Behind Bars: Insights into the Wellbeing of U.S. Prisoners*

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This research explores the causes and trends of prisoner deaths in the United States giving insights into their wellbeing in the prisons. We examine these rates both from a comprehensive standpoint and delve into demographic breakdowns, specifically considering gender and race. The paper analyse trends revealing a notable rise in deaths due to cancer and heart diseases. While AIDS-related deaths decline, homicides and drug/alcohol-related deaths show a slight increase. Comparisons across gender highlight differences in causes of death, with males experiencing higher rates of homicide, while females show a greater propensity for suicide. The examination of racial disparities exposes varying leading causes of death, emphasizing the urgent need for targeted interventions to improve the overall wellbeing of incarcerated individuals. The trends uncovered in this paper establish a foundation for further investigations into systemic problems and healthcare disparities in correctional environments.

*Code and data are available at: https://github.com/kaavyakalani26/prison_health.git and replication aspects are available at: https://www.socialsciencereproduction.org/reproductions/82b709e2-4aa0-40e8-8abe-195c51ae739b/index

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1 Introduction

The rising death rates among prisoners in the challenging environment of American jails show discrepancies, difficulties, and institutional failings. Issues including institutional prejudice and poor healthcare have been brought to light by a recent news report. For instance, the article talks about a study which discovered that although 0.85% of Americans with asthma were incarcerated, just 0.15% of asthma patients received treatment, an inequality that was more than five times higher (Murez 2023). Our goals are to identify the causes of the growing death rate, recognize the influence of demographics and highlight the significant negative effects of prison circumstances on the mental health of prisoners.

According to the US Justice Department's Office of the Inspector General (OIG), 187 individuals died by suicide inside Federal Bureau of Prisons(BoP) institutions between 2014 and 2021. The staff providing psychiatric services in the prisons stated that these deaths could have been avoided if the facilities followed protocol and provided inmates with the necessary resources and treatment. In addition, the study listed 56 "accidental" fatalities and 89 homicides that occurred during that time period. It also claimed that the BoP often neglected to appropriately punish employees for actions that led to the deaths (Levin 2024).

News reports highlight the critical need for a full understanding of prisoners' problems, going beyond simple statistics. This has sparked calls for reform and raised concerns about the efficacy of healthcare in prisons.

Homicides accounted for the second-highest number of fatalities recorded in the survey, with one prisoner, Bulger, being beaten to death by other inmates in 2018 (Press 2024). Editorials raise ethical concerns regarding the prison system by arguing that inequality in healthcare and the high rate of avoidable diseases among prisoners are reflections of larger social issues. Investigative articles highlight patterns of prejudice and neglect while exposing the realities of minorities within jails.

As we dig deeper, our focus goes beyond statistics, aiming to uncover trends of causes of prisoner death rates in the United States and examine these death rates both from a comprehensive standpoint and delve into demographic breakdowns, specifically considering gender and race. We also draw in Covid-19 data about new cases to support our analysis of wellbeing in prison.

The paper is further organised into three sections: Data, Results, and Discussion. In the Data section, I discuss how the datasets to be used for the analysis were obtained, pre-processed and cleaned. I will also explain the variables of interest in the datasets for my analysis. The Results section will then highlight and discuss the trends and associations found during the analysis. Lastly, the Discussion section will talk about some interesting trends found in Results in depth, link it to the real world and also highlight the weaknesses of our analysis.

2 Data

2.1 Source

For this analysis we have used multiple datasets. This paper uses the datasets available in the replication package of the original paper. The author of the original paper has collated a large range of files from multiple sources and we will be using some of the datasets from this collation. The raw datasets obtained from the replication package and cleaned and combined to form the datasets for this paper.

2.2 Methodology

For this paper, the datasets were cleaned and analysed using the statistical programming software R (R Core Team 2023) along with the help tidyverse (Wickham et al. 2019), knitr (Xie 2014), ggplot2 (Wickham 2016), here (Müller 2020), zoo (Zeileis and Grothendieck 2005), readxl (Wickham and Bryan 2023), writexl (Ooms 2024) and janitor (Firke 2023).

2.3 Datasets

2.3.1 cleaned_health_data_by_year.csv

This dataset is obtained by cleaning and combining the raw mass-incarceration.xlsx file and msfp0116stt02data.csv.

mass-incarceration.xlsx contains three sheets from which we will be using sheet 1 which contains time series data for incarceration from 1925-2019; each year is associated with the number of imprisoned individuals per 100k people, calculated from the total population and total number of inmates. We clean this file to get the counts of prisoners for 2006-2016.

msfp0116stt02data.csv contains counts for causes of deaths of the prisoners for the years 2001, 2006-2016. For our analysis we will not be considering 2001, but only 2006 to 2016 for the trends as it gives us a continuous period to observe trends over.

Cleaning and combining these lead to our cleaned_health_data_by_year.csv which contains:

- Year (between 2006 to 2016 inclusive)
- Disease (the cause of death of the prisoner)
- Count (the number of prisoners who died due the corresponding cause in the corresponding year)
- Prisoner_Count (the number of prisoners in that year)
- Proportion (the proportion of prisoners who died due the corresponding cause in the corresponding year)

A person becomes an entry in this dataset if they were a prisoner in any of the prisons in the United States of America between 2006 and 2016 inclusive and died in that year. The reason of the death is recorded among the following causes'categories: Illness, Cancer, Heart Diseases, Liver Diseases, Respiratory disease, AIDS-related, Suicide, Drug/alcohol intoxication, Accident, Homicide, All other reasons or illnesses.

2.3.2 cleaned_health_data_race.csv and cleaned_health_data_gender.csv

This dataset is obtained by cleaning the raw msfp0116stt09data.csv file.

msfp0116stt09data.csv contains counts for causes of deaths of the prisoners for the years 2001, 2006-2016 but segmented by demographic factors instead of time, such as gender, race, and age. For our analysis, we will be using the stats segmented by gender and race.

The information segmented by race leads to cleaned_health_data_race.csv which contains:

- x1 (the race of the prisoner)
- Cause (the cause of death of the prisoner)
- Count (the number of prisoners who died due the corresponding cause in the corresponding year)
- Proportion (the proportion of prisoners who died due the corresponding cause in the corresponding year)

A person becomes an entry in this dataset if they were a prisoner in any of the prisons in the United States of America in 2001 or between 2006 and 2016 inclusive and died in that year. The reason of the death is recorded among the following causes'categories: Illness, Cancer, Heart Diseases, Liver Diseases, Respiratory disease, AIDS-related, Suicide, Drug/alcohol intoxication, Accident, Homicide, All other reasons or illnesses. The race of the person is classified as Black, Hispanic, White or Other

The information segmented by race leads to cleaned_health_data_gender.csv which contains:

- x1 (the gender of the prisoner)
- Cause (the cause of death of the prisoner)
- Count (the number of prisoners who died due the corresponding cause in the corresponding year)
- Proportion (the proportion of prisoners who died due the corresponding cause in the corresponding year)

A person becomes an entry in this dataset if they were a prisoner in any of the prisons in the United States of America in 2001 or between 2006 and 2016 inclusive and died in that year. The reason of the death is recorded among the following causes'categories: Illness, Cancer, Heart Diseases, Liver Diseases, Respiratory disease, AIDS-related, Suicide, Drug/alcohol intoxication,

Accident, Homicide, All other reasons or illnesses. The gender of the person is either Male or Female in this dataset.

2.3.3 cleaned_covid19_data.csv

This dataset is obtained by cleaning the raw covidts01.csv file.

covidts01.csv contains the collective number of new cases and case rates per 100,000 among the incarcerated, prison staff, and the general population. The numbers are recorded on a daily basis from April 22, 2020 to the end of August 2020. For our analysis, we just look at the number of new cases per 100,000.

Cleaning of this file leads to cleaned_covid19_data.csv which contains:

- Date (the date of the new case)
- New_cases_per_100k (the number of new cases recorded on the specific date per 100k)
- Group (the group of people the case belonged to)

A person becomes an entry in this dataset if they were incarcerated or prison staff in any of the prisons or the general population in the United States of America between April 22, 2020 to the end of August 2020 inclusive and contracted Covid-19.

We will now analyse these datasets to uncover trends and draw conclusions.

3 Results

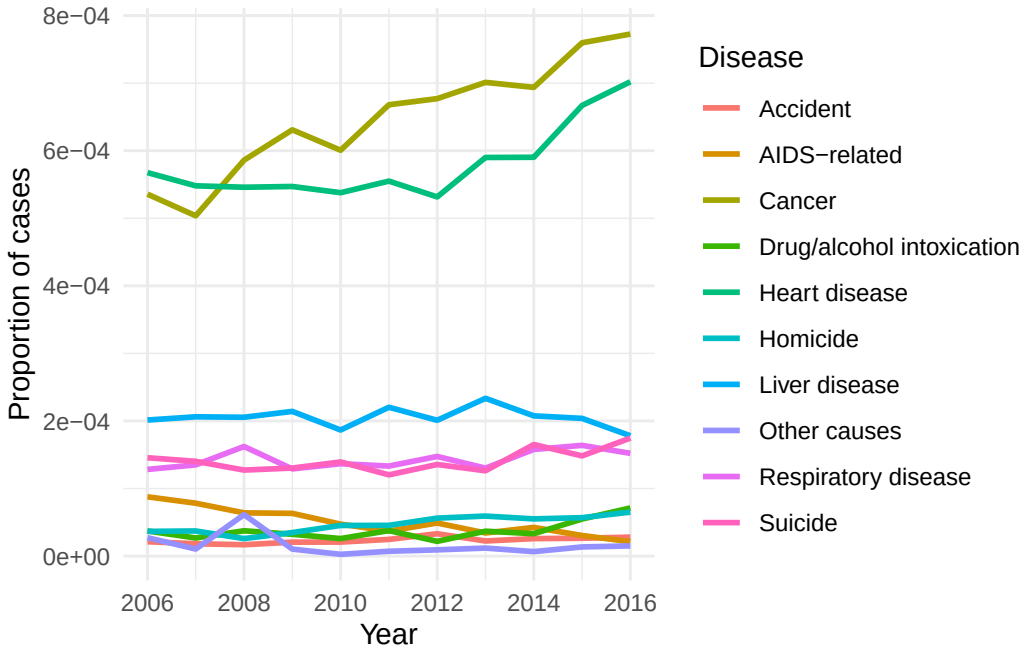

Figure 1: Causes of deaths among the prisoners from 2006 to 2016

Figure 1 compares shows the cause of death among prisoners due to different causes from 2016 to 2019. We can see that the deaths due to cancer and heart diseases have significantly increased over the years and remain to cause significantly more deaths than any of the other causes. We can also observe that there is a steady decline in the deaths caused by AIDS. The trends for death due to homicide and drug/alcohol usage saw a slight increase over the years. Deaths caused by accident remain fairly uncommon with only a very slight increase in 2012. The other causes have been almost the same with a few spikes over the years.

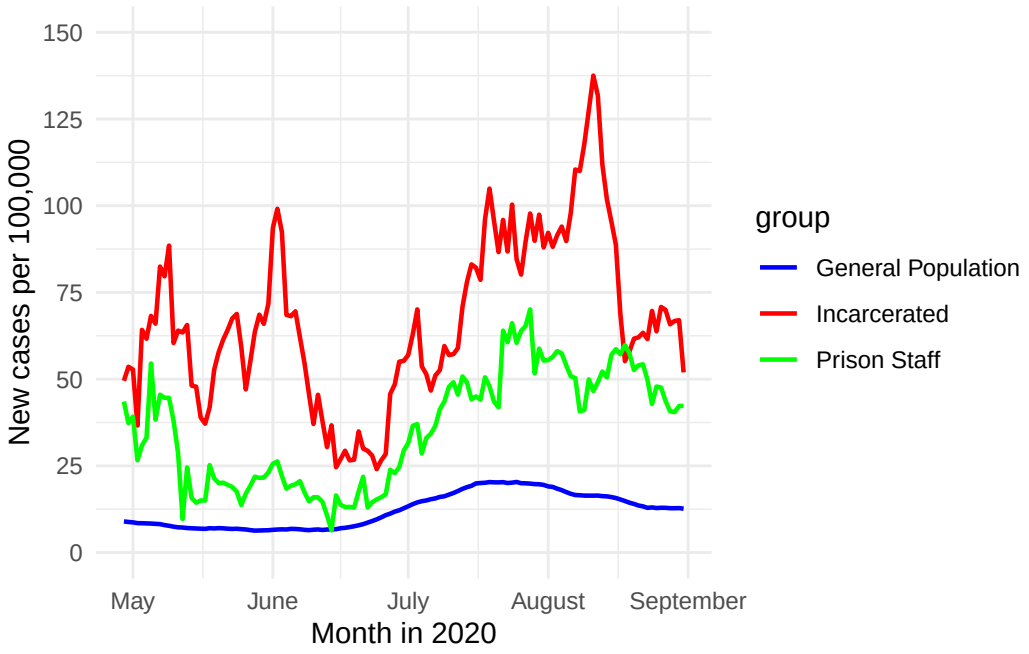

Figure 2: Moving Average of New Daily COVID-19 Cases in 2020

Figure 2 has been recreated from the original paper. This figure shows the number of new COVID-19 cases per 100,000 from April 22, 2020 to the end of August 2020. We notice that the number of new cases among the incarcerated is significantly more than the number of cases in the prison staff which is significantly more than the ones among the general population. We also see the general population population trend seems smoother compared to trend for the prison staff and the incarcerated.

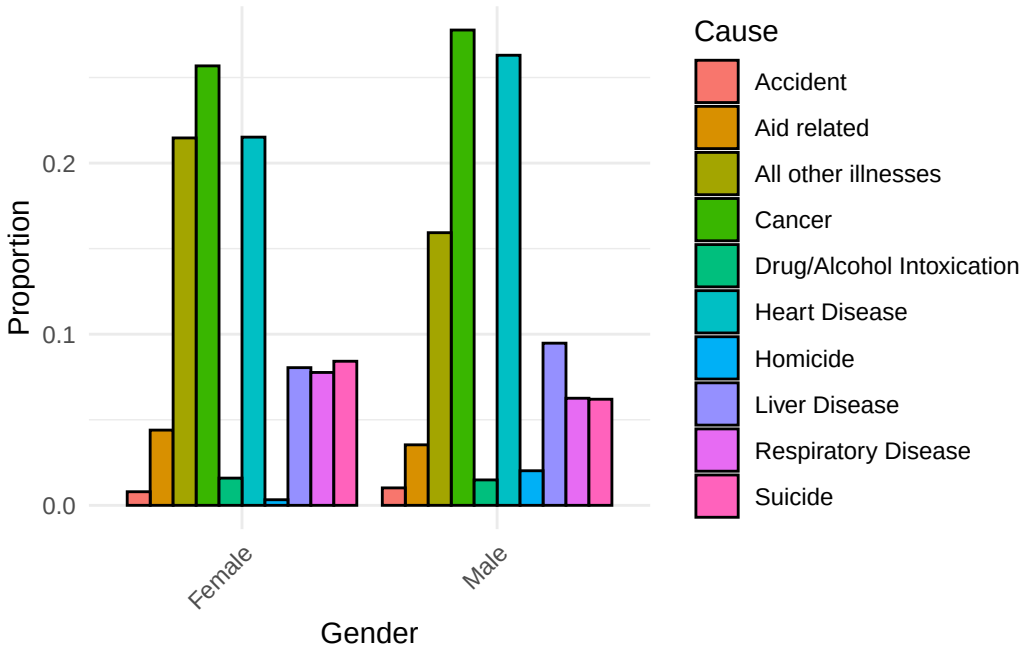

Figure 3: Causes of deaths among the prisoners by gender

Figure 3 compares the cause of death due to diseases between female and male prisoners. Both graphs have a similar general shape. Both sexes have the highest deaths caused by cancer and heart diseases, with males with a slightly higher rate than females. However, the least deaths in females are caused by homicide where its rate is almost negligible. While homicide in males is significantly less compared to other death causes, it is still significantly higher compared to its female counter part. The proportion of females committing suicide in prison is also higher than males committing suicide. On the other hand, the least deaths in males occurs due to accident. Liver disease and respiratory disease are almost comparable in females whereas for males, deaths caused by respiratory diseases are much lesser than deaths caused by liver disease.

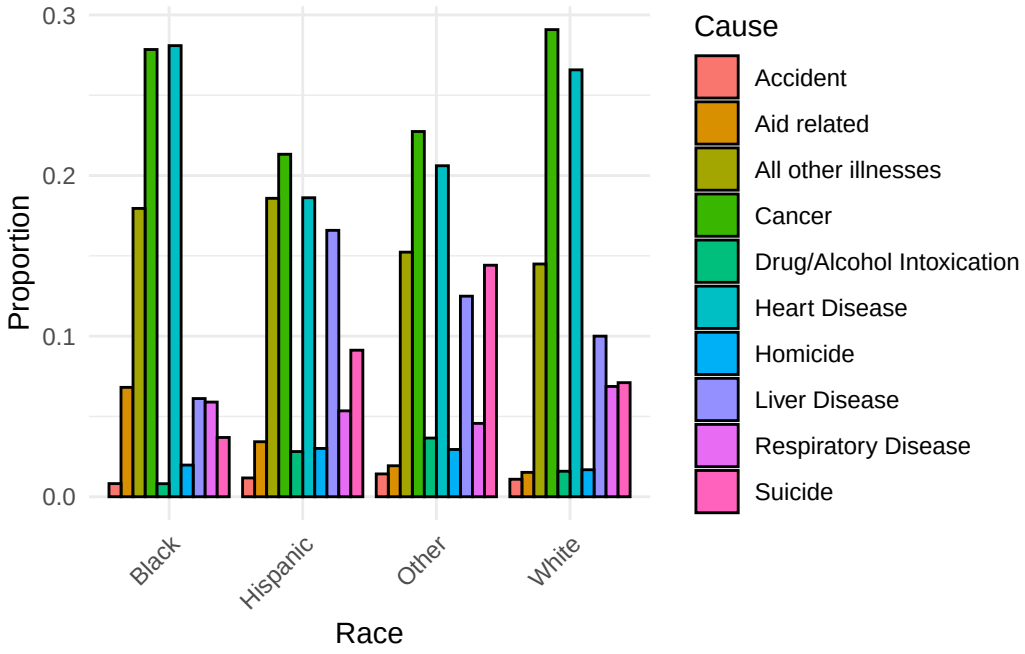

Figure 4: Causes of deaths among the prisoners by race

Figure 4 compares the causes of deaths in prison with respect to the different races of the prisoners. Among Black prisoners, heart diseases have the highest death rate while in Hispanic, White and other races, cancer has the highest death rate. Among the identified races, Hispanic prisoners have the highest suicide and homicide rates and also respiratory diseases. It can also be observed that Black prisoners have the highest rate of aids-related deaths, much higher than any of the other races. Another interesting trend that can be observed is that suicide is much higher as the reason for death for other races than Black, Hispanic and White prisoners.

4 Discussion

4.1 Learnings and Inferences

In this paper, the issue of mortality rates among U.S. inmates is analyzed and conducted. There are multiple datasets that have been utilized to investigate demographic differences, causes of death, and the potential impact of prison conditions. We also looked at the impact of the COVID-19 pandemic. The study digs deeper into a complex analysis of mortality trends, drawing from datasets that include information on gender, race, and specific causes of death. We have explored three different categories of the issue with the wellbeing of prisoners.

The first is the different causes of death in the incarcerated in the categories of gender(Male/Female). We found Cancer to cause most of the deaths in Male and Female prisoners. Heart disease was almost 0.25 times more prevalent in Male prisoners than in Female prisoners. A significant difference is found in the rates of suicide between the two genders. Female prisoners are more likely to commit suicide. This indicates a huge concern in the community of prisoners. It shadows upon the mental health resources that are not provided to those in need. Men are more prone to having disputes in the cell and hence more likely to see deaths due to homicides(Levin 2024). Our dataset from 10 years ago still supports this argument that is being discussed today.

Secondly, we analyzed a data set that shows us the different causes of death in prisoners categorized by race. We found that the prisoners of the black community were a lot more affected by aids than any other race. This also directly coincides with the fact today that incarcerated individuals with HIV represented about 2.2% of the U.S. total, but got only 0.73% of HIV antivirals, a threefold difference, researchers estimated (Murez 2023). Expanding on the suicide rates in prisons from this dataset we also noticed that the prisoners from other races have lost their lives to suicide more than black, hispanic and white prisoners. We have seen this ongoing trend in today's society as well where with depression, estimated prevalence was 15% in inmates compared to 7.64% in others. Severe mental illness was 13.12% compared to 4.89% in others (Murez 2023). We also see from this dataset and our analysis that hispanic prisoners have way more liver disease related deaths than any other race. The lack of health care in prisons is affecting the people inside and out at an alarming rate.

Our third data set shadows upon the negative impacts that COVID-19 had upon the prisoners in America. Due to the conditions of the prisons and the lack of care for the inmates, from our dataset we analyzed that the number of cases in prisoners were significantly higher than the number of cases outside prison. Despite considering the lack of healthcare and sanitary methods that should have been implemented in these isolated environments, these numbers were shocking. During the most difficult time of Covid-19 where the highest number of people were affected, if 70 people were affected outside, almost 100 people were affected inside these prisons. In a statistical study done in 2022, it was concluded that from the end of February 2020 to the end of February 2021, a total of 196 correctional staff in state and federal prisons died as a result of COVID-19(Nadel E. Ann Carson 2022).

In conclusion, the findings illuminate an alarming increase in prisoner mortality rates, particularly attributed to cancer and heart diseases. The persistent rise raises concerns about the overall well-being of incarcerated individuals. The vulnerability of inmates to COVID-19, as evidenced by the significantly higher infection rates among prisoners, highlights the urgent need for enhanced preventive measures and healthcare within correctional facilities. The study uncovers pronounced gender and racial differences in prison mortality. Males exhibit higher mortality rates across various causes, emphasizing the need for gender-specific healthcare strategies. Racial differences reveal distinct health challenges faced by different groups, necessitating tailored interventions. Exploring the influence of specific prison conditions, such as access to medical care and systemic biases, can provide deeper insights. Comparative studies with international datasets may offer a broader perspective on correctional healthcare. In all, our paper aims to strengthen the argument that the lack of attention provided to people in correctional facilities trying to improve their lives has reached an abysmal state. Instead of paying attention to these concerns in society, prisoners are often looked down upon and neglected. Our paper firmly portrays the basic fact that as humans, even prisoners have rights to access basic healthcare and clean living conditions that will help them in order to grow into better individuals in the right environment.

4.2 Weaknesses

While our analysis of prisoner mortality provides valuable insights, it is important to acknowledge certain limitations. The binary representation of gender in the original paper oversimplifies a complex spectrum, neglecting nuances beyond the male-female binary.

Additionally, the absence of data beyond 2016 restricts our ability to capture recent developments, and the lack of detailed information about other races limits a comprehensive understanding of racial disparities.

Also, the datasets' focus on co-ed adult prisons overlooks the diverse landscape of correctional facilities, including juvenile and gender-specific institutions, which could yield distinct insights.

Furthermore, the dataset gives collective information about the prisons in the US. The inclusion of regional split information could help us uncover regional variations in behavior and pre-existing medical conditions to name a few factors.

Lastly, exploring the intersectionality of race and gender would provide a more nuanced understanding of the complex factors influencing prisoner mortality.

4.3 Next Steps

To take our study one step beyond, we could look for datasets that would fulfill the weaknesses of our datasets and combine that with our existing data. This could strengthen the general

investigation that we are trying to make. We could also explore the data of other countries with either similar geography or demographic to compare how each of the prison systems perform under the general well-being category.

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