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The Effects of California's Enhanced Drug and Contraband Interdiction Program on Drug Abuse and Inmate Misconduct in California's Prisons

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Note: The opinions expressed herein represent those of the authors and do not necessarily represent the position of the California Department of Corrections and Rehabilitation.

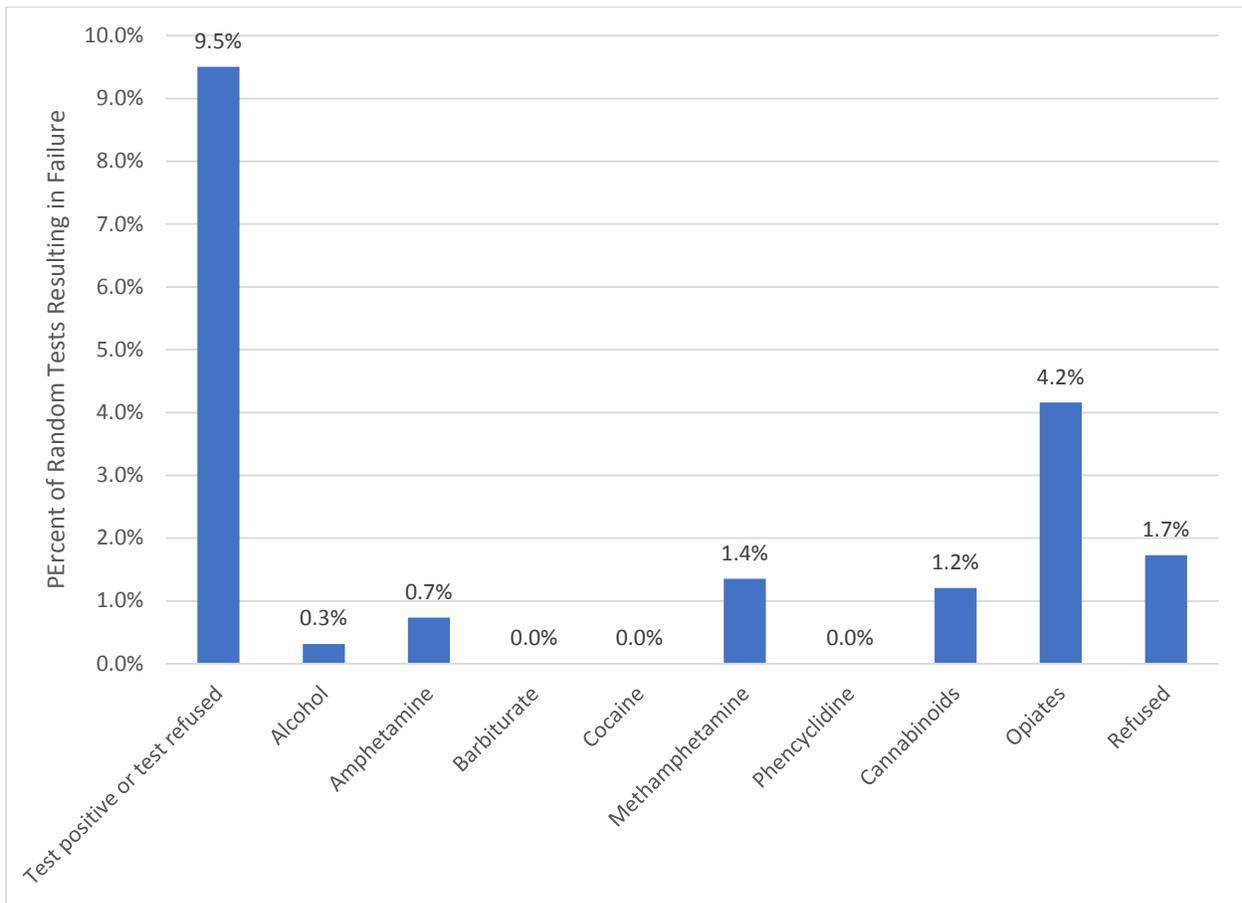
Executive Summary

The California Legislature provided the California Department of Corrections and Rehabilitation (CDCR) \$10.4 million over two years to implement a contraband interdiction effort. Beginning in fiscal year 2014-2015, CDCR implemented the Enhanced Drug and Contraband Interdiction Program (EDCIP) demonstration. The program involved interdiction efforts at 11 of California's prisons; eight receiving a moderate intervention and three receiving an intensive intervention. The EDCIP program was implemented in a manner that targeted institutions believed to have the most serious and pervasive contraband problems. The intervention introduced random monthly drug testing of roughly 10 percent of inmates at all institutions and enhanced use of K-9 detection teams and ion spectrometry scanning technology at intervention institutions. Detection screening technology, both for trace amounts of narcotics and in some instances full body scans, is applied in one form or another to inmates, visitors, staff, and mail and packages at intervention institutions, with the key differences between intensive and moderate intervention institutions residing in the volume of this scanning activity.

In this report, we use administrative data provided to us by CDCR to evaluate the effects of the EDCIP intervention on drug use in California prisons and the level of recorded inmate misconduct. We employ a series of quasi-experimental research strategies to gauge how these outcomes change in institutions receiving the EDCIP intervention relative to institutions not receiving the intervention. Specifically, we identify non-intervention institutions that are most similar to the intensive and moderate intervention sites in terms of pre-intervention prevalence of drug abuse (documented by the proportion of random drug tests that are either refused or that result in a positive outcome) and compare the changes in the proportion of drug tests that result in a failure at intervention and non-intervention institutions. We also construct a panel data set that varies by month and institution for the time period spanning the introduction of the EDCIP program. We use these data to test for an effect of the intervention on the number of monthly lockdowns, total recorded rules violations per inmate, and the rules violations rates for specific types of misconduct.

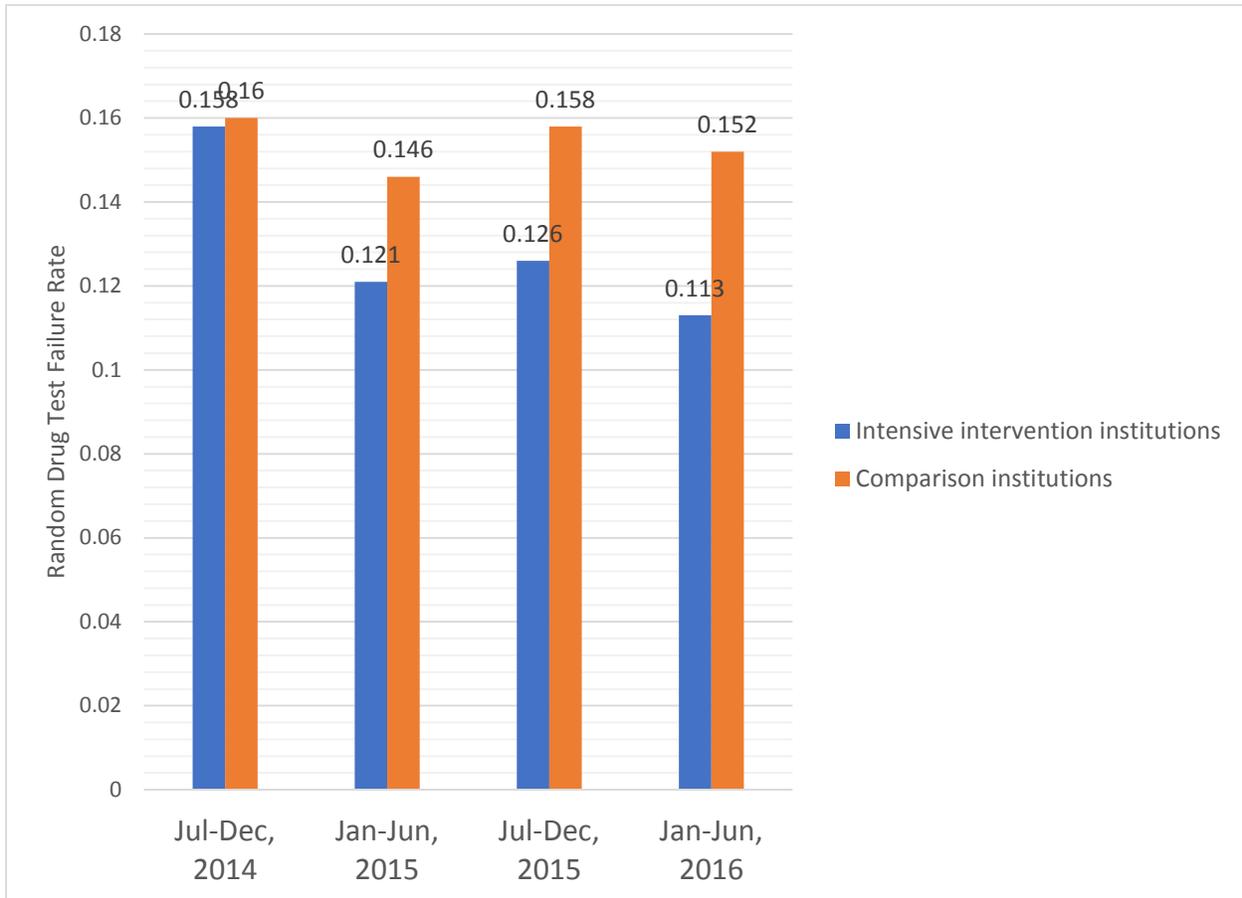
The principal conclusions of the study are illustrated here by the following figures.

Conclusion #1: Drugs and drug use are prevalent in California prisons



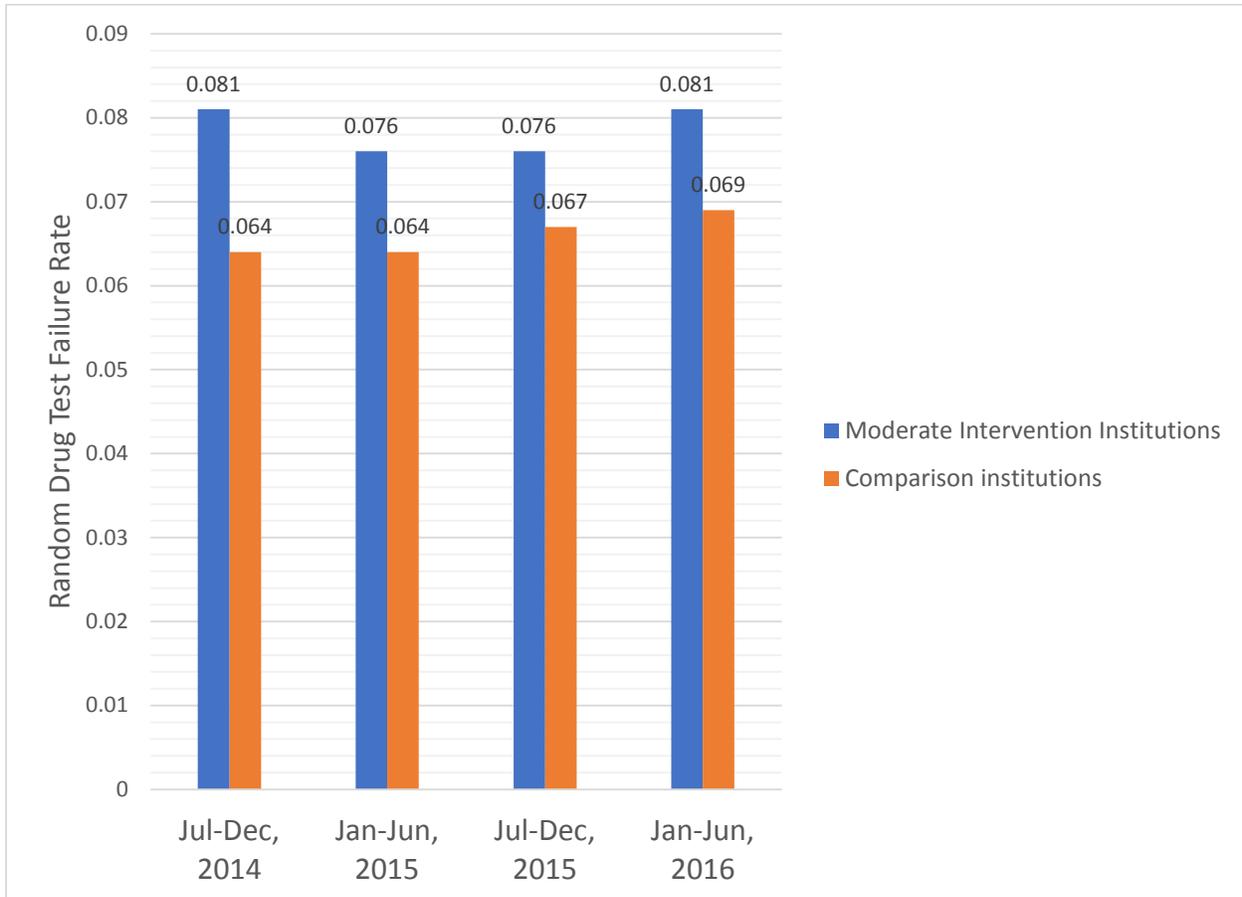
The figure above presents the percent of inmates subjected to random testing who “fail” the test during the six-month period beginning in July 2014. We define failed tests as those that test positive for a prohibited substance or where the inmate refuses to be tested. During this six month period, the failure rate for random tests stands at 9.5 percent, with 7.8 percent testing positive for a controlled substance and 1.7 percent refusing to test. The most commonly detected substances are opiates (4.2 percent), methamphetamines (1.4 percent), and cannabinoids (1.2 percent). Failure rates vary considerably across institutions. The failure rate at the median institution (the institution with a failure rate greater than half of all institutions) is 8.1 percent. The failure rate for the institution with the rate exceeding the bottom quarter of institutions was 4.1 percent, while the rate for the institution with a failure rate greater than three quarters of institution was 12.8 percent. The lowest and highest institution-level failure rates was 1.2 and 19 percent, respectively.

Conclusion #2: Drug use at intensive intervention institutions dropped by nearly a quarter with the implementation of EDCIP. We did not see a comparable decline in comparison institutions not receiving the intervention.



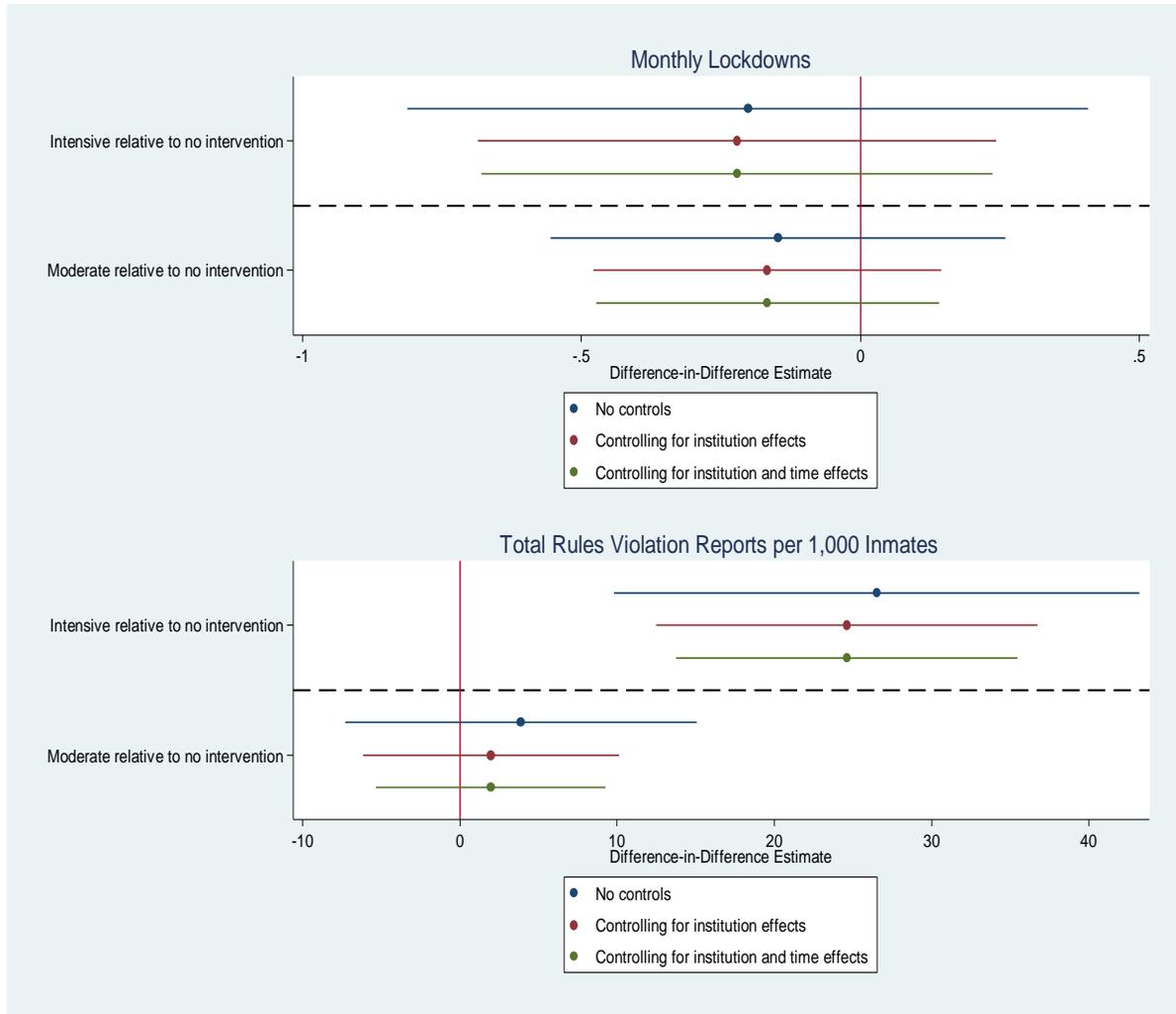
The figure above displays the proportion of drug tests that result in a failure for four six-month periods. The first period corresponds to a period where the EDCIP intervention had yet to ramp up to full scale. During the latter three periods, the ECIP program is in full effect. The blue bars display failure rates for intensive intervention institutions while the orange bars display failure rates for select institutions that did not receive the EDCIP intervention but had similar failure rates in the first period. The figure shows a clear decline in random drug test failure rates among intensive intervention institutions corresponding in time with the implementation of EDCIP. There is no comparable decline among the comparison institutions. The decline amounts to a 20 to 25 percent decline in drug failure. Most of the effect is driven by a decline in the propensity to refuse drug tests.

Conclusion #3: Drug use at moderate intervention institutions did not decline with the implementation of EDCIP. There was also no decline in comparison institutions that did not receive the intervention.



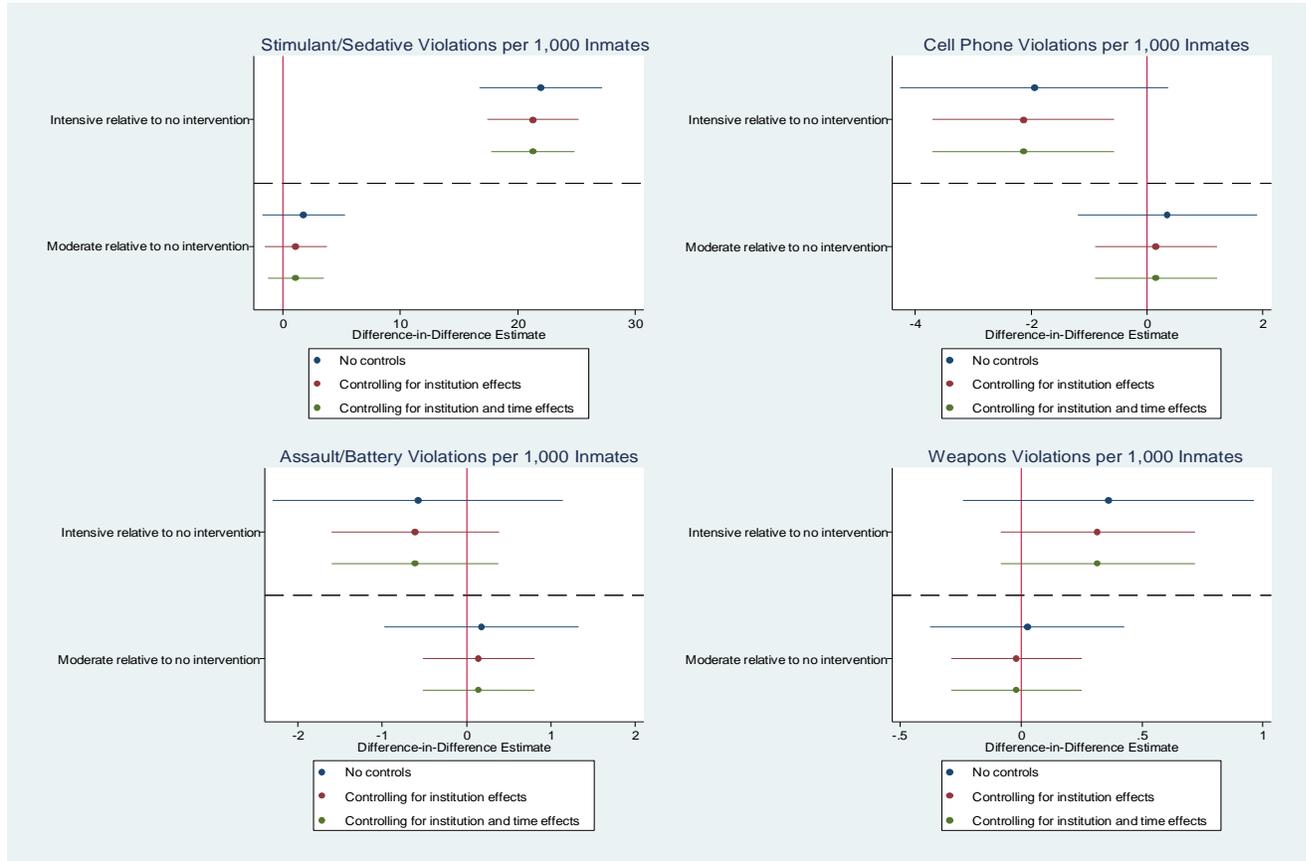
The figure above displays the proportion of drug tests that result in a failure for four six-month periods. The first period corresponds to a period where the EDCIP intervention had yet to ramp up to full scale. During the latter three periods, the ECIP program is in full effect. The blue bars display failure rates for moderate intervention institutions while the orange bars display failure rates for select institutions that did not receive the EDCIP intervention but had similar failure rates in the first period. The figure shows little evidence of change in drug test failure rates in the moderate intervention institutions corresponding to the implementation of EDCIP.

Conclusion #4: There was no relative decline in lockdowns at EDCIP institutions. There was a sizable increase in overall recorded inmate misconduct. This was driven primarily by increased rules violation reports at intensive intervention institutions.



The figure above presents statistical estimates of the change in monthly lockdowns at EDCIP institutions relative to non-intervention institutions (top figure) and the change in rules-violation report per 1,000 inmates at EDCIP institution relative to non-EDCIP institutions (bottom figure). The points show the actual estimate while the lines through the points sketch out the margin of error. The figure presents separate estimates for intensive-intervention and moderate-intervention institutions and present estimates with and without statistical adjustment for differences in institutional environment and general time trends. There are relative declines in lockdowns in the EDCIP institutions. However, these declines are not statistically significant. There is a pronounced and statistically significant increase in rules violations reports per 1,000 inmates in intensive intervention institutions.

Conclusion #5: Recorded instance of inmate misconduct for drug violations increases at intensive intervention institutions while recorded instances of inmate misconduct related to cell phones declines. There is little evidence of an impact on violence or weapons violations. There is also little evidence of an impact on any of the specific misconduct measures in moderate intervention institutions.



The figure above presents statistical estimates of the change in drug-related rules violation reports (figure top left), cell-phone related rules violation reports (figure top right), assault/battery rules violations (figure bottom left), and weapons rules violations (figure bottom right) at EDCIP institutions relative to non-intervention institutions. Violation levels are measured as violations per 1,000 inmates. The points show the actual estimate while the lines through the points sketch out the margin of error. The figure presents separate estimates for intensive-intervention and moderate-intervention institutions and present estimates with and without statistical adjustment for differences in institutional environment and general time trends. There is a sizable increase in recorded drug violations per 1,000 inmates and a notable and statistically significant relative decline in cell-phone related violations per 1,000 inmates in intensive intervention institutions (amounting to roughly 13 percent of the base level). We find no evidence of a relative decline in any of the rules violation categories for the moderate intervention institutions.

I. Introduction

Correctional institutions throughout the United States struggle to limit the flow of contraband into the nation's prisons and jails as well as the trading and use of contraband among inmates and staff. Random and targeted drug testing regularly uncovers the use of illegal drugs. Non-fatal and sometimes fatal overdoses associated with trafficking and use, while rare, do occur with regularity. In recent years, contraband cellphones have become more common. During fiscal year 2014, nearly 11,000 cellphones were confiscated in California prisons, up from 2,811 in 2008, and 261 in 2006 (Shaw 2009). This increase is particularly salient given that the state's prison population in 2014 was roughly 30 percent below the peak levels of the mid 2000s.

Drug use and the presence of cellphones in prisons and jails pose several logistical and security challenges that contravene the objectives of correctional institutions. Many inmates have histories of drug and alcohol abuse and in many instances serious substance abuse problems. The availability of drugs behind bars clearly compromises rehabilitative programming efforts. The trafficking of contraband may augment violent conflict between inmates, and between inmates and staff. Smuggling drugs and cellphones into prison may ensnare visiting family and friends who may be motivated by profit, feel compelled to help loved ones, or in some instances be coerced into bringing contraband to visiting centers. The smuggling of contraband by staff clearly undermines the authority and legitimacy of correctional officers and, more generally, prison and jail staff members.

The California Legislature provided the California Department of Corrections and Rehabilitation (CDCR) \$10.4 million over two years to implement an interdiction effort. Beginning in fiscal year 2014-2015, CDCR implemented the Enhanced Drug and Contraband Interdiction Program (EDCIP) demonstration. The program involved interdiction efforts at 11 of

California's prisons; eight receiving a moderate intervention and three receiving an enhanced intervention. The EDCIP program was implemented in a manner that targeted institutions believed to have the most serious and pervasive contraband problems. The intervention introduced random monthly drug testing of roughly 10 percent of inmates at all institutions and enhanced use of K-9 detection teams and ion spectrometry scanning technology at intervention institutions. Detection screening technology, both for trace amounts of narcotics and in some instances full body scans, is applied in one form or another to inmates, visitors, staff, and mail and packages at intervention institutions, with the key differences between intensive and moderate intervention institutions residing in the volume of this scanning activity.

In this report, we use administrative data provided to us by CDCR to evaluate the effects of the EDCIP intervention on drug use in California prisons and the level of recorded inmate misconduct. We employ a series of quasi-experimental research strategies to gauge how these outcomes change in institutions receiving the EDCIP intervention relative to institutions not receiving the intervention. Specifically, we identify non-intervention institutions that are most similar to the intensive and moderate intervention sites in terms of pre-intervention prevalence of drug abuse (documented by the proportion of random drug tests that are either refused or that result in a positive outcome) and compare the changes in the proportion of drug tests that result in a failure at intervention and non-intervention institutions. We also construct a panel data set that varies by month and institution for the time period spanning the introduction of the EDCIP program. We use these data to test for an effect of the intervention on the number of monthly lockdowns, total recorded rules violations per inmate, and the rules violations rates for specific types of misconduct.

The random drug tests at baseline reveal drug abuse in all California institutions, with a

near 10 percent failure rate. Most of the failures are due to drug detection rather than test refusals, with failure rates varying considerably across institutions. Failure rates for random drug tests administered in intensive-intervention institutions decline by roughly 23 percent relative to institutions with similar pre-intervention failures rates. This decline is statistically significant. We observe less evidence of a measurable decline in failure rates at moderate-intervention institutions relative to comparison institutions with no intervention.

There was no measurable effect of the EDCIP program on average monthly lockdowns. The intensive EDCIP intervention caused a significant and substantial increase in the number of monthly rules violation reports per 1,000 inmates, though this aggregate change masks some important compositional differences. There is a very large increase in the rules violations rate for drug violations (drug-related rules violations more than double) and moderate yet significant declines in cellphone-related violations. In the intensive-intervention prisons, cellphone rules violations drop by 13 percent. There is no evidence of an effect of the intensive intervention on assault and battery by inmates. We find no evidence of effects of the moderate intervention on inmate misconduct.

The level of drug abuse in California prisons revealed by EDCIP's introduction of random drug testing appears to be in line with what is observed in prisons throughout the country. In addition, while the research is scant the extant evidence evaluating the effects of similar interdiction efforts are generally consistent with the findings here. The level of cellphone discovery in California appears to be particularly high. In the conclusion, we offer some ideas for possible experimentation that may induce inmates to substitute towards legal phones services and some general thoughts about possible interventions targeted at reducing demand for contraband in California's prisons.

2. Description of the EDCIP Interventions

The principal avenues through which drugs and cellphones are brought into correctional facilities throughout the country include visits from family and friends, contraband smuggled in by staff, contraband smuggled in by low-security inmates with access to areas beyond secure perimeters, and contraband entering through mail and packages. The records of major contraband discoveries in California provide examples of the manner in which drugs and other prohibited items enter the system. Of the roughly 5,000 discoveries made between May 2015 and February 2016, approximately 77 percent involved recovery of contraband from inmates, 20 percent involved the discovery of an uncontrolled drop either on an institution's external perimeter or within the housing units and other secured locations, 2 percent involved visitors, and less than one percent involved discoveries from staff members. The lion's share of discoveries is made by custody staff (77 percent), ISU staff (18 percent), and K-9 teams (4 percent).

The comment sections of the discovery logs provide concrete examples of the circumstances and nature of contraband smuggling into California prisons. For example, discoveries where contraband was recovered from inmates include a discovery of methamphetamine in a bar of soap that was to be smuggled into a secure housing unit, heroine found within a body cavity, and cellphones and drugs found during cell searches. There are recorded instances where heroine is discovered concealed under stamps in the incoming mail, uncontrolled stashes found in housing unit shower drains, bundles of tobacco found in restroom trash cans, marijuana discovered in a refrigerator as well as in a dumpster near a visitor processing center, and a package of cellphones and chargers discovered buried on the external perimeter of a prison. Incidents involving visitors include drugs and cellphones found in visitors' cars, drugs found in the mouths of visitors, contraband being passed to inmates in snack packages consumed

in visiting rooms, drugs “discovered on female visitor during unclothed body search,” and incidents where inmates are discovered swallowing bundles while receiving visitors. While recorded discoveries involving staff are relatively rare, there are instances where staff are discovered bringing various narcotics, cellphones, tobacco, alcohol and other contraband into institutions. In some instances, the quantities discovered in these staff-involved incidents are quite large. There are recorded incidents involving both custody and non-custody staff.

The interdiction tools deployed in the EDCIP program involve efforts to impede the flow of contraband into prison as well as efforts to discover stashes and contraband in inmate housing areas and other locations within institutions. These tools include K-9 teams trained to detect drugs and cellphones, and new methods for scanning visitors, staff, inmates, and incoming mail. In addition, with the implementation of EDCIP, CDCR introduced monthly random drug testing of roughly 10 percent of all inmates in all institutions, with drug testing preceding the implementation of enhanced interdiction efforts in target institutions. It is certainly plausible that random testing in and of itself may be deterring drug use. However, since the outcome of the random drug tests provides our principal gauge of drug use it is difficult to assess whether testing in and of itself has impacted drug use prevalence.

CDCR devoted resources to random drug testing for the first six months of calendar year 2014, prior to receiving the FY 2014-2015 EDCIP budget allocation. This early testing was intended to provide benchmark estimates of drug use levels in each institution. However, CDCR switched vendors in July 2014 due to quality control issues and problems of specimen labeling that compromised the outcomes of the urinalysis tests. With the change in vendors, we observe a discrete increase in failure rates in all institutions that likely reflects changes in specimen processing procedures associated with the shift in vendors. For this reason, the analysis here

focuses on analyzing drug test results beginning in July 2014.

EDCIP targets 11 institutions for enhanced interdiction activities. Eight institutions were identified for the moderate intervention¹ while three institutions were slated for the intensive intervention.² The moderate intervention involved the use of at least two K-9 drug and contraband detection teams, the purchase and staffing of two ion spectrometry scanner machines capable of detecting trace amounts of narcotics in searches of visitors, staff, inmates and packages, the use of x-ray machines for scanning inmate mail, packages, and property as well as the property of staff and visitors at entry points, and the hiring of a drug and contraband interdiction officer. The intensive intervention involved all of the elements of the moderate intervention plus an additional canine team, an additional ion scanner, as well as a full body x-rays scanner for inmates, and video surveillance equipment for visiting rooms.

While EDCIP funds were available at the beginning of fiscal year 2014-2015, in practice it took several months for the interdiction efforts to ramp up to scale. Hence, the actual beginning of the intervention coincides roughly with the start of calendar year 2015. Table 1 shows the first month in the scan data where we observe scans of inmates, staff, visitors, and packages for each institution in the two treatment groups. In all institutions, inmate scans begin the soonest, with inmates scanning beginning in October and November 2014 for intensive institutions and beginning between October 2014 and February 2015 in the moderate intervention institutions.

¹ The institutions included in the moderate-intervention groups include High Desert State Prison (HDSP), the Sierra Conservation Center (SCC), Central California Women's Facility (CCWF), Salinas Valley State Prison (SVSP), the Substance Abuse Treatment Facility and State Prison in Corcoran (SATF), Kern Valley State Prison (KVSP), the California Institution for Men (CIM), and Centinela State Prison (CEN).

² The intensive intervention institutions include Calipatria State Prison (CAL), California State Prison, Los Angeles County (LAC; Lancaster), and California State Prison, Solano (SOL)

Scanning of visitors, staff and packages starts later; between October 2014 and January 2015 for intensive institutions and in 2015 (for the most part) in moderate intervention institutions.

Figure 1 displays the number of staff, inmate, visitor, and package scans (expressed as monthly scans per 1,000 resident inmates) for each month in calendar years 2013, 2014, and 2015. The figure displays separate series for intensive-intervention institutions, moderate-intervention institutions, and no-intervention institutions. The figures display a red-vertical line to indicate the beginning of fiscal year 2014-2015 when money for EDCIP was appropriated by the state legislature. The figure clearly displays differences in the scale of the intervention across the three groups. When fully ramped up in mid-2015, the volume of scanning activity is visibly greater in the intensive-intervention institutions relative to the moderate-intervention institution. Of course, in both treatment groups scanning activity is much greater than what is observed in the no-intervention institutions. In both treatment groups, most of the scans involve scans of staff. Visitor scanning is on par with staff scans in intensive institutions through mid 2015 and then declines to levels much lower than that observed for staff for the remainder of the year. Most of the scanning in moderate institutions is staff scanning.

The data we received on K-9 search teams is insufficient to characterize the timing and size of this particular aspect of the intervention. For the pre-EDCIP period we received time logs for K-9 search teams that details all activities involving each team. For the post-EDCIP period, we only received K-9 discovery logs. Hence, we cannot characterize the degree to which searches and surveillance by K-9 teams changes with the introduction of EDCIP. Characterizing the “dose” so to speak of K-9 activity is further complicated by the fact that individual teams often work in multiple institutions within given regions of the state. From these two files, however, we can tabulate the number of individual K-9 teams that are mentioned by institution in either the time

logs (for the pre-EDCIP period) or the discovery logs (for the post-EDCIP period). To be sure, this is a noisy estimate of this particular input, as for the pre-period we observe all activities while for the post-period we only observe discoveries. Moreover, if the EDCIP effort is discouraging smuggling in the intervention-group institutions, fewer dogs may be mentioned in the post period due to less discovery overall.

Table 2 shows the number of individual dogs observed in time use logs (for July through December 2013 and January through June 2014) and discovery logs (for July through December 2014 and January through June 2015) for the three groups of institutions. The number of dogs mentioned in the logs is relatively stable for no-treatment institutions. For intensive treatment and moderate treatment institutions, the number appears to decline for the first half of fiscal year 2014-2015 and then recovers to previous levels in the latter half.

As a final set of preliminary descriptive statistics, Figures 2 through 6 display monthly discoveries of cellphones (Figure 2) as well as grams of heroin (Figure 3), marijuana (Figure 4), methamphetamine (Figure 5), and tobacco (Figure 6). Each figure measures the quantity of the discovery per 1,000 inmates and presents separate time series for intensive-intervention, moderate-intervention, and no-intervention institutions. Discovery quantities for all figures are the highest in intensive intervention institutions, and tend to be higher in moderate intervention institutions relative to those prisons that were not included in the demonstration project. There are no clear time trends in discovery quantities, though methamphetamine discoveries appears to increase post-intervention in intensive-intervention institutions.

3. Empirical Strategy for Measuring the Effect of EDCIP on Drug Abuse

A key aspect of the EDCIP program that is crucially important to this evaluation report is

the introduction of random drug testing in all California prisons. Random tests provide a snap shot of drug use levels in each institution. Changes in the proportion of inmates testing positive or refusing the test provide a key indicator of the ultimate impact of EDCIP. Figure 7 presents the percent of inmates subjected to random testing who “fail” the test during the six-month period beginning in July 2014. We define failed tests as those that test positive for a prohibited substance or where the inmate refuses to be tested. During this six month period, the failure rate for random tests stands at 9.5 percent, with 7.8 percent testing positive for a controlled substance and 1.7 percent refusing to test. The most commonly detected substances are opiates (4.2 percent), methamphetamines (1.4 percent), and cannabinoids (1.2 percent). Failure rates vary considerably across institutions. The failure rate at the median institution (the institution with a failure rate greater than half of all institutions) is 8.1 percent. The failure rate for the institution with the rate exceeding the bottom quarter of institutions was 4.1 percent, while the rate for the institution with a failure rate greater than three quarters of institution was 12.8 percent. The lowest and highest institution-level failure rates was 1.2 and 19 percent, respectively.

In addition to random testing, CDCR also increased the incidence of mandatory tests for inmates with prior drug-related rules violations. Tests are also implemented in some instance following visits and following transfers between CDCR institutions and before transfer to and from non-CDCR institutions such as county jails. Table 3 presents failure rates for four six-month periods beginning with July through December 2014 for all drug tests combined, for random drug tests, and for mandatory drug tests. The first column of figures show failure rates for intensive-intervention institutions, the second provides figures for moderate-intervention institutions, while the third column presents estimates for no-intervention institutions. The final two columns estimate the difference in failure rates for each of the intervention groups relative to the no-

intervention group.³ Panel A presents results for all drug tests, panel B presents results for random drug tests, while Panel C presented results for mandatory drug tests. We tabulate failure rates and standard errors (see footnote 3) using individual test data.

There are several notable patterns in Table 3. First, failure rates overall, for random drug tests, and for mandatory drug tests, are the highest in the intensive intervention institutions. Second, the failure rate for mandatory tests are considerably higher than the failure rates for random drug tests. This seems sensible since mandatory tests are administered to those with a history of drug-related rules violations. Third, moderate-intervention institutions and no-intervention institutions have similar failure rate. Finally, failure rates decline for intensive-intervention institutions especially between the first and second six-month period. The declines are especially notable for random drug tests. We do not observe comparable declines in moderate-intervention and no-intervention institutions.

Drawing conclusions regarding the effect of the intervention from the statistics presented in Table 3 is difficult given that the intervention was not administered experimentally. In an ideal social experiment, treated institutions would be randomly selected from among all institutions and the effect of the intervention would be inferred by testing for a difference in the outcome between the treatment and control group. Through random assignment to treatment and control groups, social experimentation ensures that any differences that do exist between treatment and control groups that may impact drug use occur at random and are not driven by the experimental treatment.

³ The numbers in parentheses are standard errors for each failure rate (the first three columns) and for the difference relative to the no-intervention institutions (the last two columns). The standard error is a measure of statistical precision of the estimate, akin to a margin of error. Adding and subtracting approximately twice the standard error from the estimate provides a confidence interval within which we can be reasonably confident contains the true value. For example, the proportion of intensive intervention inmates who are tested and fail from July to December 2014 is 0.199 with a standard error of 0.003. Adding and subtracting twice the standard error from 0.199 gives use a rough confidence interval of 0.193 to 0.205.

Moreover, randomization usually leads to observable comparability between the treated and non-treated units during the pre-period for both outcome variables as well as background variables that may be independently impacting outcomes of interest.

In many instances, however, social experiments are infeasible or conflict with the objective of prioritizing intervention resources where they are most needed. For example, with limited resources and the pressing security and health issues created by drug and cellphones use within prisons, operational consideration may trump concerns pertaining to the evaluation design.

The fact that treatment resources were not randomly assigned to institutions means that we must devise a non-experimental strategy to attempt to measure the impact of EDCIP on drug use and other indicators of contraband presence and trade. Non-experimental studies identify a comparison group against which trends or changes in key outcomes for the treatment group are compared. The idea behind this design is relatively simple. In the current context, for treated institutions drug use in prison (and changes therein) will be a function of interdiction efforts, the composition of the prison population in terms of the prevalence of substance abuse problems, and perhaps market conditions pertaining to illegal drugs outside of prison (supply, price etc.). For non-intervention institutions, only the latter factors (composition of inmates, drug market conditions) influence drug use and changes in drug use over time, since no additional interdiction resources are allocated to these prisons. Assuming that absent the intervention, drug use trends in the treated institutions would have paralleled trends in the non-intervention institutions, then one can use the patterns observed for non-intervention institutions to measure what would have happened at the prisons receiving the intervention had the intervention not occurred. In terms of the language of non-experimental evaluation design, evidence of an impact of EDCIP would require patterns for the treated prisons that depart from the “counterfactual” pattern observed in

the comparison institutions.

For example, a decline in failure rates among inmates in moderate-intensive institutions but not among inmates in no-intervention institutions would provide evidence of an impact of EDCIP. Of course, this conclusion would be tempered by whatever concerns one might have regarding the comparability of the non-treated and treated institutions. In Table 3 during the earliest time period, we observe a failure rate for random testing in intensive-intervention institutions that is more than double the failure rate for non-intervention institutions. This lack of baseline comparability raises questions regarding whether the non-intervention institutions provide an appropriate bell-weather for what would have happened in the absence of this demonstration project in intensive-intervention prisons.

Our strategy for isolating the impacts of EDCIP on drug use basically identifies a more select set of comparison institutions with pre-intervention abuse rates that better align with those in treated institutions. To begin, we define the pre-intervention period to be July through December 2014. While some screening activity does begin in later 2014, the analysis in the previous section reveals that the intervention did not ramp up until early in 2015. We also make this specification choice due to non-comparability of drug test data collected during the first half of 2014.⁴

Second, we tabulate failure rates for random drug tests for this period by institution. We identify the set of non-intervention institutions with failure rates that are the closest to the failure rates for intensive-intervention and moderate-intervention institutions. These “nearest neighbor”

⁴ Failures rates increase discretely with the change in vendors, with larger increases for institutions in the intensive-intervention group. This increase cannot be attributed to EDCIP, as the timing of the intervention occurred several months later. In one of our site visits, we were informed that problems with the labelling of urine samples in the procedures followed by the previous vendor rendered many samples unusable. In the robustness section of this report, we explore whether the patterns that we identify change when we use alternative definitions of the pre-period.

institutions serve as our non-experimental comparison groups.⁵ Next, define the variables F_{Before}^T and F_{After}^T as the failure rates for treated institutions before and after EDCIP's implementation, and F_{Before}^C and F_{After}^C as the comparable failure rates for our nearest-neighbor comparison group. The before after change in failure rates for the treated institutions is given by

$$(1) \Delta_T = F_{\text{After}}^T - F_{\text{Before}}^T.$$

Any observed change will be driven by whatever impact EDCIP has on the failure rate and by changes in factors that determine drug-use levels in prison that have nothing to do with EDCIP.

The comparable change for the comparison institutions is given by

$$(2) \Delta_C = F_{\text{After}}^C - F_{\text{Before}}^C.$$

Here any change in failure rates will be driven only by factors that are independent of EDCIP. Assuming that the EDCIP-independent influences that determine drug abuse are similar for treatment and comparison prisons and that changes in these factors have similar effects on drug abuse rates in these two groups, subtracting the difference in equation (2) from the difference in equation (1) nets out the effect of external factors and isolates the impact of EDCIP. This “difference-in-differences” estimate is thus given by the equation

$$(3) \Delta_2 = \Delta_T - \Delta_C.$$

Our primary results estimate the differences in equations (1) and (2) and the difference-in-differences in equation (3) for intensive and moderate intervention institutions relative to

⁵ To be specific, we identify institution with random drug test failure rates that are just above and just below the rate for treated institutions in terms of the ranking across all institutions. This simple rule identifies SAC, CIS, and CHCF as comparison institutions for the intensive-intervention group and PVSP, CAC, ISP, CNC, CCC, VSP, CPR, WSP, RJD, and DVI as comparison institutions for the moderate-intervention group.

intervention-specific comparison groups. We believe that random drug testing provides the best gauge of the changes in overall drug use and drug availability, as the random samples of inmates provide unbiased snapshots of recent drug use at a point in time. For completeness, we also present estimates that focus on mandatory drug tests where we selectively match to nearest-neighbor comparison institutions based on pre-intervention mandatory test failure rates. We believe however that these estimates are problematic given the increase in drug-violations associated with EDCIP (a pattern we will discuss later in this study) and the increasingly non-random set of inmates subjected to mandatory testing. We discuss these issues in greater detail with the presentation of the results.

4. Estimations Results Pertaining to the Impact of EDCIP on Drug Test Failure Rates

A. Estimates for Random Drug Tests

Table 4 presents various estimates of the random-test failure rates needed to calculate the before-after changer in equations (1) and (2) and the relative change (or difference-in-difference) in equation (3). The first three columns present results for the intensive-intervention treatment group (relative to the select intensive-intervention control group) while the next three columns present comparable results for the moderate-intervention group. Beginning with the rates in the first column, we observe roughly 16 percent of randomly tested inmates (the probability of 0.158) failing their drug test in intensive-intervention institutions during our defined pre-intervention period. This drops to 12.1 percent in the first post-intervention period (January-June 2015), increases slightly to 12.6 percent in the second post-intervention period (July-December 2015), and then declines further to 11.3 percent in the final post-intervention period (January-June 2016). Note these figures are exactly the same as those in Table 3. Turning next to the nearest-neighbor

comparison institutions from among the non-intervention sites, we estimate a very similar failure rate for the pre-intervention period, with the failure rate for the select comparison group of 16 percent exceeding the comparable rate for intensive-treatment institutions by a statistically-insignificant 0.2 percentage points. Despite this alignment in the pre-period, we do not observe a comparable decline in failure rates at the comparison institutions. There is a small decline between the pre-intervention period and the first post-intervention period which is subsequently reversed. Across all time periods, the failure rate of the comparison institutions hovers around slightly above 15 percent.

The last three rows provide estimates of the relative before-after decline in failure rates for intensive-intervention prisons relative to the chosen comparison institutions (the difference-in-difference estimates from equation (3)). Starting with the first pre-intervention period, we observe a statistically significant relative decline of 2.2 percentage points in the failure rate for intensive-interventions institutions. The relative decline widens to 3 percentage points in the second post-intervention period, and to 3.7 percentage points in the third post-intervention period (both estimates are statistically significant at the one percent level of confidence). Using the estimate for the final period, the results suggest that the intensive-intervention version of EDCIP reduced drug-abuse levels (as measured by random drug test failure rates) by 23 percent relative to the pre-intervention level.

There is little evidence of an impact for moderate intervention institutions. Relative to a pre-intervention failure rate of 8.1 percentage points, failure rates decline to 7.6 percentage points in the first two post-intervention periods but return to 8.1 percent by the final period. Failure rates for the chosen comparison sample, while somewhat below the rates for the treated institutions in the pre-intervention period, show little variation, hovering around 6.5 percent. There are no

measurable relative declines in failure rates for moderate-intervention institutions with all difference-in-difference estimates near zero and statistically significant.

Figures 8 through 11 probe the robustness of these results to various statistical controls and to disaggregating the failure rate into failures due to refusals and failure to an actual positive test. We begin by statistically adjusting the estimates of the relative change in failure rates for fixed differences in the environments of different institutions and for potential time trends that are common to all institutions.⁶ We graphically display the results of this exercise in Figure 8. Figure 8 displays the relative decline in failure rates at intensive-intervention institutions relative to the comparison institution. Focusing on the top three bars in the figure which pertain to the estimates for the first post-intervention period, within each bar is a dot that marks the actual statistical estimate of the relative decline. Hence for the top blue bar, the dot indicates a relative decline in failure rates of a bit over two percentage points (with the value gleaned from the horizontal axis). The horizontal line passing through the dot shows the confidence interval within which we are confident that the true value is contained. The red vertical line at zero allows one to visibly position

⁶ To be specific, define $Period2_{ijt}$ as an indicator variable that a given test took place during the first post-intervention period where i indexes the individual test, j indexes the institution and t indexes the month-year of the test, $Period3_{ijt}$ as the comparable indicator for tests during the second post-intervention period, $Period4_{ijt}$ as the comparable indicator for test during the third post-intervention period, and $Treatment_{ijt}$ as an indicator variable indicating that the test took place in a treated institution (i.e., intensive or moderate intervention prison). Defining F_{ijt} as an indicator variable for a failed test, the difference-in-differences in equation (3) and presented empirically in the last three rows of Table 4 can be constructed from the coefficients of the following linear-probability model: $F_{ijt} = \alpha + \beta Treatment_{ijt} + \theta_2 Period2_{ijt} + \theta_3 Period3_{ijt} + \theta_4 Period4_{ijt} + \gamma_2 Treatment_{ijt} Period2_{ijt} + \gamma_3 Treatment_{ijt} Period3_{ijt} + \gamma_4 Treatment_{ijt} Period4_{ijt} + \varepsilon_{ijt}$, where $\alpha, \beta, \theta_2, \theta_3, \theta_4, \gamma_2, \gamma_3,$ and γ_4 where are parameters to be estimates and is a random error term. The three difference-in-difference estimates in Table 4 for the first, second, and third post-intervention period are given by the interaction term coefficients respectively. Adjusting for institution specific fixed effects requires adding a separate intercept term for each institution, dropping the treatment indicator (to avoid the perfect collinearity problem), but retaining the interaction terms between the treatment dummy and each of the period indicators. Adjusting for common time effects requires adding a separate intercept for each month (indexed by t), dropping the base period effects to avoid perfect collinearity with the month effects, but retaining the interaction terms. Coefficient estimates for from these alternative specifications provide the regression-adjusted difference-in-difference estimates graphically depicted in Figures 8 through 15.

the estimate given by the dot relative to the no-effect value (i.e., zero). Moreover, if the line indicating zero is outside of the demarcated confidence interval, we can conclude that the change that we observe is statistically significant. Hence, visible evidence of a statistically-significant effect of EDCIP in in the intended direction would involve a dot lying to the left of zero with a confidence interval that does not cross the red line.

Figure 8 presents three differences-in-difference estimates for each post-treatment time period: (1) the basic estimates already discussed in Table 4 (given by the blue dot and blue line confidence interval), (2) an alternative estimate that adjusts for fixed differences in practices, internal culture, drug distribution networks etc. across institutions (given by the red dot and red line confidence interval), and (3) an estimate that further adjusts for month-to-month changes in failure rates that are common to all institutions (see footnote 6 for the technical specifics). Comparing the estimates from these different models tests whether our conclusions are sensitive to these statistical adjustments.

In Figure 8, we observe relative before-after declines in failure rates in intensive-intervention institutions for all three time periods. Within time periods, adjusting for fixed differences between institutions and common time trends yields very similar results.

Figure 9 presents similar estimates where we explore patterns for a slightly different characterization of the outcome variable. Figure 9, part A presents estimates of the relative change in the likelihood of actually testing positive, while Figure 9, part B presents estimates of the relative change in the likelihood of refusing the test. For the positive-tests outcome, the relative change in the first post-intervention period is quite close to zero, becomes positive and marginally statistically significant in the models controlling for institution characteristics and time effects, and becomes negative but not statistically significant in the final post-intervention period. By contrast,

the likelihood of refusing the test declines by substantial amounts in all time periods (with some point estimates as high as five percentage points in the second post-intervention period). All of the point estimates are statistically significant and are relatively insensitive to controlling for institution characteristics and time trends.

Figures 10 and 11 repeat this exercise for the comparison of moderate-intervention institutions to nearest-neighbor comparison institutions. Here we see some important differences relative to the unadjusted results presents in Table 4. First, in Figure 10 we observe a relative decline in failure rates for the first post-intervention period in all three model estimates, but all are statistically insignificant. In the second and third post-intervention periods however, we see that statistical adjustment for differences in institutional characteristics and time trends yields slightly larger relative declines that are now statistically significant. The magnitude of these changes are small relative to the effect in the intensive-intervention comparisons (around 1 percentage point for moderates as oppose to 3 to 4 percentage points in the intensive institutions). Nonetheless, we do find some evidence here of a more modest impact.

Figure 11 reveals a similar, yet muted, set of findings that parallel what we observed for intensive intervention institutions. We find little evidence of a statistically significant effect of the intervention on the likelihood of a positive drug test. However, in each period we find significant declines in the proportion of inmates who refuse the test. Again, while statistically significant the declines are considerably smaller relative to what we observe in the intensive institution comparisons.

B. Estimates for Mandatory Drug Tests

In addition to the introduction of random drug testing, the EDCIP program also corresponded with an increase in mandatory testing for individuals with prior narcotics related

rules violations. As a measure of the prevalence of drug use within a given institution, these mandatory tests are problematic. By design, these tests are administered to inmates with prior detected drug use and thus, one would expect higher failure rates for these test. Indeed as we saw in Table 3, the failure rates for mandatory tests are discretely higher, sometimes double the failure rates for tests of randomly chosen inmates. Moreover, it is not clear how drug use among these inmates will respond to changes in interdiction efforts. To the extent that those subject to mandatory testing have more severe substance abuse problems, their consumption levels (and this likelihood of testing positive) may not be as responsive to a reduction in supply. Alternatively, the introduction of random testing may have ensnared less frequent users into the pool of those subject to mandatory testing. Such individuals may be more sensitive to supply conditions and prices within institutions, and by extension, more responsive to interdiction efforts. For these reasons, our preferred results center on the random testing that provides a more representative, point-in-time snapshot of drug use levels.

Nonetheless, we produced a set of results following a methodology similar to that described above for mandatory tests as well. Again, we first identified comparison institutions for the intensive and moderate intervention sites based on mandatory-test failure rates during our defined pre-intervention period.⁷ We then tabulated failure rate for the pre-intervention period and three alternative post-intervention six months. We also tabulated the relative change in the treatment institutions relative to the comparison institutions. Finally, we presents a series of statistically adjusted estimates of the relative change in failure rates comparable to those we presented for the random drug tests.

⁷ The comparison institutions for the intensive-treatment sires are SAC, CMF, WSP, CIM, and CIW. The comparison institutions for the moderate-treatment institutions are PVSP, SQ, CAC, CVSP, CCI, MCSP, RJD, and WSP.

Table 5 presents the failure rates for the pre-intervention period and three post-intervention periods for mandatory test in the treated facilities and the comparison facilities. The structure of the table parallels that of Table 4. The first three columns present results for the intensive-intervention comparisons, while the next three columns present results for the moderate-intervention comparisons. The figures in the final three rows provide the difference-in-difference estimates.

For the intensive-intervention institutions, we observe a sizable decline in the proportion of tests resulting in failure, from roughly 0.264 during the pre-intervention period to between 0.181 and 0.204 during the three post-intervention periods. Here, however, we see similar declines in the comparison institutions. Given that the magnitudes of the declines are similar, there is little evidence of a relative decline in failure rates among the intensive-treatment sites. While the pre-post decline is larger when comparing July through December 2015 to January through June 2015 (and statistically significant at the five percent level of confidence), by the end of the study period the declines in failures are similar in the treatment and control institutions.

For the moderate-intervention comparisons, we observe a decline in failure rates during the first two post-intervention periods before increasing in the final period almost to the level that existed before the intervention. The patterns for the comparison sample are nearly identical. Again, we do see a significant relative decline for the moderate-intervention sites. However, by the end of the study period the failure rates are very similar in treated and comparison institutions.

Figure 12 presents estimates of the relative change in failure rates for the intensive-treatment prisons both with and without statistical adjustment for fixed differences across institutions and time trends. Again, the dots on each bar show the estimated effect while the line through the dot shows the confidence interval. Statistical adjustment does not alter the conclusion

from Table 5. That is to say, by the end of the study period there is no observable decline in failure rates relative to what occurred in comparison prisons. Figure 13 presents separate estimates for the likelihood that a test results in positive detection of narcotics as well as estimates of the relative change in test refusal rates. Similar to the results for the random tests, we do not find observable relative changes in testing positive for drugs, though for the period July through December 2015, positive test rates increase in intensive-treatment prison relative to the comparisons institutions. We do find, however, that refusal rates declines in treatment facilities relative to comparison facilities.

Figures 14 and 15 present comparable results for moderate-intervention prisons. Here statistical adjustment for cross-prison difference and time trends generate significant relative increases in failure rates among moderate-treatment prisons relative to comparison prisons. However, this reflect an increase in those testing positive balanced by significant decreases in those refusing the tests.

5. The Effects of EDCIP on Lockdowns and Inmate Misconduct

Enhanced interdiction efforts may impact security and the level of inmate misconduct in California prisons through a number of channels. More frequent scanning may simply uncover more of the existing drug and contraband problem independent of the actual scope of the drug trade and level of cellphone use. Alternatively, the enhanced effort may shrink the supply of drugs and cellphones in prisons, increasing internal prices and reducing quantity demanded by inmates. Such reductions may induce a reduction in the potential for conflicts between inmates as well conflicts between inmates and staff. On the other hand, an increase in contraband prices may translate into higher conflict to the extent that in the trading of higher priced contraband there is

more at stake and perhaps greater potential for violent conflict. Finally, the higher likelihood of detection, to the extent that there are consequences associated with detection, may deter consumption and in turn, reduce demand for contraband items.

In this section, we test for an impact of the EDCIP intervention on measures of prison security as well as officially recorded inmate misconduct. We were provided with summary level data on monthly lockdowns, total rules violation reports (RVRs), and totals for specific types of RVRs (for example, cellphone discover, assault and battery, or drug-related RVRs). Since the data we received is summary level rather than individual-level incidents (the structure of the drug test data), we deploy a somewhat different yet qualitatively similar methodological strategy. Specifically, we first constructed a panel data set where the observations vary by month and institution. The panel includes observation for all California prisons for each month between January 2013 and December 2015.

Next we calculated outcome variables for each institution, one measured as total monthly incidents and the others measures as incidents per 1,000 inmates to account for differences in population across prisons. The outcome measures that we analyze include monthly lockdowns, total RVRs per 1,000 inmates, drug related RVR's per 1,000 inmates, cellphone violations per 1,000 inmates, assault/battery per 1,000 inmates, and weapons violations per 1,000 inmates.

Finally, we estimate a series of panel regression models that gauge how the pre-post EDCIP change in the outcomes variables for prisons in the intensive and moderate intervention prisons compares to the pre-post change for all other prisons. Let i index the different prisons and t index each month between January 2013 and December 2015. Define the variables $Intensive_{it}$ and $Moderate_{it}$ as indicator variables that take on the value of one for intensive and moderate institutions (respectively) and zero otherwise. Define the variable $After_{it}$ as an indicator variable

equal to one for all observations that are January 2015 or later and zero otherwise. Our estimates of the effect of EDCIP on the security and misconduct outcomes come from estimation of the equation

$$(4) \text{Outcome}_{it} = \alpha_i + \beta_t + \gamma \text{After}_{it} \times \text{Intensive}_{it} + \phi \text{After}_{it} \times \text{Moderate}_{it} + \varepsilon_{it}$$

Where Outcome_{it} is the outcome variable of interest, α_i indicates a series of prison-specific intercepts that controls for cross-prison differences in factors determining the outcome that are time-invariant, β_t indicate year-month fixed effects that adjust for time effects that are common to all prisons, and ε_{it} is a random error term. The coefficients, γ and ϕ on the two interaction terms measure the relative change (pre-post ECIP) in the outcome for intensive and moderate-intervention prisons (respectively) relative to all other prisons in the system. Evidence of an impact of EDCIP would be when these coefficient are statistically distinguishable from zero. Positive values would indicate a relative increase in the incidence of this outcome caused by EDCIP while negative values would indicate an ECIP-induced reduction.⁸

Before presenting estimation results for equation (4), Figures 16 and 17 present basic trends in the number of monthly lockdowns as well as the number of RVR's per 1,000 inmates for intensive-intervention, moderate-intervention, and no-intervention prisons. Each figures displays the outcomes for all months in 2013 through 2015. Two red vertical lines demarcate the beginning of fiscal year 2014-2015 and the beginning of calendar year 2015 (the last serving as our characterization of the timing of the intervention). Monthly lockdowns trend downwards for all institutions and appear to decline post 2014. This may be due in part to lower population levels

⁸ Note, we do not include based terms for the intensive and moderate institution dummies nor for the after dummy. This is due to the perfect multicollinearity between the institution fixed effects and treatment dummies and the perfect multicollinearity between the time dummies and the after dummy.

associated with the passage and implementation of Proposition 47 in November of 2014. There does not appear to be any notable relative changes across the three groups of institutions.

On the other hand, RVRs per 1,000 inmates increase notably in intensive institutions. During the pre-period the monthly RVR rate hovers around 75 per 1,000 inmates, but increase to between 100 and 120 per 1,000 inmates in the post period. The RVR rate for moderate-intervention institution also increases. There is no visible trends in this outcome for the non-intervention institutions.

Figure 18 graphically displays the key parameter estimates from estimating equation (4) for monthly lockdowns and total RVRs per 1,000 inmates. Similar to the previous figure, the table displays the estimated relative changes (treated prisons minus all other prisons) as a dot and draws the confidence interval through this estimate. If the confidence interval does not include zero then we conclude that the change is statistically significant. We present results from three model specifications; one that simple estimates the relative changes in averages not including prison and time fixed effects, one inclusive of institution fixed effects but omitting time effects, and the final specification inclusive of both time and prison fixed effects (the model specification of equation (4) above).

We do observe relative declines in the number of lockdowns with larger relative declines for intensive-intervention prisons relative to moderate-intervention prisons. However, neither of these relative changes are statistically significant. We see a notable and significant relative increases in the number of RVRs per 1,000 inmates in intensive-intervention institutions. The size and significance of the effect are not sensitive to adding prison and time fixed effects to the model. We also see slight increases in the number of RVR' per 1,000 inmates in moderate intervention institutions. Here, however, the changes are not statistically significant.

Figure 19 presents separate estimates of the relative change in RVR rates looking specifically at drug-related RVRs (stimulant/sedative violations per 1,000 inmates), cellphone violations, assault/battery violations, and weapons violations. Looking at these specific RVR categories reveals considerable heterogeneity in the effects of EDCIP on these misconduct categories. First, a sizable relative increase in drug-related violations in intensive-intervention institutions is driving the higher RVR rates for this group. This is an intuitively plausible result and indicates that EDCIP is uncovering more illegal drug use as a result of enhanced screening.

Second, we observe statistically-significant declines in the number of cellphone RVR's per 1,000 inmates in intensive-intervention institution. The effect size is slightly over 2 fewer incidents per 1,000 inmates per month. Given an average of 16.44 cellphone related incidents per 1,000 inmates during the pre-period for intensive intervention institutions, this amounts to a 13 percent reduction in cellphone related rules violations. There is no observable effect in moderate-intervention institutions.

Third, we do see relative declines in assault/battery RVRs in intensive-intervention institution and increases in weapons violation. However, neither of these relative changes are statistically significant. In results not shown here, we also estimated these models separately for assaults/batteries on staff and assault/battery on inmates. Both exhibited related declines similar to what is observed in Figure 19 for intensive-intervention institutions, but neither was statistically significant. There is little evidence that the moderate intervention had an impact on any of these outcomes.

6. Probing the Robustness of the Results

In this section, we subject the empirical analysis to a series of specifications checks to

assess whether the key findings are sensitive to some of the specification choices that we have made. Our basic strategy has been to compare the change in an average outcome among those institutions receiving an EDCIP intervention to a chosen set of comparison institutions with similar pre-intervention values. We defined January 2015 as the beginning of the intervention, despite the fact that funds were appropriated six months earlier and that there is some limited scanning activity as early as October 2014.

Here we present a series of streamlined results that changes these specification choices and re-estimates our principal models. For the most part, the findings we document above are robust to these changes. The specification checks that we explore include the following:

- **Generating comparisons against all non-intervention institutions:** Our main comparisons present the relative changes in outcomes for treated institutions compared with a select set of comparison institutions. We chose as comparison institutions those with similar pre-intervention failure rates for random drug tests. Some may argue that the comparison group is cherry picked to generate a specific result. Hence, we also present a series of estimates that use all non-intervention prisons as the comparison group. Figure 20 shows the results from this exercise. The figure parallels the presentation of the main results above. We see a significant relative decline in the failure rate on random drug tests of 3 to 4 percentage points for the intensive-intervention prisons relative to all non-intervention prisons. For moderate intervention prisons, the relative declines are significant for the second post-intervention period only. Hence, there is less evidence of an impact for the moderate intervention. These results are consistent with those presented above.
- **Altering the definition of the pre-intervention period for the drug test analysis:** In our

main results, we define the pre-period as July through December 2015. The analysis above revealed that EDCIP ramps up in calendar year 2015. However, Table 1 reveals scanning of some sort (usually of inmates) beginning as early as October 2014 for many of the treatment institutions. Hence, here we re-estimate our drug test models defining July through September 2014 as the pre-intervention period and then test for relative declines in failure rates for the three six-month periods beginning in October 2014. Figures 21 and 22 present these alternatives model estimates for the intensive-treatment comparisons and the moderate-treatment comparison. For the first post-intervention period (October 2014 through March 2015), there are relative declines in failure rates of roughly 2 percentage points for the intensive intervention institutions. However, the effects are not quite statistically significant.⁹ During the latter two time periods however, the relative change in failure rates is a decline of four percentage points. Both estimates are statistically significant. For the intensive intervention institutions, this amounts to a 25 percent decline in the failure rate. The relative change in failure rates for moderate institutions are all negative employing this alternative timing and in some models marginally significant. However, the effects are considerably smaller than what is observed in the intensive-intervention institutions.

- **Altering the definition of the pre-intervention period for the analysis of lockdowns and RVRs:** Figure 23 displays difference-in-difference estimates from panel data regressions where the key outcomes of analysis are monthly lockdowns and the number of monthly RVRs per 1,000 inmates. Here we define the post-period as October 2014 or later. Recall in our panel data analysis above, we define the post period as January 2015 or later.

⁹ This is due in part to the small sample of tests used to calculate failure rates during the base period.

The results in figure 22 show relative declines in monthly lockdowns in intensive-intervention institutions. However, the effects are not quite significant. We see large significant effects of the intensive intervention on the number of RVR's per 1,000 inmates. There is little evidence of an impact of the moderate intervention on these two outcomes. Figure 23 presents separates results for drug-related RVRs, assault and battery, cellphone RVRs, and weapons-related RVRs. Here we see sizable relative increases in the number of drug-related RVR's per 1,000 inmates in intensive-intervention prisons but not in moderate-intervention prisons. We also significant relative declines in the number of cellphone violations in intensive prisons but no in moderate prisons.

In summary, the findings in this study are robust to changing the comparison group or changing the defined timing of the intervention.

7. Interpreting the Findings

The findings of this study are the following. First, we find statistically significant and substantial declines in the proportion of random drug tests that results in a failure (test positive or refused) in the institutions that received the intensive EDCIP intervention. The declines amount to roughly one quarter of the baseline level and are driven primarily by a reduction in drug test refusals. This result is quite robust to changes in the definition of the pre-intervention period and the comparison set of prisons used as a benchmark. The estimates for random drug test failures for the moderate intervention is less consistent, ranging from zero to slight declines.

Second, there is a notable increase in the number of recorded instances of inmate misconduct, with most of the increase occurring in intensive-intervention institutions and driven by drug-related rules violations. We do however, observe a statistically significant decline in cellphone violations associated with the intensive-intervention version EDCIP. This decline

amounts to 13 percent of the pre-intervention level for cellphone related rules violation reports. There are no measurable effects of the moderate intervention on these outcomes.

While the body of research on prison drug interdiction is relatively small, there are a few studies that evaluate the effects of comparable efforts with findings roughly in line with what we are seeing for California. For example, Holsinger (2002) presents summaries of the findings from the National Institute of Corrections Drug Free Prison Zone Project. This demonstration involved interventions in prisons in eight states. Most of the interventions occurred during the 1990s and involved enhanced use of K-9 teams, ion spectrometry scanning, increases surveillance of visiting facilities, and the introduction of random drug testing. Random drug testing preceding the interventions yielded estimates of the prevalence of drug use comparable to what we see for California prisons in this study. These demonstration project also generally coincided with reduction in the proportion of inmates testing positive or refusing drug tests. For those sites where the final report presented effect size magnitudes, they were generally in line with what we observe for the intensive intervention institutions. Hence, while the empirical research on such interventions is thin, EDCIP appears to be as effective as these prior efforts.¹⁰

Subjecting the EDCIP program to a cost-benefit test is quite difficult given the information available. We do not know the monetary value of a reduction in failed drug tests and cellphone use in prisons. It must certainly be the case that a lower availability of drugs reduces problems that

¹⁰ The Office of the Inspector General of the U.S. Department of Justice reviewed drug and contraband interdiction efforts in the U.S. federal prisons. The June 2016 report was a follow-up to an earlier 2003 investigation and an attempt to assess progress (or lack thereof) and the degree to which the U.S. Bureau of Prisons had implemented earlier recommendations. The report found that drugs and other contraband were still present in nearly all federal prisons, with the increasing frequency of cellphone discoveries being of particular concern. The report also faults the Bureau of Prisons for not having a coherent interdiction strategy and for failing to implement standard procedures for searching staff members. There is little in this report by way of evaluation of the effectiveness of various interdiction strategies.

are incident to trade in contraband. Moreover, one might expect that a decline in availability would enhance the effectiveness of substance abuse treatment programming in California prisons. Countering these benefits are the expenses associated with purchasing and servicing the various scanners deployed under EDCIP and the additional staffing efforts associated with interdiction efforts. We were provided data on visitations, but in a format that made it hard for easy analysis. To the extent that the EDCIP demonstration discouraged visitation, this would have increased the costs of this program in terms of the welfare of inmates and their families. Absent information on monetary values associated with the various costs and benefits, we cannot say whether the benefits of this effort exceed the costs.

It is worthwhile to consider alternative/complementary strategies that may make contraband interdiction efforts more effective. The specific tools used in the EDCIP effort are all geared towards reducing the supply of contraband into prisons via visitors and staff and perhaps reducing demand through an increased likelihood of detection. For the most part, the efforts are punitive in nature and increase the likelihood of a formal sanction while reducing supply. One could certainly imagine complementary strategies that reduce demand through positive incentives. For example, demand for cellphones within prisons must depend on the cost of cellular phone call relative to a legal phone call using prison facilities. A 15 minute phone call (collect from an inmate) within California costs between \$1.44 and \$2.03 and over \$6 for a call to another state. The system could experiment with providing a weekly call allowance free of charge and assess whether this leads to substitution away from cellphones (as measured by the rate of cellphone related RVRs). Given that the families of inmates bear the costs of legal calls, and the fact that many inmate come from poor and near-poor families, a policy experiment that relieves some of these burdens while reducing the value of a cellphone in prison may be a win-win worth

exploration and experimentation.

Alternatively, enhanced substance abuse treatment efforts, and perhaps substance replacement therapies such as methadone treatment, or extended-release naltrexone (a non-controlled substance that blocks the euphoric effects of opioids for a month following injection) might reduce drug demand. Note, opiates constituted the most frequently detected substance among those whose random tests came back positive, accounting for 54 percent of positive tests. Experimentation that combined interdiction efforts with such efforts targeted at contraband demand is certainly worth exploring.

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Figure 1: Ion Scans of Staff, Inmates, Visitors, and Packages for Intensive, Moderate, and No-Intervention Institutions (Scans Normalized per 1,000 Inmates)

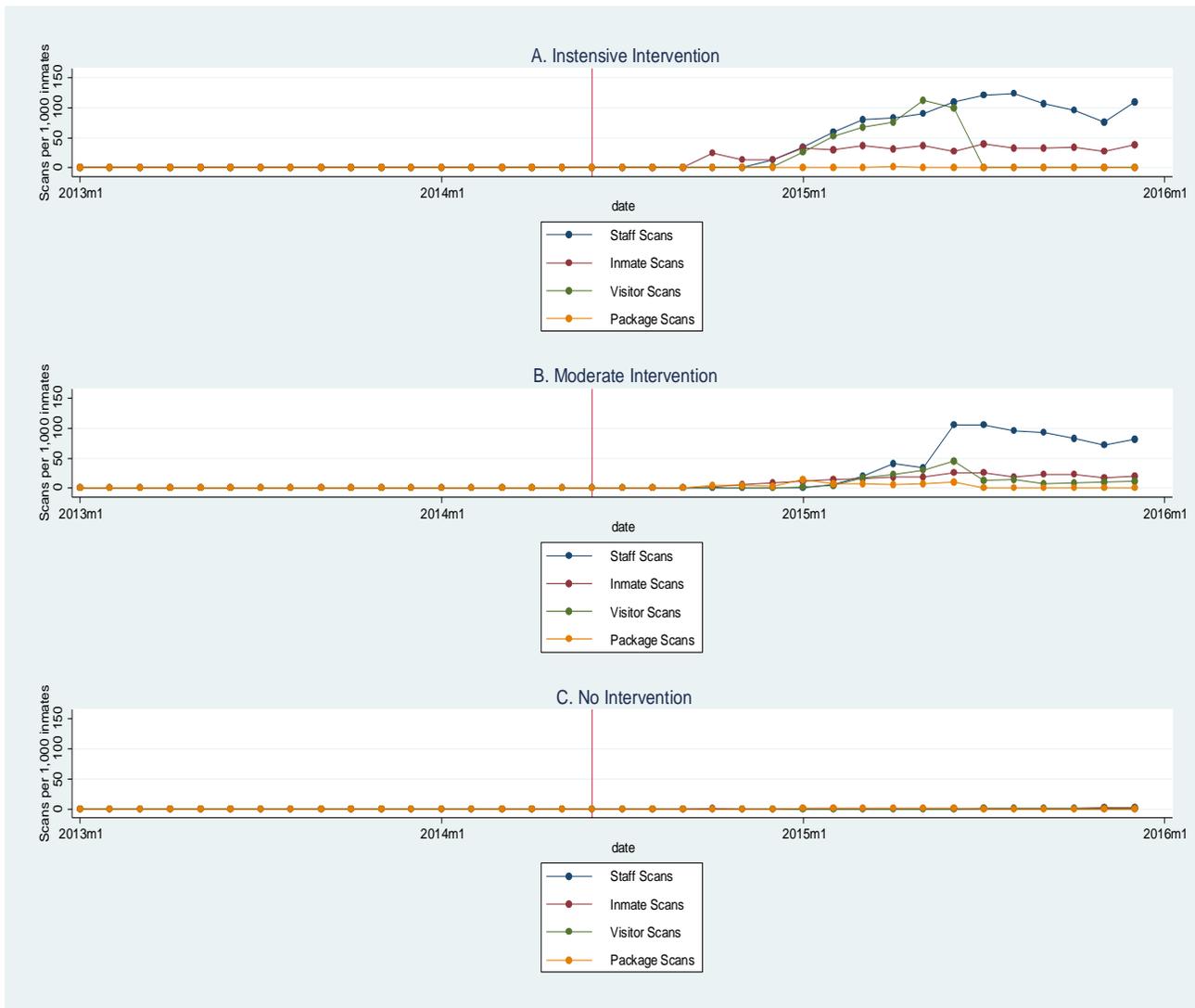


Figure 2: Monthly Confiscated Cell Phones per 1,000 Inmates for Intensive, Moderate, and No-Intervention Institutions

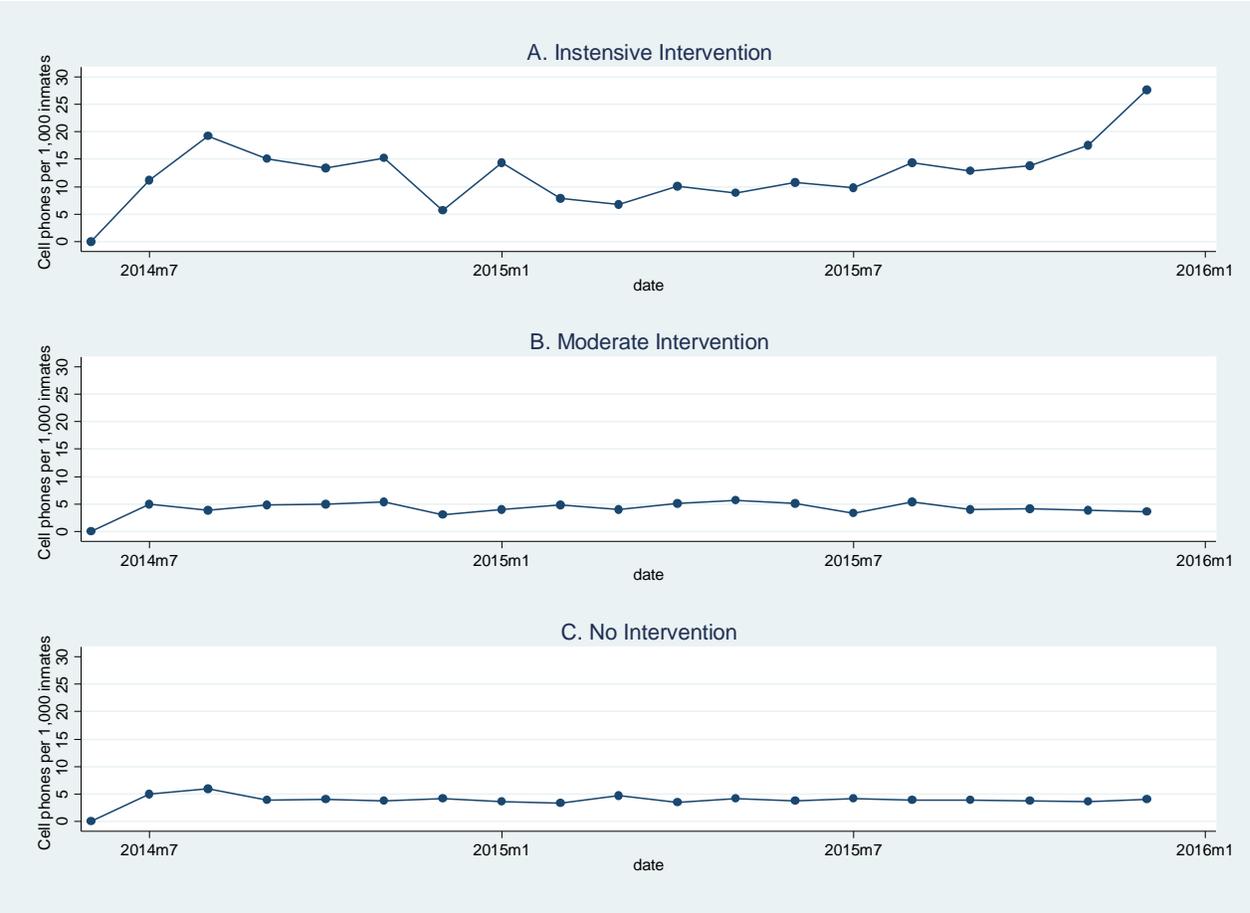


Figure 3: Monthly Heroin Discoveries Measured in Grams per 1,000 Inmates for Intensive, Moderate, and No-Intervention Institutions

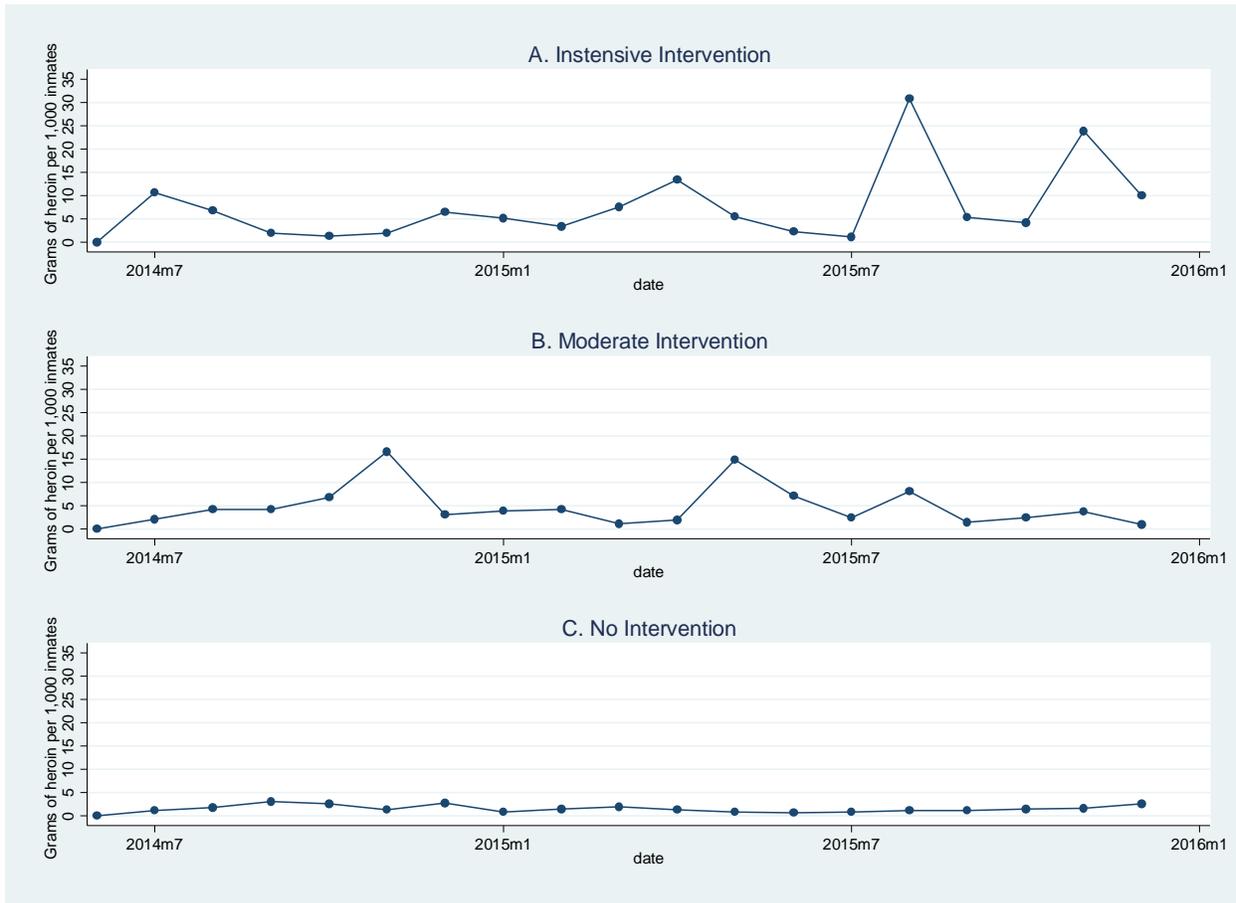


Figure 4: Monthly Marijuana Discoveries Measured in Grams per 1,000 Inmates for Intensive, Moderate, and No-Intervention Institutions

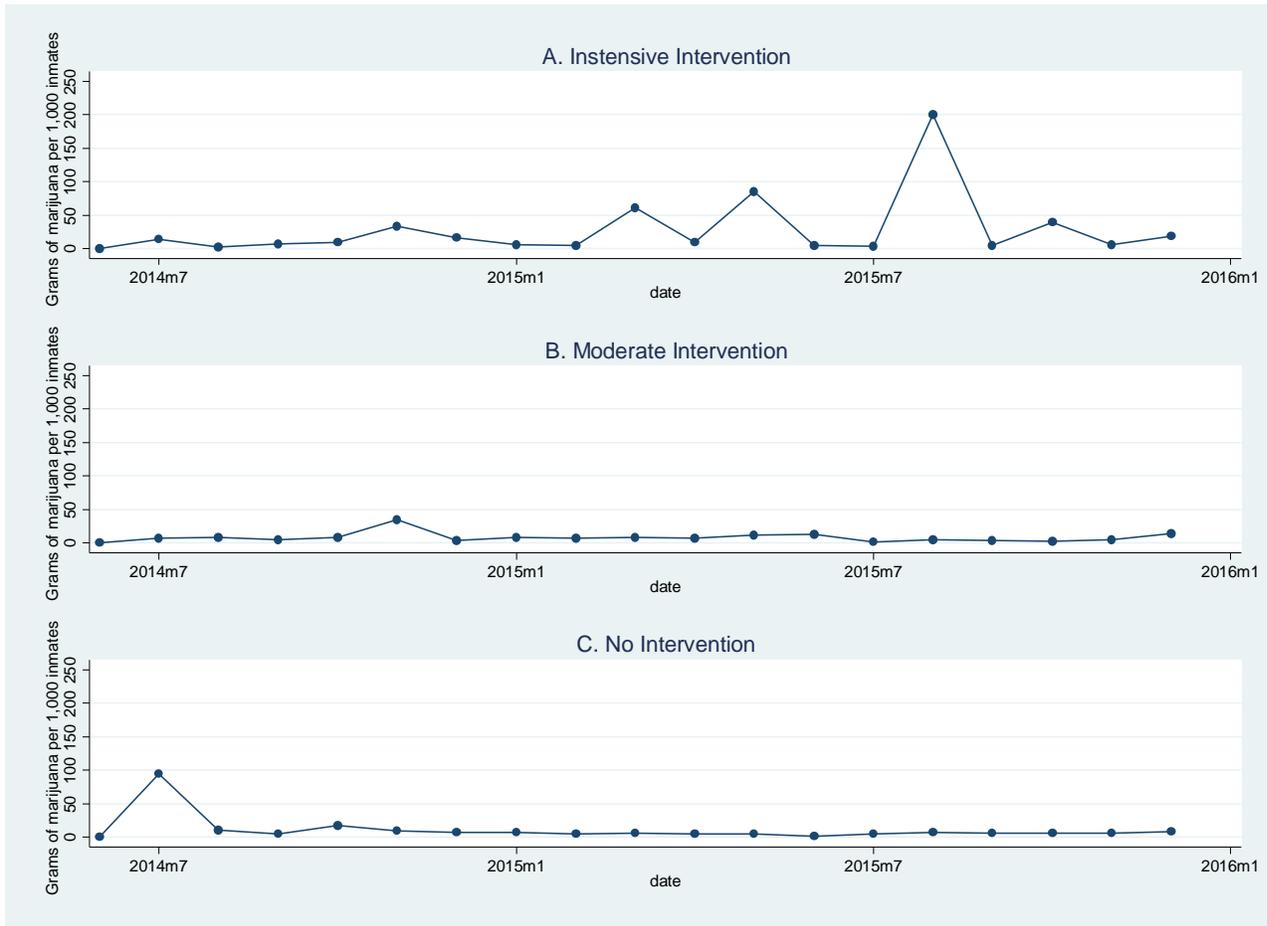


Figure 5: Monthly Methamphetamine Discoveries Measured in Grams per 1,000 Inmates for Intensive, Moderate, and No-Intervention Institutions

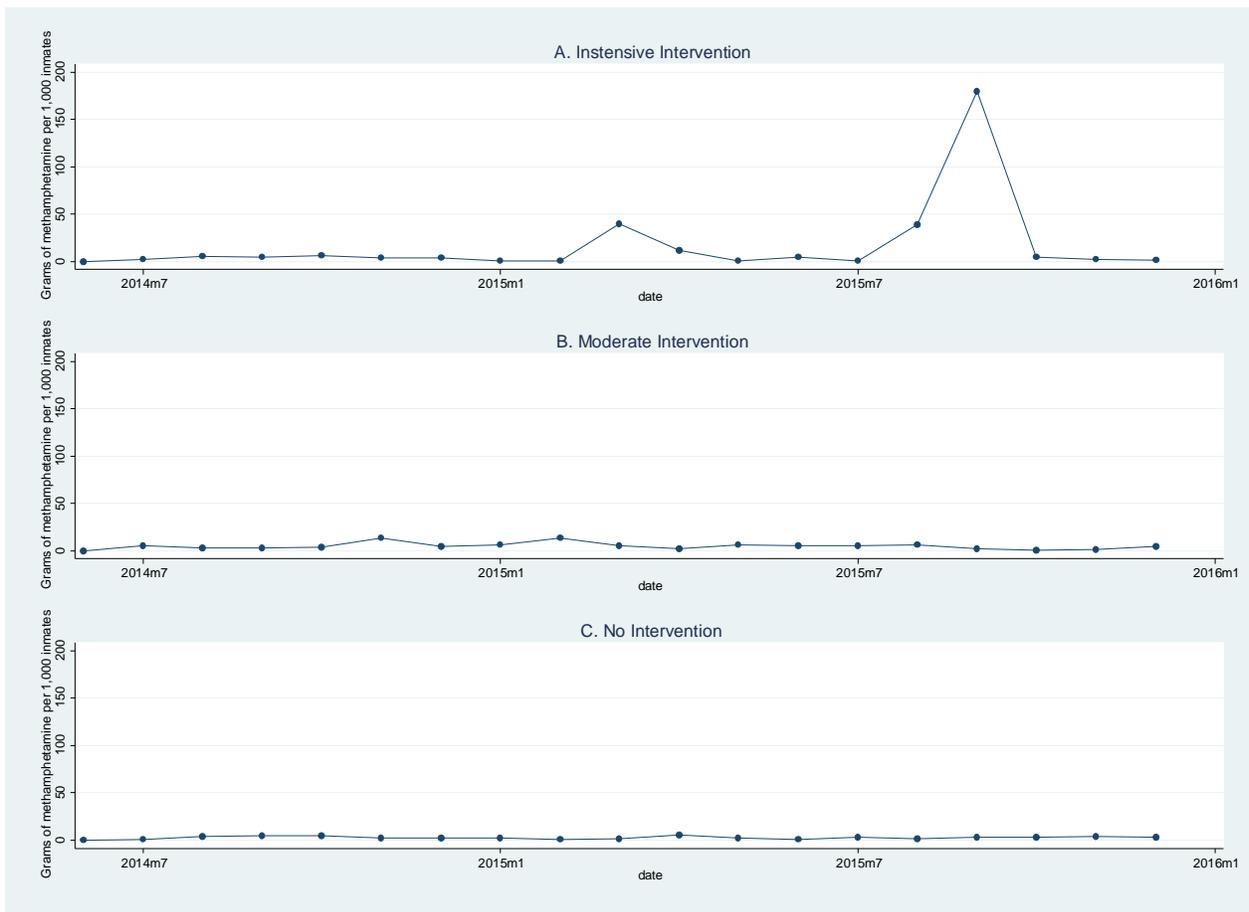


Figure 6: Monthly Tobacco Discoveries Measured in Grams per 1,000 Inmates for Intensive, Moderate, and No-Intervention Institutions

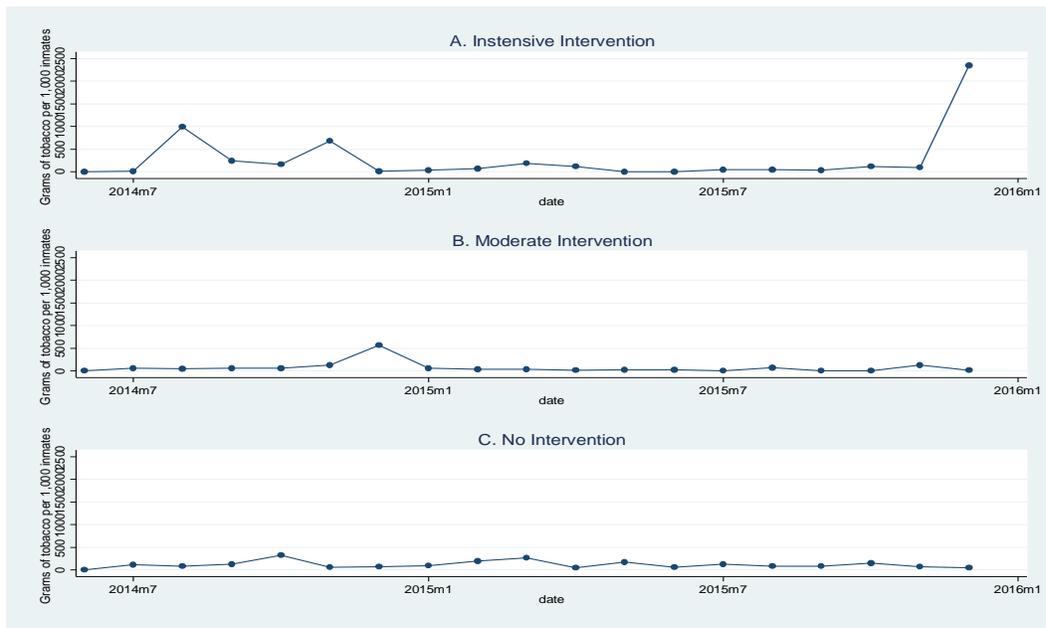


Figure 7: Results from Random Drug Tests for the Period from July through December 2014

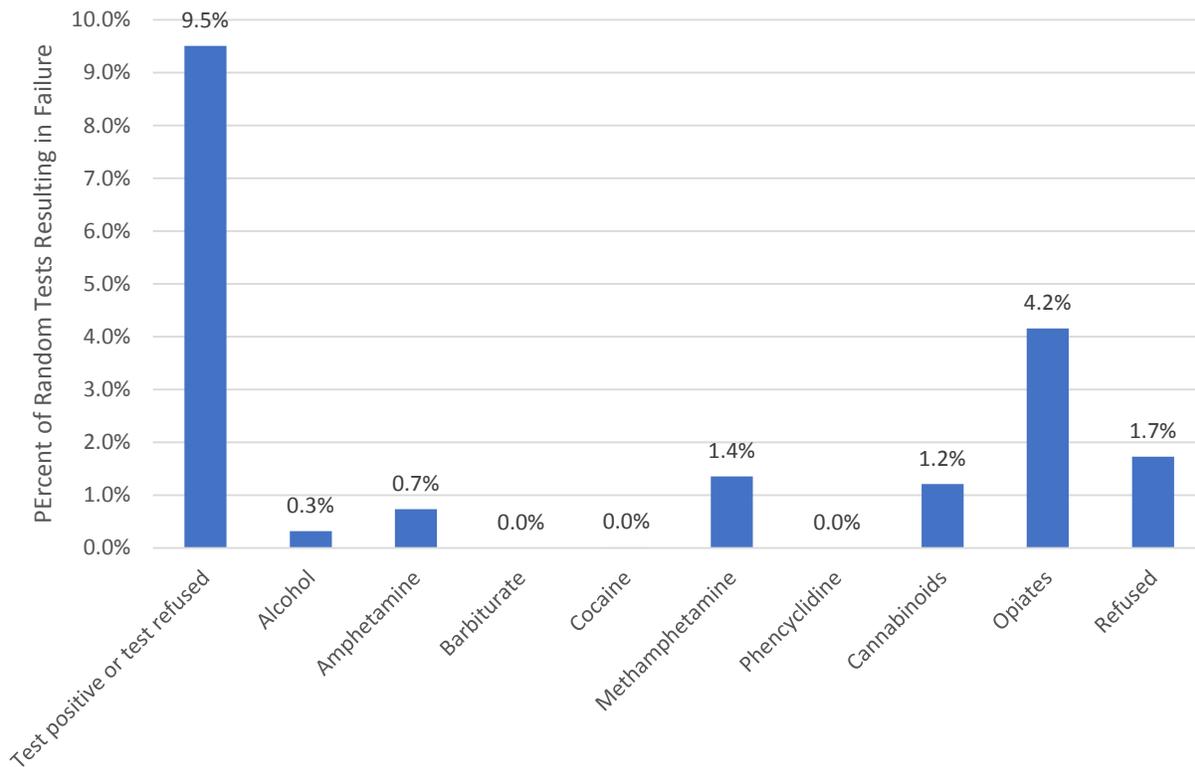


Figure 8: Difference-in-Difference Estimates of the Effects of the Intensive-Intervention on the Proportion of Random Drug Tests Resulting in Failure (Either Test Positive or are Refused)

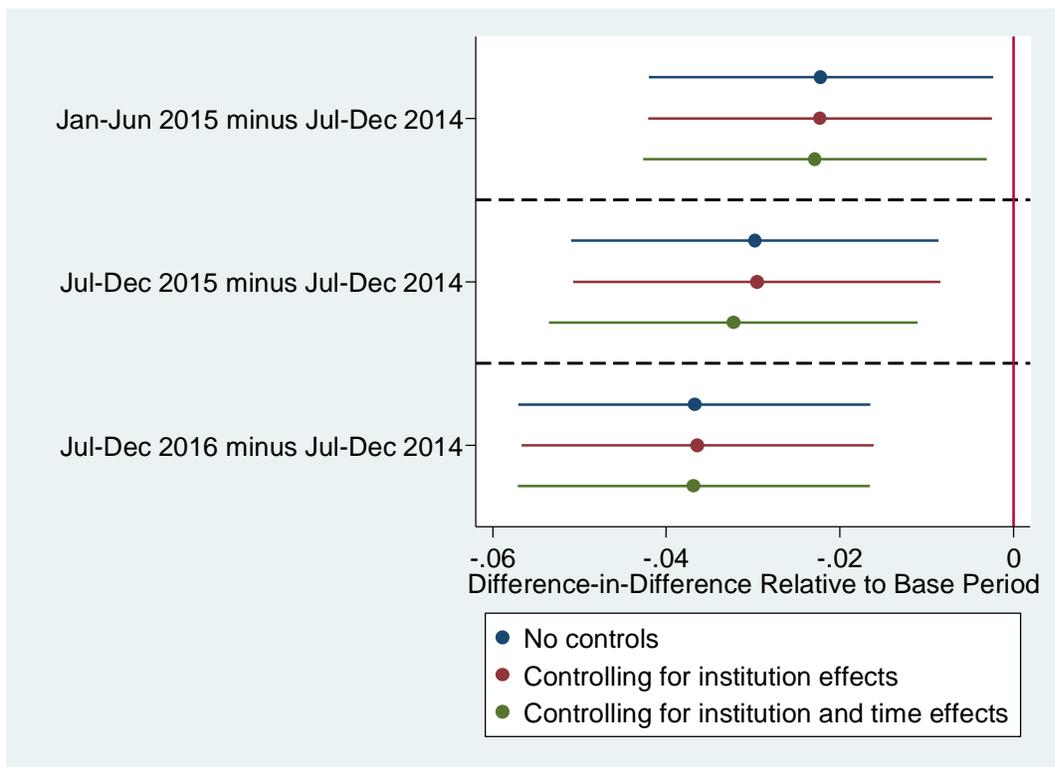


Figure 9: Difference-in-Difference Estimates of the Effects of the Intensive-Intervention on the Proportion of Random Drug Tests that Either Test Positive (Figure A) or are Refused (Figure B)

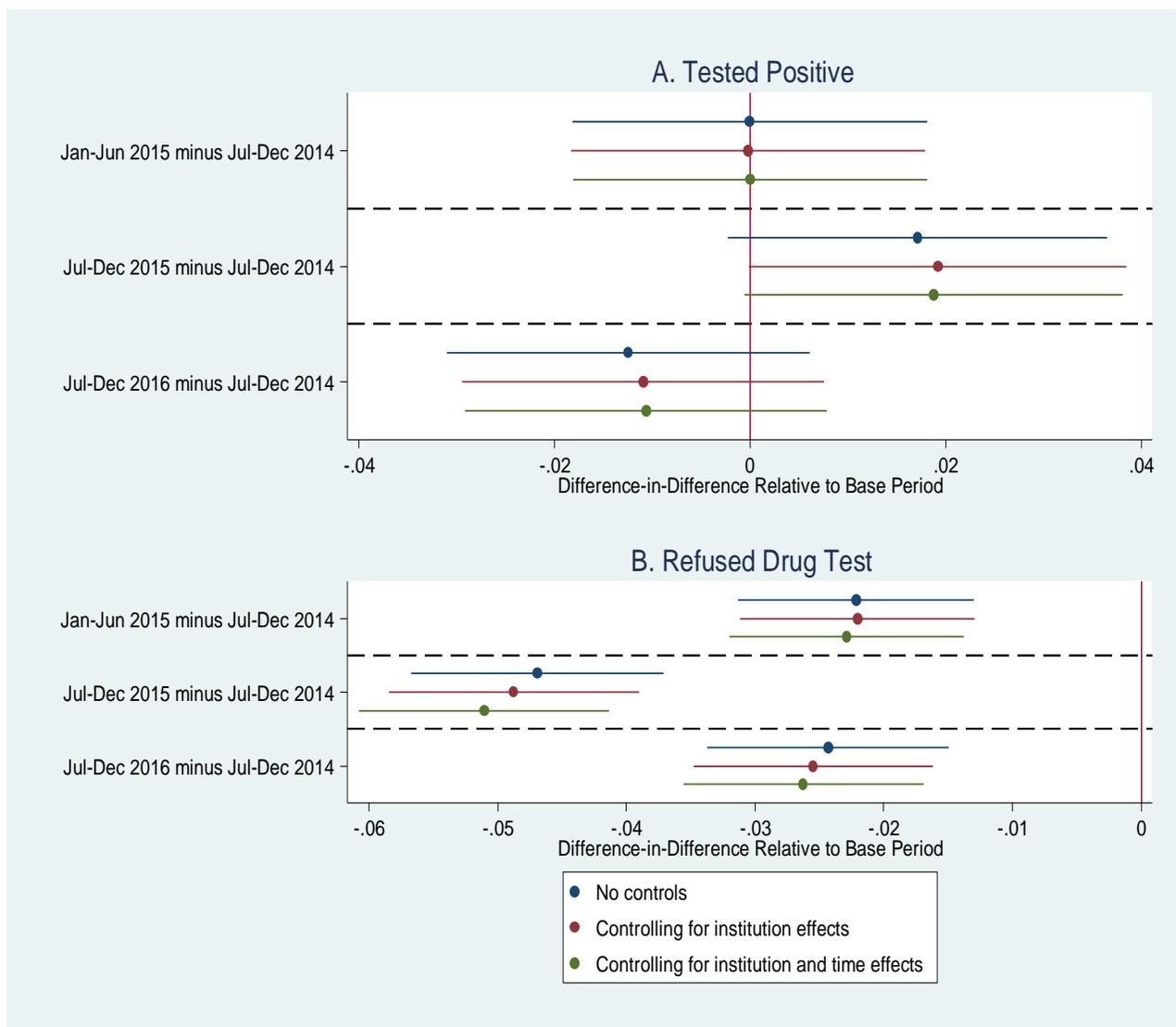


Figure 10: Difference-in-Difference Estimates of the Effects of the Moderate-Intervention on the Proportion of Random Drug Tests Resulting in Failure (Either Test Positive or are Refused)

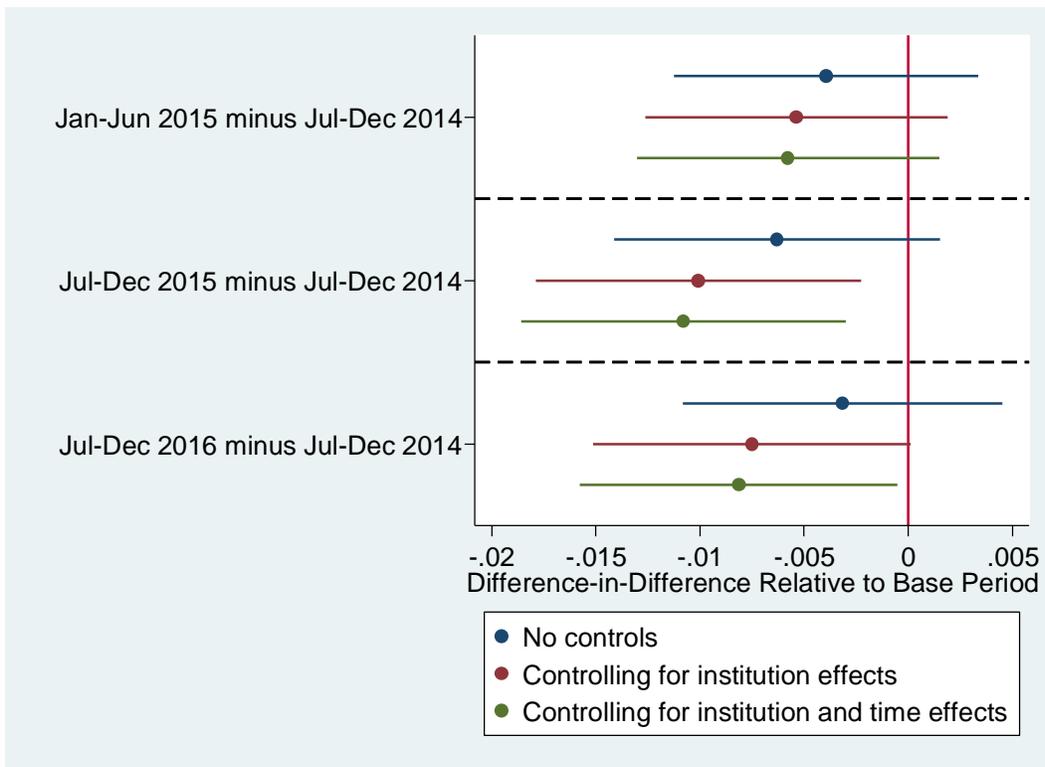


Figure 11: Difference-in-Difference Estimates of the Effects of the Moderate-Intervention on the Proportion of Random Drug Tests that Either Test Positive (Figure A) or are Refused (Figure B)

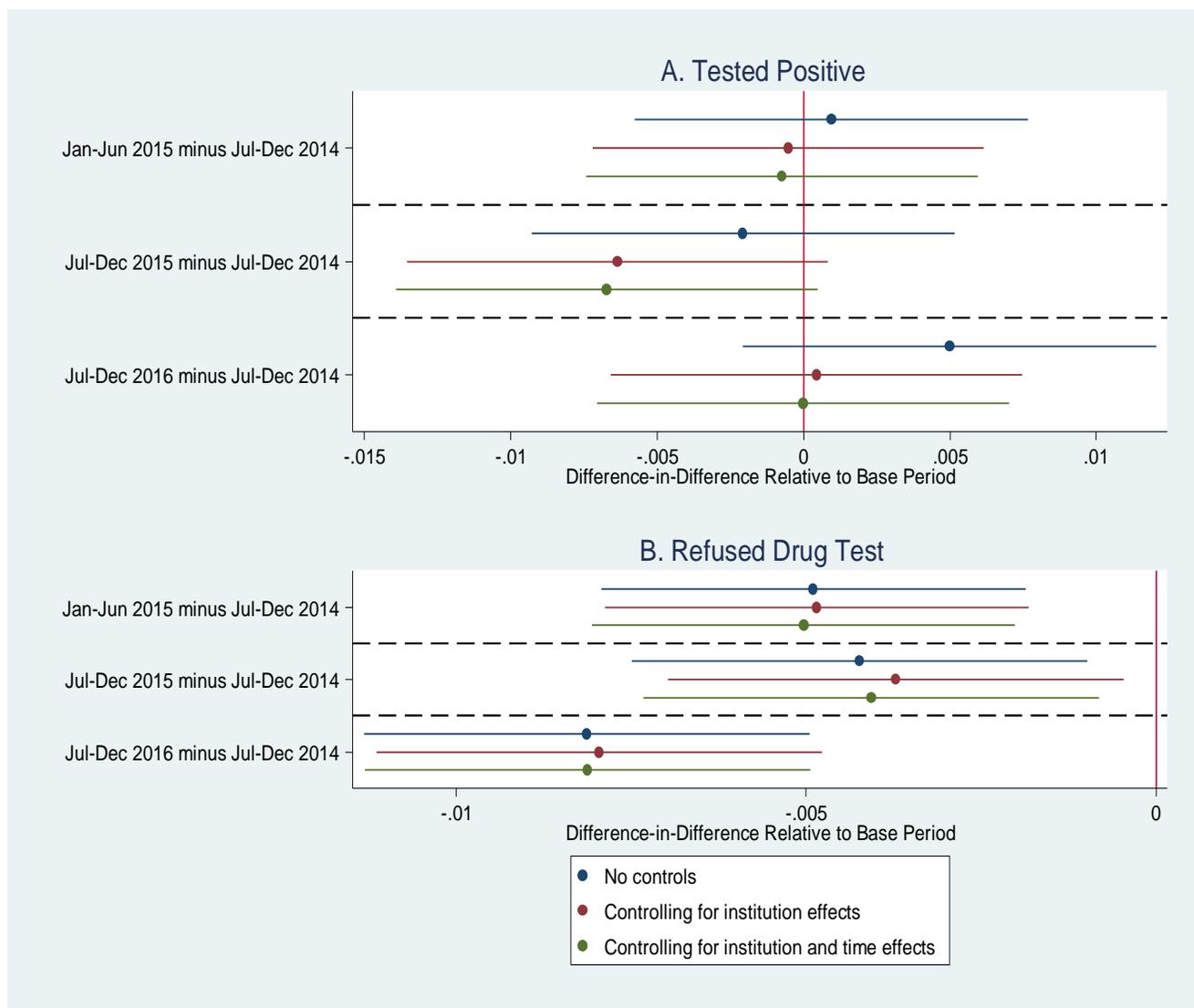


Figure 12: Difference-in-Difference Estimates of the Effects of the Intensive-Intervention on the Proportion of Mandatory Drug Tests Resulting in Failure (Either Test Positive or are Refused)

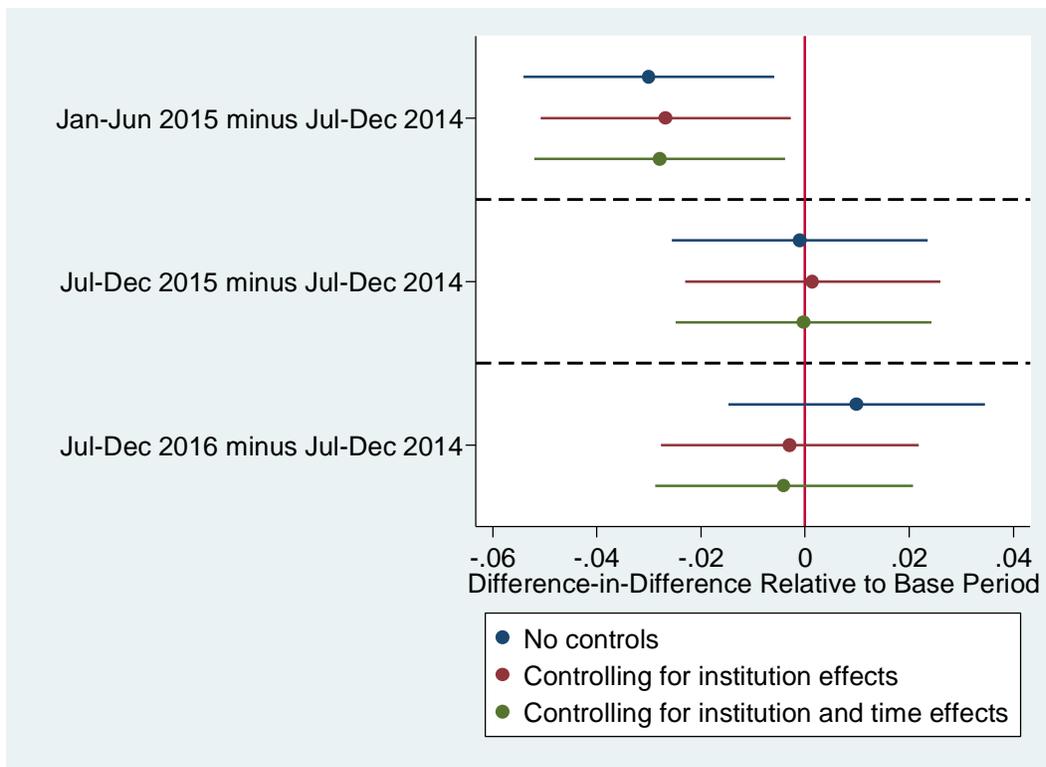


Figure 13: Difference-in-Difference Estimates of the Effects of the Intensive-Intervention on the Proportion of Mandatory Drug Tests that Either Test Positive (Figure A) or are Refused (Figure B)

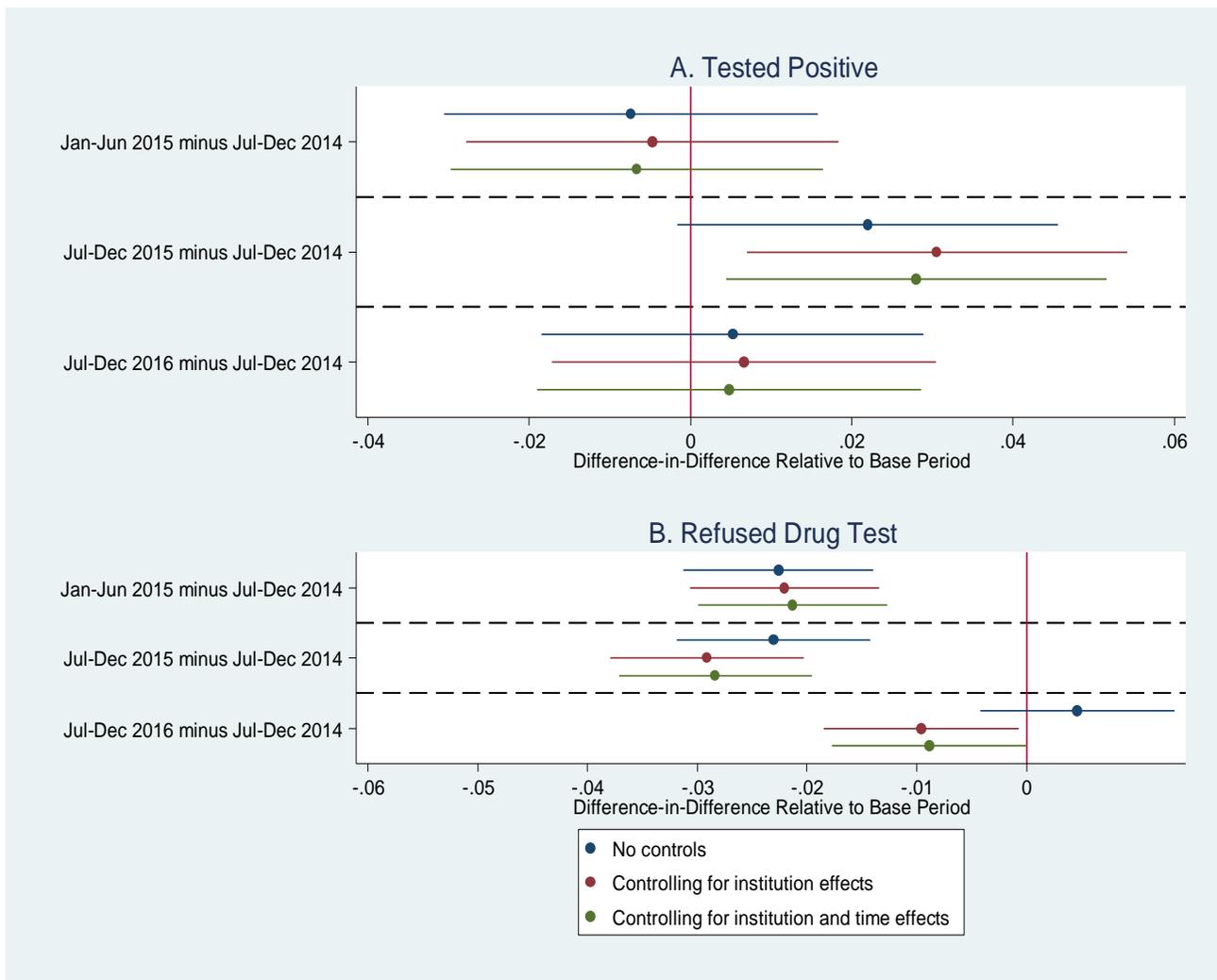


Figure 14: Difference-in-Difference Estimates of the Effects of the Moderate-Intervention on the Proportion of Mandatory Drug Tests Resulting in Failure (Either Test Positive or are Refused)

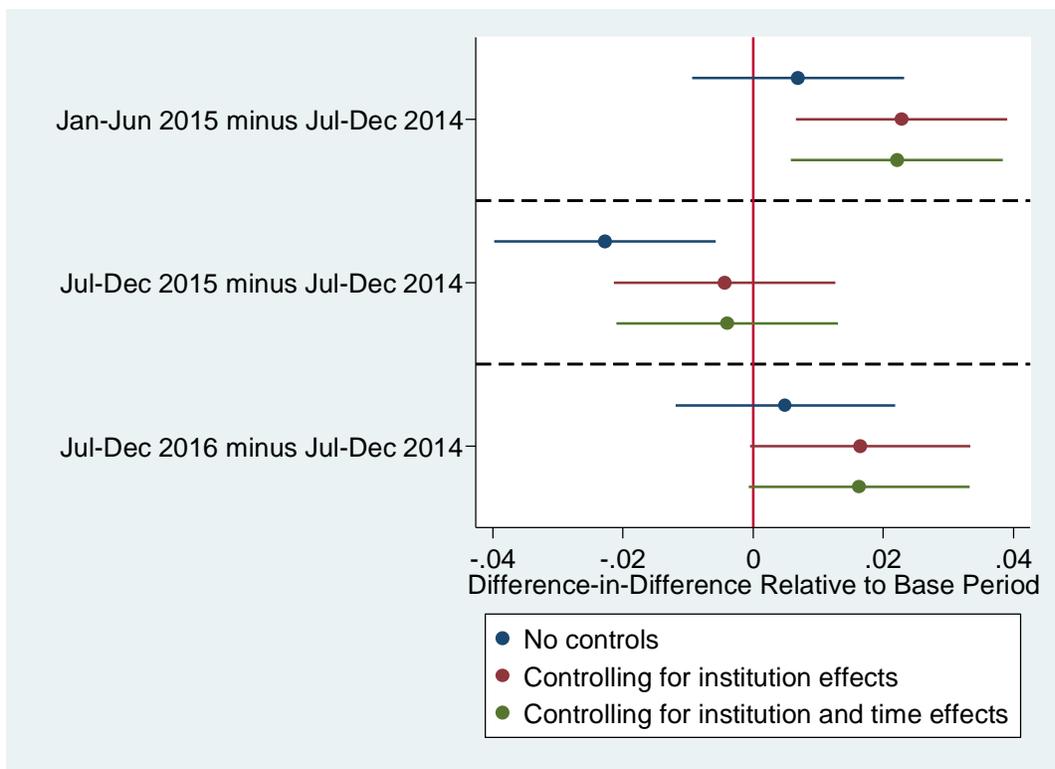


Figure 15: Difference-in-Difference Estimates of the Effects of the Moderate-Intervention on the Proportion of Mandatory Drug Tests that Either Test Positive (Figure A) or are Refused (Figure B)

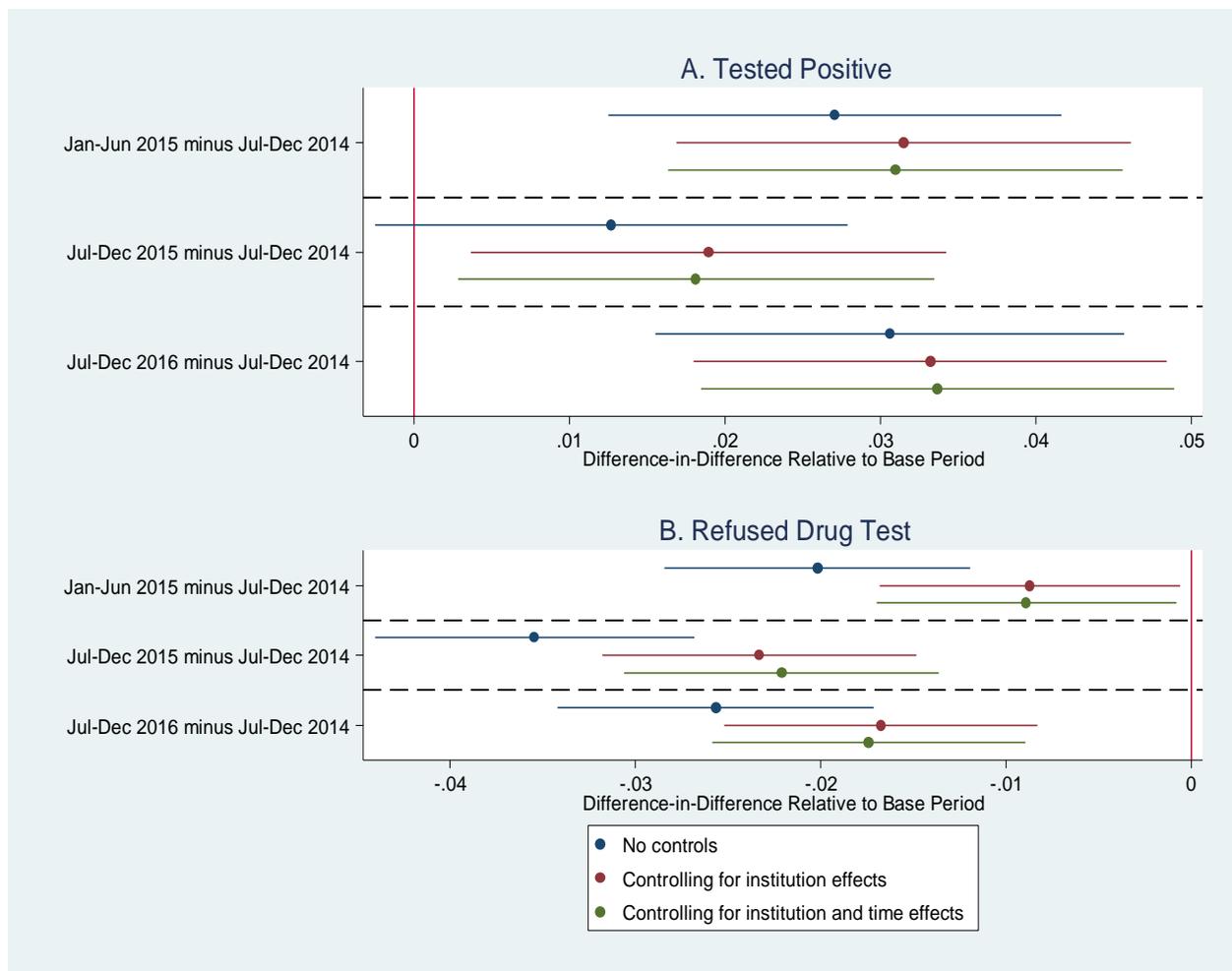


Figure 16: Monthly Lockdowns for Intensive Intervention, Moderate Intervention, and No Intervention Institutions

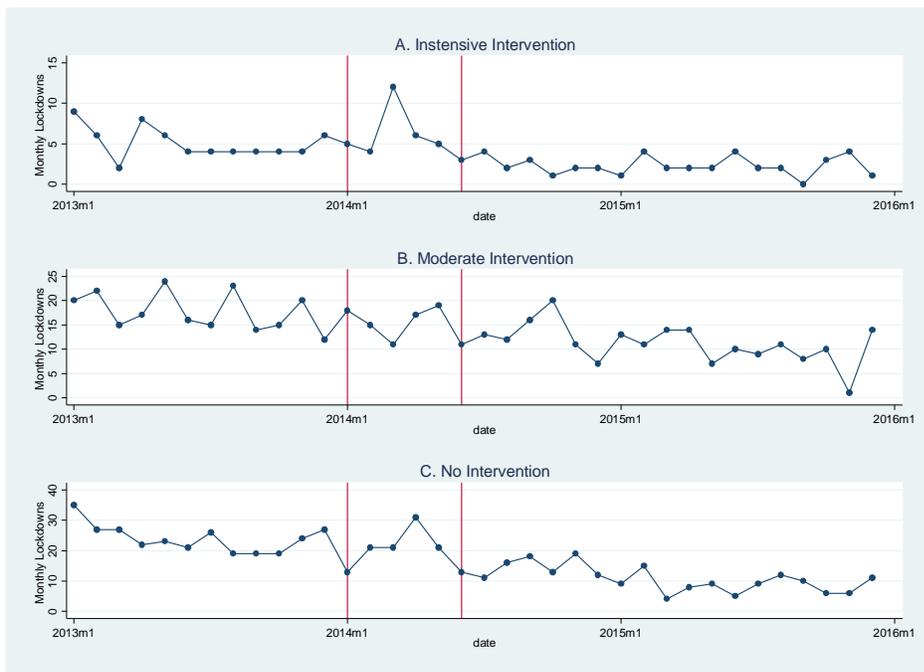


Figure 17: Rule Violation Reports per 1,000 Inmates by Month for Intensive Intervention, Moderate Intervention, and No Intervention Institutions

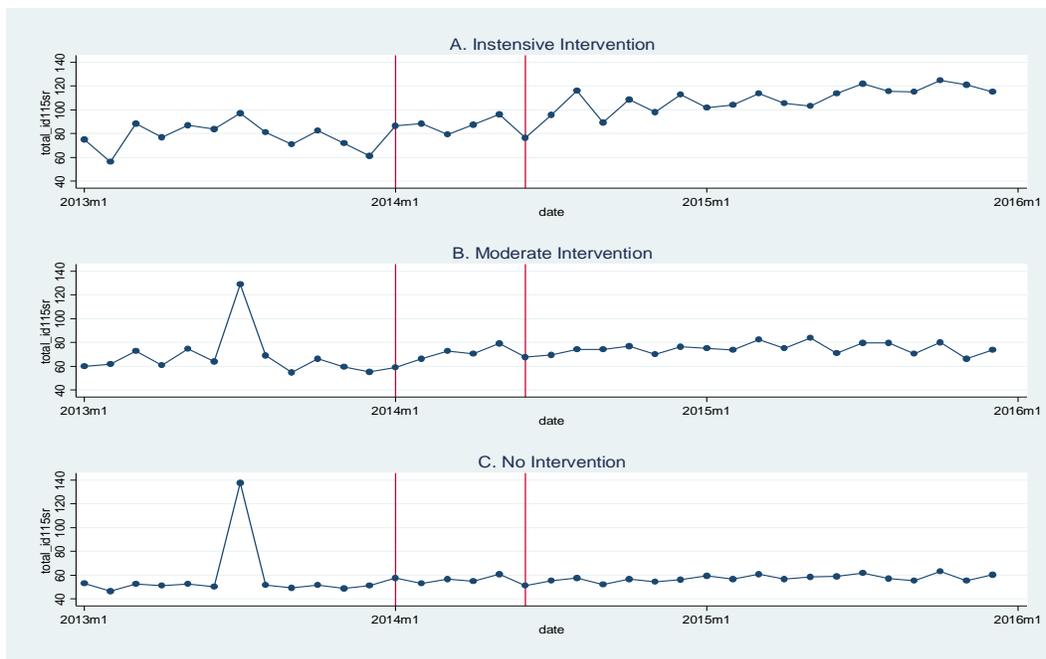


Figure 18: Panel Regression Difference-in-Difference Estimates of the Intensive and Moderate Interventions on Monthly Lockdown and Monthly Rule Violations Reports per 1,000 Inmates

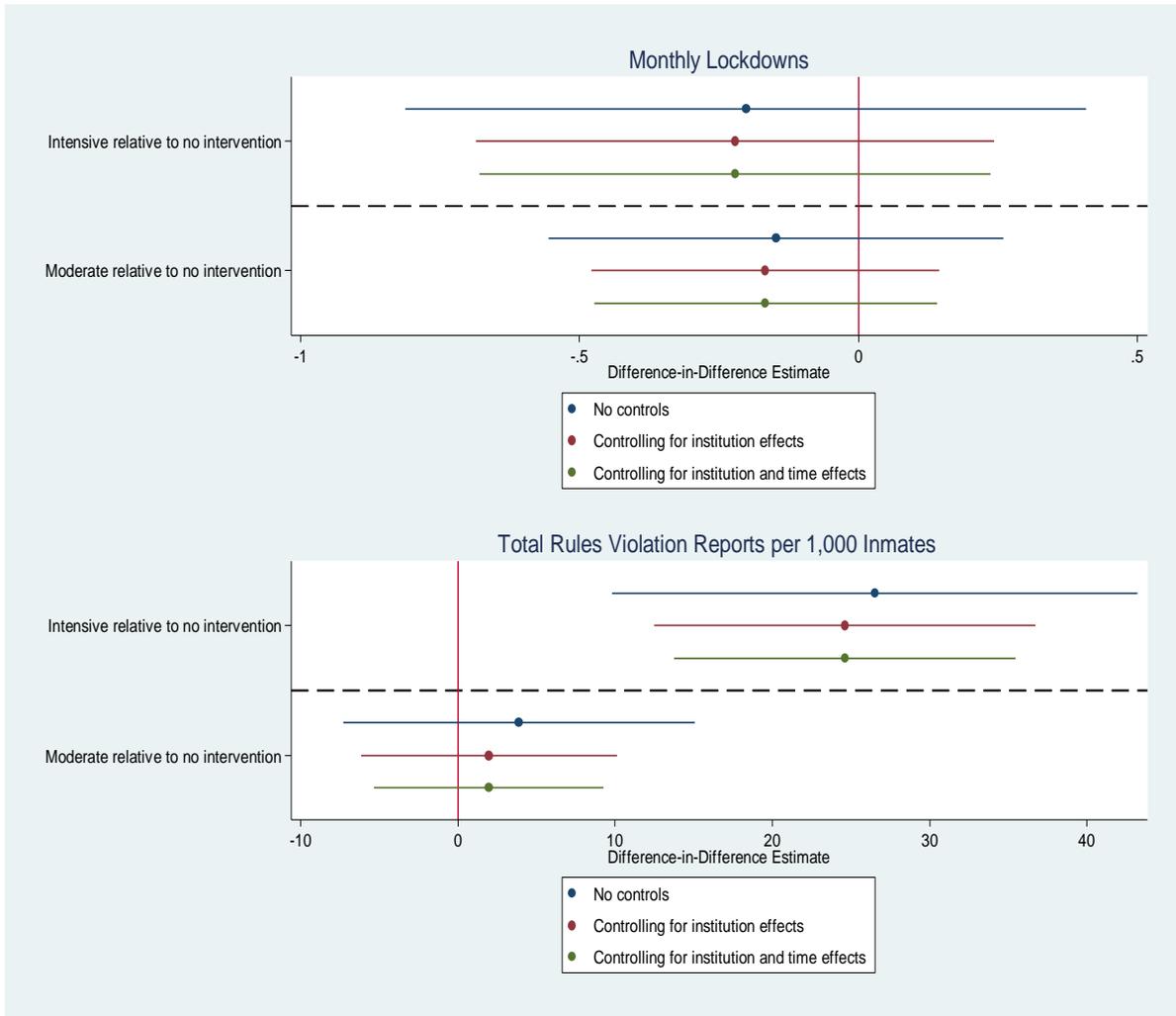


Figure 19: Panel Regression Difference-in-Difference Estimates of the Intensive and Moderate Interventions on Specific Types of Rule Violation Reports per 1,000 Inmates

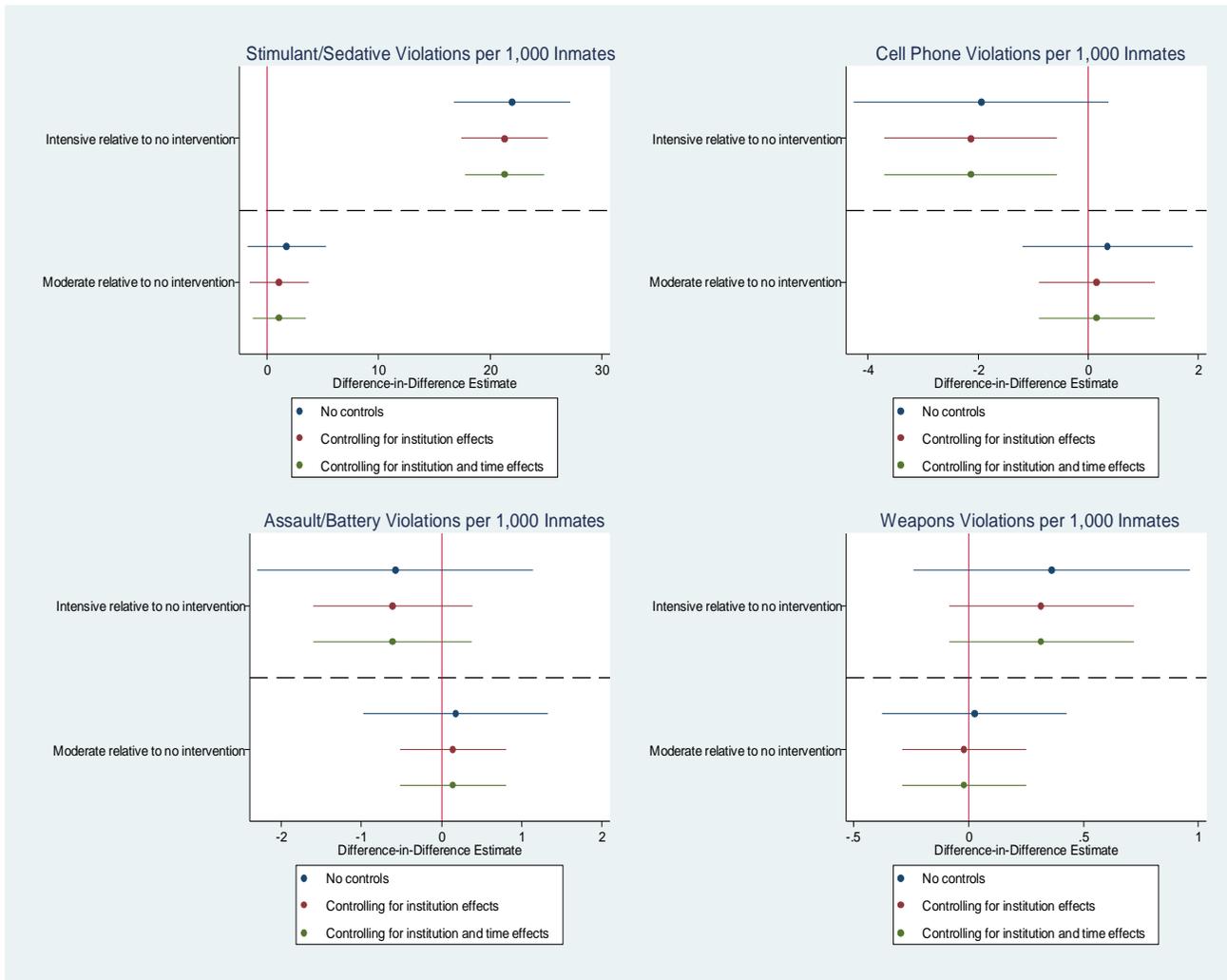


Figure 20: Alternative Difference-in-Difference Estimates for the Effect of EDCIP on Random Drug Test Failure Rates Using All Non-Intervention Prisons as the Comparison Group

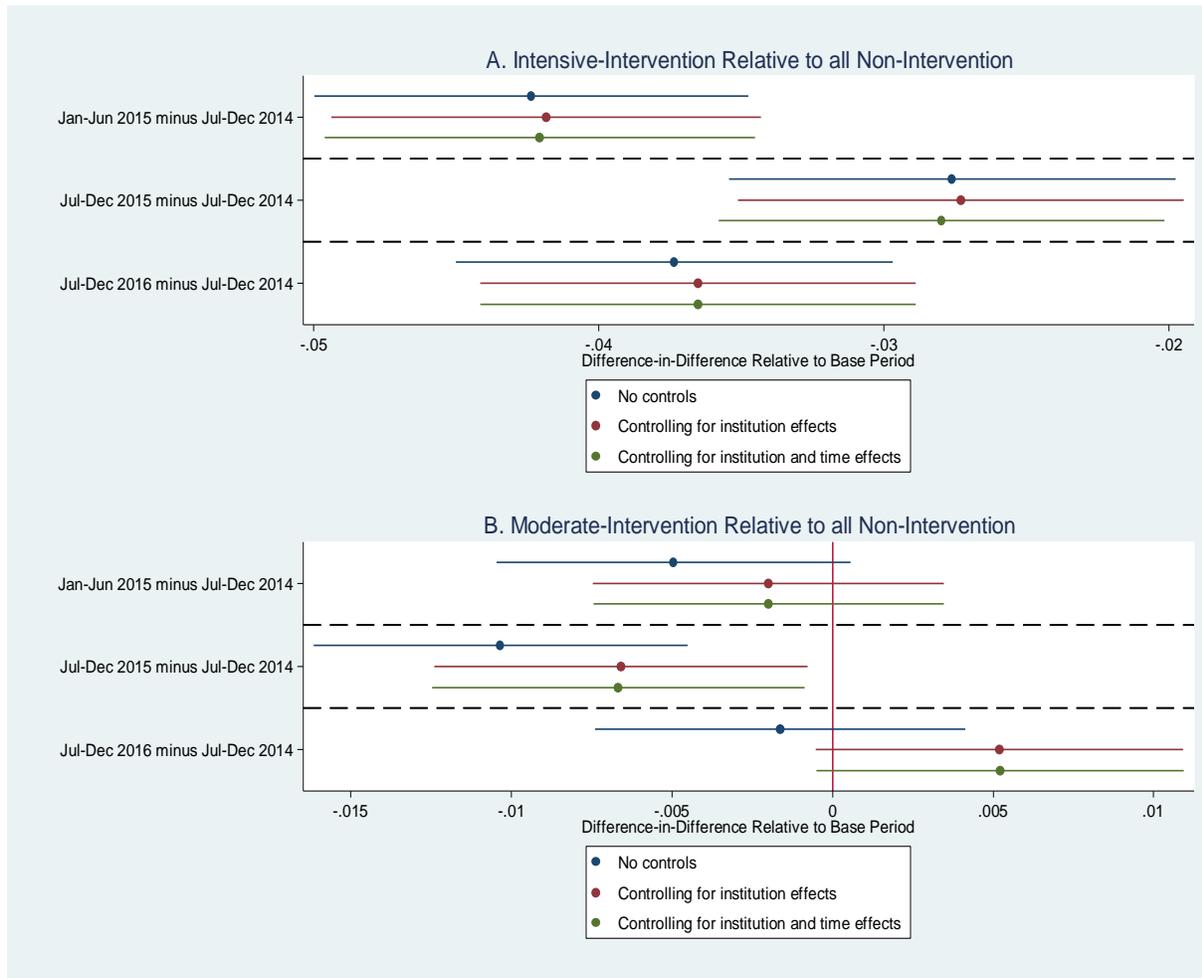


Figure 21: Alternative Difference-in-Difference Estimates for the Effect of EDCIP on Random Drug Test Failure Rates in Intensive-Intervention Institutions Defining the Pre-Period as July through September 2014

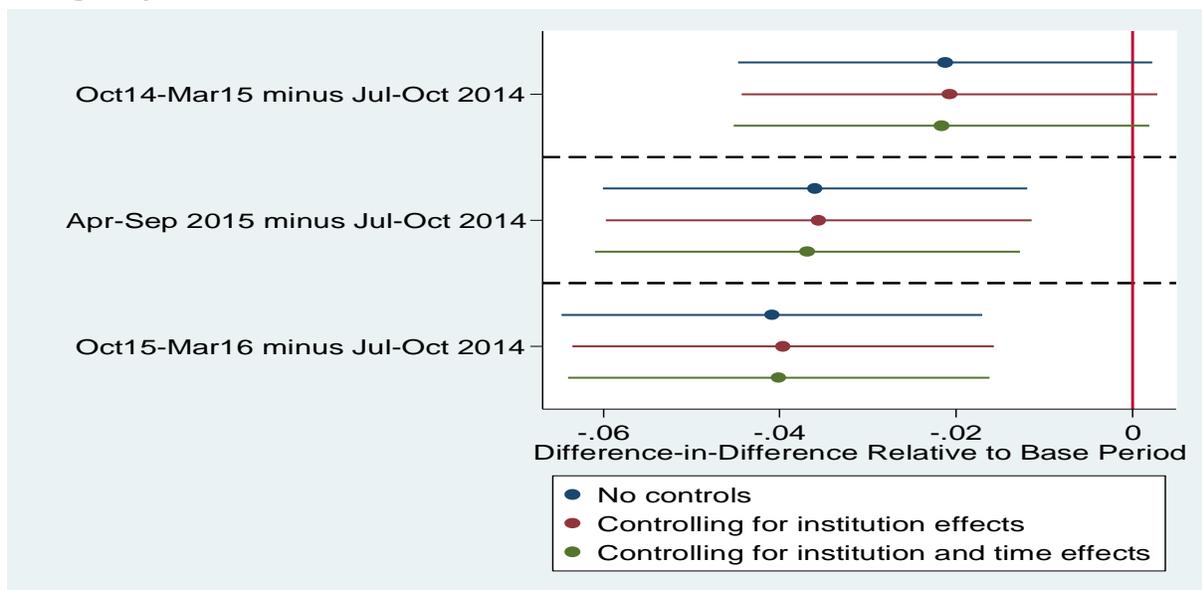


Figure 22: Alternative Difference-in-Difference Estimates for the Effect of EDCIP on Random Drug Test Failure Rates in Moderate-Intervention Institutions Defining the Pre-Period as Jul through September 2014

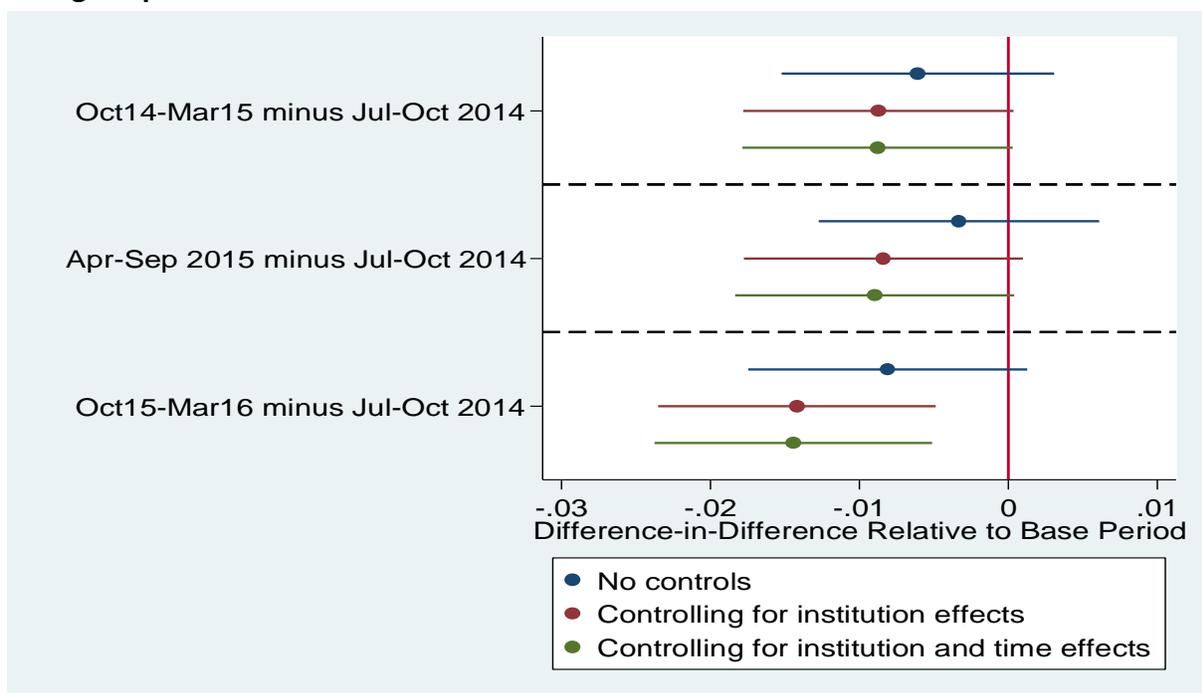


Figure 23: Alternative Difference-in-Difference Estimates of the Effect of EDCIP on Monthly Lockdowns and Rules Violation Reports per 1,000 Inmates Defining the Post-Period as October 2014 and Later

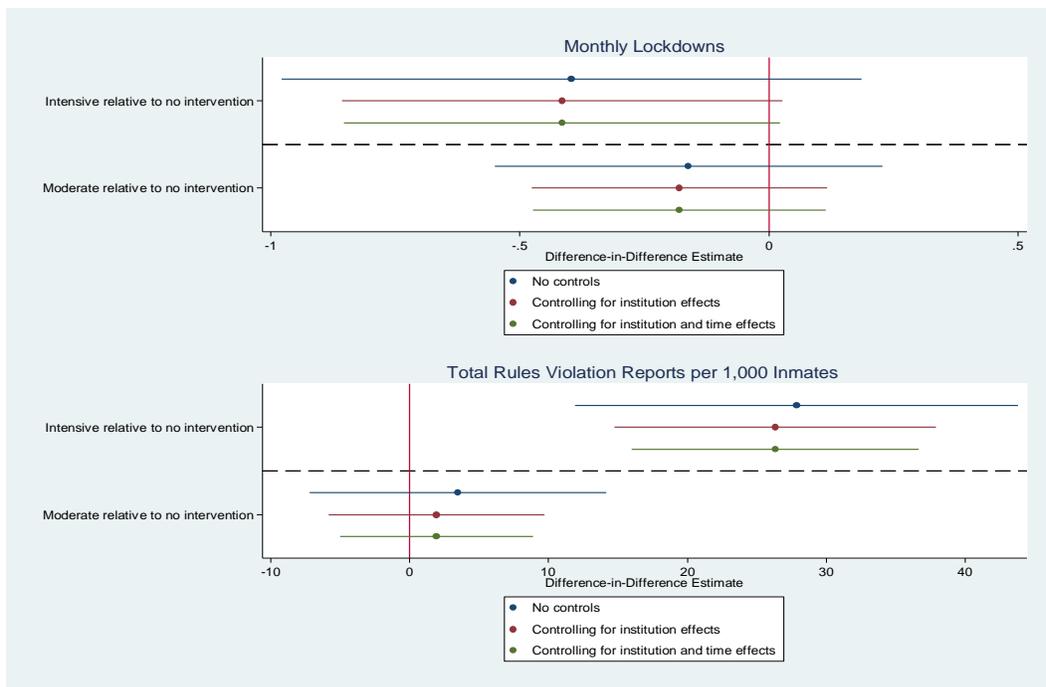


Figure 24: Alternative Difference-in-Difference Estimates of the Effect of EDCIP on Specific Types of Rules Violation Reports per 1,000 Inmates Defining the Post-Period as October 2014 and Later

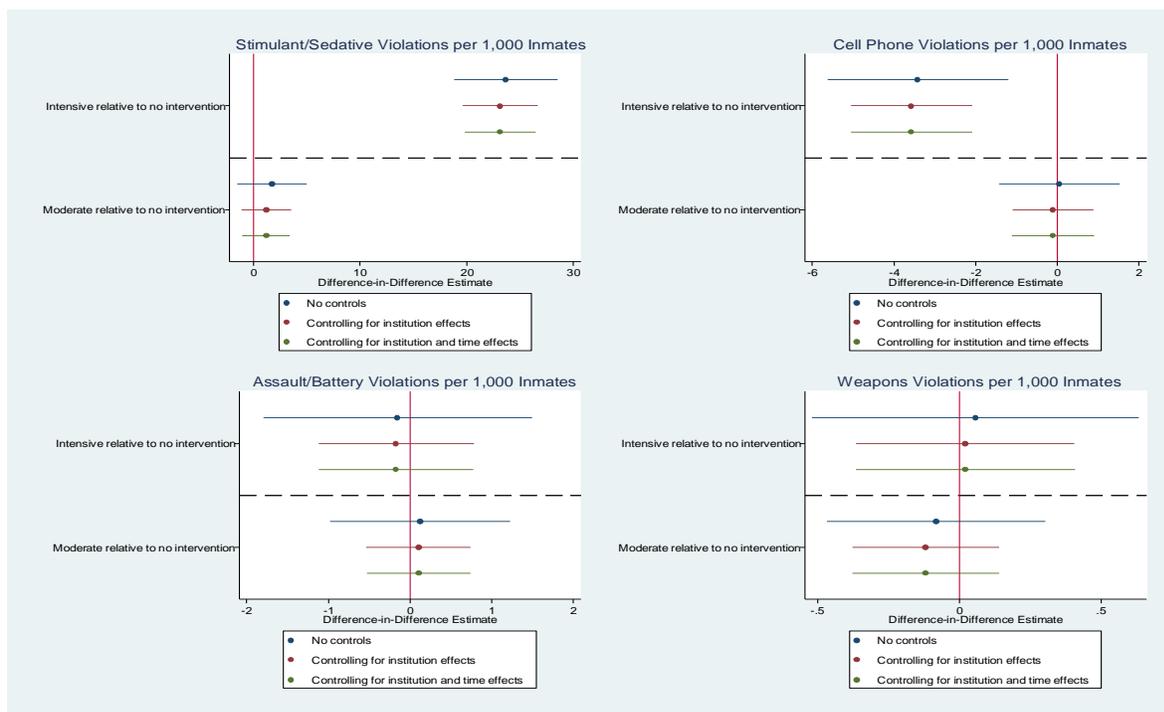


Table 1
First Month With Observable Ion Scanner Activity for Intensive and Moderate Intervention Institutions

	Inmate Scans	Staff Scans	Visitor Scans	Package Scans
Intensive Intervention				
LAC	Oct 2014	Dec 2014	Dec 2014	Oct 2014
CAL	Nov 2014	Dec 2014	Jan 2015	Dec 2014
SOL	Oct 2014	Nov 2014	Jan 2015	None through Dec 2015
Moderate Intervention				
CCWF	Nov 2014	Feb 2015	Feb 2015	Oct 2014
CEN	Dec 2014	Jan 2015	Jan 2015	Oct 2014
CIM	Dec 2014	Jan 2015	Jan 2015	Dec 2014
HDSP	Dec 2014	Apr 2015	Apr 2015	Dec 2014
KVSP	Dec 2014	Mar 2015	Mar 2015	Dec 2014
SATF	Oct 2014	Mar 2015	Mar 2015	Oct 2014
SCC	Feb 2015	Mar 2015	Apr 2015	None through Dec 2015
SVSP	Jan 2015	Feb 2015	Feb 2015	Dec 2014

Table 2
Number of Individual Dogs Observed in Institution by Six-Month Time Periods for Intensive Treatment, Moderate Treatment, and No Treatment Institutions

	Jul-Dec 2013	Jan-Jun 2014	Jul-Dec 2014	Jan-Jun 2015
Intensive Treatment Institutions	15	14	8	12
Moderate Treatment Institutions	26	29	22	27
No Treatment Institutions	32	34	35	34

Figure are the number of K-9s separately named in K-9 search activity logs.

Table 3
Proportion of Drug Tests that are Positive or are Refused by Six Month Time Periods, for Intensive Intervention, Moderate Intervention, and No-Intervention Institutions

Panel A: All Drug Tests					
	(1)	(2)	(3)	Difference,	Difference,
	Intensive	Moderate	No	(1) – (3)	(2) – (3)
	Intervention	Intervention	Intervention		
Jul-Dec, 2014	0.199 (0.003)	0.104 (0.002)	0.102 (0.001)	0.098 (0.002) ^a	0.002 (0.002)
Jan-Jun, 2015	0.152 (0.003)	0.094 (0.001)	0.097 (0.001)	0.055 (0.003) ^a	-0.003 (0.001) ^a
Jul-Dec, 2015	0.174 (0.003)	0.096 (0.002)	0.104 (0.001)	0.070 (0.003) ^a	-0.008 (0.002) ^a
Jan-Jun, 2016	0.165 (0.003)	0.106 (0.002)	0.105 (0.001)	0.060 (0.003) ^a	0.001 (0.002)
Panel B: Random Drug Tests					
	(1)	(2)	(3)	Difference,	Difference,
	Intensive	Moderate	No	(1) – (3)	(2) – (3)
	Intervention	Intervention	Intervention		
Jul-Dec, 2014	0.158 (0.005)	0.081 (0.002)	0.072 (0.001)	0.086 (0.004) ^a	0.009 (0.002) ^a
Jan-Jun, 2015	0.121 (0.004)	0.076 (0.002)	0.066 (0.001)	0.055 (0.003) ^a	0.009 (0.002) ^a
Jul-Dec, 2015	0.126 (0.005)	0.076 (0.002)	0.069 (0.001)	0.057 (0.003) ^a	0.006 (0.002) ^a
Jan-Jun, 2016	0.113 (0.004)	0.081 (0.002)	0.070 (0.010)	0.044 (0.004) ^a	0.011 (0.002) ^a
Panel C: Mandatory Drug Tests					
	(1)	(2)	(3)	Difference,	Difference,
	Intensive	Moderate	No	(1) – (3)	(2) – (3)
	Intervention	Intervention	Intervention		
Jul-Dec, 2014	0.264 (0.006)	0.153 (0.004)	0.167 (0.003)	0.097 (0.006) ^a	-0.014 (0.005) ^a
Jan-Jun, 2015	0.181 (0.004)	0.130 (0.003)	0.153 (0.002)	0.028 (0.004) ^a	-0.022 (0.004) ^a
Jul-Dec, 2015	0.203 (0.004)	0.129 (0.003)	0.175 (0.003)	0.028 (0.005) ^a	-0.045 (0.004) ^a
Jan-Jun, 2016	0.204 (0.004)	0.145 (0.003)	0.176 (0.003)	0.028 (0.005) ^a	-0.030 (0.004) ^a

Standard errors are in parentheses.

- Difference statistically significant at the one percent level of confidence.
- Difference statistically significant at the five percent level of confidence.
- Difference statistically significant at the ten percent level of confidence.

Table 4
Proportion of Random Drug Tests that are Positive or are Refused by Six Month Time Periods, for Intensive Intervention, Moderate Intervention, and Selectively Matched Institutions

	Intensive Intervention Comparison			Moderate Intervention Comparison		
	Treated Institutions	Select Comparison Institutions	Difference	Treated Institutions	Select Comparison Institutions	Difference
Period 1: Jul-Dec, 2014	0.158 (0.005)	0.160 (0.006)	-0.002 (0.007)	0.081 (0.002)	0.066 (0.002)	0.015 ^a (0.003)
Period 2: Jan-Jun, 2015	0.121 (0.004)	0.146 (0.006)	-0.024 ^a (0.007)	0.076 (0.002)	0.064 (0.002)	0.011 ^a (0.003)
Period 3: Jul-Dec, 2015	0.126 (0.005)	0.158 (0.007)	-0.032 ^a (0.008)	0.076 (0.002)	0.067 (0.002)	0.009 ^a (0.003)
Period 4: Jan-Jun, 2016	0.113 (0.004)	0.152 (0.006)	-0.039 ^a (0.007)	0.081 (0.002)	0.069 (0.002)	0.012 ^a (0.003)
Diff-in-diff: Period 2 – Period 1	-	-	-0.022 ^b (0.010)	-	-	-0.004 (0.004)
Diff-in-diff: Period 3 – Period 1	-	-	-0.030 ^a (0.011)	-	-	-0.006 (0.004)
Diff-in-diff: Period 4 – Period 1	-	-	-0.037 ^a (0.010)	-	-	-0.003 (0.004)

Standard errors are in parentheses. The comparison institutions for the intensive treatment are SAC, CIW, CHCF. The comparison institutions for the moderate treatment are PVSP, CAC, ISP, CNC, CCC, VSP, COR, WSP, RJD, and DVI.

- a. Difference statistically significant at the one percent level of confidence.
- b. Difference statistically significant at the five percent level of confidence.
- c. Difference statistically significant at the ten percent level of confidence.

Table 5
Proportion of Mandatory Drug Tests that are Positive or are Refused by Six Month Time Periods, for Intensive Intervention, Moderate Intervention, and Selectively Matched Institutions

	Intensive Intervention Comparison			Moderate Intervention Comparison		
	Treated Institutions	Select Comparison Institutions	Difference	Treated Institutions	Select Comparison Institutions	Difference
Period 1: Jul-Dec, 2014	0.264 (0.006)	0.254 (0.008)	0.010 (0.009)	0.153 (0.004)	0.163 (0.006)	-0.010 (0.006)
Period 2: Jan-Jun, 2015	0.181 (0.004)	0.200 (0.006)	-0.019 ^b (0.008)	0.130 (0.003)	0.133 (0.004)	-0.003 (0.005)
Period 3: Jul-Dec, 2015	0.203 (0.004)	0.193 (0.007)	0.010 (0.008)	0.129 (0.003)	0.162 (0.005)	-0.033 ^a (0.006)
Period 4: Jan-Jun, 2016	0.204 (0.004)	0.183 (0.007)	0.021 ^b (0.008)	0.145 (0.003)	0.150 (0.005)	-0.005 (0.006)
Diff-in-diff: Period 2 – Period 1	-	-	-0.030 ^b (0.012)	-	-	0.007 (0.008)
Diff-in-diff: Period 3 – Period 1	-	-	-0.001 (0.012)	-	-	-0.023 ^a (0.008)
Diff-in-diff: Period 4 – Period 1	-	-	0.010 (0.013)	-	-	0.005 (0.009)

Standard errors are in parentheses. The comparison institutions for the intensive treatment are SAC, CMF, WSP, CIM, and CIW. The comparison institutions for the moderate treatment are PVSP, SQ, CAC, CVSP, CCI, MCSP, RJD, and WSP.

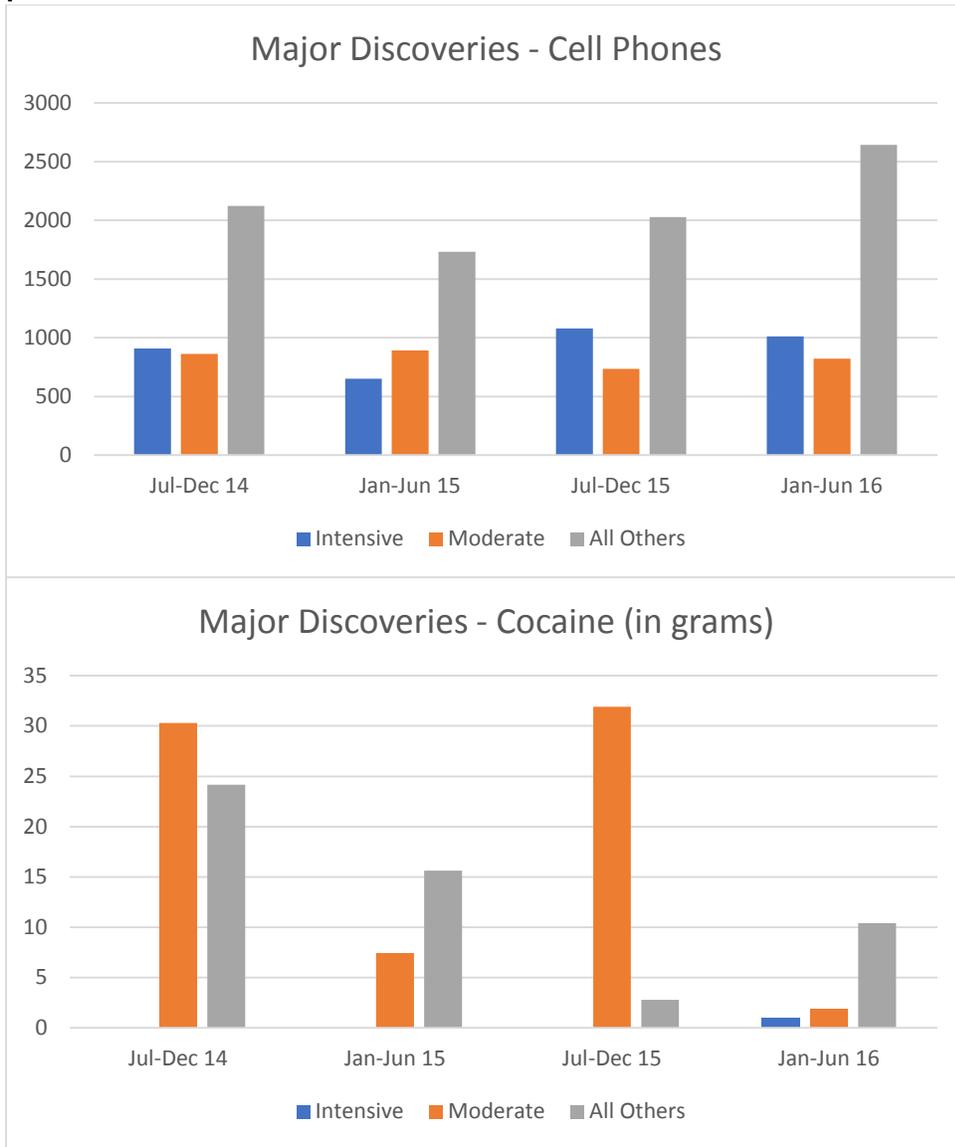
- a. Difference statistically significant at the one percent level of confidence.
- b. Difference statistically significant at the five percent level of confidence.
- c. Difference statistically significant at the ten percent level of confidence.

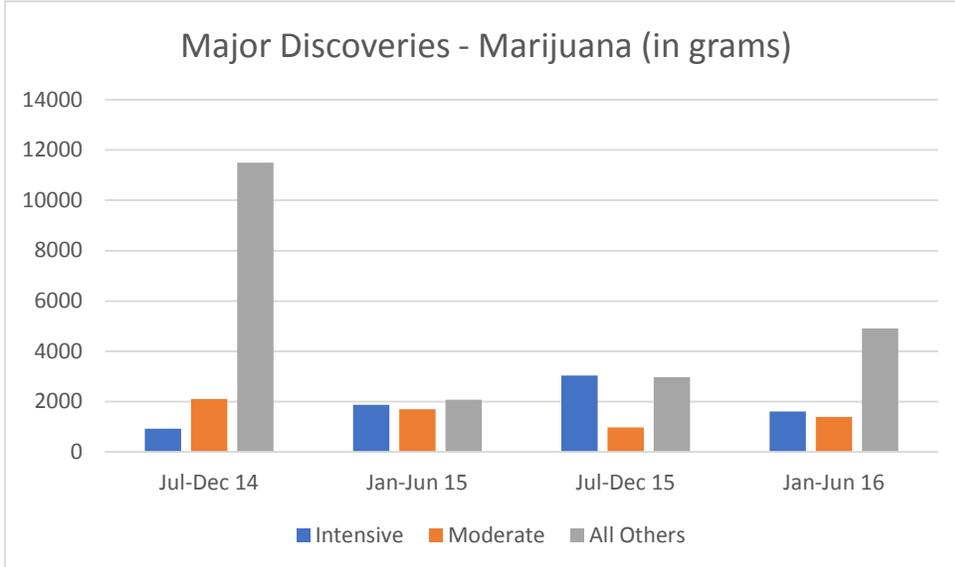
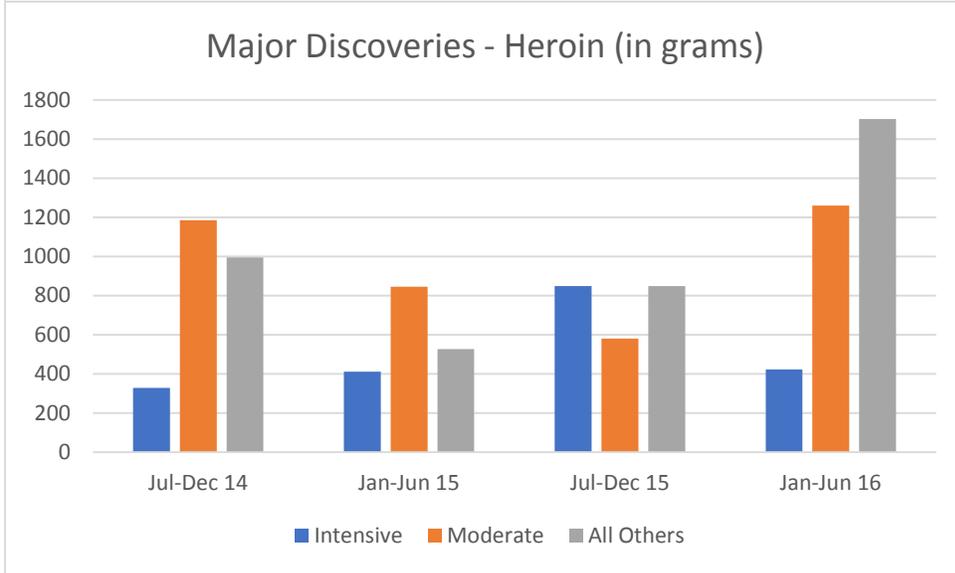
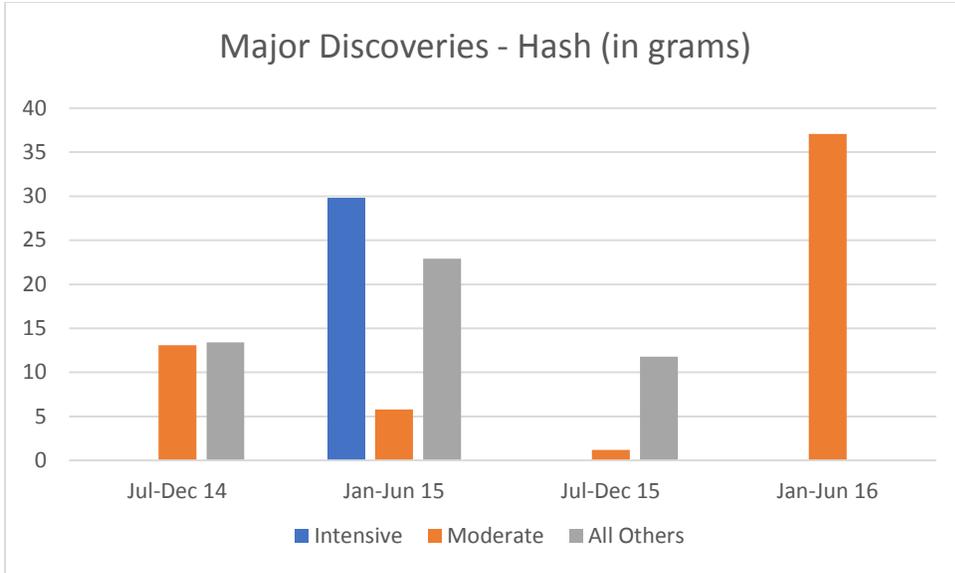
DATA APPENDIX: THE FIGURES PRESENTED IN THE APPENDIX GRAPHIALLY DISPLAY RAW COUNTS OF KEY OUTCOMES FOR THE FOUR SIX MONTH PERIODS USED IN THIS EVALUATION. THESE ADDITIONAL FIGURE INCLUDE

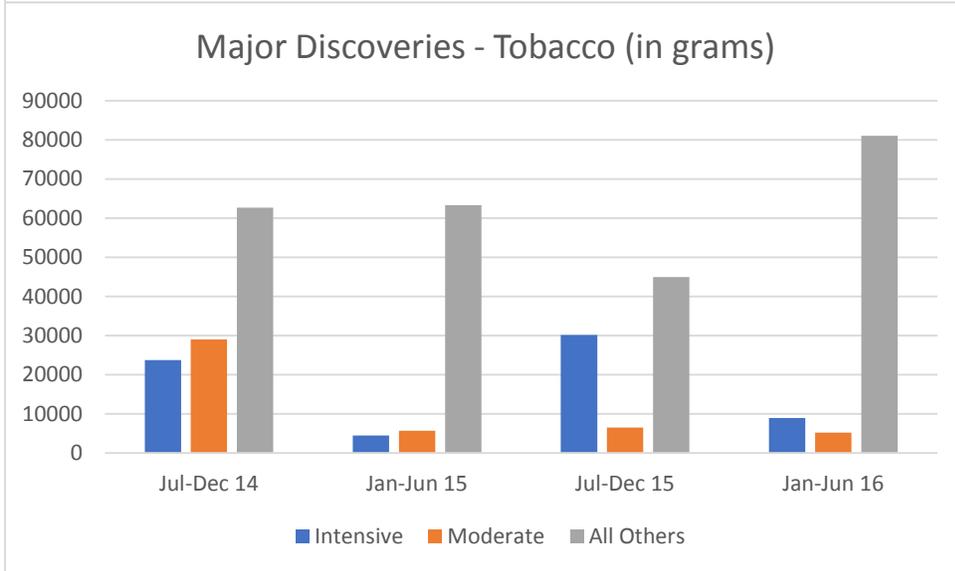
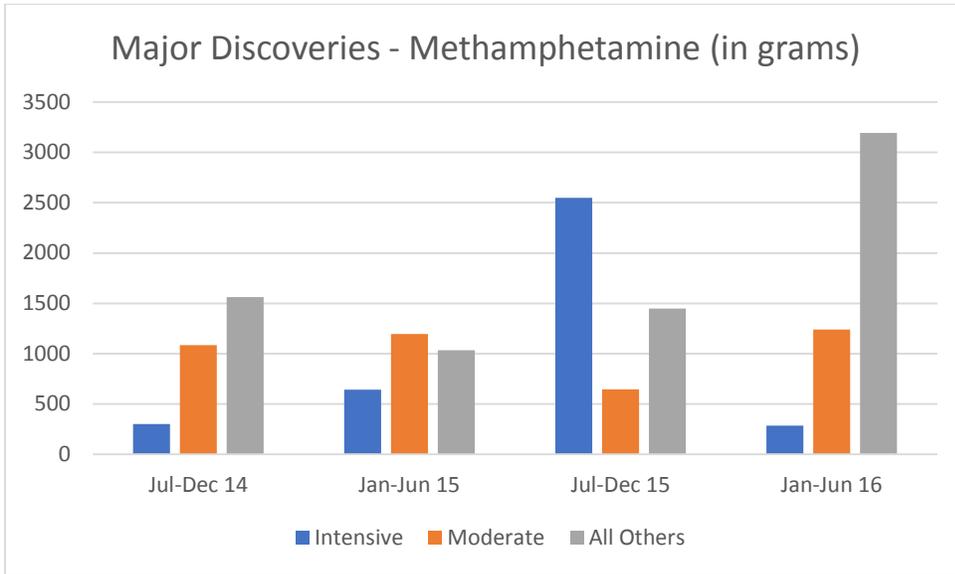
- **COUNTS OF MAJOR CONTRABAND DISCOVERIES BY TYPE**
- **COUNTS OF VIOLENT INCIDENTS DIRECTED AT STAFF AND OTHER INMATES**
- **EDCIP-RELATED ARRESTS**
- **COUNTS OF RULES VIOLATION REPORTS**

THE FIGURES DISPLAY COUNTS FOR SEPARATE COUNTS FOR INTENSIVE INTERVENTION INSTITUTIONS, MODERATE INTERVENTION INSTITUTIONS, AND INSTITUTIONS THAT WERE NOT PART OF THE EDCIP DEMONSTRATION.

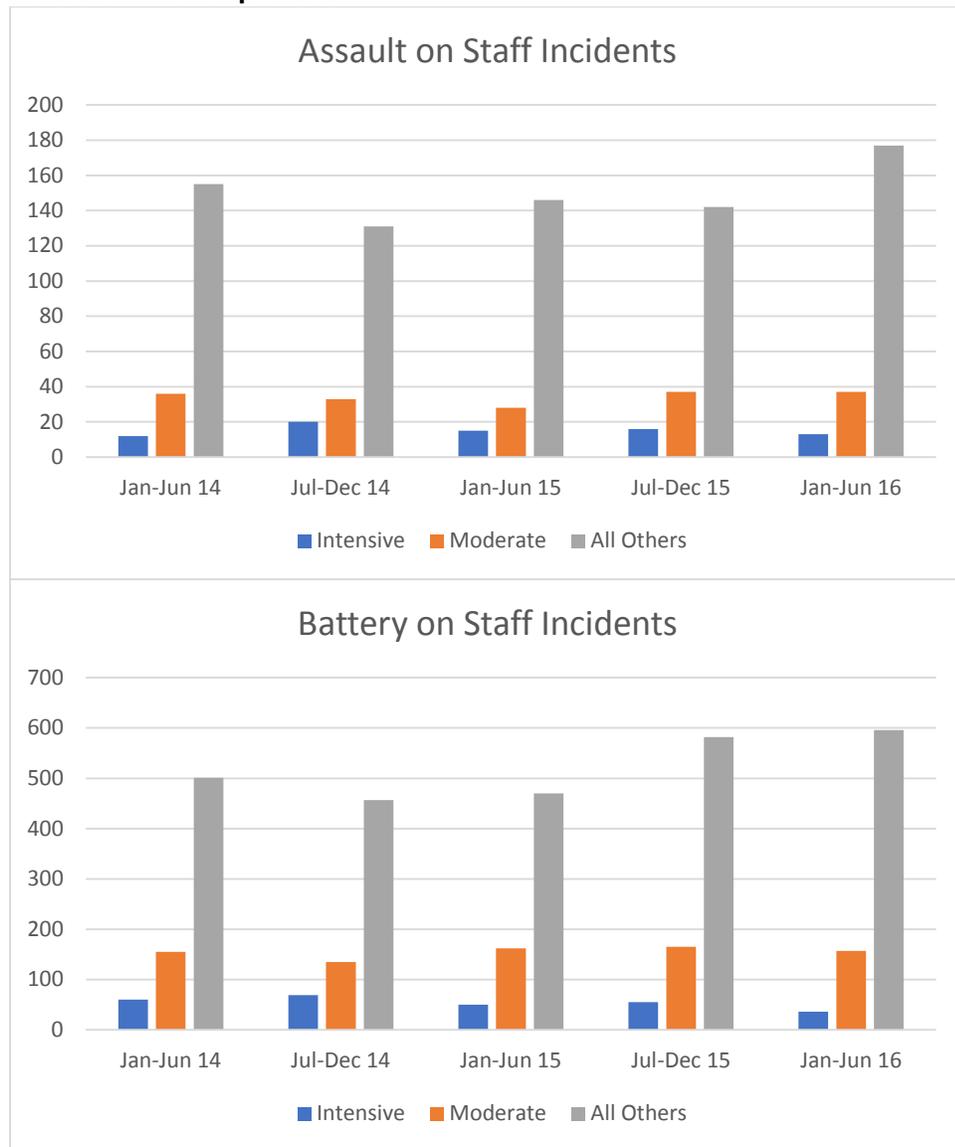
APPENDIX FIGURE 1: Major Discoveries: Totals by EDCIP institution type across six month periods

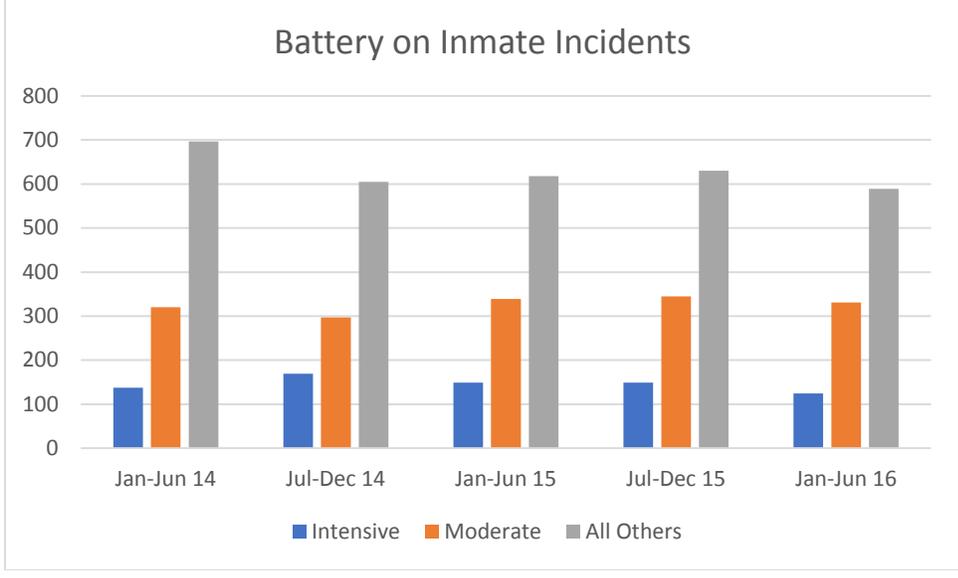
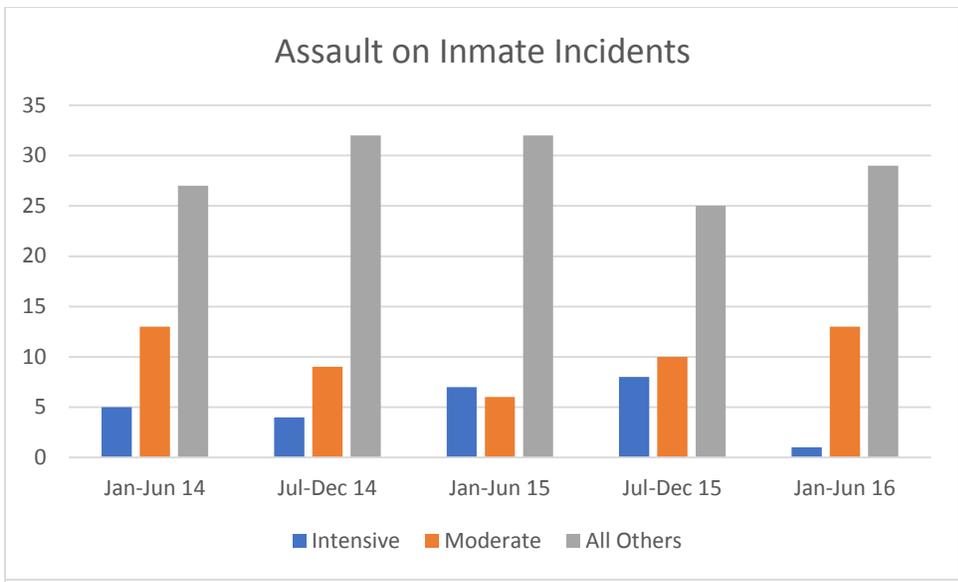




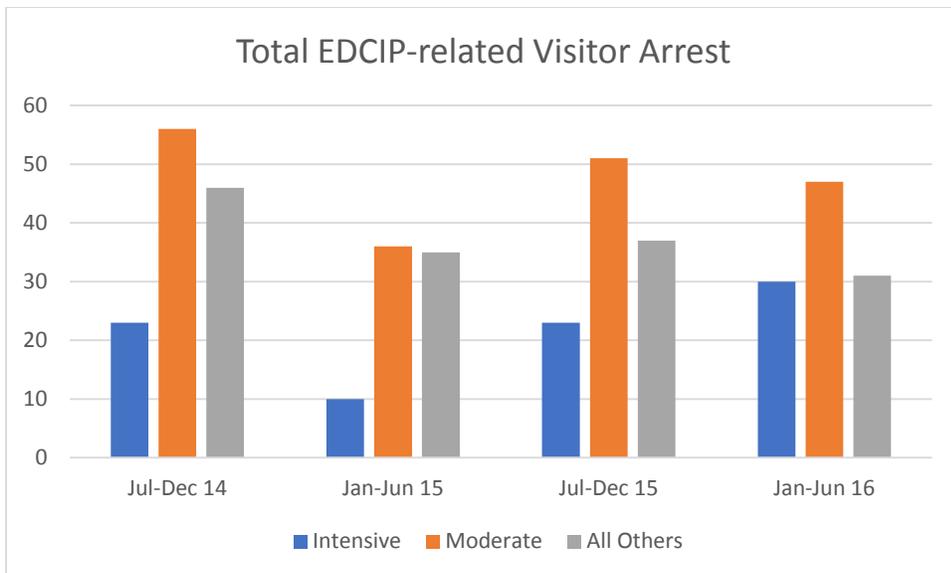
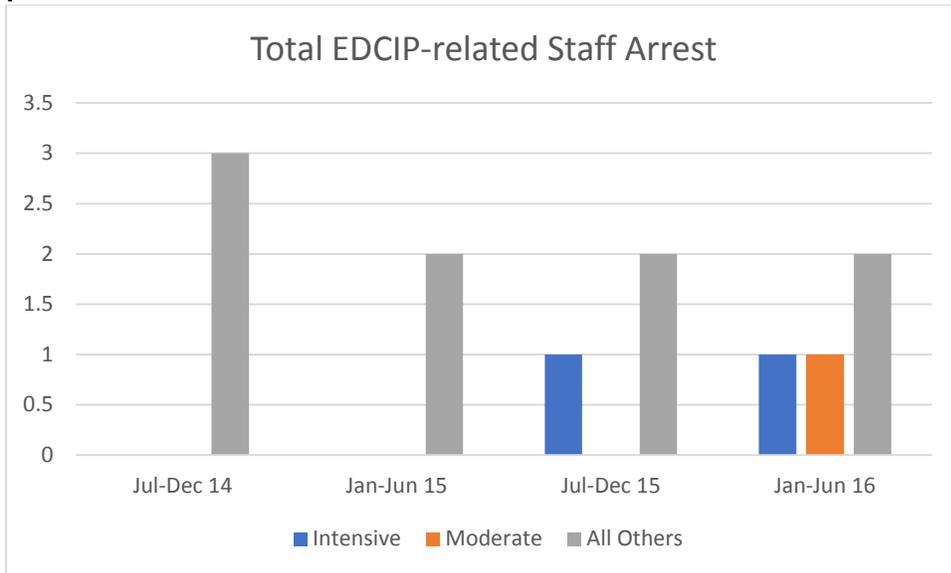


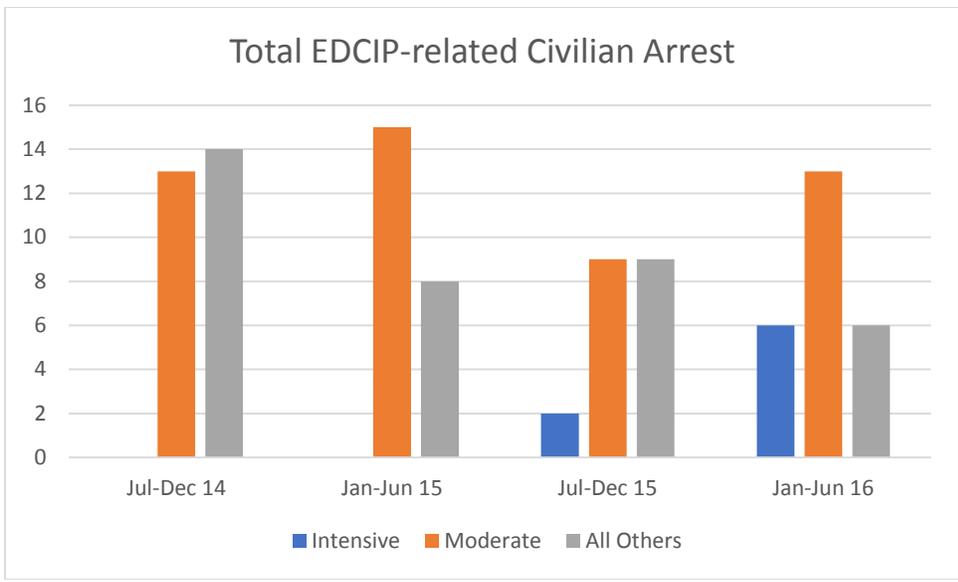
APPENDIX FIGURE 2: Staff and Inmate Violent Incidents: Totals by EDCIP institution type across six month periods





APPENDIX FIGURE 3: EDCIP Related Arrests: Totals by EDCIP institution type across six month periods





APPENDIX FIGURE 4: COMSTAT 115s: Totals by EDCIP institution type across six month periods

