Depopulating NYC Jails in the Onset of the Coronavirus Outbreak

An Analysis of Inmate Population Fluctuations in NYC Open Data

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Abstract:

As New York City's coronavirus outbreak surged in late March 2020, city officials took measures to depopulate the New York City jail system by discharging hundreds of inmates. As a result, the jail population dropped from about 5,000 to about 3,300 in the span of two weeks. From my analysis of the dataset made available on NYC Open Data, I find that the March 2020 drop in population was largely driven by a higher-than-expected number of detainee discharges, a slightly higher-than-expected number of city sentenced inmate discharges, and crucially, a dramatic drop in inmate admissions. Length of time spent in jail was much more closely correlated with likelihood of discharge than inmate age. In other words, the inmates discharged tended to fit the profile of inmates that the city felt needed to be in jail the least. This indicates that the de Blasio administration's discharge and admission policies at this time were focussed on reducing the jail population as much as possible, rather than purely discharging specific at-risk individuals. It also indicates that, even after multiple efforts by the city and state government to reduce jail populations and prevent "unnecessary" detentions, there were still people in jail in March 2020, who by some standards did not "need" to be there.

Introduction

As New York City's coronavirus outbreak surged in late March 2020, city officials and public defenders became alarmed that inmates in the city's jails were especially vulnerable. "A storm is coming," wrote the city jail system's top physician, Dr. Ross MacDonald, in a tweet. "We cannot socially distance dozens of elderly men living in a dorm, sharing a bathroom," he wrote, asking readers to imagine the jail as a "cruise ship recklessly boarding more passengers each day." As of Saturday, March 14th, Rikers Island, the largest of the city's jails, had confirmed 38 coronavirus cases, up from eight the previous day. At that rate of unrestrained exponential growth, the entire jail system, with its 5,300 inmates and more than 1,000 employees, could have been infected in two weeks. Jails had already started taking precautions, such as limiting visitors, equipping guards with personal protective equipment, cleaning shared surfaces more frequently, and mandating that inmates in bunk beds sleep "head-to-toe." But many jail staffers worried that these measures would not be sufficient to prevent a mass outbreak. "The only meaningful public health intervention here," jail doctor Dr. Rachael Bedard told the New York Times, "is to depopulate the jails dramatically."

By the beginning of the next week, New York City Mayor Bill de Blasio had heeded this advice, ordering the release of hundreds of inmates. In a press conference, de Blasio said that he was looking to discharge inmates who were both "at a high risk of contracting coronavirus, and are at a low risk of reoffending." Public defenders urged de Blasio to widen his criteria,

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¹ Jan Ransom and Alan Feuer, "<u>A Storm is Coming</u>': Fears of an Inmate Epidemic as Virus Spreads in Jails," *New York Times*, March 20, 2020

²@RossMacdonaldMD, Twitter post, March 18th, 2020, 9:51PM,

³ Ransom and Feuer, "A Storm is Coming," New York Times, March 20, 2020

⁴ Chelsea Rose Marcius, "<u>Coronavirus Drives De Blasio to Release 300 More People from NYC Jails</u>," *New York Daily News*, March 24, 2020

highlighting harrowing accounts of the conditions inside the jails, where inmates were frequently denied basic sanitary products or protective equipment. "This feels like a death sentence," one Rikers inmate told Mother Jones.⁵ By mid-April, the New York City's jail inmate population had decreased by 30%.

What kind of inmates did the city decide were at both a high risk of contracting the virus, and a low risk of reoffending? How have they been able to maintain this lower inmate population since then? Who have they decided still needs to be in jail, no matter what public-health cost? And how do the answers to these questions inform perennial debates about jail reform, and criminal justice reform more generally, both in New York City and across the country? In this paper, I will analyze the data that the city posts on their Open Data website to investigate these questions.

Context/Significance

In 2010, Kalief Browder, a 16-year old Black man from the Bronx, was arrested for allegedly stealing a backpack. Since his family was unable to pay the \$3,000 cash bail, he spent three years awaiting a trial date in the Rikers Island jail, before being released in 2013 due to a lack of evidence. The three years in jail enacted a heavy toll on Browder's mental health, and after struggling to readapt to society for two years, in 2015, he killed himself. He was 22.6

Browder's story, and many others like it, have inspired criminal justice advocates to fight for sweeping reforms to New York City's jail system. In October 2019, the City Council voted to approve an \$8 billion plan to close the Rikers Island jail and replace it with new, smaller

⁵Samantha Michaels, "<u>Rikers Jail Inmates Speak Out As Coronavirus Cases Spread</u>," motherjones.com, March 27, 2020

⁶Jennifer Gonnerman, "Kalief Browder Learned How to Commit Suicide on Rikers" New Yorker, June 2, 2016

facilities scattered throughout the city.⁷ These facilities would have a combined capacity of 3,300, which meant that the city needed to reduce its jail population of more than 7,000 inmates in October 2019, by more than 50%. So by necessity, jail population reduction has become a major priority for the De Blasio administration.

To accomplish this goal, jail reformers have urged the state to enact a longtime policy objective: bail reform. The United States justice system's reliance on pretrial bail has been widely criticized as a mechanism of jailing people simply for being poor. It has also come under focus as a driver of racial inequity, because a disproportionate number of defendants in New York City who cannot pay bail are Black or Hispanic. In July 2018, New York City's Independent Commission on Criminal Justice and Incarceration Reform released "Beyond Bail or Nothing: The Case for Supervised Release." Money bail, they argued, citing the city's Open Data database, is the preeminent driver of the jail population in New York City. As of May 2018, nearly 75% of inmates in jail were pretrial, and were therefore only there because they could not afford bail. They found that an expanded supervised release program, where defendants are allowed to remain in the community as long as they submit to frequent monitoring by city-employed social workers, would lower jail populations while successfully ensuring that defendants attended their court dates.

New York State helped expedite this process in March 2019 by abolishing the use of cash bail for all defendants not charged with a small subset of violent felonies. This bail-reform law went into effect January 1, 2020, but judges began applying it retroactively to inmates already in

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⁸Insha Rahman, "Highlights of the 2019 Bail Reform Law," Vera Institute of Justice, July 2019

⁹Independent Commission on New York City Criminal Justice and Incarceration Reform, "Beyond Bail or Nothing: The Case for Expanding Supervised Release," morejustnyc.org, July 2018

jail for not posting bail in November 2019.¹⁰ As a result, the city's jail population dropped from above 7,000 at the beginning of November, to around 5,200 in the beginning of February 2020.

The goal of reducing the city's jail population has not received unanimous support.

Republican City Council minority leader Steven Matteo voted against the closure of Rikers, arguing that the plan would "require putting more potentially dangerous offenders back on the street, jeopardizing public safety." When the New York State bail reform came into effect in January, New York Police Department Commissioner Dermot Shea called for its reversal in a New York Times Op-Ed entitled "New York's New Bail Laws Harm Public Safety," writing that the reform was unnecessary because "New York is not a jurisdiction that over-incarcerates." And the city's efforts to depopulate the jails during the onset of the coronavirus outbreak have been similarly criticized. "We're continuing to see people get arrested over and over and let right back out," Shea told reporters in June. "It really defies common sense."

But other authorities have argued that the March inmate discharges were essential not just for the individuals released but for the public health of the entire city. In June, the Analytics division of the American Civil Liberties Union, in partnership with a team of statistical modeling researchers, published their report "Flattening the Curve: Why Reducing Jail Populations is Key to Beating Covid-19." After analyzing the United States' coronavirus death data, they built an SEIR model, a standard technique of modelling viral outbreaks, to mimic the spread of Covid-19

¹⁰Rebecca Rosenberg and Bruce Golding, "<u>Nearly 900 City Inmates May Be Freed Even Before Bail-Reform Law Takes Effect</u>," *New York Post*, November 3, 2019

¹¹ Matthew Haag, "N.Y.C. Votes to Close Rikers, Now Comes the Hard Part," New York Times, October 17, 2019

¹² Dermot Shea, "New York's New Bail Laws Harm Public Safety," New York Times, January 23, 2020

¹³ Melissa Russo, "NYPD Brass: We're Arresting Too Many Prisoners on Early COVID Release," nbcnewyork.com, June 13, 2020

¹⁴ ACLU Analytics et all, "<u>Flattening the Curve: Why Reducing Jail Populations is Key to Beating Covid-19,</u>" aclu.org, June 3, 2020

in a city with varying jail populations. They found that due to the unsanitary conditions in most jails, mixed with the daily churn of new inmates entering the system and then leaving to rejoin society, keeping jails at their pre-pandemic population levels could greatly exacerbate the spread of the virus and double a city's virus death toll. By reducing jail populations, they found, the United States could save as many as 100,000 lives, and New York City in particular could save at least a thousand.

The study of New York City's inmate discharge policy in March 2020, therefore, has implications both for ongoing debates on the city's criminal justice system, and for the continuing worldwide struggle to find effective public policies to curtail the spread of Covid-19.

Generating the Dataset

On March 7, 2012, New York City Mayor Michael Bloomberg signed the Open Data

Law which required that by the end of 2018, all nominally "public" data that the city collectseverything from political campaign contributions to the annual financial performance of the

NYPD pension fund--should be published on the city's new website data.cityofnewyork.us.¹⁵ In

compliance with this law, in 2016 the city's Department of Corrections published a dataset with

demographic data on every single inmate in jail, updated daily.¹⁶

Despite the city's efforts to become more transparent with data, tracking jail population over time is still a nontrivial task, because NYC Open Data does not publish archived versions of this dataset. Therefore, from this dataset alone, there is no way to obtain the historical inmate data that I wanted to study -- the site only shows data as of that day. The Vera Institute of Justice houses "JailVizNYC"¹⁷, a dashboard that helps visualize some of this data, and it includes a few

¹⁵ New York City Council, "Publishing Open Data," Int 29-2010, enacted March 7, 2012

¹⁶ NYC Open Data, "<u>Daily Inmates in Custody</u>," data.cityofnewyork.us

¹⁷ Vera Institute of Justice, "JailVizNYC," vera-institute.shinyapps.io

historical trend graphs that range from January 2017 to November 2019. But they have no visualizations of any 2020 data, and they do not publish the data underlying those visualizations. Instead, I used two other NYC Open Data sets: "Inmate Discharges," and "Inmate Admissions." Both datasets span from January 1st, 2014 to the present, and together, they provide data on every inmate of the last six years. Each inmate is assigned a unique inmate ID number, which is consistent in both datasets, so to create my final dataset, I used the R Base function "merge" to combine all entries with the same ID number and admission date. I then added all "Inmate Discharges" entries with admission dates before 2014, because those would fall outside the range of "Inmate Admissions." Finally, I performed a similar merge between "Inmate Admissions," and "Daily Inmates," as these entries represent admitted inmates who have not yet been discharged, and therefore are not in "Inmate Discharges." I excluded all other entries that were in one dataset but not the other. I also excluded the 14 entries where the admission dates of both datasets matched, but the discharge dates did not. I included entries with inconsistencies in all other columns. My final dataset had 325,892 entries.

Daily Population

Having compiled this dataset of individual inmate entries, I set out to create cumulative population data for each date between January 1st, 2014 and August 1st, 2020. To do this, I gave each entry a date interval, spanning the time spent in jail between admission and discharge.

Then for each date, I counted the number of inmates that had that date inside their interval, using the "%within%"²¹ function from the Lubridate package.

¹⁸NYC Open Data, "Inmate Discharges," data.cityofnewyork.us

¹⁹NYC Open Data, "Inmate Admissions," data.cityofnewyork.us

²⁰ R v3.6.2, "merge,"

²¹ lubridate v1.7.9, "%within%"



Figure #1: Daily Population of New York City Jails, as calculated above.

To confirm the validity of this calculation method, I compared the data to the Vera Institute visualization, and found that the levels and contours of the two graphs match closely. (I could not do a more rigorous comparison because Vera does not publish the underlying data).

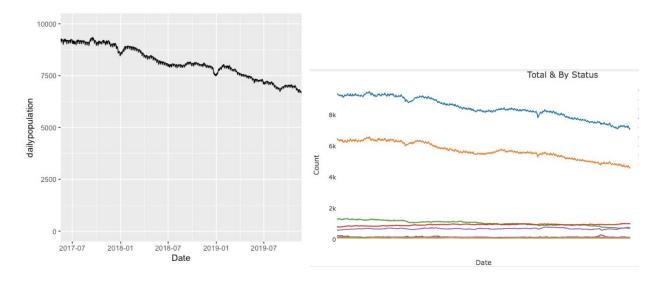


Figure #2: A comparison of my calculation (left) of daily inmate population from "Inmate Discharges" and "Inmate Admissions" to the visualization posted on the Vera Institute of Justice's "JailVizNYC" (right) over the same date range. In the "JailVizNYC" graph, the blue top line represents the total daily population.

STL decomposition

From a superficial glance at the raw population graph, it looks like there is a big drop around December 2019, when the state bail reform came into effect, and another around March 2020, during the onset of the coronavirus outbreak. But it's hard to tell for certain because the graph is noisy, and has significant seasonal fluctuations on both a weekly and yearly scale. To make the superficial observation of these two "drops" more rigorous, I used a Seasonal and Trend decomposition using Loess (STL decomposition)²² to isolate the overall trend from the seasonal effects. To perform this decomposition, the corresponding function "stl" takes two input parameters: "s.window," and "t.window." Since I assume that seasonal effects (ie fewer entries on weekends and holidays, and loose correlation to hotter weather) of inmate admissions and discharges does not change from one year to another, I set the s.window to "periodic." The t.window, which determines the number of points that the function decomposes into a smooth trend at a time, poses a more difficult problem. On one hand, the higher the t.window, the smoother and less noisy the trend will be. On the other hand, since I am interested in fluctuations that occurred over the course of only 14 days, a decomposition with a t.window that is significantly larger than 14 will smooth the trend line to the point where these fluctuations will vanish completely. In this case, the default t.window of $\frac{1.5s}{1-1.5/s} = \frac{1.5(365)}{1-1.5/(365)} \approx 151$ is too large. I settled on a t.window of 101 instead.

²² R.B. Cleveland, W.S. Cleveland., J.E. McRae, and I Terpenning, "STL: A seasonal-trend decomposition procedure based on Loess". *Journal of Official Statistics*, 6:3–33, 1990 ²³ R stats v3.6.2, "stl"

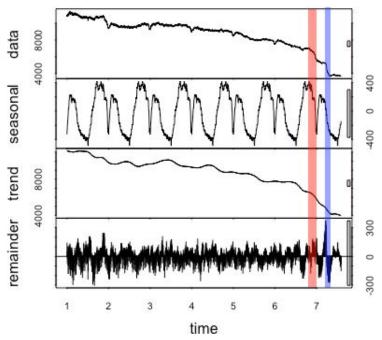


Figure #3: STL Decomposition of daily inmate population. The December 2019 drop from the effects of the new state bail reform are shown in red, and the March 2020 drop from the onset of the coronavirus outbreak is shown in blue. With a t.window of 45, the trend is smooth enough to remove some of the seasonal noise, but sensitive enough to still recognize the short-term fluctuations of these two events.

Change-Point Analysis

Having isolated the trend from the raw data, I used a change-point analysis²⁴ to identify statistically significant changes to the trend. "Mosum," the function that performs this analysis, requires the specification of input parameter G, which determines the size of the subset with which the function calculates the relevant moving sum, or "mosum." In a similar way to t.window in the STL decomposition, the choice of G has a major effect on the sensitivity of the analysis. A large G window will dampen the effects of any one specific fluctuation, which make the analysis sensitive only to the most dramatic change points. A smaller G window will be more sensitive to local fluctuations, and will identify a larger set of change points. In any case,

²⁴ A, Meier, H. Cho, and C. Kirch, "Mosum: Moving sum based procedures for changes in the mean". *R-package Version 1.2.1*, 2019

over a wide range of *G* inputs, the function identified September 7th, 2019 as a change-point. In order to get a day in December 2019 or March 2020 to be identified as a change point, I had to select a G that was so low (.04) that the analysis also identified 27 other change points. In other words, the change-point analysis failed to identify December 2019 or March 2020 as statistically significant change points.

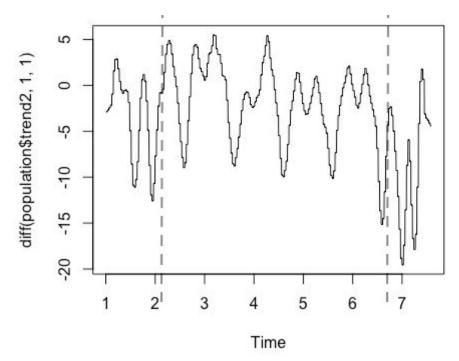
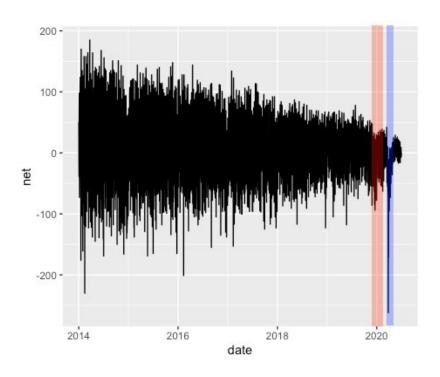


Figure #4: Slope of the trend line shown in Figure #3. Dotted lines represent the change points identified with G = .4. No change points are identified in December 2019 or March 2020, because while the slope clearly changes dramatically in both these times, there is a quick rebound to the initial slope, rather than a long term change that would imply an inflection point.

From this analysis, I conclude that the discharges due to the coronavirus lockdown in March 2020 (and the discharges due to the bail reform in 2019), did not lead to a statistically significant change in trajectory of the city's jail population. Both periods did, however, see significant changes to the level of the jail population. We see this on both the trend graph in Figure #3, and in the slope graph in Figure #4, where the slope briefly reaches its lowest, and second lowest nadirs. We can also see this in Figure #5, which shows a rapid decrease in net

inmates per day (daily admissions minus daily discharges) concentrated in a small number of days.



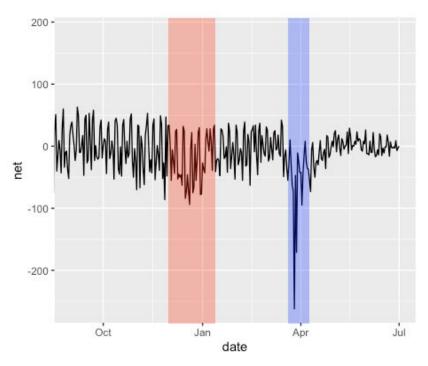


Figure #5: Net change in daily inmates across the entire time span (top) and zoomed into September 2019 to July 2020 (bottom). Overall, the amplitude of the fluctuations of net change decreased with the overall population, but there is a slight sustained decrease during the (red) bail-reform discharges, and a short, extreme decrease during the March coronavirus outbreak (blue)

Demographic analysis:

With the March coronavirus lockdown identified as a discrete events of rapid population level change, rather than inflection points that shifted the overall trajectory, I can now isolate the inmate data from this time period (March 23rd, 2020 to March 30th, 2020) and compare it to the data from the same period in different years. First, I isolated the raw discharges and admissions data, as shown in Figure #6.

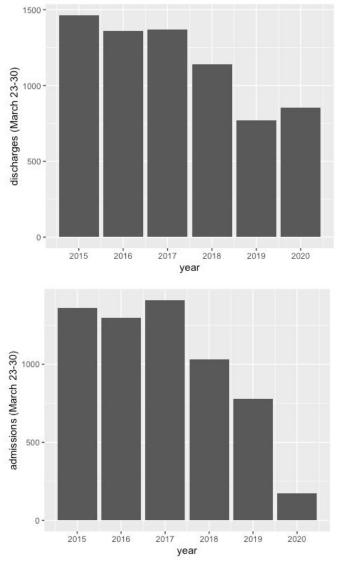


Figure #6: Discharges (top) and admissions (bottom) during the week of March 23-30 in each year available. The number of discharges in 2020 was slightly higher than expected from the decreasing trend set in previous years, but was not a dramatic outlier to the historical data. The number of admissions in 2020, however, was more than 4

times lower than the previous year. Clearly, decrease in admissions was a major driver in the decrease in overall population.

Since the number of discharges in the week of March 23-30, 2020 was similar to the number in previous years, we can compare demographic distributions directly without worrying too much about sample size error (we cannot do this as much with admissions, since the 2020 number is so much lower than the rest). In Figure #7, I compare the distribution of the number of days that inmates discharged between March 23-30 spent in jail year to year.

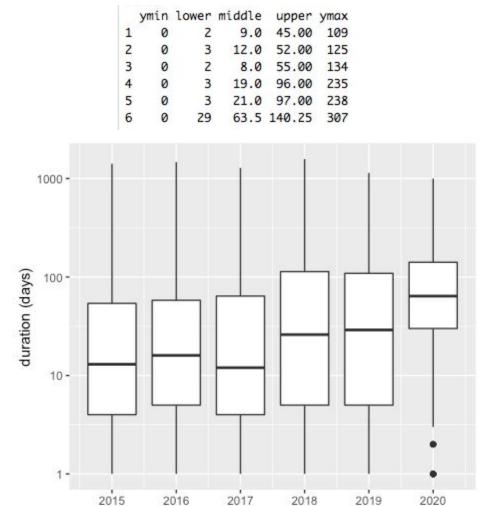


Figure #7: A box-plot (below) of the number of days spent in jail that inmates discharged between March 23-30, with a table of the corresponding quartile values (above). The y-axis is plotted on a logarithmic scale, because duration lengths become exponentially less frequent as they increase. We can see that the inmates discharged in 2020 had been in jail for longer than in previous years. The entire second quartile of 2020 is above the median of every other year. 2020's durations are also more closely concentrated around the median, at least on a log scale.

year

In Figure #8, I perform a similar analysis on the distribution of ages of the same inmates.

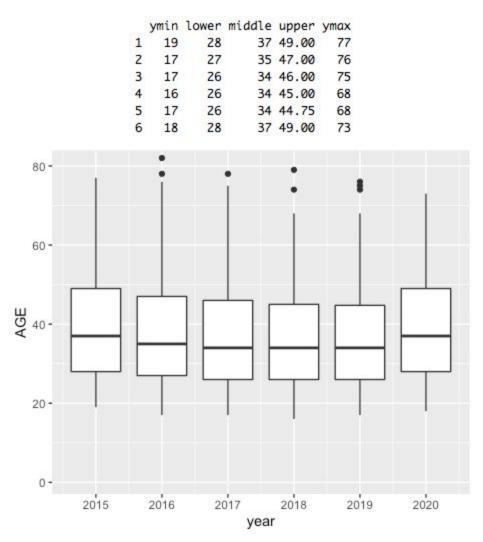


Figure #8: A box-plot (below) of the age distribution of inmates discharged between March 23-30, with a table of the corresponding quartile values (above). From 2019 to 2020, there is a 3 year increase in median, a 4 year increase in upper quartile, and a five year increase in maximum. Overall, though, the age distribution of 2020 is not an outlier compared to that of previous years.

As we can see, the age distribution of 2020 does not diverge from that of previous years like the duration distribution does. This is unexpected, because the stated purpose of the lockdown discharges was to protect as many "vulnerable" people as possible, and older inmates

are more likely to be seen as vulnerable. Therefore, I expected that the discharges of 2020 would skew much older than in previous years.

Finally, I examined the inmate status codes assigned to the inmates discharged during this week each year. Inmates are assigned status codes to describe their general reason for being in jail. They use abbreviations to denote these codes, which I explain below:

Code	Symbol	Explanation ²⁵
Detainee	DE	The most common code. While everyone in jail is technically a detainee, this usually means that this inmate is pre-trial, (due to bail or public safety risk)
City Sentenced	CS	These inmates have been convicted of city crimes with short (usually a year or less) sentences.
Newly Sentenced	DNS	These inmates have been convicted of crimes, and are briefly held in jail before being transferred to a long-term prison facility.
Parole Violator	DPV	These inmates have violated their parole agreements, and are held in jail until either being returned to prison or released, depending on the violation
State Court Order	SCO	Similar to CS, but these inmates have been convicted of state crimes instead of city crimes.
State Ready	SSR	These inmates have been convicted of crimes, and are ready to be transferred to state prisons. The distinction between SSR and DNS is not clear to me.

During the December 2019 bail-reform discharges, I expected that most of the discharged inmates would have the "DE" status code. However, I had no intuition as to which status codes would make an inmate more likely to be discharged during the March 2020 coronavirus lockdown. In fact, since the goal of those discharges was to protect specific vulnerable inmates, and reduce population overall, I expected that there would be very little correlation between status codes and likelihood to be discharged. I analyzed these in two ways. First, I broke down population over time by status code, shown in Figure #8.

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 $^{^{25}}$ Vera Institute of Justice, "JailVizNYC,"

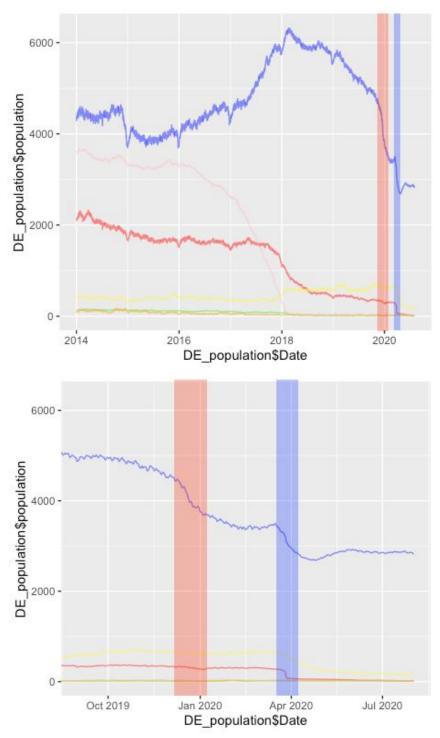


Figure #8: jail population by status code over the whole time span (top) and zoomed into September 2019 to the present (bottom). Status codes are colored as follows: DE, CS, DNS, DPV, SCO, SSR. As we can see, the December 2019 drop is driven by a decline in DE inmates, as expected. However, the March 2020 drop is

consistent among the three most common status codes (DE, CS, DPV). This implies that status code was not a major factor in the March discharging, and that the city discharged all vulnerable inmates regardless of status code.

Then, I focussed on the discharges only, once again comparing the discharged inmates from March 23-30, 2020 to the discharged inmates of that same week in previous years, shown in Figure #9.

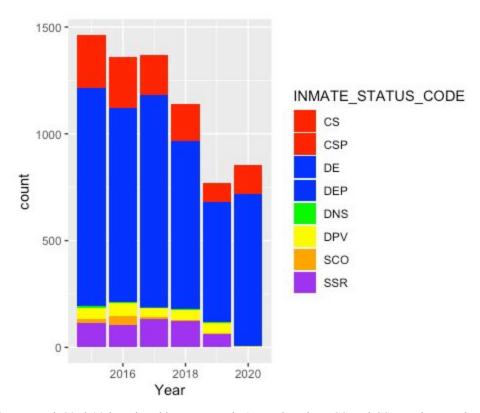


Figure #9: Discharges from March 23rd-30th, colored by status code (Note that since CS and CSP, and DE and DEP seem to be used interchangeably, they are assigned the same color. In both cases, the code with P is used very rarely). Clearly, 2020 saw an increase in discharged inmates with DE and CS. Meanwhile, almost no inmates with a different status code were discharged. The drop in DPV population did not come from the first week of discharges.

To summarize, the March 2020 drop in population was largely driven by a higher-than-expected number of detainee discharges, a slightly higher-than-expected number of city sentenced inmate discharges, and crucially, a dramatic drop in inmate admissions. Length of time spent in jail was much more closely correlated with likelihood of discharge than inmate age.

In other words, the inmates discharged tended to fit the profile of inmates that the city felt needed to be in jail the least. This indicates that the de Blasio administration's discharge and admission policies at this time were focussed on reducing the jail population as much as possible, rather than purely discharging specific at-risk individuals. It also indicates that, even after multiple efforts by the city and state government to reduce jail populations and prevent "unnecessary" detentions, there were still people in jail in March 2020, who by some standards did not "need" to be there.

Challenges/Limitations

This analysis is only as accurate as the underlying data, and while it is commendable that New York City makes its jail inmate data so easily accessible, I found a few areas where NYC Open Data could improve these datasets' accuracy, clarity, and transparency. Firstly, NYC Open Data should keep a public archive of historical versions of the "Daily Inmates in Custody" dataset. The complicated programming and cleaning that I had to perform to merge "Inmate Admissions" with "Inmate Discharges" probably poses a significant barrier to entry for most interested users. Since they have decided to make this data publicly available anyway (which is good!), they should present it in the most accessible possible form.

Secondly, NYC Open Data should explain what their abbreviations stand for, and what they mean. The "Daily Inmates in Custody" dataset assigns inmates a single letter code, either "A," "B," "I," "O," "U," or "W." The inmate status codes are also just abbreviations. The top charge data is even more opaque, because they refer to the number of the article of New York State penal code that denotes the charge. To figure out what it meant that an inmate had a top

charge of 121.12, I had to go to section 121 of the New York State penal code.²⁶ This was time consuming, and could have been expedited if the dataset had used keywords instead of numbers, but was ultimately doable. However, I was completely unable to decipher top charge codes that used letter abbreviations like "AC," "CO" or "CCW." This category was also left blank for about a third of the inmates in each dataset, making it difficult to draw any reliably accurate conclusions from the remaining two-thirds.

Finally, NYC Open Data should completely change the way that they denote race in "Inmate Discharges" and "Inmate Admissions." Currently, in both these datasets, inmates are classified as "BLACK," "ASIAN," or "OTHER." This is a completely absurd and inadequate way to disclose racial data. It is well documented that Blacks and Hispanics fare significantly worse in every single facet of our justice system than people of other races. It would be extremely interesting to study the racial demographics of the discharged inmates that this paper focuses on. But since "OTHER" includes both Hispanics and Whites, it was impossible for me to identify any differences or discrepancies between the treatment of inmates of these two races. Whether this is an act of deliberate subterfuge or simply an accidental quirk in the system, it should be fixed immediately.

As explained in the "Generating the Dataset" section, there are a few hundred inconsistencies between "Inmate Discharges" and "Inmate Admissions." In such large datasets (more than 300,000 total entries in each), this is to be expected, and I do not think that it poses a significant concern to the overall accuracy of the data.

Avenues of Future Study

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²⁶ It turns out to be "strangulation in the second degree."

The ACLU paper places emphasis on slowing the "churn rate" of inmates entering and exiting jails as a significant factor in containing community spread of coronavirus. It would be interesting to measure this churn rate to see how effective these discharge policies were in accomplishing this goal, both in late March specifically, and since then. It would also be interesting to track the specific Inmate ID numbers of inmates who were discharged during this time, to see how many of them have been readmitted to jail. The question of which people the city actually "needs" to keep in jail, and which ones it can afford to discharge will be a deeply relevant one as the city continues to work to lower its jail population and make its criminal justice system more equitable and just.