Death Rates in California Prisons Post Realignment

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by

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This Honours Thesis represents my own work and due acknowledgement is given whenever information is derived from other sources. No part of this Honours Thesis has been or is being concurrently submitted for any other qualification at any other university.

Signed: _____

Acknowledgement

I would like to express my most sincere gratitude to Dr. Raphael for his mentorship and generous guidance throughout this thesis process. His active research in related subject matter was a truly invaluable resource.

Abstract

In this paper I study trends in inmate death rates in California for the time period surrounding the historic realignment reforms. I use microdata from the California Department of Justice on inmate deaths in custody combined with population data from the California Department of Corrections and Rehabilitation to estimate age adjusted death rates for inmates in state operated facilities. To account for the aging of inmates within California prisons in recent years, I weight the population totals used for death rate analysis by their earliest population totals that are included in this study. Comparing the death rates for different sub-age groups before and after realignment to a placebo distribution of comparable changes generated by randomly permuting the data, I find significant decreases in death rates in California for all age groups over the age of 40. Following these changes to sentencing laws, however, I find that death rates during the same period increased for the two youngest age groups, 18-34 and 35-39 respectively.

Contents

1. Introduction

The U.S. incarceration rate is historically and geographically unprecedented. Over the past forty years, the number of people imprisoned has increased nearly 700 percent. America's "War on Drugs" launched in the 1970s, called for swift punishment for drug crimes, in particular. Moreover, sentencing for all offenses have become tougher over the past three decades. Since the start of the "Tough on Crime" era, states through a variety of mechanisms have stiffened sentences for felony offenses, sometimes through the use of mandatory minimums, sometimes through repeat offender statutes, and often by altering parole practices. The net effect of these changes has been to facilitate immediate and severe sanctions following convictions.

Legislators, however, did not foresee the deleterious impact such laws would have on the prison system as a whole. Numerous questions arise when evaluating the overcrowding of state prisons. First, how has this rise in incarceration impacted the fiscal health of states? Is growth in corrections spending outpacing growth in tax revenue? If so, are correctional expenditures commanding more general fund resources and perhaps crowding out other expenditure categories (i.e., Medicare, higher education, etc.) as a consequence? These increased demands due to rising incarceration rates may have led state and federal corrections systems to cut corners and to allow overcrowding within their facilities rather than front the costs of building new ones to accommodate their larger prison populations. Additionally, has removing more people from the population to live in supervised facilities actually reduced crime or recidivism overall? Putting these fiscal and policy questions aside, this paper will focus on an entirely different domain -inmates' quality of life, as measured through death rates amongst different age groups incarcerated in California Department of Corrections and Rehabilitation facilities.

Under pressure from federal courts following the Supreme Court's ruling in *Plata v. Brown*, the California legislature passed Assembly Bill 109, commonly referred to as the Realignment Initiative, in an attempt to meet the court mandate to reduce the state's prison population to 137.5% of the system's rated capacity within two years. At the time the legislation was implemented (October 2011), the prison population stood at 200 percent

of the collective rated capacity of the state's prisons. The legislation largely achieved this goal with discrete permanent decreases in the state's prison population. By maintaining the pre-existing number of correctional officers, facilities and medical resources for a smaller inmate population, one would expect this to impact the overall safety of the institutions and the health of the inmates. Among older inmates and those with severe health problems, one might even expect to see an effect of on the overall death rate amongst inmates under California supervision.

One potential confounding factor to studying the effect of changes in crowding on inmate death rates concerns the fact that over the time period of my study California's inmate population ages. Because many inmates incarcerated in the 1970s and 1980s are aging into their sixties and older, we would expect the number of deaths from natural causes to have increased over time. To account for this aging phenomenon's effect on overall death rates, I use microeconomic data to estimate age adjusted death rates in California in order to test whether death rates have, in fact, changed over time within CDCR facilities post realignment.

We determine statistical significance of the hypothesized change in death rates from the Pre-Realignment period to the Post-Realignment period using a standard permutation test. Comparing the p-values from each age group's test statistic to their respective permuted p-values, we find that death rates in California prisons decreased for all age groups over the age of 40. We also find that death rates during the same period increased for the two youngest age groups, 18-34 and 35-39 respectively.

2. Background

Enormous costs are not the only concern associated with the United States' rising incarceration rates. With prisons remaining over-capacity not only in California but also in a growing number of states across the country, legislators and criminal justice officials must ask themselves what the impact of overcrowding is on inmates' overall quality of life. Namely, how has the alarming rise in incarceration over the past forty years affected inmates' access to adequate health care or mental health services? Per the 8th Amendment, the government has a constitutional obligation to provide appropriate levels of care to those whom they supervise and remove from the general population. This became the central issue in *Plata v. Brown*, the federal class action suit that was originally filed on April 5th, 2001. The plaintiffs in the suit alleged that the California Department of Corrections and Rehabilitation's failure to provide adequate medical services violated their 8th Amendment rights, section 504 of the Rehabilitation Act of 1973 along with the Americans with Disabilities Act. Among their complaints were "lack of quality control measures," insufficient on duty competent medical staff, incomplete medical records and the "interference of custodial staff with the provision of medical care". The court approved the parties' stipulation for injunctive relief in June 2002, which required the California Department of Corrections and Rehabilitation (CDCR) to provide "only the minimum level of medical care required under the Eighth Amendment" (Specter (1994)).

Three years later, the court conducted a follow up evidentiary hearing which ultimately revealed the continuation of appalling conditions within California prisons. Due to the defendant's failure to provide the medical care mandated by the 2002 stipulation, the court issued an order officially putting the CDCR health care system into receivership. In 2006, Governor Schwarzenegger issued a proclamation which declared a State of Emergency due to California's alarming prison population. Following a published report by CDCR's Expert Panel on Adult Offender Recidivism Reduction Programming, the Chief Justice of the United States Court of Appeals for the Ninth Circuit convened a three-judge district court to evaluate the necessity and feasibility of limiting the state's prison population. The court ordered on August 4th, 2009 that the defendants in the matter submit a plan within 45 days

outlining "a population reduction plan that [would] in no more than two years reduce the population of the CDCR's adult institution to 137.5% of their combined design capacity". After CDCR's second revised plan was ordered by the court on January 12th, 2010, California appealed its order to the Supreme Court. Justice Kennedy wrote the majority opinion of the Court which affirmed the lower court's prisoner release order. Rather than releasing lower level offenders back to the general population, the California state legislature passed the 2011 Public Safety Realignment Initiative. Though the initiative called for thousands of low-level offenders to be transferred from state facilities to community ones, local jails did not have the physical capacity to house all 46,000 inmates required to leave the CDCR prison system. Thus, hundreds of non-sexual, non-serious and non-violent criminal offenses were subsequently redefined by the state legislature so as to only constitute sentencing time in county jail rather than in a state penitentiary. The effect of realignment on the state prison population can be seen on the chart below labeled Figure 2.1, which graphically illustrates a weekly time series of the state's prison population for several years prior to and following realignment. Note, the variable indicating week is measured relative to the week realignment was implemented. Assembly Bill 109 went into effect at week zero, labeled below.

The visible decline through the first approximately 150 weeks demonstrates the effects of realignment. The subsequent decline at roughly 150 weeks reflects the effect of California's Proposition 47, "The Reduced Penalties for Some Crimes Initiative". The ballot measure was introduced on November 4th, 2014 and approved three weeks later. The initiative reclassified a number of "non-serious and nonviolent property and drug crimes" from felony to misdemeanor offenses. Not only did prison populations within California decrease once the proposition went into effect, but also numerous counties, including Los Angeles County, were able to end their "early release" policies -a last resort measure in response to the Realignment Initiative (Gerber et al. (2015)).

Approximately 300 weeks following the *Plata v. Brown* decision, California passed Proposition 57, The Public Safety and Rehabilitation Act of 2016, as demonstrated above in the third peak on Figure 2.1. The motive behind the initiative was to encourage inmates to strive for and achieve their own rehabilitation through credit earning opportunities for "sustained good behavior". Under Proposition 57, nonviolent offenders can be considered for parole after serving the first full-term of their sentence and after demonstrating that they

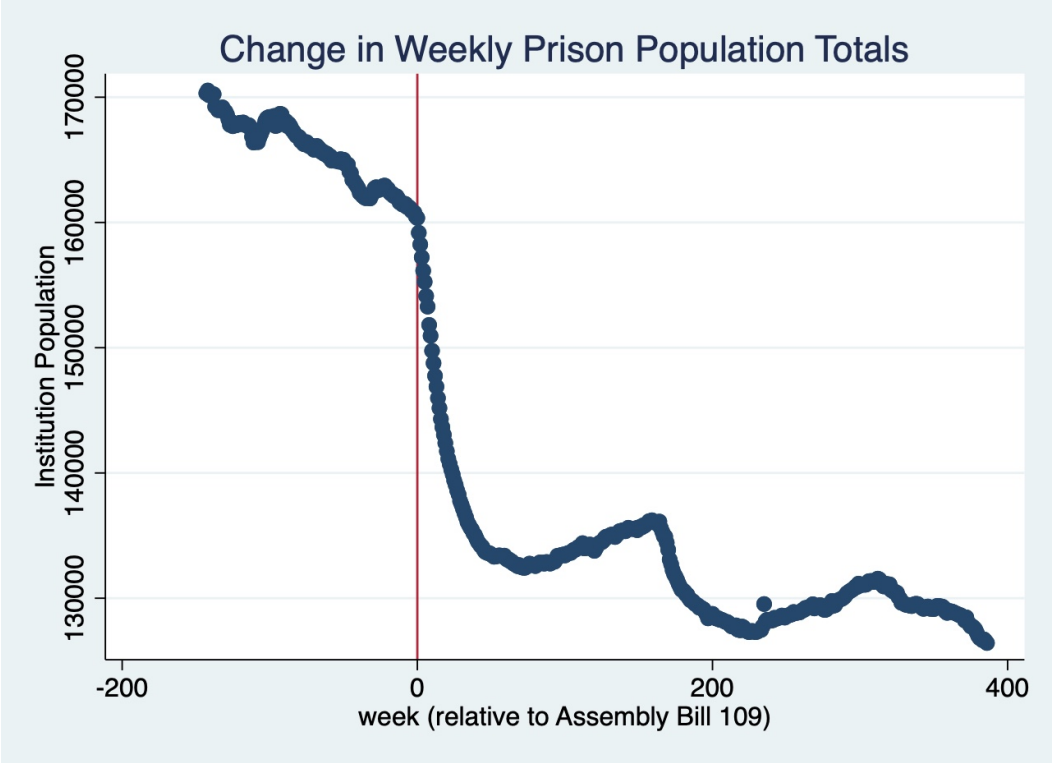

Figure 2.1: Weekly Population Totals

would no longer pose an unreasonable risk of violent behavior to the community. However, the Second District Court of Appeals ordered that "Third Strike" offenders do not necessarily qualify for resentencing hearings (Webmaster & Rehabilitation (2015)).

Having discussed how realignment affected prison overcrowding in California, logical inferences can be made to hypothesize how distinct age groups within the prison system subsequently changed in their composition. The Realignment Initiative reduced incarceration for simple technical violations and relatively less serious felonies. Because a high percentage of lower-level offenders were transferred from state facilities to community ones, the younger inmates who remain under state custody are individuals serving sentences for more serious and violent offenses. If being convicted for a more serious offense is correlated with poorer health, holding age constant, we would expect realignment to inflate death rates due to this change in composition alone. There may be certain characteristics about the individuals who remain in state facilities today, that differ significantly from the individuals who populated the same facilities ten years ago. These characteristics may confound our inference about their wellbeing. Furthermore, if the individuals serving time for more serious or violent

offenses are more prone to violent behavior, we might expect the number of injuries from physical altercations within prisons to increase, which increases the probability of serious disease transfer, such as Tuberculosis or HIV.

The fact that fewer people are rotating in and out of prison today than before the 2011 Realignment Initiative should also be noted. Perhaps decreasing the amount of people transferring in and out of CDCR facilities on a weekly basis has improved the health of inmates overall, by reducing the transfer of infectious diseases. This in turn may lead to improved health outcomes, and perhaps lower mortality.

Furthermore, since realignment, the overall population of inmates has changed in composition to include fewer young individuals in their twenties and thirties and more inmates aging into their fifties and sixties. Older inmates in prison tend to be individuals who were convicted in their young adolescent years for serious offenses. Unlike a facility housing younger inmates, in a facility supervising an older population we would expect less violence, a factor we would expect to be positively correlated with death rates.

One of the main contentions in the *Plata v. Brown* matter was the fact that inmates did not have timely access to urgently needed care for life threatening and chronic illnesses. By reducing prison overcrowding and maintaining the same level of medical care and resources, we would expect death rates, especially for inmates who are at a high risk of dying due to chronic illness, to decrease from the Pre-Realignment period, which was marked by record overcrowding. Setting aside the selection issue, the bottom line is that existing medical resources are now stretched over a smaller population than in the past which means more people are able to receive timely medical assistance. Furthermore, reducing overcrowding would likely decrease violence and reduce stress amongst inmates by separating individuals from tight quarters over-capacity by two or three-fold.

3. Data, Methods and Empirical Strategy

I use data covering all California Department of Corrections and Rehabilitation facilities from 2005 to 2017 to test whether death rates in California prisons have changed over time and after realignment, specifically. Weekly inmate population totals come from CDCR's Office of Research webpage. Microdata on deaths in custody for the period 2005 through 2017 come from the California Department of Justice Open Justice webpage. Specifically, I use the publicly available "Death in Custody and Arrest-Related Deaths" raw file which compiles report information on all deaths in custody from county probation departments, state hospitals, state correctional facilities and California law enforcement agencies. I draw population totals by age from CDCR. It should be noted that after the Realignment Initiative was entered into effect in 2011, CDCR did not publish yearly Population Reports for 2013 and 2014. Rather than using their projections for prison population totals for 2013 and 2014, I linearly interpolated population totals for those years respectively by using previous and subsequent population totals.

I estimate the following model to isolate the effect of realignment on death rates:

$$deathrate_t = \alpha + \beta After_t + \epsilon_t$$
$$E[Deathrate_t|After = 1] - E[Deathrate_t|After = 0] = \beta$$

In the equations above, t indexes year, $deathrate_t$ is the death rate for $year_t$ (either overall age-adjusted death rate, or death rates for specific age groups), $After_t$ is a dummy variable set equal to one for all observations for 2011 or later, and ϵ_t is a mean-zero random error term. The coefficient of interest, β, measures the difference in average death rates between the pre and post period.

Accounting for the aging of inmates within California prisons in recent years is crucial in order to accurately assess whether realignment has had an actual effect on death rates for older age groups. Evidence of the change in inmate age distributions over time are illustrated below in Table 3.1. The change in those distributions from 2005 to 2017 can be seen graphically in the graph below, labeled Figure 3.1. In order to account for the aging of inmates in recent years in California prisons, I adjust overall death rates for each year by

calculating a weighted average of the group-specific death rates in subsequent years using either the population shares for 2005 (the earliest year in my data), or the population shares for 2017 (the latest year in my data). Ultimately, I find that the effect of realignment is not sensitive to the age adjustment utilized in this study.

Table 3.1: Inmate Age Distribution Over Time

Year	18-34	35-39	40-44	45-49	50-54	55-59	60+
2005	47.7%	15.6%	14.9%	10.9%	5.8%	2.9%	2.2%
2006	47%	15.1%	14.6%	11.5%	6.4%	3.1%	2.4%
2007	46.3%	14.6%	14.1%	11.9%	6.9%	3.4%	2.7%
2008	46%	14.1%	13.5%	12.1%	7.5%	3.7%	3%
2009	45.7%	13.6%	13.1%	12%	8%	4.1%	3.4%
2010	45.2%	13.2%	12.7%	12%	8.6%	4.4%	3.9%
2011	45%	13.1%	12.6%	11.7%	8.8%	4.7%	4.1%
2012	42.2%	13%	12.6%	12%	9.5%	5.5%	5%
2013	42.4%	13.1%	12.1%	11.4%	9.9%	5.9%	5.6%
2014	43.1%	13.6%	11.5%	10.4%	9.4%	6.1%	5.9%
2015	42.4%	13.9%	11.2%	10.2%	9.2%	6.4%	6.6%
2016	41.8%	14.3%	11.3%	9.9%	8.9%	6.7%	7.1%
2017	41.2%	14.6%	11.3%	9.8%	8.5%	6.9%	7.6%

Note: The age distributions are estimates for years 2011-2013. As discussed earlier, population estimates were linearly interpolated from previous interpolated prison population totals.

Let,

$$\text{i} = (1,2,3,\ldots 7)$$

$$\text{t} = (2005,2006,2007\ldots 2017)$$

w_{it} = proportion of prison population in $year_t$ that is in $group_i$

$$\sum_{i=1}^{7} w_{it} = 1$$

For any given year, the weighted average death rate is given by:

$$DR_t = \sum_{i=1}^{7} w_{it} D_{it}$$

Whereby,

$$D_{it} = \text{death rate for age } group_i \text{ in } year_t$$

I age adjust to the 2005 age distribution using the formula:

$$DR_t^{2005} = \sum_{i=1}^{7} w_{i,2005} D_{it}$$

This is what the overall death rate would have been had the age distribution remained constant from 2005.

I age adjust for comparison to the 2017 age distribution using the following formula:

$$DR_t^{2017} = \sum_{i=1}^{7} w_{i,2017} D_{it}$$

This is what the overall death rate would have been had the age distribution been fixed to the age distribution from 2017.

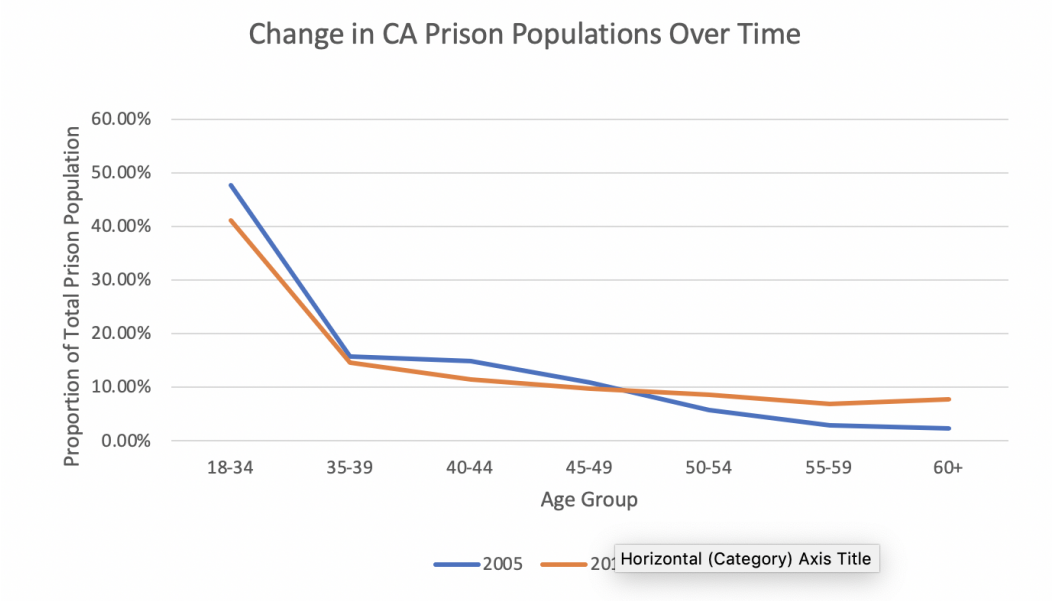

Figure 3.1: Change in Inmate Age Distributions from 2005 to 2017

Because the data is constrained to 13 observations, the number of years included in this study, it is important to be cautious when drawing inferences from the data as the Central Limit Theorem might not apply. In order to account for this limitation, I compare the p-values for each age group's death rates using a standard permutation test to the p-values from the test statistics of those death rates regressed against the realignment dummy variable. Many samples are needed in order to estimate the sampling distribution of the test statistics for each age group's death rates. Should the null hypothesis be valid, changing the exposure would have no effect on the outcome. To derive the p-values from the permutation test, I permute the data 1000 times. Given this number of permutations, the smallest possible p-value is 0.001 with an uncertainty of about +/- 1%.

It is important to note that creating a plausible counterfactual for the prison system in California would likely draw misleading conclusions. California's prison system is unique. No other state has either had such a remarkable increase in prison populations over the same period nor been faced with a judicial mandate to reduce prison overcrowding in such a short period of time. To compare California's prison system from 2005 to 2017 to any one other state would be misleading and not rigorous enough to draw definite conclusions about the effect of reducing prison overcrowding on inmates' overall quality of life. Further studies should compare the varying death rates across all states' prison systems for the same time period. However, because all states and the District of Columbia run their corrections systems differently and have different funding allotted to the endeavor of keeping accurate records of the inmates whom they supervise, compiling such a mass raw data file would not be currently feasible.

4. Results

The change in death rates overtime can be seen below in Table 4.1 and are displayed graphically in Figure 4.1. It should be noted that 2017 saw an increase in death rates in 5 of the 7 age groups studied. Further analysis of mortality rates is needed to assess whether this trend has continued to the present day or was no more than a mere anomaly. This outlier year skewed the p-values for the pre-post comparison of three age groups in question, 18-34, 35-39 and 60+, respectively.

Table 4.1: Table of Inmate Death Rates by Age Group

Year	18-34	35-39	40-44	45-49	50-54	55-59	60+
2005	4.869886	9.156112	17.53477	29.36059	56.32937	91.45708	200.0541
2006	5.187491	9.612797	23.88915	34.41992	58.33561	105.0111	212.7145
2007	4.024347	8.80634	16.49961	30.38024	57.34525	101.0101	208.8773
2008	4.065247	7.879894	16	26.03664	50.42278	76.89893	199.8079
2009	4.396741	8.256562	10.39407	24.57848	59.4884	103.7102	207.9329
2010	5.576259	11.19038	16.38633	27.1183	42.92459	95.99332	215.9962
2011	4.668342	9.419744	13.30574	21.58008	46.6003	83.64312	216.2656
2012	5.398252	11.77856	14.0647	27.64807	41.24971	84.32606	201.5595
2013	6.157747	14.62673	11.3888	24.87562	38.76871	73.29305	206.3842
2014	5.346641	8.010222	8.918144	23.29246	39.08693	55.4925	184.1883
2015	5.613543	7.277477	10.90326	18.85475	37.0458	68.06088	224.1901
2016	4.663212	10.41153	14.2073	12.10568	29.40709	71.66282	198.9674
2017	10.12966	14.02761	12.53569	17.70048	30.71935	63.33739	219.8194

The results of the pre-post comparison in overall and age-specific death rates are displayed below in Table 4.2. The coefficient of interest, β, for both age adjusted estimates shows a significant decrease in mortality rates after the implementation of the 2011 Realignment Initiative. I compare the coefficients derived from weighting the population totals by their 2005 age distributions (recall Table 3.1) and their 2017 age distributions and find a

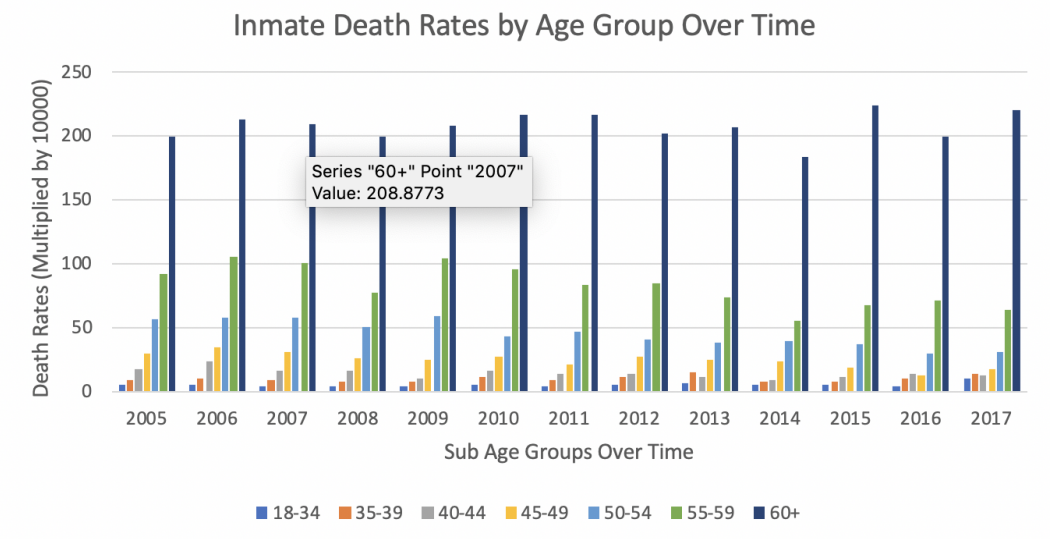

Figure 4.1: Death Rates Across Age Groups Over Time

larger effect in the latter, as expected, after giving a disproportionately greater magnitude to the age groups that demonstrated the largest decrease in overall mortality rates.

If we look to the coefficient of interest for the two youngest age groups, we find that death rates actually increased slightly in the post-period. This disconfirms our initial hypothesis that maintaining the same medical resources for a smaller population of inmates would have a positive impact on health outcomes for all inmates. As the results of the following regressions demonstrates, the reduction in prison overcrowding does not benefit all inmates equally. However, there is no way to determine from the microdata used within this study what additional factors are confounding our inference about the medical health of California inmates ages 18-39. All we know for certain is that the composition of inmates, ages 18-39, supervised in CDCR facilities today differs from the inmates the same age who resided there before Realignment, because of the difference in severity of crimes for which they are serving sentences. However, as my hypothesis predicted, the coefficient of interest for the pre-post comparison in death rates for all age groups older than 40 years old is negative. As Table 4.2 shows, realignment had the largest effect on mortality rates for inmates, ages 50-59.

In order to assess the statistical significance of the estimates of the pre-post change in mortality rates, I compare the p-values from each test statistic in question to the p-values derived from a standard permutation test. I find no significant difference in p-values for any

of the death rates estimated in this study.

Table 4.2: Table of Statistical Significance using Permutation Test

β	Coefficient (SE)	p-value 1 (t-statistic)	p-value 2 (permutation test)
DR adjusted to 2005	-2.135 (0.903)	0.038	0.045
DR adjusted to 2017	-3.609 (1.106)	0.008	0.009
DR 18-34	1.534 (0.778)	0.074	0.016
DR 35-39	1.833 (1.222)	0.162	0.173
DR 40-44	-4.284 (1.865)	0.042	0.024
DR 45-49	-6.893 (2.726)	0.028	0.032
DR 50-54	-17.018 (3.213)	0.000	0.000
DR 55-59	-24.598 (5.688)	0.001	0.004
DR 60+	-2.955 (6.158)	0.641	0.641

5. Conclusion

This work considers the causal effect of reducing prison overcrowding in California following a large exogenous change in prison population totals following the implementation of Assembly Bill 109. I proxy the effect of reducing prison overcrowding on inmates' quality of life through their mortality rates. In order to control for aging amongst inmates in recent years, I weight the population totals used to calculate annual death rates by the earliest population distributions used in this study. I find that reducing overcrowding by 137.5% within CDCR facilities has reduced death rates for all age groups over the age of 40. These results have significant policy implications. States can improve health outcomes for the inmates who they supervise by reducing prison overcrowding.

However, I find that death rates increased post-Realignment for the two youngest age groups, 18-34 and 35-39. There are many plausible explanations for this increase in mortality rates, though the microdata used in this study cannot attempt to explain such an effect causally. Among these explanations are the effect of changing the composition of inmates in California prisons following the immediate transfer of low-level offenders to community jails. The inmates that are serving sentences today in CDCR facilities, unlike the inmates that once resided there, are no longer serving sentences for non-serious, non-sexual and/or non-violent offenses. Perhaps, there are certain underlying characteristics about these individuals that confounds our inference regarding their overall medical health and wellbeing. Perhaps, their incidence of disease is higher than the population of inmates that age that once resided there. Determining if there is a correlation between the specific causes of death amongst inmates for inmates post-Realignment is an area for further research. Another area for further research is the impact realignment had on health outcomes for inmates who were transferred to community jails. Research is needed to evaluate the impact of this large discrete increase in county jail populations on the overall safety of those facilities and the health of its inmates.

A. Appendix

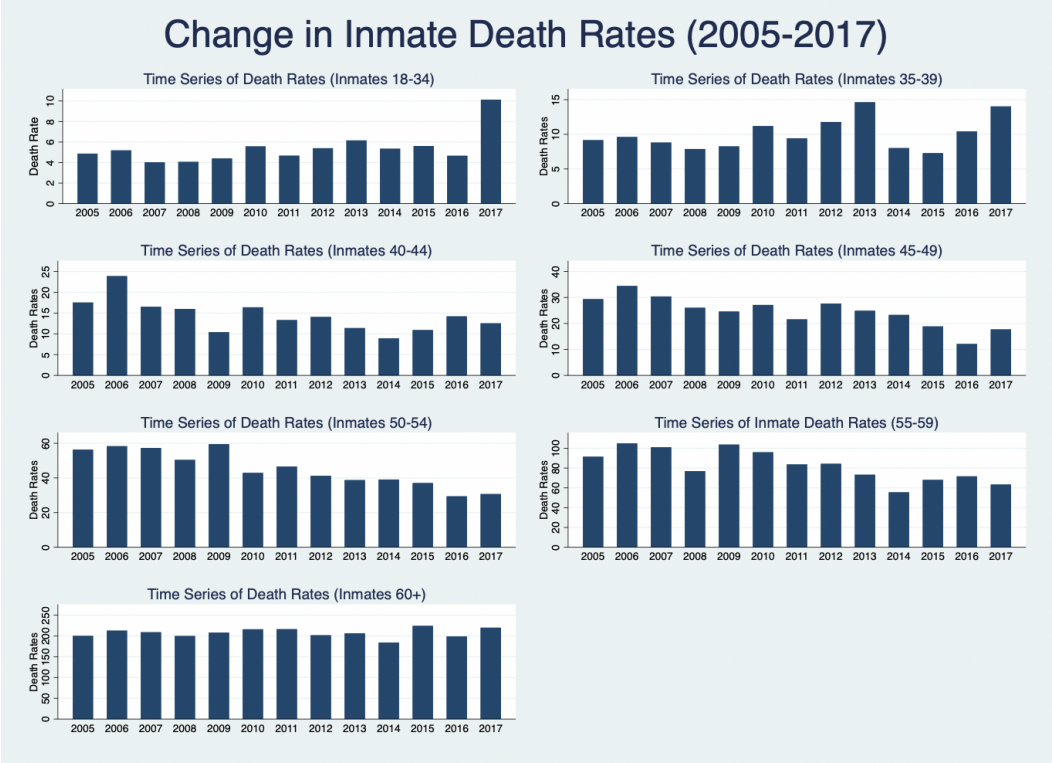

Figure A.1: Change in Inmate Death Rates Across Age Groups from 2005-2017

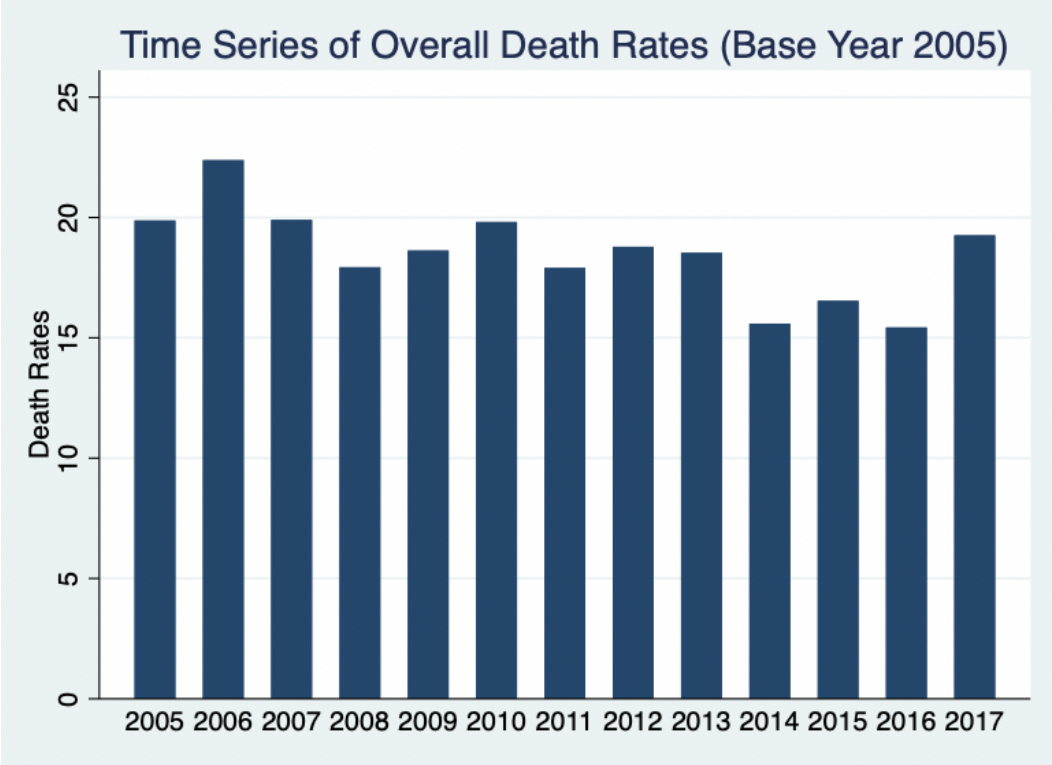

Figure A.2: Change in Age Adjusted Death Rate Over Time: Base Year 2005

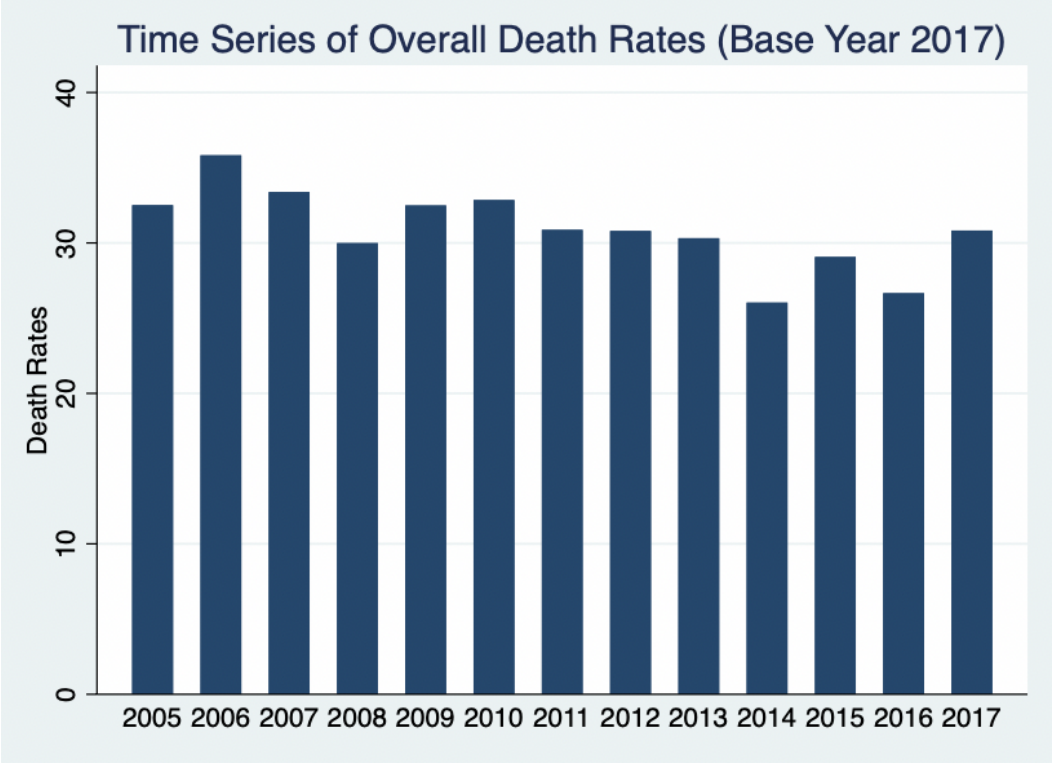

Figure A.3: Change in Age Adjusted Death Rate Over Time: Base Year 2017

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