

Offender Diversion Into Substance Use Disorder Treatment: The Economic Impact of California's Proposition 36

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The overall societal costs of substance use disorders (SUDs) have in recent years reached disproportionate levels across the nation. The White House Office of National Drug Control Policy¹ estimated annual societal costs of \$180.9 billion in 2002 and noted that these costs have increased at a higher rate than the US gross domestic product over the past 10 years (5.3% per year vs 5.1% per year). The largest- and fastest-growing cost components were, not surprisingly, those for criminal justice activities, particularly increased spending on law enforcement and adjudication, as well as for incarceration for drug offenses and income-generating crimes. The annual federal budget allocated to combat SUDs for the 2011 fiscal year was \$15.5 billion,² with more than \$7.6 billion for domestic law enforcement and interdiction. By comparison, \$1.7 billion was allocated for prevention programs and \$3.9 billion for treatment services.

Public policies regarding criminal justice interventions with drug-using offenders have largely been driven by the acknowledged association between drug use and crime. The research literature has consistently reported that SUDs intensify rates of criminal activity, especially among dependent individuals.^{3–8} The importance of treating offenders with an SUD is further illustrated by the fact that both severity of drug use and recidivism rates decline during and after treatment.^{9,10} Consequently, a reduction or cessation of drug use has been targeted as a direct method of reducing drug-related crime and enforcement and as an indirect method of reducing other adverse social consequences associated with drug use.^{11–13}

A popular criminal justice approach to dealing with drug-using offenders has been the drug court movement, although these programs can target only a relatively few offenders. A recent systematic review¹⁴

determined the impact of adult drug courts in the United States. The nonexperimental and quasi-experimental literatures have indicated that drug courts successfully reduce future criminal behavior and future substance use, at least in the short term, versus traditional adjudication. However, none of the 3 randomized studies identified showed a consistent effect on rearrest rates for drug-involved offenders participating in drug court rather than typical adjudication. The 2 studies examining conviction and reincarceration, however, demonstrated reduced rates for the drug court group versus those typically adjudicated. A review of California drug courts in particular found that drug court participants' rearrest rates were reduced by 11% to 14%, with the largest reduction in rearrest rates found among individuals graduating from their treatment programs.¹⁵ Research has also been conducted to determine the economic impact of drug

courts in the United States and internationally.^{16–18} Yet many methodological and analytical concerns have been raised in the evaluation of drug courts given the selectivity of participants and other concerns,¹⁹ although comprehensive economic analyses are available in the peer-reviewed literature that display reliable cost savings for drug courts.^{17,20,21}

In parallel with the national drug court movement, federal, state, and local jurisdictions have experimented with various diversion strategies for drug-involved offenders. One of the most extensive and recent of these was prompted by public dissatisfaction with existing California enforcement policy, which led advocates to propose Proposition 36 in the November 2000 state election, subsequently passed by citizens and enacted into California law as the Substance Abuse and Crime Prevention Act of 2000 (SACPA).²² SACPA represented a major shift in criminal justice policy

Objectives. We determined the costs and savings attributable to the California Substance Abuse and Crime Prevention Act (SACPA), which mandated probation or continued parole with substance abuse treatment in lieu of incarceration for adult offenders convicted of nonviolent drug offenses and probation and parole violators.

Methods. We used individually linked, population-level administrative data to define intervention and control cohorts of offenders meeting SACPA eligibility criteria. Using multivariate difference-in-differences analysis, we estimated the effect of SACPA implementation on the total and domain-specific costs to state and county governments, controlling for fixed individual and county characteristics and changes in crime at the county level.

Results. The additional costs of treatment were more than offset by savings in other domains, primarily in the costs of incarceration. We estimated the statewide policy effect as an adjusted savings of \$2317 (95% confidence interval = \$1905, \$2730) per offender over a 30-month postconviction period. SACPA implementation resulted in greater incremental cost savings for Blacks and Hispanics, who had markedly higher rates of conviction and incarceration.

Conclusions. The monetary benefits to government exceeded the additional costs of SACPA implementation and provision of treatment. (*Am J Public Health.* 2013;103:1096–1102. doi:10.2105/AJPH.2012.301168)

whereby adults convicted of nonviolent drug offenses who meet SACPA eligibility criteria can be sentenced to probation with SUD treatment instead of incarceration or probation without treatment, regardless of treatment motivation level or other indicators of program suitability. The law was modeled after historical and concurrent offender diversion efforts, including the Treatment Alternatives to Street Crime programs, drug courts, and other diversion efforts and attempted to implement a program more broadly applicable than any previously implemented, in part by removing motivation and suitability criteria for participation.^{23,24} SACPA eligibility criteria include a requirement of no previous or concurrent serious or violent felonies, physical injury misdemeanors, or concurrent nondrug charges.²⁵

The law was written to also allow offenders on probation or parole who commit nonviolent drug offenses or who violate drug-related conditions of community supervision to elect community-based treatment. Incarceration of offenders for program noncompliance is prohibited in most cases, and SACPA provides as many as 3 opportunities for most offenders (2 for parolees) to reenter treatment without incarceration despite initial violations (e.g., stemming from failures to report to treatment or court appointments, subsequent drug-related arrests, or other acts of program noncompliance). In essence, SACPA became a statewide policy that changed the course of criminal justice processing for all eligible offenders and service entities involved, including the courts, district attorneys and public defenders, probation and parole officers, and SUD treatment providers.

SACPA required an annual budget of \$120 million for the first 5 years, spent primarily on expansion of treatment services. Subsequently, funding authority reverted to the state legislature, which reduced targeted funding for SACPA beginning in fiscal year 2008–2009 and terminated funding indefinitely in 2009–2010. Given the large financial investment and the substantial impact the law has had on SUD treatment in California, determining the economic impact of SACPA implementation, taking into account both the costs of treatment and program administration and the potentially off-setting changes in the costs of health resource utilization, criminal recidivism, and

incarceration, is important. We took advantage of individually linked state-level data on criminal justice, corrections, publicly funded health resource utilization, and SUD treatment to determine the economic impact of California's implementation of the SACPA program.

METHODS

Randomized controlled trials provide the highest level of validity in estimating the impact of an intervention; however, random assignment was not possible in addressing SACPA effects because the law was applicable throughout the state and allowed all eligible offenders the choice to participate. Other, relatively rigorous designs use comparison groups to better assess intervention effects. We constructed a time-lagged cohort of individuals meeting SACPA eligibility criteria in the proximate years before the program was enacted (July 1, 1997–June 30, 1998; $n = 47\,355$) to compare with the intervention group, made up of SACPA-eligible nonviolent drug offenders convicted within the first 12 months of SACPA implementation (July 1, 2001–June 30, 2002; $n = 41\,607$). We identified both population-level cohorts through the California Department of Justice database. We captured outcomes pertaining to health, criminal justice, and substance abuse treatment involvement for 30-month periods before and after the identifying conviction, for a total of 60 months of offender observation (control cohort observation: January 1, 1995–December 31, 2000; SACPA cohort observation: January 1, 1999–December 31, 2004). Both cohorts were followed with an intent-to-treat basis, such that all cohort members were included whether they accepted the option to enter treatment under SACPA or subsequently did so within either condition.

Ideally, the comparison group would be identical to the intervention group in all respects other than the change in policy. In practice, differences usually existed between the 2 groups in observed and unobserved characteristics. However, a less onerous assumption, the parallel trends assumption, is that, in the absence of the policy intervention, the unobserved differences between the 2 groups would be similar over time.²⁶ Difference-in-differences (DID) analysis is an empirical

technique commonly used in evaluating the impacts of policy changes; it typically adopts this assumption in a manner similar to a pre–post design but in a multivariate context.^{27,28}

We used a regression-based DID approach to estimate the effect of SACPA implementation on a set of study outcomes. The DID analytic design is common in econometric analyses assessing average treatment effects using nonexperimental data.²⁸ Absolute differences between the SACPA cohort and the comparison cohort are not important. The DID, or the differences in the changes in outcomes are the measures subject to analysis, which implies that the statistical methodology strips out any potentially unobserved confounding differences in the control and treatment groups that are fixed over time. The analysis also controls for differences at baseline.

Data Sources

We identified study cohorts in the California Department of Justice database and linked them to other state population-level administrative databases using individually unique identifiers. We applied deterministic methods of individual linkage across databases, using individuals' name, birth date, gender, Social Security number, and Criminal Identification and Information number. We used previously developed algorithms for cleaning and matching across databases.²⁹

Five primary data sources were used. We retrieved criminal records from the Department of Justice Automated Criminal History System, which includes personal background data, arrests, citations, charges, court actions (e.g., convictions, sentences), and supervision information for all California arrestees for both felonies and misdemeanors. Substance abuse treatment admissions and discharges were captured in the California Department of Alcohol and Drug Programs' California Alcohol and Drug Data System. This system included clients' intake characteristics, including drugs used, duration of use, treatment type and duration, discharge status, and other information for clients of all publicly funded or state licensed treatment programs. Clients referred by all sources (SACPA or other sources) can be identified in these records. The Offender Based Information System, maintained by the California Department of Corrections and

Rehabilitation, captured prison and parole movement records. Public health resource utilization was captured in the Medi-Cal (California Medicaid) claims data, received from the Department of Health Services. Records included payment histories, diagnoses, surgery codes, types of service providers, physician specialties, days of stay in hospital, treatment unit, amounts paid, and types of health plans for all individuals eligible for Medi-Cal in the study cohorts. Finally, we collected county-level predictors of outcomes, including indicators of policing intensity and socioeconomic status, by calendar year for each of the 58 counties of California from publicly available data from the Federal Bureau of Investigation,³⁰ Office of the Attorney General,³¹ the California Employment Development Department,³² and the US Census.³³

Study Outcomes

The primary outcomes and units of analyses were the total cost per offender paid for by state and county governments, with an emphasis on the health and criminal justice sectors as well as drug treatment. We calculated costs for each member of the cohorts in the 30 months before and after an SACPA-eligible conviction in 8 cost domains: prison, jail, probation, parole, arrests, convictions (including adjudication costs), publicly funded health care use, and SUD treatment. We multiplied event frequency and duration, derived from administrative databases, by unit costs whenever possible.

We derived other economic costs, representing the opportunity cost of resources used rather than prices, from state databases and the peer-reviewed literature.³⁴ All unit costs were average costs, accounting for physical overhead and administration. All costs are presented in 2009 US dollars.

Statistical Analysis

We conducted univariate comparisons of baseline patient characteristics across study cohorts by means of the 2-sample χ^2 test for categorical variables and the *t*-test for continuous variables. We summarized total costs and costs by domain by study cohort and follow-up (pre- and post-index conviction) and estimated univariate and multivariate linear regression models to determine the effect of

SACPA on the difference in total costs. Subsequent univariate and multivariate regression models were estimated separately for each of the 8 cost domains. We considered individual- and county-level covariates to control for differences in study cohorts and, critically, changes in county-level factors associated with both the intervention and the outcome over time. At the individual level, we captured mean-centered age, gender, and race in the Department of Justice data set and incorporated them into the analyses.

Given the use of a time-lagged comparison cohort, parallel trends between cohorts is a strong assumption. Changes in policies at the county level within or between study follow-up periods may have affected the stated outcome. We hypothesized that the DID of total costs may have been affected by changes at the county level in the probability of arrest for criminal activity. We used county residence, also derived from the Department of Justice data set, to link county-level indicators of arrests per capita. Baseline levels (mean centered), as well the change in arrests per capita (percentage of change from baseline), were included to control for differences in trends in these factors between study cohorts, thus addressing concerns of potential violations of the parallel trends assumption. We performed all statistical analysis using SAS version 9.1 (SAS Institute, Cary, NC).

RESULTS

Both study cohorts were primarily male (control = 75.8%, SACPA = 75.2%; $P < .05$). Black or Hispanic individuals represented 44.4% and 48.1% of the control and SACPA cohorts, respectively, and the majority had previous criminal records (Table 1). SACPA cohort members had a higher rate of conviction in the 30 months before index conviction (SACPA = 74.8%, control = 66.2%; $P < .001$) and in the 30 months post-index conviction (SACPA = 46.3%, control = 36.9%; $P < .001$), partly as a result of not being incarcerated for their index conviction and subsequently having a longer time at risk for arrest (i.e., more street time). Participation in SUD treatment in the post-index conviction period was substantially greater in the SACPA cohort (54.7%) than in the control cohort (25.1%; $P < .001$).

Summary statistics of study outcomes are presented in Table 2 and Figure 1. Mean costs accumulated in the pre- and post-index conviction periods are shown, as well as the differences in these domains for each cohort. The highest costs for both cohorts were accumulated in enforcement (arrests, convictions) and incarceration (jail, prison). Individuals in both cohorts tended to have higher costs of incarceration in the post-index conviction period, with a decrease in enforcement costs; however, the differences were greater for the comparison

TABLE 1—Characteristics of Offenders in SACPA Cohort (July 1, 2001–June 30, 2002) and Control Cohort (July 1, 1997–June 30, 1998): California Department of Justice Database

Characteristics	Control Cohort (n = 47 355), Mean (SD) or %	SACPA Cohort (n = 41 607), Mean (SD) or %
Male gender	75.8	75.2*
Age, y	34.1 (8.7)	34.2 (9.7)
Race		
Black	16.4	16.4
Hispanic	28.0	31.7***
White	46.5	47.9***
Other	9.1	3.9***
Convicted		
Pre-index conviction	66.2	74.8***
Post-index conviction	36.9	46.3***
Received treatment postconviction	25.1	54.7***

Note. SACPA = Substance Abuse and Crime Prevention Act.
* $P < .05$; *** $P < .001$.

TABLE 2—Summary of Unadjusted Costs Incurred by the Control Cohort (January 1, 1995–December 31, 2000) and SACPA Cohort (January 1, 1999–December 31, 2004), by Cost Domain: California

Cost Domain	Control Cohort (n = 47 355)			SACPA Cohort (n = 41 607)		
	Pre-Index Conviction, \$, Mean (SD)	Post-Index Conviction, \$, Mean (SD)	Difference, Post - Pre, \$, Mean (SD)	Pre-Index Conviction, \$, Mean (SD)	Post-Index Conviction, \$, Mean (SD)	Difference, Post - Pre, \$, Mean (SD)
Prison	3808 (12 334)	10 777 (20 526)	6969 (18 641)	4772 (13 598)	7588 (16 958)	2815 (16 384)
Jail	2114 (5309)	5753 (8042)	3640 (8632)	2324 (5597)	4126 (7496)	1802 (8629)
Parole	477 (1526)	781 (1756)	305 (1834)	603 (1683)	649 (1699)	46 (1754)
Probation	963 (1294)	2378 (1407)	1415 (1770)	1008 (1290)	2658 (1267)	1650 (1606)
Health care	876 (5706)	1293 (9011)	417 (8330)	1044 (7159)	1698 (10 398)	654 (8909)
Arrest	4567 (7838)	3150 (6364)	-1416 (8893)	4800 (8085)	5020 (8709)	220 (10 239)
Conviction	1763 (6006)	1129 (4446)	-635 (6962)	1458 (5232)	856 (4040)	-602 (6248)
Drug treatment	727 (2909)	1334 (4338)	607 (4871)	924 (3364)	2960 (5694)	2036 (6232)
Total	15 294 (21 074)	26 595 (25 911)	11 301 (24 853)	16 935 (21 412)	25 251 (24 894)	8316 (24 712)

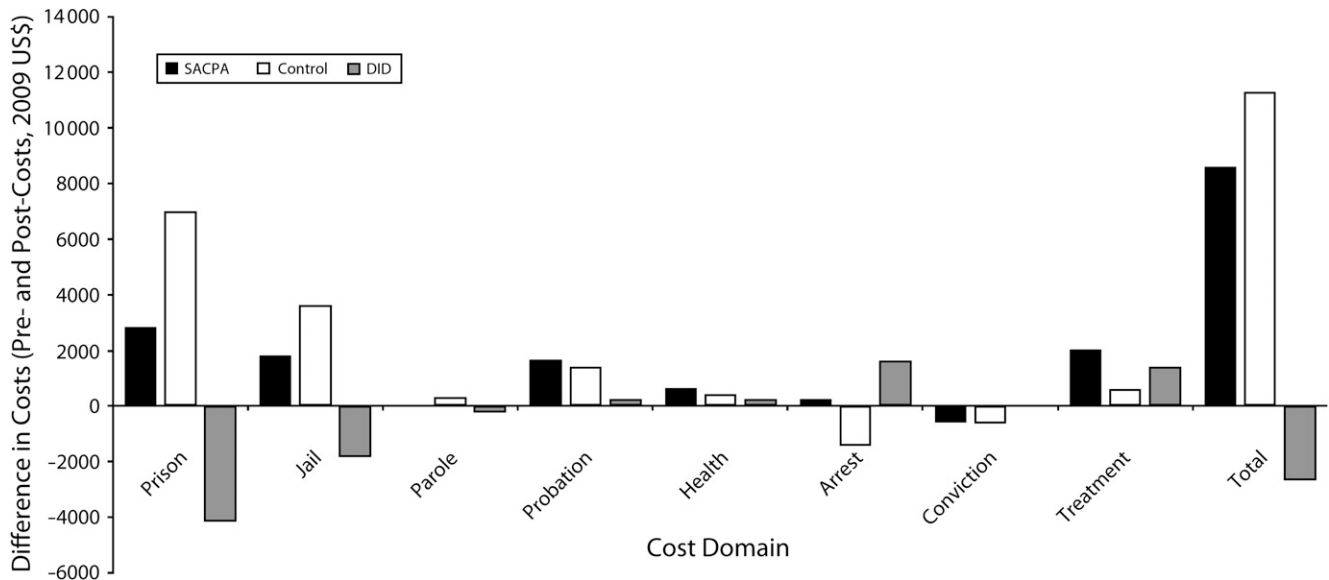
Note. SACPA = Substance Abuse and Crime Prevention Act; pre-index conviction = 30-mo period before index conviction; post-index conviction = 30-mo period after index conviction. All figures are given in 2009 US\$.

cohort because a higher proportion of clients received sentences and subsequently spent less time at risk for arrest. Conversely, those in the SACPA cohort had higher costs of drug treatment in the post-index conviction period and a greater difference in costs. The univariate, unadjusted DID estimator can be derived by subtracting the mean difference in total costs

for the control cohort from those for the SACPA cohort (\$8316 – \$11 301 = -\$2985), indicating a total cost savings of \$2985 per individual. Similarly, these estimators can be derived for each component cost as described.

We present the results of the univariate and multivariate regression-based DID estimators in Table 3. After adjustment, the total DID cost

savings was \$2317 (95% CI = \$2730, \$1905) per offender under SACPA over the 30-month follow-up. Given the imbalance in covariates in the control and SACPA cohorts, the inclusion of demographic controls (age, gender, and race) and county-level controls had an important influence on our estimate of the overall effect of the SACPA program. Specifically, wide



Note. DID = difference-in-differences; SACPA = Substance Abuse and Crime Prevention Act. Negative differences indicate savings resulting from SACPA program

FIGURE 1—Domain-specific and overall adjusted difference in costs (30-month pre-index conviction and 30-month post-index conviction) and cohort difference-in-differences: California; January 1, 1995–December 31, 2000 (control cohort), and January 1, 1999–December 31, 2004 (SACPA cohort).

TABLE 3—Regression-Based Estimates of the Effect of SACPA Implementation by Cost Domain Over the 30-Month Follow-Up Across Control (January 1, 1995–December 31, 2000) and SACPA Cohorts (January 1, 1999–December 31, 2004): California

Outcome ^a	Unadjusted Effects, DID Estimator (95% CI)	Individual-Level Controls, ^b DID Estimator (95% CI)	County-Level Controls, ^c DID Estimator (95% CI)	Fully Adjusted Effects, ^d DID Estimator (95% CI)
Total costs	-2681 (-3007, -2354)	-2845 (-3173, -2518)	-2173 (-2584, -1762)	-2317 (-2730, -1905)
Prison	-4153 (-4386, -3921)	-4392 (-4624, -4159)	-2758 (-3050, -2466)	-3072 (-3364, -2779)
Jail	-1838 (-1951, -1724)	-1838 (-1952, -1724)	-2420 (-2564, -2277)	-2378 (-2522, -2235)
Parole	-259 (-282, -235)	-268 (-292, -245)	-231 (-261, -201)	-238 (-268, -208)
Probation	234 (212, 257)	252 (230, 275)	198 (170, 226)	232 (204, 260)
Health care	237 (124, 351)	230 (117, 344)	252 (110, 395)	220 (77, 363)
Arrest	1636 (1510, 1761)	1677 (1550, 1803)	1500 (1341, 1658)	1564 (1405, 1724)
Conviction	32 (-55, 120)	63 (-25, 151)	-54 (-164, 56)	2 (-109, 112)
Drug treatment	1126 (1053, 1198)	1127 (1054, 1201)	1037 (946, 1129)	1052 (960, 1145)

Note. CI = confidence interval; DID = difference-in-differences; SACPA = Substance Abuse and Crime Prevention Act. All figures are given in 2009 US\$.

^aDifference in costs accumulated in post-index conviction vs pre-index conviction follow-up periods.

^bControlling for age, gender, and race.

^cControlling for county-level baseline arrests per capita and change in arrests per capita.

^dControlling for all individual-level and county-level covariates.

disparities in the rates of conviction and incarceration pre-index conviction among Black and Hispanic individuals resulted in greater incremental cost savings for these clients as a result of SACPA implementation (results not shown). The incremental costs of drug treatment as a result of SACPA enactment was more than offset by savings in the costs of incarceration. Only the SACPA DID estimator for the costs of legal proceedings (i.e., conviction) was not statistically significantly different from zero.

DISCUSSION

We estimated that SACPA implementation led to a savings of \$2317 per offender over a 30-month follow-up. Most of the savings were realized in reduced levels of incarceration. The increases in probation supervision costs, as well as in spending on SUD treatment, were expected and were among the stated goals of SACPA. Although the determination of a cost-benefit ratio for SACPA is beyond the scope of the available data, the savings of \$2317 per offender allows us to project about \$97.3 million in savings over the long term for the nearly 42 000 offenders affected during the first year of SACPA implementation. Because our analyses accounted for the costs of both treatment and probation, these estimated savings are net of the additional costs of the SACPA program. Thus, moving offenders from

the correctional system and into the treatment system, where they are exposed to rehabilitative efforts, should provide long-term savings through a reduction in the overall incarcerated population, or at least an attenuation of its historical growth rate.

This finding is substantial in view of the large increase in the drug offender population in California since the 1980s, suggesting that policy concerns regarding the welfare and rehabilitation of drug users should be seen as aligned with rather than running counter to the notion of fiscal responsibility and public safety concerns. Such savings are important, especially given the current fiscal crisis being experienced in California and other states. As previously noted, recent budgetary decisions eliminated targeted funding for SACPA during and subsequent to fiscal year 2009–2010. Qualified offenders remain eligible to elect to enter treatment, yet at what level this program will continue to function without dedicated funding is unclear. Policymakers should promote continuing assessment of SACPA effects under these changing circumstances.

Although the mean overall savings realized as a result of the SACPA program was substantial, these savings, and program performance in general, varied greatly among demographic groups and across the State of California. Extended results of the multivariate analyses suggested that the savings resulting

from the implementation of SACPA were higher among Black and Hispanic individuals, and results also varied considerably across counties. Adjusting for these covariates in multivariate analysis allowed us to estimate the overall effect of the SACPA program independent of these factors—the critical means to judge the economic impact of SACPA. A detailed assessment of the variation within these domains is outside the scope of this article, in which we aimed to characterize the overall effect of SACPA implementation within the measured outcome domains. Nonetheless, these contextual results naturally have important implications for effective implementation of such offender diversion programs. Further study is required to explicate the variation in the heterogeneous effect of SACPA and other offender diversion programs.

Ample support exists within the scientific literature that treatment, rather than incarceration, provides both short- and long-term improvements in criminal offending, drug use, and social functioning.^{12,35} In California, 2 previous studies of the economic impact of SUD treatment, using a pre- and postadmission design, found that treatment was associated with a net savings to society of 7 times the cost of treatment.^{34,36} These findings are consistent with those of other studies that have estimated the value of SUD treatment initiatives.^{37–39} The value of this study lies in revealing that

these benefits do not come at a cost to taxpayers but instead offer savings along with their other societal and individual benefits—a result found to be independent of potential confounding factors.

This analysis is unique within the substance abuse literature in that it makes use of established econometrics methods²⁸ to control for individual variability and environmental influences while assessing the economic impact of a statewide program. Similar methods have recently been applied in quasi-experimental settings to evaluate the effects of hospital payment methods,⁴⁰ health and social service delivery in resource-poor settings,⁴¹ and the implementation of integrated primary care and mental health services in the Department of Veterans Affairs.⁴¹

Study Limitations

The study was not without limitations. First, as noted earlier, the key limitation in DID analytic designs is the implicit assumption of parallel trends in differences in outcomes of 2 disparate cohorts, a limitation that is likely amplified when using a time-lagged comparison cohort. We attempted to control for differential trends in county-level factors hypothesized to be associated with the outcome of our analysis. In terms of the statistical analysis presented herein, regression models with alternate functional forms (generalized linear models with log link and normal distribution), fitted to account for wide variability in outcomes, produced similar results. We presented outputs of ordinary least squares models for ease of interpretation. Second, linkage between administrative data sets also resulted in some degree of misclassification. We imputed missing drug treatment costs in the SACPA cohort after the index conviction because of the availability of an external data source (SACPA Reporting Information System) indicating levels of SACPA treatment participation.⁴² Because some level of equivalent types of missing values are likely to have existed in the control cohort, we believe our results are likely conservative because we could not correct for missing treatment costs in that cohort.

Third, costs of health resource utilization were available only for individuals eligible for Medi-Cal coverage. Although we cannot determine to what extent cohorts were

unbalanced with regard to Medi-Cal coverage, this domain contributed relatively little to the overall costs in any given period, and the effect of SACPA on differences in health care costs, though significant, was small, suggesting that this limitation was not consequential. Fourth, the broader societal impact was not captured within the cost domains considered. For the latter, these omissions would include victimization costs and those related to insurance reimbursement. Moreover, including the costs of improved productivity of rehabilitated clients in an economic evaluation is controversial,^{43,44} and it and the external costs of family hardship as a result of incarceration are likely to result in underestimation of the effect of SACPA implementation. Finally, because unit costs specific to the study periods were not available, we implicitly assumed that the costs of drug treatment, probationary supervision, and judicial administration were equivalent for the comparison and SACPA cohorts once inflation was taken into consideration.

Conclusions

The goal of SACPA passage was to reduce incarceration rates for nonviolent drug users in the State of California while offering a mechanism for these individuals to receive treatment for their SUDs. As such, SACPA can be considered a successful program, enrolling tens of thousands of offenders each year and resulting in outcomes comparable to those commonly observed in SUD treatment research. Among the chief arguments raised against SACPA passage was that the ultimate cost of the initiative would be “far higher than its promised savings after considering costs for law enforcement, probation and court expenses.”⁴⁵(para.12) Our work shows the converse: California will realize long-term cost savings by offering treatment to nonviolent drug offenders rather than incarcerating them. ■

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Human Participant Protection

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