *The Lancet, 395*(10234), 1411-1412. doi:10.1016/s0140-6736(20)30984-3.

Bureau of Prisons. (2016, July 19). Annual determination of average cost of incarceration. Retrieved February 10, 2021, from https://www.federalregister.gov/documents/2016/07/19/2016-17040/annual-determination-of-average-cost-of-incarceration.

California Ebudget - Budget Summary. (n.d.). Retrieved February 17, 2021, from http://www.ebudget.ca.gov/budget/publication.

Cantú, A. (2020, September 28). Prisoners describe Official missteps at the center of Michigan's Worst Coronavirus outbreak. Retrieved February 17, 2021, from https://theintercept.com/2020/09/28/covid-prison-outbreak-michigan-coronavirus.

Carson, Ann E. (2020, October). Prisoners in 2019. Retrieved from https://www.bjs.gov/content/pub/pdf/p19.pdf.

Castle, J. (2020, April 26). Coronavirus outbreak At Marion, Ohio prison: What we know so far. Retrieved February 17, 2021, from https://www.marionstar.com/story/news/2020/04/21/coronavirus-marion-ohio-prison-what-we-know-correctional-covid-19-outbreak/5165016002.

CDCR facility Locator. (2021, February 01). Retrieved February 17, 2021, from https://www.cdcr.ca.gov/facility-locator.

Coronavirus disease 2019 (COVID-19). (2020). Retrieved February 17, 2021, from https://www.cdc.gov/coronavirus/2019-ncov/index.html.

COVID-19 in correctional and detention facilities - United STATES, February–April 2020. (2020, May 14). Retrieved February 17, 2021, from https://www.cdc.gov/mmwr/volumes/69/wr/mm6919e1.htm?ref=theprepping-com.

Delgado, M., & Humm-Delgado, D. (2009). *Health and Health Care in the Nation's Prisons*. Lanham, MD: Rowman & Littlefield.

Department of Justice, Federal Prison System. (2020). *FY 2020 Performance Budget*. Washington DC.

Farmer, Paul. (2002). The House of the Dead: Tuberculosis and Incarceration. Pp. 239–57 in Invisible Punishment: The Collateral Consequences of Mass Imprisonment, edited by Marc Mauer and Meda

Federal Prison System, Department of Justice. (2018). *FY 2019 Budget Request*.

Flynn, M. (2017, November 03). Poor health care moving from prison to jails. Retrieved February 17, 2021, from https://www.calhealthreport.org/2013/05/15/poor-health-care-moving-from-prison-to-jails.

Gandhi, M., Yokoe, D. S., & Havlir, D. V. (2020). Asymptomatic transmission, the Achilles' heel of current strategies to control covid-19. *New England Journal of Medicine, 382*(22), 2158-2160. doi:10.1056/nejme2009758.

Graves, S. (2019, April). Most State Corrections Spending Support Prison Operations or Health-Related Services, Including Mental Health Care. Retrieved from https://calbudgetcenter.org/wp-content/uploads/2019/04/Fact-Sheet_Most-State-Corrections-Spending-Supports-Prison-Operations-or-Health-Related-Services-Including-Mental-Health-Care_04.2019.pdf.

Grawert, A., Merkl, T., & Eisen, L. (2020, November 04). The History of Mass Incarceration. Retrieved February 17, 2021, from https://www.brennancenter.org/our-work/analysis-opinion/history-mass-incarceration.

Griesbach, R., & Turcotte, M. (2021, January 28). Limited testing in Mississippi prisons may be Obscuring Virus's Toll. Retrieved February 10, 2021, from https://www.nytimes.com/2021/01/28/us/mississippi-prisons-covid.html.

Gunter, A., & Callahan, B. (2021, January 07). COVID-19 in Prisons: Two charts show the virus spreading at an alarming rate. Retrieved February 10, 2021, from https://csgjusticecenter.org/2020/11/04/covid-19-in-prisons-two-charts-show-the-virus-spreading-at-an-alarming-rate.

Hawks, L., Woolhandler, S., & McCormick, D. (2020). COVID-19 in prisons and jails in the United States. *JAMA Internal Medicine, 180*(8), 1041. doi:10.1001/jamainternmed.2020.1856.

Hellewell, J., Abbott, S., Gimma, A., Bosse, N. I., Jarvis, C. I., Russell, T. W., . . . Van Zandvoort, K. (2020). Feasibility of Controlling covid-19 outbreaks by isolation of cases and contacts. *The Lancet Global Health, 8*(4). doi:10.1016/s2214-109x(20)30074-7.

Highest to lowest - Occupancy level (based on official capacity). (n.d.). Retrieved February 17, 2021, from https://www.prisonstudies.org/highest-to-lowest/occupancy-level?field_region_taxonomy_tid=22.

Highest to lowest - Occupancy level (based on official capacity). (n.d.). Retrieved February 17, 2021, from https://www.prisonstudies.org/highest-to-lowest/occupancy-level?field_region_taxonomy_tid=22.

Lind, D. (2020, June 18). The prison was built to hold 1,500 Inmates, it had over 2,000 Coronavirus cases. Retrieved February 17, 2021, from https://www.propublica.org/article/the-prison-was-built-to-hold-1500-inmates-it-had-over-2000-coronavirus-cases.

Lindsay, S. (2020, November 26). WGXA investigates shocking conditions in some Georgia prisons during pandemic. Retrieved February 10, 2021, from https://wgxa.tv/news/local/wgxa-investigates-shocking-conditions-in-some-georgia-prisons-during-pandemic.

Lyman, B. (2020, September 03). Federal court orders monitor for mental health care in Alabama prisons. Retrieved February 17, 2021, from https://www.montgomeryadvertiser.com/story/news/2020/09/03/federal-court-orders-monitors-mental-health-care-alabama-prisons/5708142002.

Maruschak, L., Unangst, J., & Berzofsky, M. (n.d.). *Special Report: Medical Problems of State and Federal Prisoners and Jail Inmates, 2011-12* (US Department of Justice, Bureau of Prison Statistics).

Massoglia, M., & Pridemore, W. A. (2015). Incarceration and health. *Annual Review of Sociology, 41*(1), 291-310. doi:10.1146/annurev-soc-073014-112326.

Mauer, M. (n.d.). The House of the Dead: Tuberculosis and Incarceration. In 1199539480 895578242 M. Meda Chesney-Lind (Ed.), *Invisible Punishment: The Collateral Consequences of Mass Imprisonment* (pp. 239-257).

McCarthy, N. (2018, January 30). The world's most Overcrowded prison Systems [Infographic]. Retrieved February 17, 2021, from https://www.forbes.com/sites/niallmccarthy/2018/01/26/the-worlds-most-overcrowded-prison-systems-infographic/.

McCullough, J. (2017, July 20). Heat is part of life at Texas prisons, but federal judge orders one to cool it. Retrieved February 17, 2021, from https://www.texastribune.org/2017/07/20/texas-prison-heat-air-conditioning-lawsuit.

Ndeffo-Mbah, M., Vigliotti, V., Skrip, L., Dolan, K., & Galvani, A. (2018, March 16). Dynamic models of infectious disease transmission in prisons and the general population. Retrieved February 17, 2021, from https://doi.org/10.1093/epirev/mxx014.

NIH. (2020). Why COVID-19 testing is the key to getting back to normal. Retrieved February 17, 2021, from https://www.nia.nih.gov/news/why-covid-19-testing-key-getting-back-normal.

PEW Charitable Trusts. (2018, July). State Prisons and the Delivery of Hospital Care. Retrieved from https://www.pewtrusts.org/-/media/assets/2018/07/prisons-and-hospital-care_report.pdf.

Prison overcrowding. (2020, August 06). Retrieved February 17, 2021, from https://www.penalreform.org/issues/prison-conditions/key-facts/overcrowding/.

Saloner, B., Parish, K., Ward, J. A., DiLaura, G., & Dolovich, S. (2020). Covid-19 cases and deaths in federal and state prisons. *JAMA, 324*(6), 602. doi:10.1001/jama.2020.12528.

San Quentin's Coronavirus OUTBREAK shows Why 'herd immunity' could mean disaster. (2020, August 11). Retrieved February 17, 2021, from https://www.latimes.com/california/story/2020-08-11/san-quentin-coronavirus-herd-immunity-covid-19.

Smith, J., Vaughn, J., Weill-Greenberg, E., & Corey, E. (2020, July 4). Obscure new jersey 'TREATMENT' facility has a HIGHER Covid-19 death rate than any prison in the country.

Retrieved February 17, 2021, from https://theappeal.org/obscure-new-jersey-treatment-facility-has-a-higher-covid-19-death-rate-than-any-prison-in-the-country.

Solis, J., Franco-Paredes, C., Henao-Martínez, A. F., Krsak, M., & Zimmer, S. M. (2020). Structural vulnerability in the U.S. revealed in three waves of covid-19. *The American Journal of Tropical Medicine and Hygiene, 103*(1), 25-27. doi:10.4269/ajtmh.20-0391.

Stanley, L. L. (1919). Influenza at San Quentin prison, California. *Public Health Reports (1896-1970), 34*(19), 996. doi:10.2307/4575142.

Texas Department of Criminal Justice - Agency Operating Budget. (2020). Retrieved from https://www.tdcj.texas.gov/documents/bfd/FY2020_Operating_Budget.pdf.

Tolbert, J., Kates, J., & Michaud, J. (2021, February 01). The COVID-19 Vaccine priority line continues to change as states make further updates. Retrieved March 03, 2021, from https://www.kff.org/policy-watch/the-covid-19-vaccine-priority-line-continues-to-change-as-states-make-further-updates/.

United States Government Accountability Office. (2012, September). *Bureau of Prisons*.

US Legal. (n.d.). State Prison Law and Legal Definition. Retrieved December 2, 2022, from https://definitions.uslegal.com/s/state-prison.

Vera Institute. (2016). Annual determination of average cost of incarceration. Retrieved February 10, 2021, from https://www.vera.org/publications/price-of-prisons-2015-state-spending-trends/price-of-prisons-2015-state-spending-trends/price-of-prisons-2015-state-spending-trends-prison-spending.

Wei, W. E., Li, Z., Chiew, C. J., Yong, S. E., Toh, M. P., & Lee, V. J. (2020). Presymptomatic transmission OF sars-cov-2 — Singapore, January 23–March 16, 2020. *MMWR. Morbidity and Mortality Weekly Report, 69*(14), 411-415. doi:10.15585/mmwr.mm6914e1.

Wesley, R. W. (2021, February 16). SPECIAL REVIEW The California Department of Corrections and Rehabilitation [Letter to Governor of CA and Legislative Leaders]. Office of the Inspector General, Sacramento, California.

WHO. (n.d.). Coronavirus Disease (COVID-19) Dashboard. Retrieved April 5, 2021, from https://covid19.who.int/?gclid=CjwKCAjwiOv7BRBREiwAXHbv3DYENSXf-GJOupOiLjVugXypXzZbhSH0oNH9Fjxxbm5EHNO70b12bxoCJcYQAvD_BwE.

Zuckerman, J. (2020, September 22). Coronavirus death TOLL SURPASSES 100 in Ohio prisons. Retrieved February 17, 2021, from https://highlandcountypress.com/Content/In-The-News/Headlines/Article/Coronavirus-death-toll-surpasses-100-in-Ohio-prisons/2/73/60273.

11.1 Bibliography – Data Collection

Alabama DOC. (n.d.). The Prison Rape Elimination Act 2003 (PREA). Retrieved December 29, 2020, http://www.doc.state.al.us/prea.

Arizona DCRR. (n.d.). Reports. Retrieved December 29, 2020, from https://corrections.az.gov/reports-documents/reports.

California CDRC. (n.d.). PREA Annual Reports and Audits. Retrieved December 29, 2020, https://www.cdcr.ca.gov/prea/prea/reports-audits.

Colorado DOC. (n.d.). Prison Rape Elimination Act (PREA). Retrieved December 29, 2020, from https://coloradoc2.migrate.acquia.com/pacific/cdoc/prison-rape-elimination-act-prea.

Connecticut Judicial Branch. (n.d.). PREA Reports. Retrieved December 29, 2020, from https://www.jud.ct.gov/PREA/reports.html.

Dolovich, S., Evertt, M., Marquez, N., & Johnson, H. (n.d.). UCLA law Covid-19 Behind Bars Data Project. Retrieved February 17, 2021, from https://law.ucla.edu/academics/centers/criminal-justice-program/ucla-covid-19-behind-bars-data-project.

Federal Bureau of Prisons. (2019). *Allenwood FCC PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/caa/caa_prea_201712.pdf.

Federal Bureau of Prisons. (2017). *Aliceville PREA Audit* (Rep.). Retrieved December 25, 202, from https://www.bop.gov/locations/institutions/ali/ALI_prea_201704.pdf.

Federal Bureau of Prisons. (2018). *Atlanta USP PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/atl/prea_atl_2018.pdf.

Federal Bureau of Prisons. (2018). *Beaumont USP PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/bml/bml_prea.pdf.

Federal Bureau of Prisons. (2017). *Bennettsville FCI PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/ben/BEN_prea_20170625.pdf.

Federal Bureau of Prisons. (2020). *Butner FCC PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/buh/BUH_prea.pdf.

Federal Bureau of Prisons. (2017). *Brooklyn MDC PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/bro/bro_prea_2017.pdf.

Federal Bureau of Prisons. (2017). *Canaan USP PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/caa/caa_prea_201712.pdf.

Federal Bureau of Prisons. (2019). *Carswell FMC PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/crw/prea_crw.pdf.

Federal Bureau of Prisons. (2018.). *Coleman FCC PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/cop/COP_prea.pdf.

Federal Bureau of Prisons. (2020). *Chicago MCC PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/ccc/CCC_prea_2020_0519.pdf.

Federal Bureau of Prisons. (2019). *Cumberland FCI PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/cum/CUM_prea.pdf.

Federal Bureau of Prisons. (2017.). *Dublin FCI PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/lof/prea_lof.pdf.

Federal Bureau of Prisons. (2018.). *Englewood FCI PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/eng/prea_eng.pdf.

Federal Bureau of Prisons. (2019). *El Reno FCI PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/ere/prea_final_report_ere.pdf.

Federal Bureau of Prisons. (2017). *Estill FCI PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/est/est_prea_0717.pdf.

Federal Bureau of Prisons. (2019). *Fairton FCI PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/fai/PREA_fai.pdf.

Federal Bureau of Prisons. (2017). *Fort Dix FCI PREA Audit* (Rep.). Retrieved December 25, 2020,
https://www.bop.gov/locations/institutions/ftd/PREA_final_report_ftd.pdf.

Federal Bureau of Prisons. (2018). *Fort Worth FMC PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/ftw/prea_ftw.pdf.

Federal Bureau of Prisons. (2019). *Gilmer FCI PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/gil/prea_gil_1119b.pdf.

Federal Bureau of Prisons. (2019). *Houston FDC PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/hou/prea_hou.pdf.

Federal Bureau of Prisons. (2017). *La Tuna FCI PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/lat/LAT_prea.pdf.

Federal Bureau of Prisons. (2020). *Lewisburg USP PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/lew/LEW_prea_20200325.pdf.

Federal Bureau of Prisons. (2018.). *Lompoc FCC PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/lof/prea_lof.pdf.

Federal Bureau of Prisons. (2019.). *Los Angeles MDC PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/trm/prea_trm.pdf.

Federal Bureau of Prisons. (2020). *Marion USP PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/mar/PREA_mar.pdf.

Federal Bureau of Prisons. (2018.). *Miami FDC PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/mim/prea_mim.pdf.

Federal Bureau of Prisons. (2019). *Milan FCI PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/mil/MIL_prea.pdf.

Federal Bureau of Prisons. (2017). *Montgomery PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/mon/prea_mon_17.pdf.

Federal Bureau of Prisons. (2018). *New York MCC PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/nym/NYM_prea.pdf.

Federal Bureau of Prisons. (2018). *Oklahoma City FTC PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/okl/prea_okl.pdf.

Federal Bureau of Prisons. (2018). *Otisville FCI PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/otv/otv_prea_2018.pdf.

Federal Bureau of Prisons. (2019). *Petersburg FCI PREA Audit* (Rep.). Retrieved December 25, 2020, https://d3hyxzxej5w0b8.cloudfront.net/locations/institutions/pet/PEX_prea.pdf.

Federal Bureau of Prisons. (2017). *Philadelphia FDC PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/phl/PHL_prea_2017.pdf.

Federal Bureau of Prisons. (2018). *Pollock FCC PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/pom/POM_prea.pdf.

Federal Bureau of Prisons. (2018). *Ray Brook FCI PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/rbk/prea_rbk.pdf.

Federal Bureau of Prisons. (2018). *Rochester FMC PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/rch/prea_rch.pdf.

Federal Bureau of Prisons. (2020). *Talladega PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/tdg/TDG_prea_20200504.pdf.

Federal Bureau of Prisons. (2018). *Tallahassee FCI PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/tal/TAL_prea.pdf.

Federal Bureau of Prisons. (2019). *Terminal Island FCI PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/trm/prea_trm.pdf.

Federal Bureau of Prisons. (2018). *Texarkana FCI PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/tex/prea_tex.pdf.

Federal Bureau of Prisons. (2019). *Thomson USP PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/tom/PREA_tom.pdf.

Federal Bureau of Prisons. (2017). *Tucson FCC PREA Audit* (Rep.). Retrieved December 25, 2020, https://www.bop.gov/locations/institutions/tcn/TCN_prea051217.pdf.

Georgia DCOR. (n.d.). PREA Audit Reports - 3rd Cycle. Retrieved December 29, 2020, http://www.dcor.state.ga.us/reports/prea-audit-reports-3rd-cycle.

Illinois DOC. (n.d.). Prison Rape Elimination Act (PREA). Retrieved December 29, 2020, from https://www.tn.gov/correction/sp/prison-rape-elimination-act.html.

Indiana DOC. (n.d.). IDOC Sexual Abuse and Sexual Harassment Reports. Retrieved December 29, 2020, from https://www.in.gov/idoc/prea/.

Iowa DOC. (n.d.). PREA Audits. Retrieved December 29, 2020, from https://doc.iowa.gov/administration/prea/prea-audits.

Kansas DOC. (n.d.). PREA Audits. Retrieved December 29, 2020, from https://www.docr.nd.gov/prea-information/adult-prea-report.

Kentucky DOC. (n.d.). Prison Rape Elimination Act (PREA). Retrieved December 29, 2020, from https://corrections.ky.gov/About/Pages/Prison-Rape-Elimination-Act-(PREA).aspx.

Maryland DPSCS. (n.d.). Prison Rape Elimination Act of 2003 (PREA) - Audit Reports. Retrieved December 29, 2020, https://dpscs.maryland.gov/prea/prea-audits.shtml.

Massachusetts DOC. (n.d.). PREA Reports. Retrieved December 29, 2020, from https://www.mass.gov/lists/prea-reports#audit-reports-.

Michigan DOC. (n.d.). Prison Rape Elimination Act. Retrieved December 29, 2020, from https://www.michigan.gov/corrections/0,4551,7-119-68854_70096---,00.html.

Minnesota DOC. (n.d.). PREA Information. Retrieved December 29, 2020, from https://mn.gov/doc/family-visitor/prea-policy/.

Mississippi DOC. (n.d.). PREA Audit Reports. Retrieved December 29, 2020, https://www.mdoc.ms.gov/Divisions/Pages/PREA-Audit-Reports.aspx.

Montana DOC. (n.d.). Facility PREA Audits. Retrieved December 29, 2020, from https://cor.mt.gov/PREA/ArchiveDocs.

Nevada OIG. (n.d.). PREA Audits. Retrieved December 29, 2020, https://doc.nv.gov/About/NDOC_Office_of_the_Inspector_General/2019_PREA_AUDITS.

New Hampshire DOC. (n.d.). Prison Rape Elimination Act. Retrieved December 29, 2020, from https://www.nh.gov/nhdoc/divisions/victim/prea.html#:~:text=The%20Federal%20Prison%20Rape%20Elimination,%40doc.nh.gov.

New Jersey OAG. (n.d.). PREA – Prison Rape Elimination Act. Retrieved December 29, 2020, https://www.nj.gov/oag/jjc/prea.html.

New Mexico DOC. (n.d.). Prison Rape Elimination Act (PREA). Retrieved December 29, 2020, https://cd.nm.gov/divisions/administrative-support/office-of-inspector-general/prison-rape-elimination-act/.

New York DOCCS. (n.d.). Final Audit Reports. Retrieved December 29, 2020, from https://doccs.ny.gov/final-audit-reports.

North Carolina DPS. (n.d.). Prison Rape Elimination Act. Retrieved December 29, 2020, from https://www.ncdps.gov/adult-corrections/prison-rape-elimination-act#cycle-3--2019---2022.

North Dakota CR. (n.d.). Adult PREA Report. Retrieved December 29, 2020, from https://www.docr.nd.gov/prea-information/adult-prea-report.

Ohio DCR. (n.d.). Prison Rape Elimination Act (PREA). Retrieved December 29, 2020, from https://www.drc.ohio.gov/prea.

Oklahoma DOC. (n.d.). State Facility PREA Audit Reports. Retrieved December 29, 2020, https://oklahoma.gov/doc/offender-info/prison-rape-elimination-act/state-facility-prea-audit-reports.html.

Oregon DOC. (n.d.). Prison Rape Elimination Act-- Information and Statistics on PREA and Reporting. Retrieved December 29, 2020, from https://www.oregon.gov/doc/prison-rape-elimination-act/Pages/statistics-and-reports.aspx.

Pennsylvania DOC. (n.d.). PREA Audits. Retrieved December 29, 2020, from https://www.cor.pa.gov/Facilities/Prison_Rape_Elimination_Act/Pages/DOC-Audits.aspx.

Rhode Island DOC. (n.d.). Prison Rape Elimination Act (PREA). Retrieved December 29, 2020, from http://www.doc.ri.gov/resources/prea.php.

Sentencing Project. (2020, July 28). State-by-state data. Retrieved February 10, 2021, from https://www.sentencingproject.org/the-facts/#map?dataset-option=SIR.

South Carolina DOC. (n.d.). Prison Rape Elimination Act (PREA) – Audit Reports. Retrieved December 29, 2020, http://www.doc.sc.gov/preaweb/prea_audits.html.

Tennessee DOC. (n.d.). Prison Rape Elimination Act (PREA). Retrieved December 29, 2020, from https://www.tn.gov/correction/sp/prison-rape-elimination-act.html.

Texas DCJ. (n.d.). Administrative Review & Risk Management Division — Prison Rape Elimination Act (PREA) Audits. Retrieved December 29, 2020, from https://www.tdcj.texas.gov/divisions/arrm/rev_stan_prea.html.

U.S. Census Bureau QUICKFACTS: United States. (2019). Retrieved February 10, 2021, from https://www.census.gov/quickfacts/fact/table/US/RHI125219.

Vermont DOC. (n.d.). Prison Rape Elimination Act (PREA). Retrieved December 29, 2020, from https://doc.vermont.gov/prison-rape-elimination-act-prea.

Virginia DOC. (n.d.). Prison Rape Elimination Act Reports. Retrieved December 29, 2020, https://vadoc.virginia.gov/general-public/prison-rape-elimination-act-reports/.

Washington DOC. (n.d.). Prison Rape Elimination Act (PREA). Retrieved December 29, 2020, from https://www.doc.wa.gov/corrections/prea/resources.html.

West Virginia DCR. (n.d.). PREA (Prison Rape Elimination Act). Retrieved December 29, 2020, from https://dcr.wv.gov/resources/Pages/prea.aspx#:~:text=Reporting%20Sexual%20Misconduct&text=If%20you%20were%2C%20or%20are,email%20dcrprea%40wv.gov.

Wisconsin DOC. (n.d.). Prison Rape Elimination Act. Retrieved December 29, 2020, from https://doc.wi.gov/Pages/AboutDOC/PrisonRapeEliminationAct.aspx.

Hawaii DOPS. (n.d.). PREA. Retrieved December 29, 2020, from https://dps.hawaii.gov/policies-and-procedures/pp-prea/.