

# THE IMPACT OF HIV TESTING POLICIES IN STATE DETENTION FACILITIES

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*Human immunodeficiency virus (HIV) among the incarcerated population highlights the demographic inequities that are prevalent among both the incarcerated and the HIV-affected. Testing those inmates to reduce risk behaviors and provide highly active antiretroviral linkages is increasingly important as the rate of HIV among the incarcerated rises, though testing policies vary widely. This paper employs propensity score matching in order to test the effects of different types of testing policies on inmates' long-term health outcomes. Policy implications of the findings and recommendations for future research are discussed.*

## INTRODUCTION<sup>1</sup>

The United States incarcerates more than two million inmates, and this population has been heavily affected by human immunodeficiency virus (HIV).<sup>2</sup> Nationally, the HIV prevalence rate among the incarcerated is approximately 1.5%. AIDS.<sup>3, 4, 5</sup> At state prisons in Florida, Maryland, and New York, the prevalence rate exceeds 3%, which is higher than the national prevalence of any country outside sub-Saharan Africa.<sup>6</sup> Within the prison population, marginalized groups are particularly hard hit by HIV, and generally have less access to care outside the detention facilities.<sup>7</sup> As such, many high-risk or at-risk individuals pass through the correctional system and may not otherwise have an opportunity to learn their HIV serostatus, receive counseling to reduce risk

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1 This paper benefitted from constructive reviews from Professors Seth Gershenson and Jane Palmer, School of Public Affairs, American University. All remaining errors are my own.

2 Mayer, Kenneth H., Anne Spaulding, Becky Stephenson, Grace Macalino, William Ruby, Jennifer G. Clarke, and Timothy P. Flanigan. "Human immunodeficiency virus in correctional facilities: a review." *Clinical Infectious Diseases* 35, no. 3 (2002): 305-312.

3 Health and Human Services. "HIV/AIDS and incarceration. Federal resources: policies/issues." Last modified October 2013. Accessed October 13, 2013. <http://aids.gov/federal-resources/policies/incarceration/>.

4 Mayer, Kenneth H., Anne Spaulding, Becky Stephenson, Grace Macalino, William Ruby, Jennifer G. Clarke, and Timothy P. Flanigan. "Human immunodeficiency virus in correctional facilities: a review."

5 Westergaard, Ryan P., Anne C. Spaulding, and Timothy P. Flanigan. "HIV among persons incarcerated in the US: a review of evolving concepts in testing, treatment and linkage to community care." *Current opinion in infectious diseases* 26, no. 1 (2013): 10.

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behaviors, or be tested and treated for other sexually-transmitted infections.<sup>8</sup>

Testing at-risk individuals in detention facilities is an important public health priority because voluntary HIV testing and counseling can reduce the prevalence of HIV risk behaviors.<sup>9</sup> Most incarcerated individuals serve short sentences and return to their communities, so testing during incarceration and linking to community care may be the only opportunity for some under-resourced individuals to learn their status.<sup>10</sup> However, there no common set of policies, procedures, and regulations regarding HIV testing and counseling across jurisdictions, and not all correctional facilities provide testing.<sup>11</sup> There has not been any study of the long-term effects of testing policies, so it is difficult to assess what if any impact HIV testing has had on AIDS-related fatalities.

This study will describe the current situation, issues, and challenges faced by prison service providers and policymakers. I will use data from the United States Bureau of Justice Statistics (BJS) to perform a longitudinal analysis of the impact of these policies. I will also recommend policies and topics for future research.

#### Institutional Details

Since 2006, the United States Centers for Disease Control and Prevention (CDC) has recommended routine HIV testing for adults in all clinical settings, including correctional facilities.<sup>12</sup> Recently, it was reported that 24 states disclosed testing all inmates for HIV at admission or sometime during their custody. It is important to note that some states may test inmates repeatedly based on individual facility policies, inmate situation, or at the determination of a medical officer within the institution. Of the 24 states, 23 test at admission, five test while in custody, and six test upon the inmates' release. Forty-two states and the federal system test inmates after they are involved in an incident in which the prison determines the inmate is exposed to possible HIV transmission. Fifty states test inmates if they have HIV-related symptoms or if they request an HIV test.<sup>13</sup> A recent national survey of prison and jail systems found that 39% of prisons do mandatory or routine HIV testing and 36% of jails perform any HIV testing.<sup>14</sup>

### REVIEW OF RELEVANT LITERATURE

The first documented case of AIDS in a correctional facility occurred in 1982. Three years later, the first comprehensive study of HIV prevalence in detention facilities identified 766 cases of HIV/AIDS among prisoners, of whom 322 had already

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8 Grinstead, Olga, David W. Seal, Richard Wolitski, Timothy Flanigan, Christine Fitzgerald, Jill Nealey-Moore, John Askew, and the Project START Study Group. "HIV and STD testing in prisons: perspectives of in-prison service providers." *AIDS Education and Prevention* 15, no. 6 (2003): 547-560.

9 Ibid.

10 Ibid.

11 Grinstead, Olga, David W. Seal, Richard Wolitski, Timothy Flanigan, Christine Fitzgerald, Jill Nealey-Moore, John Askew, and the Project START Study Group. "HIV and STD testing in prisons: perspectives of in-prison service providers."

12 Westergaard, Ryan P., Anne C. Spaulding, and Timothy P. Flanigan. "HIV among persons incarcerated in the US: a review of evolving concepts in testing, treatment and linkage to community care."

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died at the time the study was conducted.<sup>15</sup> Currently, all correctional systems have reported cases of HIV infection among their incarcerated populations.<sup>16</sup>

Prisons and jails face different circumstances related to HIV and HIV testing. Jails are facilities operated by local jurisdictions, and jailed inmates are typically sentenced for one year or less or are awaiting trial or sentencing. The average jail stay is ten to twenty days.<sup>17</sup> The rapid turnover in jails suggests that caring for immediate medical concerns may be prioritized over screening for infectious diseases and other preventive care, especially since 29% of jail inmates were under the influence of an illegal drug at the time of arrest and 54% reported use of any illicit substance in the month preceding arrest.<sup>18</sup> Inmates of both sexes are more likely to accept HIV testing if it is available within the first 24 hours of incarceration.<sup>19</sup>

Prisons are state or federal facilities in which an inmate's sentence is a year or more, so there is less turnover than jails. This environment fits an opt-out policy, in which the prison routinely administers HIV tests unless a patient explicitly refuses to consent to the examination.<sup>20</sup> This approach allows authorities to identify and treat HIV-affected inmates who may have otherwise gone untested.<sup>21</sup> Empirically, the opt-out policy has resulted in more awareness and treatment of HIV/AIDS within a prison population. A review of a prison without HIV testing noted that 60% of individuals with HIV risk factors were never tested. After the same prison implemented a routinized screening process with an opt-out testing policy, the proportion of inmates tested and the new diagnoses quickly and dramatically increased. The Washington Department of Corrections found that a change to an opt-out testing policy led to 90% of incoming inmates tested for HIV.<sup>22</sup>

Routine HIV testing has had an important role in the diagnosis of HIV in Rhode Island.<sup>23</sup> The state of Rhode Island enacted a law that mandated confidential HIV testing for all sentenced inmates in 1988, regardless of the brevity of the sentence or expected length of stay.<sup>24</sup> Inmates refusing HIV testing at intake may undergo mandatory HIV testing if or when they are found guilty and sentenced.<sup>25</sup> A study conducted from 1989-1999 found that 32.9 percent of all HIV positive tests in the state were retrieved from the state correctional facility, which suggests that public health campaigns cannot ignore incarcerated populations.<sup>26</sup>

15 Mayer, Kenneth H., Anne Spaulding, Becky Stephenson, Grace Macalino, William Ruby, Jennifer G. Clarke, and Timothy P. Flanigan. "Human immunodeficiency virus in correctional facilities: a review."

16 Ibid.

17 Health and Human Services. "HIV/AIDS and incarceration. Federal resources: policies/issues."

18 Karberg, J. C., & James, D. J. (2005). *Substance dependence, abuse, and treatment of jail inmates, 2002*. Washington, DC: US Department of Justice, Office of Justice Programs, Bureau of Justice Statistics.

19 Ibid.

20 Health and Human Services. "HIV/AIDS and incarceration. Federal resources: policies/issues."

21 Westergaard, Ryan P., Anne C. Spaulding, and Timothy P. Flanigan. "HIV among persons incarcerated in the US: a review of evolving concepts in testing, treatment and linkage to community care."

22 Ibid.

23 Desai, Amar, E. Timothy Latta, Anne Spaulding, Josiah Rich, and Timothy Flanigan. "The importance of routine HIV testing in the incarcerated population: the Rhode Island experience." *AIDS Education and Prevention*. no. 5 (2002): 45-52.

24 Ibid.

25 Desai, Amar, E. Timothy Latta, Anne Spaulding, Josiah Rich, and Timothy Flanigan. "The importance of routine HIV testing in the incarcerated population: the Rhode Island experience."

26 Ibid.

Recently, it has also been found that a distinct proportion of newly-identified cases in detention facilities was among detainees “whose only disclosed risk was heterosexual intercourse.”<sup>27</sup> As such, testing programs that target inmates based on self-reported risk behavior may miss some detainees who are perceived as ‘less risky.’ Others may not disclose their risky behaviors, and testing might not be accepted by those who need it most.<sup>28</sup> Stigma within the criminal justice system is often a significant deterrent to self-identification of risk behaviors, not only those related to infection status.<sup>29</sup>

The prevalence and availability of highly active anti-retroviral therapy (HAART) in correctional facilities has been credited for the decrease in AIDS mortality.<sup>30</sup> While 242 state prisoners died of AIDS-related causes in 1999, only four years earlier in 1995, 1010 inmates died of the same cause.<sup>31</sup> Moreover, by 2005, a national survey of jails and prisons found that all systems surveyed reported providing anti-retrovirals (ART) to at least some incarcerated individuals.<sup>32</sup>

Because HIV prevention resources in correctional facilities are limited and HIV testing has proved cost effective in clinics, understanding the cost associated with testing in prisons is important. Empirical evidence suggests that the costs of counseling and testing (CT) for HIV-infected inmates is \$78.17 for each seropositive inmate and \$24.63 for each seronegative inmate.<sup>33</sup> Despite these up-front costs, the evidence suggests that offering no CT services would result in 35 future cases of HIV per institution and would cost society \$6.6 million in lifetime medical treatment costs.<sup>34</sup> Besides cost savings, CT services in prison has the potential to have a significant public health effect in communities that are a greater risk for infections.<sup>35</sup> Importantly, follow-through with results, even seronegative results, can diminish the likelihood of risk-taking behavior and deliver accurate information.<sup>36</sup>

## METHOD AND MEASURES

### *Data*

This study uses data collected by BJS and compiled in the Census of State and Federal Correctional Facilities. These censuses have been conducted over multiple

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27 Spaulding, Anne C., Kimberly R. Jacob Arriola, Theodore Hammett, Sofia Kennedy, and Melinda Tinsley. “Rapid HIV testing in rapidly released detainees: Next steps.” *Sexually transmitted diseases* 36, no. 2 (2009): S34-S36.

28 Spaulding, Anne C., Kimberly R. Jacob Arriola, Theodore Hammett, Sofia Kennedy, and Melinda Tinsley. “Rapid HIV testing in rapidly released detainees: Next steps.”

29 Westergaard, Ryan P., Anne C. Spaulding, and Timothy P. Flanigan. “HIV among persons incarcerated in the US: a review of evolving concepts in testing, treatment and linkage to community care.”

30 Mayer, Kenneth H., Anne Spaulding, Becky Stephenson, Grace Macalino, William Ruby, Jennifer G. Clarke, and Timothy P. Flanigan. “Human immunodeficiency virus in correctional facilities: a review.”

31 *Ibid.*

32 Westergaard, Ryan P., Anne C. Spaulding, and Timothy P. Flanigan. “HIV among persons incarcerated in the US: a review of evolving concepts in testing, treatment and linkage to community care.”

33 Varghese, Beena, and Thomas A. Peterman. “Cost-effectiveness of HIV counseling and testing in US prisons.”

34 *Ibid.*

35 *Ibid.*

36 *Ibid.*

years, but this study considers the data collected in 1990 and 2000 as a result of data availability. According to BJS, questionnaires were mailed to facility respondents in June of 1990 and 2000. In 1990, telephone follow-ups occurred in the fall, and in 2000, telephone and e-mail follow-ups both occurred in the fall. In both years, the final response rate was 100%.

These are cross-sectional data in which the unit of observation is the correctional facility. This study observes only state-level correctional facilities, due to the fundamental differences between these and other types of facilities, including federal and privately contracted facilities. Other types of facilities fall out of the scope of the current project. Because data from 1990 and 2000 are available, this study compares the effects of testing policies upon fatalities related to AIDS in both years.

Due to the structure of the HIV testing variables, the predictor variable is binary, denoting “treatment” if the facility tests all inmates or high-risk inmates and denoting “untreated” if it tests based on request, clinical indicator, court order, admission or release status, random sample of inmates, another subset, or performs no testing. The theory behind the treatment classification is that having policies for testing all inmates or testing high-risk inmates will allow the facility to test many of the inmates. Testing on request, at an indicator, upon a court order, at admission or release, on a random sample, on another subset, or not testing at all will not capture as many inmate cases. Because many of the latter testing categories require a request from a person or another institution (which is prohibitive due to institutional and between-inmate HIV stigma), it is unlikely many inmates will be tested in these ways. Testing at admission may not capture as many inmates as other regulations because, according to the literature review, a significant proportion of incoming inmates are under the influence of illicit substances at the time of intake and cannot consent to testing. The long-term health outcome variable is continuous, and it measures the number of AIDS-related fatalities in the facilities that occurred in the previous year.

Data were obtained from state detention facilities in years 1990 and 2000, as noted above, and included observations on 1,129 and 1,295 facilities, respectively. Approximately seven percent of the facilities were included in the treated group in 1990, and three percent were included in the same group in the 2000 evaluation. The mean number of AIDS-related fatalities in 1990 was 0.37, and in 2000 the mean number of fatalities was 4.49 (Table 1).

## METHODOLOGY

A facility’s testing policies are, as the literature review suggests, endogenously determined by a number of factors, including unobserved effects such as inmate rights within a state. In order to address this potential selection problem, I use propensity score matching, achieved by matching samples of treated and untreated detention facilities based on observable characteristics. Following Rosenbaum and Rubin, I estimate a logit model of whether a facility “tests many” or “tests few.”<sup>37</sup>

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37 Rosenbaum, Paul R., and Donald B. Rubin. “The central role of the propensity score in observational studies for causal effects.” *Biometrika* 70, no. 1 (1983): 41-55.

The process of matching treated facilities with comparison facilities is as follows: each facility is assigned a propensity score from the logit estimation and subsequently matched with a comparison facility of a similar propensity score.<sup>38</sup> Finally, average treatment effects of each testing policy are calculated for treated and untreated facilities. The demographic composition of the facilities is important because the literature review indicates that there are distinct social and demographic disparities among the incarcerated living with HIV. The other, facility-related characteristics are necessary to identify facilities that are similar to one another in order to ascertain potential counterfactuals.

From the literature review, I gather that there are significant gender, racial, and socioeconomic differences between the general population and the incarcerated population, especially those most likely to be affected by HIV and AIDS. Therefore, it is important to include these factors within the propensity score because facilities may be more likely to test based on the perceived needs of the demographics of the inmate population, which vary dramatically by gender and race. In the propensity score, white inmate population, black inmate population, Hispanic inmate population, Asian inmate population, Native inmate population, male population, and female population act as demographic controls. Additionally, while it was previously noted that HAART has been made available to all inmates who require it, facilities of lower custody level tend to provide only reactive medical care, rather than preventive services. Including the existence of a medical facility in the propensity score is useful because those facilities without some medical facility are unlikely to be able to either test inmates or have the capacity to identify new HIV cases and make HAART linkages. Furthermore, institutional policies within a facility may limit an inmate's access to programming or other services. As a result, testing procedures may be influenced by the facility's confinement policies. Inmate segregation, either as a result of their conviction or due to medical issues or needs, may also affect their access to medical services. This study will control for general confinement and medical confinement. Lastly, in order to determine robustness of the propensity scores, I conduct additional matching algorithms, including nearest neighbor matching and caliper-nearest neighbor matching.

## RESULTS

This study does not find statistically significant evidence that prison policies to test more inmates are associated with any change in AIDS-related fatalities. In 1990, the average treatment effects suggest a statistically insignificant, small negative finding, such that facilities that are likely to test more inmates via "test all inmates" or "test high risk inmates" policies have 0.157 fewer fatalities related to AIDS than facilities that have adopted looser or perfunctory testing guidelines. Similar average treatment effects are found in the 2000 data, where facilities that test more inmates using test all or test high-risk inmate policies have 0.512 fewer fatalities related to AIDS than

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<sup>38</sup> Abadie, Alberto, and Guido W. Imbens. "Large sample properties of matching estimators for average treatment effects." *Econometrica* 74, no. 1 (2006): 235-267.

the facilities that adopted other policies. The 2000 findings are also statistically insignificant (Figure 4). It is important to note, however, that the number of facilities that fall into the treatment group decreases over the ten-year period (Table 2).

These results are consistent across the sensitivity analysis conducted via other matching algorithms. Notably, the OLS coefficient without the added controls is the highest estimate. With the added independent control variables in the OLS estimate, the coefficient decreases, and the coefficient is also low when controlling for the propensity score within the OLS estimate across both years (Table 3). This reflects the anticipated result, because OLS would bring about selection on observable bias, which would have to be corrected by additional controls using a different method. The matching algorithms used for sensitivity analysis reported fairly consistent results within each year. Importantly, after obtaining the initial propensity score average partial effect, the matching algorithms were performed on the area of common support.

It is striking that the effects are very similar across the span of ten years. Due to the increased awareness efforts around HIV/AIDS and the developments in HAART, a lower in-facility AIDS mortality rate overall was expected. Instead, the mean number of AIDS-related fatalities is higher in 2000. This may be because the more ineffective therapy drugs of earlier decades did not allow the life expectancy of the more modern HAART technology now available to inmates, resulting in those inmates taking the less effective drugs passing away during those ten years.

It is noteworthy that the average treatment effects on the treated facilities between the two years becomes positive from 1990 to 2000 and also decreased substantially (Table 4). The average of the subpopulation of treated facilities of testing more inmates using the testing policies specified suggests that facilities with policies to test all inmates or test high-risk inmates may have made significant improvements in their linkages to HAART and other treatment. While it is not likely that HIV testing is responsible for the improvement, there may be unobserved factors among the facilities that test more inmates for HIV, such as a more overt policy-level advocacy stance on widely disseminating HIV/AIDS information to inmates.

## POLICY CONCLUSIONS

Though the empirical results from this study do not show a relationship between testing policy and AID-related deaths , policy-makers should consider adopting opt-out testing policies at the institution or state level. The literature suggests that prison populations are at high risk for HIV infections. By offering testing, institutions discourage the most vulnerable from engaging in risky behaviors, especially in populations moving in and out of incarceration. Not only has this type of policy been proven cost-effective to both the institution and on the societal level, but it also allows inmates the opportunity to take control of their health status and be linked to the care they require, without the ethical violations of subjecting all inmates to mandatory testing.

This analysis had two limitations which may have impacted the reliability of the estimations. Primarily, the data that were available did not contain a unique identifier for the detention facilities. This resulted in the inability to control for facility-level

fixed effects, or the ways in which the facility adopted new policies (or did not adopt new policies) in response to demographic changes over time. Controlling for facility-level fixed effects would have made this model more robust. Future work on this topic should collect data over time from the same facilities that actively report data on testing and demographics, but also contain an identifier in order to assess facility-level changes over the course of that period.

The second limitation exists within the coding of the predictor variable. In order to obtain more nuanced effects, it would have been more useful to parse out the testing types and understand the partial effects of the individual testing types on the outcome variable. Again, the data availability limited the capacity of this analysis to parse out the effects as thoroughly as desired. However, the binary variable coding takes advantage of the extensive literature that exists on the different types of testing and how many inmates each is likely to impact. While this analysis could have been improved by analyzing each testing policy individually, this remains a recommendation for future research. Work in the future should build upon these preliminary results by analyzing the partial effects of receiving or not receiving a particular type of testing program within the facility.

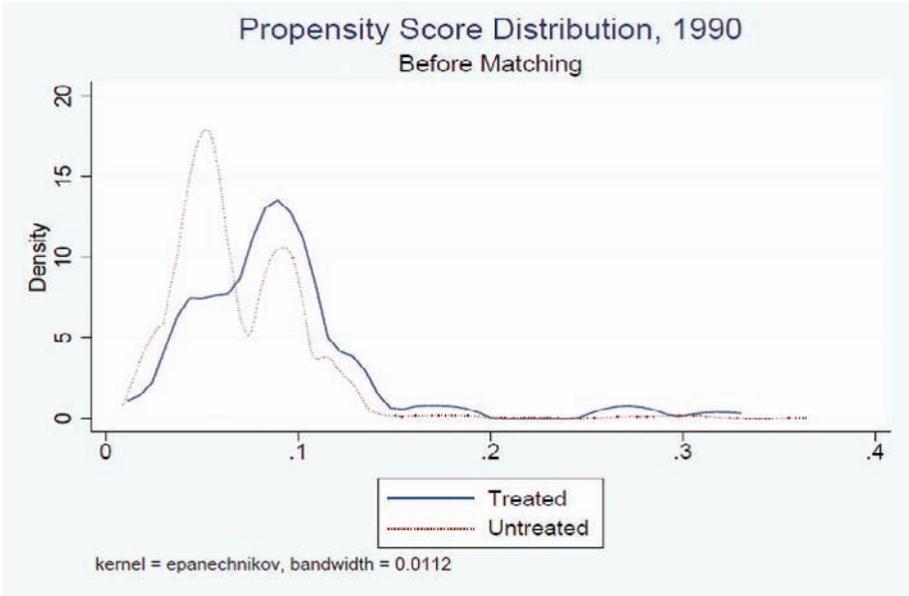


Figure 1

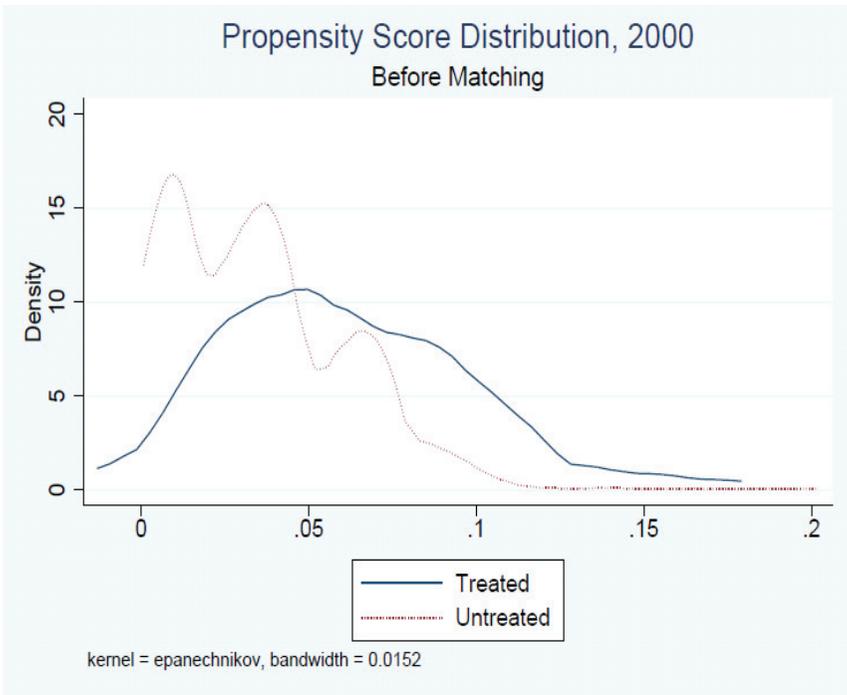


Figure 2

TABLE 1: DESCRIPTIVE STATISTICS

	<i>1990</i>	<i>2000</i>
Sample Size Detention Facilities	1129	1295
Mean AIDS Fatalities	0.338	4.49
Standard Deviation AIDS Fatalities	1.86	17.062
Minimum AIDS Fatalities	0	0
Maximum AIDS Fatalities	27	452

TABLE 2: TREATMENT DISTRIBUTION

	<i>Facilities Treated</i>	<i>Facilities Untreated</i>
<i>1990</i>	1051	78
<i>2000</i>	1256	36

TABLE 3: REGRESSION-ADJUSTMENT TREATMENT EFFECT REGRESSION

	<i>1990</i>	<i>2000</i>
Unconditional estimate	-0.293 (0.218)	-3.6 (2.773)
Control with independent variables	-0.144 (0.208)	-0.704 (2.684)
Control with propensity score	-0.152 (0.221)	-0.71 (1.59)

TABLE 4: PROPENSITY SCORE ESTIMATES

		<i>1990</i>	<i>2000</i>
1	PSM ATE, with independent variable controls	-0.157 (0.124)	-0.512 (1.097)

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		<i>1990</i>	<i>2000</i>
2	PSM ATT, with independent variable controls	-0.097 (0.652)	0.199 (8.784)
3	PSM ATE, with independent variable controls, common support	-0.097 (0.652)	-0.512 (1.097)
4	PSM ATT, independent variable controls, common support	-0.097 (0.652)	-1.752 (1.575)
5	PSM ATE, with independent variable controls, nearest neighbor matching	-0.281 (0.099)	-1.187 (0.94)
6	PSM ATT, with independent variable controls, nearest neighbor matching	-0.07 (0.61)	-0.072 (6.869)
7	PSM ATE, with independent variable controls, caliper restrictions	-0.157 (0.124)	-0.512 (1.097)
8	PSM ATT, with independent variable controls, caliper restrictions	-0.096 (0.652)	0.199 (8.784)
9	PSM ATE, with independent variable controls, caliper restrictions, nearest neighbor matching	-0.28 (0.99)	-1.187 (0.94)
10	PSM ATT, with independent variable controls, caliper restrictions, nearest neighbor matching	-0.07 (0.61)	-0.072 (6.87)

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