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Essays on Healthcare Utilization in Persons Who Inject Drugs

A dissertation submitted in partial satisfaction of the

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in

Public Health (Global Health)

by

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The Dissertation of Erik Michael Hendrickson is approved, and it is acceptable in quality and form for publication on microfilm and electronically:

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ABSTRACT OF THE DISSERTATION

Essays on Healthcare Utilization in Persons Who Inject Drugs

by

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Doctor of Philosophy in Public Health (Global Health)

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Background: Persons who inject drugs (PWID) are at increased risk for infectious diseases and overdose, and need access to primary care and substance use disorder (SUD) services. Yet, PWID historically have avoided and delayed seeking care, in part due to lacking insurance coverage for services they need and an availability of these services at local clinics. The Affordable Care Act (ACA) made insurance mandatory and included SUD services as an essential health benefit.

Objectives: This dissertation research sought to examine the impact of the implementation of the ACA on the use of SUD treatment (Chapter 2) and primary care services

(Chapter 3) among PWID in San Diego. It also sought to understand the changes in offering of SUD services at community and free primary care clinics after this health reform was implemented (Chapter 4).

Methods: This dissertation is comprised of three papers assessing different aspects of health service use among PWID in San Diego County. Papers one and two (Chapters 2 and 3) used data from a longitudinal cohort study of 576 PWID in San Diego (STAHR 2 Study) to determine the impact of the ACA on the use of SUD treatment and the use of primary care services, respectively. Paper three (Chapter 3) used facility-level data on community and free primary care clinics in San Diego County from the California Office of Statewide Health Planning and Development to understand changes in offering of SUD services at these clinics after the ACA compared to before.

Results: For paper one (Chapter 2), there was an increase (12%) in use of SUD treatment after the ACA compared to before, with a similar increase (10%) in insurance coverage. The ACA was associated with greater use of SUD treatment among PWID and the strength of this association was not impacted by insurance coverage. For paper two (Chapter 3), there was an increase (4%) in primary care use after the ACA compared to before, with a much larger increase (24%) in those who had insurance coverage. The ACA was associated with greater use of primary care services among PWID and the strength of the association was not entirely explained by an increase in insurance coverage. Paper three (Chapter 4) showed an decrease of 7% in the number of community and primary care clinics that offered SUD services after the ACA compared to before, but an increase in the proportion of patients covered by Medi-Cal and had contact with a substance abuse counselor.

Conclusion: These findings suggest that the ACA may have been an effective health policy for increasing access and use of essential health services among PWID in San Diego, and for bolstering SUD services in community and free primary care clinics.

Chapter 1: Introduction

Globally, there are 15.6 million persons who inject drugs (PWID).[1] The United States has 14% of this global PWID population (2.1 million).[2] PWID are at increased risk for overdose and infectious diseases, requiring more preventive health services than non-drug using populations. Yet even with increased need for healthcare services, PWID use less and delay going to primary care and preventive services.[3,4] Instead they use more emergency and catastrophic services.[5,6] Increasing the use of primary care services and substance use disorder (SUD) services for PWID could help to prevent disease and overdose as well as reduce substance use, particularly when these services are integrated. However, one barrier to using primary care and SUD services among PWID in the United States has been a lack of health insurance coverage.[7] The Affordable Care Act (ACA) sought to remove this barrier, bringing coverage and parity to SUD benefits and physical health benefits.[8] Using the Andersen Behavioral Model of Health Service Utilization to conceptualize the relationships between health policy, health systems, and health behaviors, this dissertation explores changes in supply and use of primary care and SUD services among PWID in San Diego after the implementation of the ACA.

Morbidity and Mortality among PWID

PWID, along with other persons who use drugs, are at increased risk for fatal and non-fatal overdose.[9] In the United States during 2017, there were over 70,000 unintentional drug overdose deaths and an estimated 326,000 hospitalizations for nonfatal drug poisonings, which have tripled since 2002.[10] Also in 2017, 7% of the United States population (320 million) had a SUD.[11] Health service programs for SUD such as screening for Fentanyl in routine clinical toxicology testing, targeted naloxone distribution, and Medication-Assisted Treatment (MAT), are evidence-based programs that can prevent overdose by identifying persons at risk and providing them with resources for harm reduction.[12] These interventions are particularly effective

in primary care settings where physicians can be provided support to use evidence-based approaches when working with substance using populations.[12]

PWID are also at higher risk for infection of blood-borne pathogens such as hepatitis B virus (HBV), hepatitis C virus (HCV),[13,14] and human immunodeficiency virus (HIV).[15,16] Of the estimated 2.1 million PWID in the United States, 53% are estimated to have the HCV antibody and 9% are estimated to have the HIV antibody.[1] HIV and HCV are easily spread through the sharing of injection drug equipment and may indicate a lack of knowledge about the threats of the diseases, limitations in accessing sterile syringes, and/or high frequency of risky behaviors such as sharing needles and injecting in group settings.[17,18] PWID, similar to drug users in general, are also associated with a higher prevalence of latent TB infection (LTBI) that can be attributed to living in cramped and poorly ventilated environments or sharing drug using equipment (i.e. marijuana water pipes).[19,20] Health service programs such as needle/syringe exchange programs (NEP), antiretroviral treatment (ART), and direct observed therapy (DOT) are evidence-based programs that can prevent and reduce transmission of infectious diseases in PWID.[17,18] These programs have been successfully used to reduce HIV, HCV, and TB transmission. Primary care providers could be a suitable outlet for implementing these programs, as they are already trained in screening and treating infectious diseases, and in combination with screening and treatment for SUD, can provide high quality healthcare to PWID.

Health Service Use among PWID

Unfortunately, PWID do not feel welcome at most healthcare establishments and delay seeking services until their condition is dire.[21] They usually frequent the emergency department instead of primary or preventative care for their health issues since they know they are not able to be refused by emergency services.[21] As the use of the emergency department should be a

rare occasion, a high frequency of use if often times viewed as an indicator of the lack of access to other services better suited to prevent and manage health issues for PWID. Primary care can prevent unnecessary use of costly emergency services by treating current health needs, helping to prevent future health events, and linking patients to appropriate specialty care.[22,23] However, barriers exist that prevent and delay the use of primary care and SUD services by PWID such as 1) lacking insurance coverage, 2) lacking insurance coverage for SUD services, 3) lacking of knowledge about infectious diseases and associated risk behaviors; and 4) internalized stigma.[7,8,24] Furthermore, healthcare providers may also have little incentive to care for PWID due to low reimbursement rates and difficulty effectively treating diseases in this population.[11]

Introduction of the Affordable Care Act

Access to health services has been found to be an indicator of health system performance.[25] The implementation of the ACA improved access to healthcare in the United States by: mandating all citizens and legal residents maintain health insurance coverage, expanding Medicaid coverage and creating public marketplaces for qualified plans to be offered, and including SUD services as essential health benefits in all qualified plans.[26] The individual mandate, which took effect on January 1, 2014, required most citizens and legal residents of the United States to maintain health insurance or pay a penalty.[27] The mandate was enforced with an income tax penalty implemented as an annual fine relative to annual income, but no more than the cost of the lowest-priced bronze plan. Persons with income low enough that they did not have to file taxes; were a member of a recognized Native American tribe; a member of a religious sect with religious objections to insurance; incarcerated persons; or citizens living abroad, were exempt from the individual mandate.

Legislation in December 2017 repealed the individual mandate starting in Spring 2019, however, recent reports in the news have mentioned the repeal may not have weakened the

act.[28] The ACA also expanded Medicaid for states that chose to do so, increasing eligibility from its previous limit of 40% of the federal poverty level to 138% of the federal poverty level.[29] Tax credits were provided to persons over 138% of the federal poverty level to 400% of the federal poverty level, for those purchasing coverage from the federal or state marketplaces (e.g. Covered California).[30] The ACA included SUD services as one of the ten elements of the essential health benefits and required of all health insurance packages provided by Medicaid and public marketplaces to cover these services.[31] By including SUD services as essential to health insurance benefits, PWID are able to get coverage for services and healthcare providers are able be paid for them, thus increasing access to and use of SUD services for this population.

The ACA also provided $11 billion to bolster and expand community and free primary care clinics, of which $9.5 billion was allocated for building new clinics in medically underserved areas, to expand preventive and primary care services, and to include behavioral health in the clinics.[32] Community and free primary care clinics are part of the healthcare systems' "safety net", providing essential care and serving as a "medical home" for low-income individuals, racial and ethnic minorities, rural communities and other underserved populations.[33] Community and free primary care clinics operate as tax-exempt nonprofit corporations supported by grants, government funds, or contributions, and charge for their services based on a sliding scale or do not require direct payment from patients.[33] These types of clinics are sensitive to changes introduced by the ACA because they are mainly funded by public programs (Medicaid, Medicare, federal grants) and are good indicators for its impact on vulnerable populations. In addition, community and free primary care clinics focus on comprehensive services that meet the varying needs of their patient populations including PWID who need: substance use disorder screening and treatment, chronic and infectious disease management, patient education activities, and outreach. This integrated approach provides an advantage for case management

in-house compared to other healthcare settings where referrals are made outside of clinics, and information may be lost or the patient may never make it to their referral.

Theoretical Model

This dissertation draws on the Andersen framework for health services utilization, which conceptualizes the causal pathways for health service use.[32] The framework begins with social determinants (e.g. norms), their effect on the health system (e.g. resources and organizational structure), and the direct and indirect influences of social determinants and the health system on individual determinants (e.g. predisposing and enabling factors) of health service use. Drawing on the Andersen framework as a guide for variable selection and for conceptualizing the relationships between health policy, health services, and health behaviors, we conceptualized the ACA as a health policy that affected both individual determinants of health service use and the organization of the healthcare system. The ACA was a federal health policy introducing a new norm (e.g. mandatory health insurance, SUD services included as essential health benefits), which directly impacted the way that resources were organized in the healthcare system (e.g. primary care clinics offering SUD services) and directly affected the insurance status of individuals (enabling factor), which in turn impacted the amount of health services used (SUD services, primary care services) (Figure 1.1).

Problem Statement

Previously, studies on health service use among PWID in the United States focused on exploring barriers to care using qualitative methods or identifying predictors and correlates of use.[35-39] There were a few studies in Australia and Canada that focused on health service use and the ability to access health and social services, which found PWID used more health services in general including primary care services,[22,40,41] but these are countries that have

already established universal healthcare systems and findings may not be generalizable to the United States. Few studies have assessed the changes in health service use following the introduction of a major health policy change such as the ACA. Most recently there was a study conducted in the United States that evaluated health service use in states that expanded Medicaid compared to non-expansion states, and found that PWID in Medicaid expansion states were more likely to have insurance, have used medication-assisted treatment, and were less likely to have an unmet need for care.[42] While there is growing evidence to suggest that the ACA was effective at increasing health services use among PWID at a state level, there is still a need for more studies on health service use among PWID spanning the Affordable Care Act at the local level so that findings can be relevant for local agencies that directly serve these populations.

This dissertation offers to contribute to PWID and healthcare reform literature as the first analyses to our knowledge to examine changes in health service utilization among PWID and changes in the supply of SUD services at primary care clinics, in San Diego County, California after the implementation of the ACA. This dissertation provides local data useful for policy-makers, leaders, and program managers in San Diego to understand the use of health services among PWID and SUD service offerings in primary care settings, before and after the ACA healthcare reform. Included in this dissertation are three independent papers that are being prepared for publication. Papers 1 and 2 (Chapters 2 and 3) use data from a longitudinal cohort study of PWID in San Diego to 1) examine changes in the use of SUD treatment by PWID in San Diego after the implementation of the ACA compared to before, and to 2) examine changes in primary care use by PWID in San Diego after the implementation of the ACA compared to before. Paper 3 (Chapter 4) uses facility-level data from licensed community and free primary care clinics in San Diego County to 3) understand changes in the offering of SUD services at

community and free primary care clinics in San Diego County after the implementation of the ACA compared to before.

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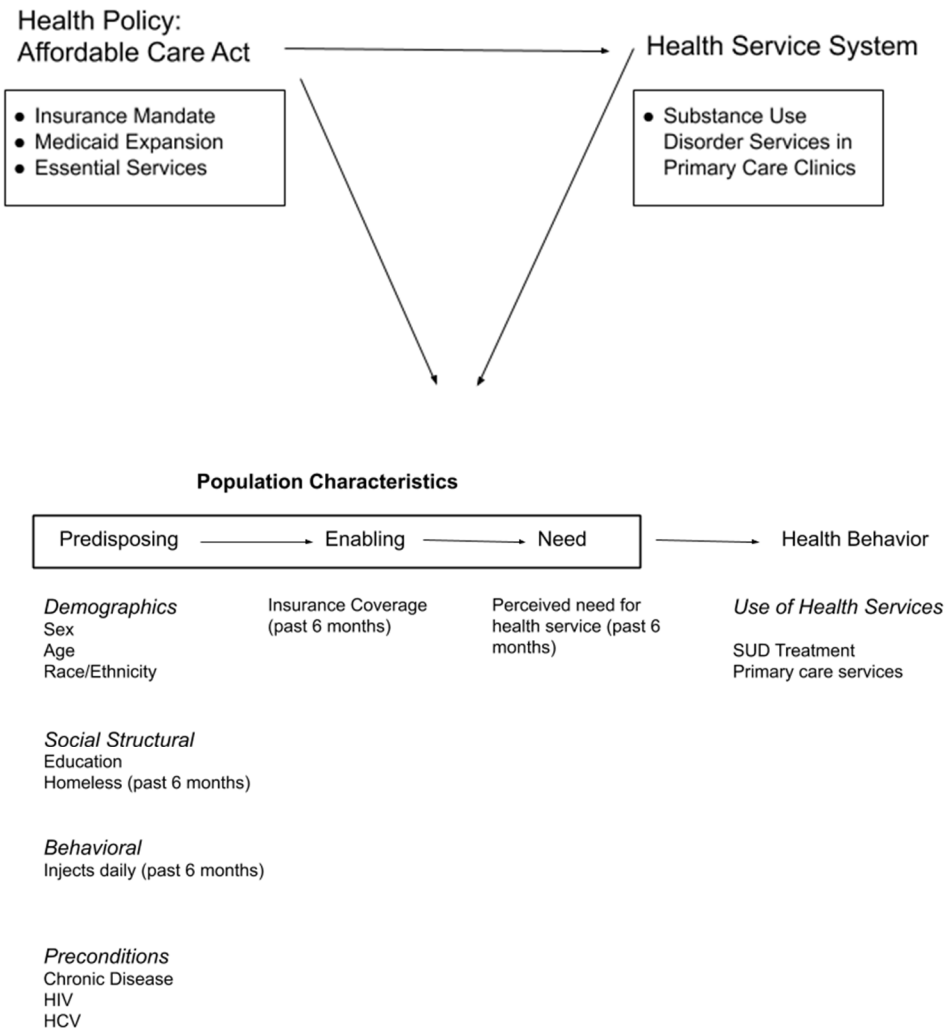

Figure 1.1. Conceptual Framework adapted from the Andersen Behavioral Framework[25] for Health Service Utilization

Chapter 2: Impact of the Affordable Care Act on the use of substance use disorder treatment among persons who inject drugs in San Diego, California.

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Abstract

Background. Substance use disorder (SUD) treatment for persons who inject drugs (PWID) can reduce the risk of HIV and HCV transmission, yet the lack of health insurance overall or coverage that excludes SUD treatment is a major barrier to PWID entering SUD treatment. Provisions in the U.S. Patient Protection and Affordable Care Act (ACA) were expected to increase the use of SUD treatment in PWID by increasing access to health insurance and including these services as an essential health benefit.

Method. We analyzed use of SUD treatment before and after the expansion of the ACA in California on January 1, 2014 among participants enrolled in STAHR-II, a longitudinal cohort study of PWID in San Diego, California that included a baseline and up to 4 semi-annual follow-up interviews between 2012 and 2016. To examine longitudinal changes in self-reported SUD treatment within participants pre- and post-ACA implementation, we included participants who had at least one follow-up visit before and one follow-up visit after the ACA's implementation. We excluded visits with referent time periods that overlapped with the ACA implementation date.

We described the changes in the proportions of PWID that used SUD treatment or had insurance pre- and post-ACA implementation. We then used multivariable logistic regression analysis with Generalized Estimating Equations (GEE) for repeated measures to assess the association between the ACA and SUD treatment , adjusting for baseline covariates: age, sex, race, education, HIV, HCV, chronic disease, prior SUD treatment use, past 6-month daily injection, past 6-month homelessness, and perceived need for SUD treatment. Time-varying insurance coverage was also adjusted for.

Results. Among the 170 participants eligible for the analysis, 71% were male, 50% were white, and the mean age was 45 years. Overall, there was an 11.8% increase in use of SUD treatment after the ACA, compared to before (52.4% vs. 40.6%) and a 10.6% increase in the proportion

who had insurance after the ACA compared to before (81.2% vs. 70.6%). We found a beneficial effect of the ACA on SUD treatment (Relative Risk [RR]=1.48, 95% Confidence Interval [CI]:1.23-1.79) however, the effect of SUD treatment could not be entirely explained by an increase in insurance coverage (adjusted relative risk [aRR]=1.48, 95%CI:1.20-1.83).

Conclusion. These findings support our hypothesis that the ACA increased both insurance coverage and SUD treatment use among PWID in California immediately following its implementation. One possible explanation for the increase in SUD treatment independent of insurance coverage is that the ACA led to structural changes that increased SUD treatment access for uninsured PWID.

Introduction

Despite the increased need, persons who inject drugs (PWID) delay and avoid using health services because they are unable to access or afford them, particularly substance use disorder (SUD) treatment.[1,2] Access to SUD treatment is crucial for PWID where its use has been shown to reduce the risk of HIV and HCV infections, overdoses, as well as preventing the initiation of others into injection drug use.[3] However, less than 12% of PWID in the United States who need treatment are enrolled.[4,5] When access to SUD treatment is difficult, there is a greater potential for overdose mortality and injection-related diseases including hepatitis C virus (HCV) infection and the human immunodeficiency virus (HIV) infection.[6,7]

In the United States, the historically low utilization of SUD treatment in PWID has been due at least in part to lack of access.[8] Access to drug treatment can be affected by the availability of protection from financial-risk (e.g. affordable insurance plans), availability of plans that cover SUD treatment, and residing in regions where there were no SUD treatment centers accepting plans (e.g. Medicaid).[9] This was confirmed in 2013 with a study of randomly sampled SUD treatment centers in the United States that found a large proportion of centers did not accept Medicaid (41%) or private health insurance (45%), with lower odds of acceptance among those offering residential treatment or serving homeless patients.[10]

In 2010, the United States Patient Protection and Affordable Care Act (ACA) established an individual mandate, also known as the individual shared responsibility provision, that required all permanent residents or citizens to acquire and maintain a qualified health insurance plan or pay a financial penalty when filing personal income taxes. Qualified health insurance plans were to include the minimal essential health benefits and were not to discriminate based on pre-existing conditions or demographics such as race, national origin, or gender. Essential health benefits include at minimum ambulatory, emergency, and hospital services; maternity and newborn care; prescription drugs; rehabilitative services and devices; laboratory services;

preventive and wellness services; chronic disease management; pediatric services that also include oral and vision care, as well as mental health and substance use disorder care. Prior to the ACA, a standard list of essential health benefits did not exist, and insurance providers were able to change prices by cutting benefits or denying plans based on pre-existing conditions. After the ACA, PWID who previously did not have adequate health coverage due to such discriminatory practices were able to find affordable and comprehensive health insurance plans through Medicaid or state-run health marketplaces.

The ACA's Medicaid expansion brought coverage to adults aged 21-64 years old with a Modified Adjusted Gross Income less than 138% of the Federal Poverty Level (FPL) ($11,670 in 2014 for 1-Person Household), and provided subsidies for insurance premiums to those who had a household income of 100% to 400% of the FPL. Prior to the ACA expansion of Medicaid, states were only required to provide healthcare for at-risk groups such as pregnant women, parents with young children, and the disabled. State-run health insurance exchanges were implemented as the cost-efficient venue to acquire these newly expanded Medicaid programs and qualified individual and group plans for small businesses.

California was one of the first states to expand its Medicaid program, known as Medi-Cal, and to establish a health insurance marketplace called *Covered California (https://www.coveredca.com/)*. Enrollment began on October 1, 2013 and continued until April 2014, providing 1.9 million persons with insurance.[11] After 2014, California responded to federal initiatives that were decreasing the impact of the ACA by creating state-based legislation that would reinforce its original intent (e.g. individual mandates to maintain health insurance).[12] Consequently, the proportion of adults who were uninsured in California dropped from 16% in 2013 to 11% in 2014;[13] however, the proportion of PWID who became insured or used SUD treatment following the ACA expansion is unknown.

Given the potential for broad direct and indirect impacts of the ACA in other states or for future expansions, studies are needed to assess whether and to what extent vulnerable groups such as PWID benefited from this new policy. We analyzed data from an existing cohort of PWID in San Diego, California to determine whether the use of SUD treatment increased after the implementation of the ACA.

Methods

Data Source

We used data from the Study of Tuberculosis, AIDS, and Hepatitis C Risk (STAHR II), a longitudinal cohort study of 576 PWID in San Diego, California with baseline assessment conducted in 2012 to 2013 and follow-up assessment from 2013 to 2016. Complete methods for this study are described elsewhere.[14] In brief, eligibility criteria for the study included: being at least 18 years old, having injected illicit drugs in the past 30 days, speaking English or Spanish, having no plans to move within the next two years, and residing in San Diego County. Upon written consent at baseline and reaffirmed at each follow-up visit, participants completed structured interviewer-administered questionnaires using computer-assisted personal interviewing technology (CAPI) that assessed socio-demographics, patterns of drug use and associated risk behaviors, health status, health behaviors, and infectious disease perceptions. Participants completed interviews and biological testing semi-annually for two years and were provided $25 for completion of the baseline visit, with escalating incentives for follow-up visits. Among 576 participants enrolled, 73% completed at least one follow-up visit; 286 (50%) at 6-month follow-up (visit 2), 259 (45%) at 12-month follow-up (visit 3), 290 (50%) at 18-month follow-up (visit 4), and 353 (61%) at 24-month follow-up (visit 5). The study was approved by the University of California at San Diego Institutional Review Board.

Measures

We used SUD treatment and insurance status at follow-up visits. Recent use of SUD treatment was assessed by asking participants at each follow-up visit, “In the last 6 months, have you received any type of professional help for your use of alcohol or drugs?”, with responses coded as either 1=Yes or 0=No. Exposure to the ACA was defined as being interviewed after June 1, 2014 (post-ACA implementation [x=1]) versus before (pre-ACA implementation [x=0]). Recent insurance status (in the past 6-months) was also used as a time-updated covariate when examining its mediating effect on the relationship between ACA and use of SUD treatment. Participants were also asked “did you have insurance in the past 6 months?”, which was coded as either 1=Yes or 0=No.

We then considered potential confounders in the relationship between ACA and SUD treatment based on a priori knowledge and previous literature, focusing on baseline characteristics. Baseline covariates consisted of demographics including sex, age groups chosen to have balanced sample size in each group (18-24; 25-34; 35-49; 50-64; 65+), race/ethnicity (white non-Hispanic/non-white) and highest level of education (no college; some college). Other baseline covariates included experiencing homelessness in the past 6 months, injecting daily in the past 6 months, having insurance in the past 6 months, perceiving a need for SUD treatment, self-reported chronic disease diagnosis (e.g. diabetes, heart disease, asthma, high blood pressure), positive HIV or HCV test, and ever having used SUD treatment (all responses were Yes/No).

Statistical Analysis

We restricted data to participants who had follow-up visits before and after the ACA to assess within-participant changes in SUD treatment use and insurance. All participants included in the analyses had data for the baseline visit and at least one follow-up visit pre- and post-ACA

implementation (i.e. minimum of three visits). Of the 576 PWID with a baseline assessment, there were 197 (34.2%) with a baseline and at least one pre-ACA and one post-ACA assessment (i.e. 3 total assessments). Since the 6-month referent time period assessed during follow-up visits that occurred within 6 months of the ACA's implementation (i.e. between January 1 and June 30, 2014) could not discern whether events took place before or after the ACA started, these visits were excluded from the analysis (n=27 [13.7%]). All baseline characteristics, except for past 6-month daily injection, were similar between participants included and excluded in this analysis (Table 2.3).

The primary outcome was use of SUD treatment in the past 6 months. The primary exposure variable was exposure to the ACA (January 1, 2014 or later). We first described the change in the proportion of PWID who used SUD treatment in the past 6 months post-ACA compared to pre-ACA as well as the change in the proportion of PWID who had insurance in the past 6 months post-ACA compared to pre-ACA. We then assessed the effect of the ACA on SUD treatment multivariable regression with generalized estimating equations (GEE) for repeated measures. We conducted multivariable models that adjusted for a minimum set of covariates including sex, age, race/ethnicity, and perceived need for SUD treatment (Model 1); as well as all potential baseline covariates including sex, age, race/ethnicity, education, homelessness, diagnosis of chronic disease, diagnosis of HIV, diagnosis of HCV, injected daily in the past 6 months, perceived need for SUD treatment, and ever used SUD treatment (Model 2). We also assessed the association between ACA and SUD treatment by conducting another multivariable model that adjusted for the minimal baseline covariates as well as insurance coverage at follow-up (Model 3).

All available observations were used to estimate the maximum likelihood of the parameters using a log link function and a binomial distribution of variance. We considered independent, exchangeable, and first-order autoregressive correlations matrix structures.

Variance-covariance structures and goodness of fit were determined using the Quasi-likelihood under Independence Model Criterion (QIC) and the Corrected Quasi-likelihood under Independence Model Criterion (QICC).[23] A smaller QIC statistic indicates greater parsimony in the covariance structures and its ability to account for the repeated measurement.[24] Based on these steps, we selected an exchangeable correlation matrix for our final models.

Results

Of the 170 participants meeting inclusion criteria, 29.4% were female, 50.0% were white, and their mean age was 45 years (SD=11.22). Over one-third (36.5%) had some college education. At baseline, most participants had experienced homelessness in the past 6 months (62.9%), perceived they needed SUD treatment (69.6%), and had ever used SUD treatment (77.1%). A minority of participants at baseline had injected daily in the past 6 months at baseline (41.2%), been previously diagnosed by a doctor with HCV (23.8%), and had been previously diagnosed with HIV by a doctor (8.0%). Half of the participants were diagnosed with a chronic disease ([50.0%] Table 2.1).

When looking at the follow-up data, there was an increase of 11.8% in recent use of SUD treatment (40.6% pre-ACA vs. 52.4% post-ACA). Similarly, there was a 10.6% increase in possessing health insurance in the past 6 months (70.6% pre-ACA vs. 81.2% post-ACA) (Figure 2.1).

When assessing the effect of the ACA on SUD treatment (Table 2.2), we found that the ACA expansion increased the use of SUD treatment among PWID (Relative Risk [RR]=1.48, 95% Confidence Interval [CI]: 1.23-1.79). In a multivariable model adjusting for the minimum set of covariates (Model 1), we found that the ACA expansion still increased the use of SUD treatment among PWID (adjusted RR [aRR]=1.58, 95%CI: 1.30-1.92). In a multivariable model adjusting for all potential covariates (Model 2), we found that the effect of the ACA expansion on

the use of SUD treatment among PWID was nearly the same as with the minimum set of covariates (aRR=1.59 95%CI: 1.31-1.93). When assessing if insurance changed the effect of the ACA expansion on the use of SUD treatment, we found that the effect of the ACA on SUD treatment slightly decreased but remained positive (aRR=1.48, 95%CI: 1.20-1.83). The increase in SUD treatment was found to be independent of insurance coverage.

Discussion

Our analyses found that the ACA had a positive effect on the use of SUD treatment among PWID in San Diego. We found a modest increase in the proportion of PWID who used SUD treatment after the implementation of the ACA compared to before, with PWID after the ACA having 48% higher risk of using SUD treatment compared to before the ACA. Unexpectedly, this effect was not entirely due to the increase in insurance coverage.

Based on prior studies,[15-17] we anticipated that there would be an increase in the use of SUD treatment among those who were uninsured and acquired insurance with newly expanded public plans. This result further concurs with other studies since the implementation of the ACA that found an increase of admissions to SUD treatment facilities in states with expanded Medicaid programs.[18] Our analysis provides further evidence that the ACA had the desired effect of increasing access to and use of SUD treatment for a cohort of PWID in San Diego, California.

The proportion of PWID who had insurance also increased after the implementation of the ACA. This result aligns with other studies that found an increase in health insurance coverage after the ACA among cohorts of PWID in other parts of the country.[19-21] The nearly parallel increases in SUD treatment use and insurance coverage suggest there could have been a relationship between these changes, which we further examined.

PWID had almost 50% higher risk of using SUD treatment after the ACA compared to before, further reinforcing our finding that the use of SUD treatment increased after the implementation of this health policy, and the policy had a positive association on changing this type of health service use. We also observed that sex, age, race, and perceived need for SUD treatment had very little effect on the association between the ACA and SUD treatment. There was also a minimal effect on the association between the ACA and SUD treatment when additionally considering education, homelessness, diagnosis of chronic or infectious diseases, injecting daily, as well as having ever used SUD treatment. This may indicate that the impact of the ACA on SUD treatment among PWID was not influenced by demographic, health status, or health behaviors, and that PWID status overpowers the affect of these other disparities.

Furthermore, having insurance did not significantly affect the association between the ACA and SUD treatment, this could indicate that changes in insurance coverage from the ACA were not responsible for the changes in the use of SUD treatment. Those who were uninsured after the ACA and used SUD treatment might have been affected by the ACA through the creation of more community and free primary care clinics, by bringing health professionals to underserved areas, and by reducing costs for mental health and alcohol screenings.[22]

Overall, our findings indicate that the ACA was a successful policy for increasing the use of SUD treatment among PWID in San Diego, CA and was a critical step for providing access to health services for this vulnerable population. While this analysis did not assess which structural changes made the greatest impact on SUD treatment use among PWID, the findings suggest that there were significant improvements in access to SUD treatment from these changes as a whole.

These analyses have several limitations that should be noted. All results were based on self-reported data, which may be limited by social desirability bias and could have affected the results towards greater insurance coverage and use of health services from after the ACA, in

particular if participants believed they should be abiding by the individual mandate and using their coverage. Since the STAHR 2 study was conducted within a region of a single state that was the first to authorize exchanges for the ACA and integrate the key provisions, it is unknown whether the rest of the state or other states who did not support the provisions had similar results in SUD treatment use among PWID. Findings may not be generalizable to other countries that have different health systems and methods for delivering SUD treatment. Findings are also restricted to the subgroup of PWID who had measures prior to and after the ACA implementation and may limit the ability to generalize findings to the greater San Diego PWID population. However, we compared baseline data between those who were included and excluded in analyses and they appeared to be similar. It is also unknown whether other systemic factors limited our ability to decipher the effect of the ACA from contemporaneous events. We were not able to decipher exactly which mechanisms of the ACA affected the change in substance use treatment.

The strength of this analysis is the use of a longitudinal cohort study design and were able to compare the effect of the ACA within the same individuals over time, whereas most research on the effect of the ACA used cross-sectional study designs. This analysis is unique in investigating the overall impact of the ACA on SUD treatment as a holistic phenomenon independent of insurance as the main mechanism. This is particularly important considering the increase in PWID who had insurance cover treatment may have created new slots for PWID without insurance.

Conclusion:

These findings support our hypothesis that the ACA increased both insurance coverage and SUD treatment use among PWID in California immediately following its implementation. Our finding that the increase in SUD treatment use was not entirely explained by the increase in

insurance coverage suggests that the ACA could have led to structural changes that made it possible for uninsured PWID to use SUD treatment, potentially due to increasing the availability of treatment slots for uninsured PWID. Further research is needed to understand the direct and indirect impacts that the ACA had on access and use of SUD treatment.

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Chapter 2, as an abstract, was accepted at the CROI 2020 Conference as a poster presentation and is currently being prepared for publication in full. Co-Authors include Garfein, Richard; Cuevas-Mota, Jazmine; Strathdee, Steffanie, Benmarhnia, Tarik. The dissertation author is the primary author of this material.

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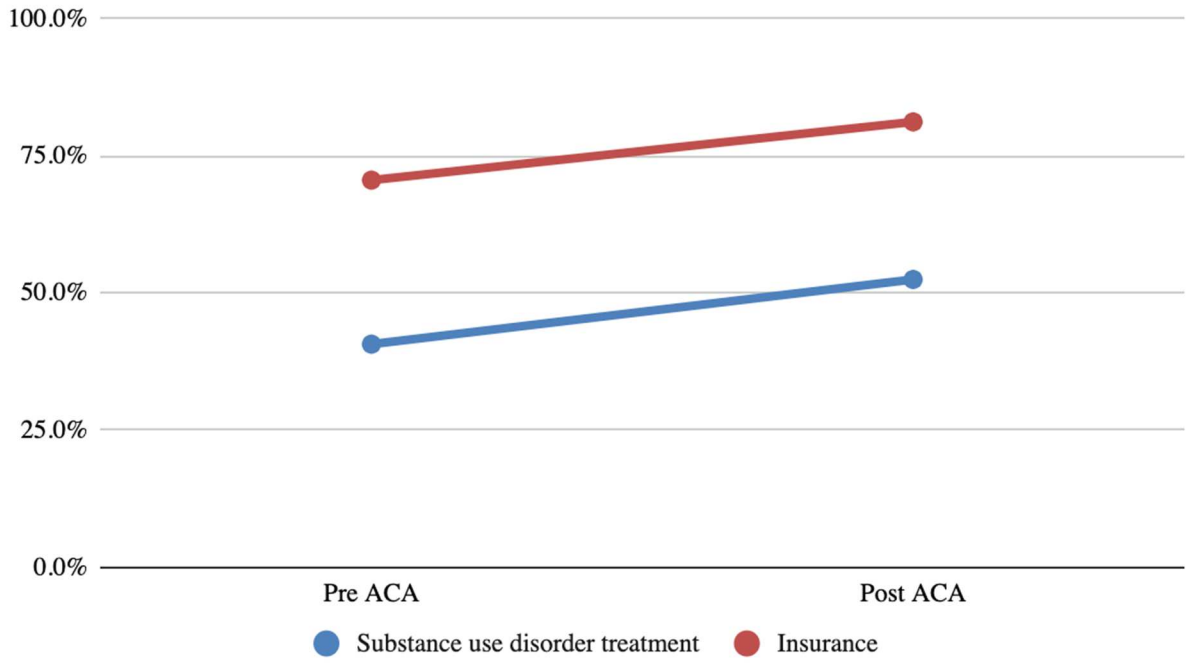

Figure 2.1. Proportion of PWID in a San Diego, California cohort who reported SUD treatment use in the past 6 months and who had insurance in the past 6 months, prior to and after the implementation of the Affordable Care Act.

Table 2.1. Sample participant characteristics among a cohort of persons who inject drugs, San Diego, California, 2012-2016.

Baseline Characteristics	N (%)
Sex	
Female	50 (29.4)
Male	120 (70.6)
Age Group	
18-34	36 (21.2)
35-44	35 (20.6)
45-49	33 (19.4)
50-54	32 (18.8)
55+	34 (20.0)
Race	
Non-White	85 (50.0)
White	85 (50.0)
Some College	
No	108 (63.5)
Yes	62 (36.5)
Homeless in the Past 6 Months	
No	63 (37.1)
Yes	107 (62.9)
Diagnosed with Chronic Disease	
No	85 (50.0)
Yes	85 (50.0)
Diagnosed with HIV	
No	149 (92.0)
Yes	13 (8.0)
Diagnosed with HCV	
No	128 (76.2)
Yes	40 (23.8)
Injected Daily in the Past 6 Months	
No	100 (58.8)
Yes	70 (41.2)
Perceived Need for SUD treatment	
No	51 (30.4)
Yes	117 (69.6)
Ever Used SUD treatment	
No	39 (22.9)
Yes	131 (77.1)

Table 2.2. Change in 6-month use of substance use disorder treatment before and after the implementation of the Affordable Care Act in a cohort of persons who inject drugs in San Diego, California 2012-2016.

Baseline Characteristics	RR (95%CI)	Model 1* aRR (95%CI)	Model 2** aRR (95%CI)	Model 3*** aOR (95%CI)
Time Period				
PreACA	ref	ref	ref	ref
PostACA	1.48 (1.23-2.79)	1.58 (1.30-1.92)	1.59 (1.31-1.93)	1.48 (1.20-1.83)

*Association between ACA and SUD treatment, adjusted for baseline sex, age, race/ethnicity, and perceived need for SUD treatment.

**Association between the ACA and SUD treatment, adjusted for baseline sex, age, race/ethnicity, education, homelessness in the past 6 months, diagnosis of chronic disease, diagnosis of HIV, diagnosis of HCV, injected daily in the past 6 months, perceived need for SUD treatment, and ever used SUD treatment.

***Association between the ACA and SUD treatment, adjusted for baseline sex, age, race/ethnicity, perceived need for SUD treatment, and insurance at follow-up.

Table 2.3. Demographics among the STAHR cohort and selected sample.

	Missing Sample 406		Final Sample 170		
Baseline Characteristics	N	%	N	%	OR (95%CI)*
Sex					0.85 (0.57-1.29)
Male	299	73.6%	120	70.6%	
Female	98	24.1%	50	29.4%	
Transgender	5	1.2%	0	0.0%	
Missing	4	1.0%	0	0.0%	
Age Group					0.73 (0.53-1.02)
18-34	124	30.5%	36	21.2%	
35-44	87	21.4%	35	20.6%	
45-49	59	14.5%	33	19.4%	
50-54	60	14.8%	32	18.8%	
55+	71	17.5%	34	20.0%	
Missing	5	1.2%	0	0.0%	
Race					1.09 (0.75-1.58)
Non-White	196	48.3%	85	50.0%	
White	207	51.0%	85	50.0%	
Missing	3	0.7%	0	0.0%	
Some College					1.07 (0.73-1.57)
No	257	63.3%	108	63.5%	
Yes	145	35.7%	62	36.5%	
Missing	4	1.0%	0	0.0%	
Homeless in Past 6 Months					0.90 (0.61-1.33)
No	158	38.9%	63	37.1%	
Yes	244	60.1%	107	62.9%	
Missing	4	1.0%	0	0.0%	
Insured in Past 6 Months					0.91 (0.63-1.33)
No	200	49.3%	79	46.5%	
Yes	198	48.8%	91	53.5%	
Missing	8	2.0%	0	0.0%	

Table 2.3. Demographics among the STAHR cohort and selected sample continued.

	Missing Sample		Final Sample		
	406		170		
Baseline Characteristics	N	%	N	%	OR (95%CI)*
Diagnosed with HIV					0.99 (0.50-1.96)
No	343	84.5%	149	87.7%	
Yes	31	7.6%	13	7.7%	
Missing	32	7.9%	8	4.7%	
Diagnosed with HCV					1.20 (0.78-1.84)
No	289	71.2%	128	75.3%	
Yes	101	24.9%	40	23.5%	
Missing	16	3.9%	2	1.2%	
Diagnosed with a Chronic Disease					0.80 (0.55-1.16)
No	223	54.9%	85	50.0%	
Yes	177	43.6%	85	50.0%	
Missing	6	1.5%	0	0.0%	
Perceived Need for SUD treatment					1.30 (0.86-1.98)
No	95	23.4%	51	30.0%	
Yes	303	74.6%	117	68.8%	
Missing	8	2.0%	2	1.2%	
Injected Daily in Past 6 Months					0.44 (0.30-0.65)
No	154	37.9%	100	58.8%	
Yes	247	60.8%	70	41.2%	
Missing	5	1.2%	0	0.0%	
Ever Used SUD treatment					1.21 (0.77-1.90)
No	85	20.9%	39	22.9%	
Yes	315	77.6%	131	77.1%	
Missing	6	1.5%	0	0.0%	

*OR was calculated for the association between the missing data variable (1=final sample; 0=missing data) and the covariate, with the missing data variable as the independent factor and the covariate as the dependent variable. Missing data (x=0) was used as the reference category.

Chapter 3: Increasing use of primary care: effects of the Affordable Care Act on persons who inject drugs in San Diego, CA.

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Abstract:

Background: Persons who inject drugs (PWID) use less primary care and preventative services and more emergency services than the general population, due in part to a lack of health insurance. The United States Patient Protection and Affordable Care Act (ACA) sought to increase access to primary care and preventative services among the uninsured, including PWID, through the expansion of Medicaid and state-run insurance exchanges.

Methods: We analyzed the use of primary care before and after the ACA was implemented on January 1, 2014 among PWID enrolled in a longitudinal cohort study in San Diego, California with baseline and 4 semi-annual follow-up interviews between 2012 and 2016. To examine longitudinal changes in primary care use among participants, we included participants whose baseline visit occurred before January 1, 2014 and had at least one follow-up visit after this date. Visits with referent time periods that overlapped with the implementation date were excluded. We investigated changes in the proportions of PWID who recently used primary care, an emergency department, and had insurance before and after the ACA implementation. We then used multivariable logistic regression analysis with Generalized Estimating Equations (GEE) for repeated measures to assess the association between the ACA and primary care use, adjusting for baseline characteristics and changes in insurance coverage.

Results: Among the 350 PWID included in the analysis, compared to the pre-ACA period, we observed a 4.3% average increase in primary care use (44.6% vs. 48.9%) and a 24% increase in insurance coverage (61.7% vs. 85.7%) after the ACA was implemented. We found a positive effect of the ACA on primary care use (Relative Risk [RR]: 1.25, 95% Confidence Interval [CI]: 1.08-1.45), although the association was not statistically significant after adjusting for insurance status (Adjusted Relative Risk [aRR]: 1.09, 95%CI: 0.94-1.28).

Conclusion: Primary care use increased among San Diego PWID after implementation of the ACA, which appeared to be facilitated by an increase in insurance coverage. This

increase occurred immediately following the ACA implementation suggesting that given the opportunity, PWID will obtain health insurance and use it to access primary care. Future studies are needed to assess whether increased primary care use decreases emergency department and tertiary care use among PWID. Long term follow-up is also needed to see if the effect was temporary.

Introduction

Persons who inject drugs (PWID) are disproportionately affected by poor access to healthcare and are at higher risk for blood-borne infections such as hepatitis C virus (HCV),[1,2] and human immunodeficiency virus (HIV),[3,4] as well as chronic health conditions such as diabetes and hypertension.[5] PWID require more healthcare services than the general population, but due to financial barriers, they use less and delay seeking primary care services until needs become urgent and seek care in emergency departments.[6-11] This synergistic effect of higher disease risk and lower healthcare access contributes to excessive morbidity and mortality among PWID, as well as high costs to the emergency department and tertiary care services.

Given their lack of access to affordable primary care services, PWID often rely on emergency departments for healthcare when their health state becomes dire. PWID are three times more likely to present to the emergency department compared to the general population.[12] Frequent use of the emergency department by PWID is associated with having HIV, injecting more than 4 times a day, and having experienced homelessness; risk factors that are better addressed by primary care and behavioral health services.[11] The use of the emergency department should be a rare occasion and a high frequency of use may indicate lack of access to other services better suited to manage their health conditions. Primary care can prevent unnecessary use of costly emergency services by treating current health needs, helping to prevent future health events, and linking patients to appropriate specialty care.[5,13] However, there are barriers to accessing primary care for PWID including experiencing drug-use stigma in healthcare settings,[14.15] difficulty navigating a complex service system requiring appointments and referrals,[16] and the inability to pay out-of-pocket costs.[17]

Before the United States Patient Protection and Affordable Care Act (ACA) was implemented, health insurance in the United States was optional and for most it came as a

benefit in employment packages or government programs supporting persons with a qualified disability, very low-income, or an age over 65 years.[18] PWID are more likely to be unemployed or underemployed and are often relegated to cheaper plans with fewer benefits and higher deductibles, or denied plans based on pre-existing conditions including addiction to substances.[19] The prevalence of uninsured and underinsured persons in the United States prior to the ACA was nearly 25% among the general population, with nearly 40% for low-income populations such as PWID.[20]

The ACA expanded Medicaid programs to persons with a Modified Adjusted Gross Income of 138% of the Federal Poverty Level (FPL) from the previous limit of 100% FPL, introduced federally sponsored state-run health insurance exchanges, and required all plans to include at minimum a designated set of essential health benefits. On January 1, 2014, California became one of the first states to implement the ACA, which reduced the rate of uninsured among the general population from 17.2% to 7.4%.[21] While the ACA in California has been in effect since 2014, its impact has not been fully evaluated, particularly among the most-vulnerable populations such as PWID. What still needs to be better understood are the impacts that the ACA had on primary care use among PWID, and what determining factors were important for this change.

The Gelberg-Andersen Behavioral Model for Vulnerable Populations is used to assess the impact of multiple social structural factors on health service utilization and health outcomes specific to populations with high morbidity and mortality rates. The model includes traditional domains originally defined by Andersen as 1) predisposing factors: demographics, health beliefs, and social structures; 2) enabling factors: personal, familial, and community resources; as well as 3) need factors: perceived and evaluated health statuses.[22] Gelberg, in collaboration with Andersen, expanded the original model to include additional determinants specific to vulnerable populations including social structures (country of birth and language/acculturation),

sexual orientation, childhood characteristics; and personal and family resources (i.e. food security, communications, transportation).[23]

In this paper, we use the Gelberg-Andersen model to explore potential pathways by which the ACA may have influenced primary care use among PWID. We examined changes in visits to primary care providers pre-post implementation of the ACA, adjusting for factors that potentially account for non-use of primary care. The Gelberg-Andersen model provides an explanatory framework for variable selection and exploring hypothesized causal pathways for health service use among PWID. We hypothesize that primary care use among PWID increased after the ACA due to an increase in insurance coverage.

Methods

Data Source

We used data from the Study of Tuberculosis, AIDS, and Hepatitis C Risk (STAHR II). The STAHR II study was a longitudinal cohort study of adult PWID in San Diego, CA from 2012 to 2016, who injected illicit drugs in the past 30 days, were fluent in English or Spanish, and currently resided in San Diego County, with no plans to move within two years. Details on the complete study methodology can be found elsewhere.[24] Socio-demographics, patterns of drug use and associated risk behaviors, health status, and infectious disease perceptions were assessed using structured interviewer-administered questionnaires and computer-assisted personal interviewing technology (CAPI). There were 576 participants assessed at baseline, with 286 (50%) at the 6-month follow-up (visit 2), 259 (45%) at the 12-month follow-up (visit 3), 290 (50%) at the 18-month follow-up (visit 4), and 353 (61%) at 24-month follow-up (visit 5). The University of California at San Diego Institutional Review Board approved this study and all participants gave written informed consent to take part in the study.

Measures

We used information from all five visits (2012-2016) consisting of baseline covariates as well as insurance and primary care use at follow-up visits, mapping them according to the domains from the Gelberg-Andersen model (Figure 3.1). Predisposing measures consisted of baseline demographics including gender identity (male/female/transgender), age groups based on a balanced sample size for each group (18-24; 25-34; 35-49; 50-64; 65+), race/ethnicity (White; Black/African American; Hispanic; Other), and the highest level of education at baseline (<High School Grad; ≥High School Grad). We also included predisposing risk-factors at baseline including having experienced homelessness in the past 6 months (Yes/No), injecting daily in the past 6 months (Yes/No), being diagnosed with a chronic disease (e.g. diabetes or heart disease) (Yes/No), or being diagnosed with HIV (Yes/No) or HCV (Yes/No). Enabling measures consisted of insurance coverage in the past 6 months at baseline and follow-up, a status that could change at each assessment (Yes/No). Need was measured by whether a participant perceived they needed to see a doctor or healthcare provider in the last 6 months, but did not go (Yes/No). Health service use was measured as primary care use in the past 6 months at baseline and follow-up (Yes/No) as well as emergency department use in the past 6 months at baseline and follow-up (Yes/No). The ACA as a health policy was measured as a point in time where assessments collected after January 1, 2014 were designated as post-ACA (x=1) and prior to this date as pre-ACA (x=0).

Statistical Analysis

We restricted data to participants who had a baseline visit pre-ACA, and a follow-up visit post-ACA to assess within-participant changes in primary care use and insurance coverage. All participants included in the analyses had data a baseline visit pre-ACA and at least one follow-up visit post-ACA (i.e. minimum of two visits). Of the 576 PWID enrolled, 374 (64.9%) had a

baseline assessment pre-ACA and at least one assessment post-ACA (i.e. minimum 2 total assessments). Of these PWID, 24 (6.4%) were excluded from the final sample because they had an assessment between January 1 and June 30, 2014, which made it impossible for us to determine whether events reported over this 6-month period occurred pre-ACA versus post-ACA. All baseline characteristics were similar between participants included and excluded in this analysis (Table 3.3.).

The objective of this analysis was to determine whether primary care use among PWID increased following the ACA, by comparing the proportions of primary care use post-ACA to pre-ACA and determining the rate of change. We used recent use of primary care as the primary outcome and time (pre-ACA vs. post-ACA) as the primary exposure variable. For each post-ACA assessment, we described the change in the proportion of PWID who used primary care in the past 6 months as well as the change in the proportion of PWID who had insurance in the past 6 months, after the ACA as compared to before the ACA. We then assessed the population average effect of the ACA on the slope of primary care use, accounting for repeated measurement using a generalized estimating equations (GEE) to fit marginal models with a logistic regression.

Using the Gelberg-Andersen framework, covariates were chosen based on findings from previous literature, as well as whether the distribution of the variable could conceptually be unequal before and after the implementation of the ACA and to represent any domain likely to confound the relationship between the ACA and primary care use. We conducted multivariable regression models that adjusted for a minimum set of a priori selected covariates including sex, age, race/ethnicity, and perceived need for primary care services (Model 1); as well as all potential baseline covariates included in model 1 plus education and homelessness in the past 6 months (Model 2). Assuming that having health insurance is necessary for using primary care

among PWID, we repeated Model 1 and added insurance status at follow-up to examine its effect on the association between the ACA and primary care use (Model 3).

All available observations were used to estimate the maximum likelihood of the parameters using a log link function. We considered independent, exchangeable, and first-order autoregressive correlations matrix structures. Such final model parameters were chosen based on the Quasi-likelihood under Independence Model Criterion (QIC) and the Corrected Quasi-likelihood under Independence Model Criterion (QICC).[25]

Results

Of the 350 participants included in this analysis, 70.6% were male, 52.3% were White, 30.6% were Hispanic, 9.7% Black/African American, with a mean age of 44 (SD= 11.2) years. Among the predisposing factors at baseline, a majority of participants had been homeless (62.0%) and injected daily (52.0%) in the past 6-months. At baseline, 36.6% reported having some college education, and reported health conditions including chronic disease (48.0%), HCV infection (23.7%) and HIV infection (8.9%); and nearly half perceived they needed medical treatment ([46.9%] Table 3.1).

Post-ACA, there was a 24.0% increase in insurance coverage in the past 6 months (61.7% pre-ACA vs. 85.7% post-ACA), our main enabling factor. There was an increase of 4.3% in recent primary care use (44.6% pre-ACA vs. 48.9% post-ACA). There was a decrease of 5.1% in recent emergency department use (49.4% pre-ACA vs. 44.3% post-ACA) (Figure 3.2). Among the 156 PWID who used primary care pre-ACA, 22.4% were uninsured, compared to 5.3% of the 171 PWID who used primary care post-ACA and were still uninsured

In multivariable analyses we found a 25% increase (relative risk [RR]: 1.25, 95% confidence interval [CI]: 1.08-1.47) in primary care use post-ACA compared to pre-ACA, which remained after adjusting for sex, age, race/ethnicity, and perceived need for primary care

(adjusted relative risk [aRR]: 1.26, 95%CI: 1.08-1.47) (Model 1). Expanding our adjustment to all potential baseline confounders, the positive effect of the ACA on primary care use remained (aRR: 1.19, 95%CI: 1.02-1.39) (Model 2). Yet, after adjusting for insurance at follow-up, the effect of the ACA on primary care use reduced and became more imprecise (aRR: 1.09, 95%CI: 0.94-1.28) (Model 3) (Table 2).

Discussion

These analyses demonstrated that the ACA had a positive effect on the use of primary care among PWID in San Diego. We observed a modest increase in the proportion of PWID who used primary care services, a slightly larger decrease in the use of the emergency department, as well as a much larger increase in the proportion of PWID who had health insurance after the ACA compared to before. As expected, the increase in primary care use was attributable to an increase in insurance coverage.

Given that most participants were over 45 years of age, injected daily, recently experienced homelessness, and had greater rates of infectious diseases than the general population, there were clear predispositions indicating a need for regular primary care use.[26] However, while these predisposing factors may allude to a greater need for primary care among PWID in San Diego, less than half of the participants perceived a need for healthcare services in the last 6 month. This finding corresponds with other research that found PWID often downplay their health issues and need of care, for fear of experiencing stigma or discrimination from healthcare providers.[15] Instead of seeking professional care immediately, PWID will often delay using clinical services, use alternative approaches that are not evidence-based, and avoid disclosing their drug using status to clinicians when they do use services.[15] This delay in seeking services and lack of transparency between the patient and provider can exacerbate the spread and negative impacts of certain illnesses including HIV and HCV.[15]

We found a slight increase in primary care use among PWID in San Diego after the ACA compared to before. The immediate effect of the ACA was to increase primary care use among PWID from 45% to 49%, but this is still far below the general population (69.5%). Further studies are needed to determine the long-term impact of the ACA on primary care use among PWID.[27] As such, there is still an unmet need for primary care among PWID, in particular ones that provide behavioral health and harm reduction services, and serve as the first and central delivery point for care for PWID. Future studies need to investigate if the increase in primary care use continued or was greater during a longer period of time after the ACA, elucidate the barriers to primary care use among PWID that still exist after the ACA, and create interventions that will encourage PWID to go to primary care physicians.

The proportion of PWID who had insurance also increased after the ACA compared to before. We expected insurance coverage to increase because a main attribute of the ACA was an individual mandate for citizens and permanent residents to maintain continued health insurance. Our finding that a greater proportion of PWID were insured after the ACA compared to before is in alignment with other research that also found an increase in insurance coverage among PWID after the implementation of the ACA.[28] There has been a dearth of consistent and adequate health insurance for PWID due to unemployment and underemployment as well as a lack of awareness and knowledge of how to access public insurance plans such as Medicaid or Medicare.[29] With the ACA's expansion of insurance programs and plans for PWID who are unemployed and underemployed, we expected to see an increase in insurance coverage and thought it would translate to greater health service use. Future studies need to investigate if PWID kept their insurance coverage beyond a one-year time period to know if the acquisition of insurance from the ACA was lasting.

Among PWID in San Diego, we found that predisposing and need factors had little influence on the association between the ACA and primary care use. However, when

considering our main enabling factor of recent insurance coverage, the association between the ACA and primary care use changed dramatically, potentially indicating that the change in insurance from the ACA was the main mechanism for the increase in primary care use among PWID in San Diego.

Overall, these findings indicate that there was an increase in primary care use among PWID after the ACA and that insurance coverage was a critical factor for this change. They suggest that insurance has a strong effect on the use of primary care among PWID and is a critical factor for this type of health service. This finding is corroborated by other research that also concludes that health insurance has a positive effect on healthcare utilization and health outcomes.[30]

These analyses have certain limitations that must be considered. All results are based on self-reported data and may be limited by problems with recall and social desirability bias where participants may have a tendency to answer questions based on what they perceived to be a favorable answer and bias the findings towards the null. The STAHR 2 study was conducted using a targeted outreach method of recruitment among PWID in San Diego, CA and may not be generalizable to other states or even regions of the state unless the studies used the same methods. Results are limited to those who had a follow-up measure after the ACA and may not be representative of the general PWID population in San Diego, CA; however, comparing the participants who were included and excluded in this analysis, no differences were found in any sociodemographic or predisposing factors. Since this analysis treated the ACA as a point in time, this approach is not able to decipher the impact of other contemporaneous events on primary care use.

The strength of this analysis is the use of a longitudinal cohort design and its ability to show changes of health service use over time, since most research on health care utilization used cross-sectional designs. This analysis uniquely investigated the impact of the ACA on

primary care use and the factors that were associated with primary care use among a general PWID population in San Diego, CA.

Conclusion:

This analysis found that primary care use and insurance coverage both increased immediately following the implementation of the ACA, with emergency department use decreasing. The increase in primary care use appeared to be attributed to the increase in insurance coverage. These findings suggest that the ACA made a positive impact by increasing insurance coverage among PWID and moving their use of emergency departments to primary care.

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Chapter 3, in full, is currently being prepared for submission. Co-Authors include Garfein, Richard; Cuevas-Mota, Jazmine; Strathdee, Steffanie, Benmarhnia, Tarik. The dissertation author is the primary author of this material.

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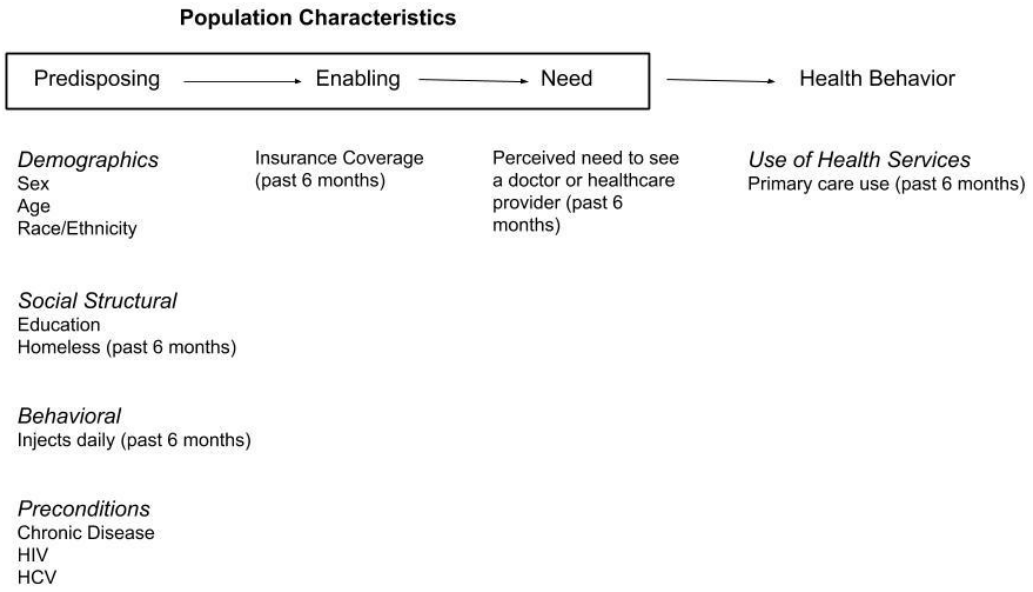

Figure 3.1. Adapted Gelberg-Andersen Behavioral Model for Vulnerable Populations to Primary Care Use among PWID in San Diego, CA.

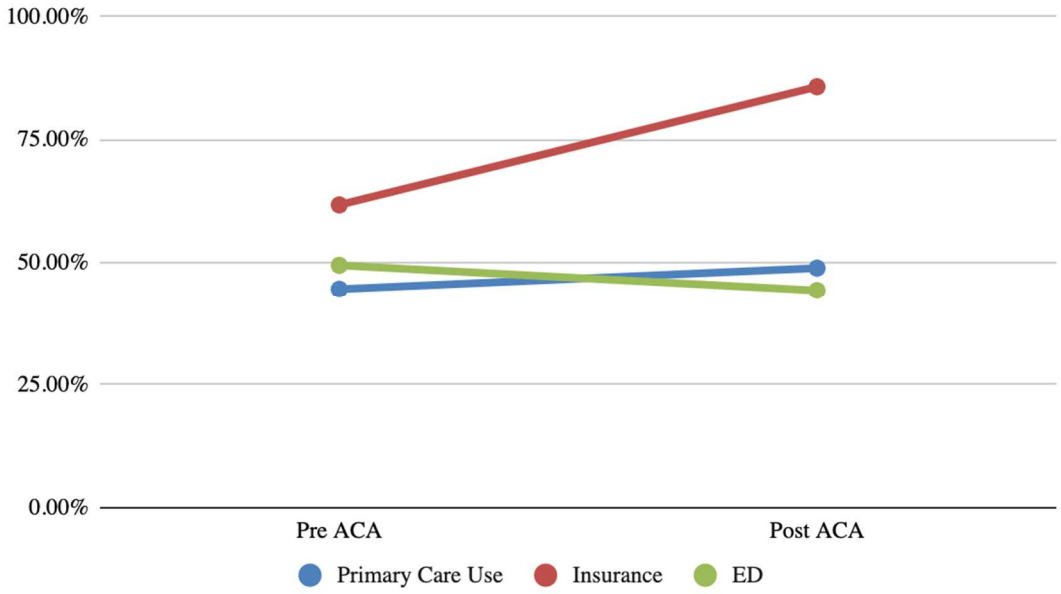

Figure 3.2. Proportion of people who inject drugs that reported primary care use in the past 6 months, who had insurance in the past 6 months, and who used the emergency department; prior to and after the implementation of the Affordable Care Act in San Diego, California, 2012-2016.

Table 3.1. Sample participant characteristics among a cohort of persons who inject drugs in San Diego, California 2012-2016.	
Baseline Characteristics	N (%)
Sex	
Male	247 (70.6)
Female	100 (28.6)
Transgender	3 (0.9)
Age Group	
18-34	84 (24.0)
35-44	75 (21.4)
45-49	67 (19.1)
50-54	60 (17.1)
55+	64 (18.3)
Race	
White	183 (52.3)
Black/African American	34 (9.71)
Hispanic	107 (30.6)
Other	26 (7.43)
Some College	
No	128 (36.6)
Yes	222 (63.4)
Homeless in the Past 6 Months	
No	133 (38.0)
Yes	217 (62.0)
Diagnosed with Chronic Disease	
No	182 (52.0)
Yes	168 (48.0)
Diagnosed with HIV	
No	301 (86.0)
Yes	31 (8.9)
Diagnosed with HCV	
No	262 (74.9)
Yes	82 (23.7)
Injected Daily in Past 6 Months	
No	168 (48.0)
Yes	182 (52.0)
Perceived Need for Primary Care	
No	186 (53.1)
Yes	164 (46.9)

Table 3.2. Change in 6-month use of primary care before and after the implementation of the Affordable Care Act in a cohort of persons who inject drugs in San Diego, California 2012-2016.

Baseline Characteristics	RR (95%CI)	Model 1* aRR (95%CI)	Model 2** aRR (95%CI)	Model 3*** aOR (95%CI)
Time Period				
Pre-ACA	ref	ref	ref	ref
Post-ACA	1.25 (1.08-1.45)	1.26 (1.08-1.47)	1.19 (1.02-1.39)	1.09 (0.94-1.28)

*Association between ACA and primary care use, adjusted for baseline sex, age, race/ethnicity, and perceived need for primary care.

**Association between the ACA and primary care use, adjusted for variables included in model 1 plus education, homelessness in the past 6 months, diagnosis of chronic disease, diagnosis of HIV, diagnosis of HCV, and injected daily in the past 6 months.

***Association between the ACA and primary care use, adjusted for variables included in model 1 plus insurance at follow-up.

Table 3.3. Demographics among the STAHR cohort and selected sample.					
	Missing Sample		Final Sample		
	226		350		
Baseline Characteristics	N	%	N	%	OR (95%CI)
Sex					0.70 (0.47-1.04)
Female	48	21.2%	100	28.6%	
Male	172	76.1%	247	70.6%	
Transgender	2	0.9%	3	0.9%	
Missing	4	1.8%	0	0.0%	
Age Group					0.77 (0.57-1.06)
18-34	76	33.6%	84	24.0%	
35-44	47	20.8%	75	21.4%	
45-49	25	11.1%	67	19.1%	
50-54	32	14.2%	60	17.1%	
55+	41	18.1%	64	18.3%	
Missing	5	2.2%	0	0.0%	
Race					0.98 (0.70-1.36)
White	109	49.1%	107	52.3%	
Black/African American	16	7.2%	34	9.7%	
Hispanic	69	31.1%	107	30.6%	
Other	28	12.6%	26	7.4%	
Some College					1.06 (0.74-1.52)
No	143	63.3%	222	63.4%	
Yes	79	35.0%	128	36.6%	
Missing	4	1.8%	0	0.0%	
Homeless in Past 6 Months					0.94 (0.66-1.35)
No	88	38.9%	133	38.0%	
Yes	134	59.3%	217	62.0%	
Missing	4	1.8%	0	0.0%	
Insured in Past 6 Months					0.81 (0.57-1.16)
No	116	51.3%	182	52.0%	
Yes	102	45.1%	168	48.0%	
Missing	8	3.5%	0	0.0%	

Table 3.3. Demographics among the STAHR cohort and study selected sample continued.

	Missing Sample		Final Sample		
	226		350		
Baseline Characteristics	N	%	N	%	OR (95%CI)
Diagnosed HIV					0.69 (0.35-1.35)
No	191	84.5%	301	86.0%	
Yes	13	5.8%	31	8.9%	
Missing	22	9.7%	18	5.1%	
Diagnosed HCV					1.28 (0.87-1.91)
No	155	68.6%	262	74.9%	
Yes	58	25.7%	82	23.4%	
Missing	13	5.8%	6	1.7%	
Diagnosed Chronic Disease					0.83 (0.59-1.19)
No	126	55.8%	182	52.0%	
Yes	94	41.6%	168	48.0%	
Missing	6	2.7%	0	0.0%	
Perceived Need for Primary Care					0.96 (0.68-1.36)
No	119	52.7%	186	53.1%	
Yes	95	42.0%	164	46.9%	
Missing	12	5.3%	0	0.0%	
Injected Daily in Past 6 Months					0.73 (0.51-1.05)
No	86	38.1%	168	48.0%	
Yes	135	59.7%	182	52.0%	
Missing	5	2.2%	0	0.0%	
Primary Care Use in Past 6 Months					1.12 (0.76-1.63)
No	152	67.3%	250	71.4%	
Yes	67	29.6%	100	28.6%	
Missing	7	3.1%	0	0.0%	

*OR was calculated for the association between the missing data variable (1=final sample; 0=missing data) and the covariate, with the missing data variable as the independent factor and the covariate as the dependent variable. Missing data (x=0) was used as the reference category.

Chapter 4: Substance Use Disorders Services

in San Diego County Community and Free Primary Care Clinics

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Abstract

Objective. Substance use disorders (SUD) services, including screening and treatment, are critical for people who use drugs, which can be up to 22% of a primary care providers' patient population. Since the Paul Wellstone and Pete Domenici Mental Health Parity and Addiction Equity Act of 2008 (MHPAEA), there has been a requirement that health plans with SUD services do not restrict the benefits for SUD more than benefits for medical conditions. The Affordable Care Act (ACA) furthered this initiative to integrate SUD services within primary care by requiring all citizens and legal residents to maintain health insurance, that all new plans provide SUD services as an essential health benefit, and created incentives for providers to accept Medicaid patients.

Methods. Using annual reports from the Office of Statewide Health Planning and Development (OSHPD) between 2008 and 2017, we describe the number of community and free primary care clinics in San Diego County and whether they offered SUD services. We described the number of patient encounters with mental, behavioral, and neurological conditions as a principal diagnosis; and the number clinics with substance abuse counselors as well as the number of contacts they had with patients. We also described the number of clinics in operation and if they offered SUD services before and after the implementation of the ACA on January 1, 2014.

Results. There was a 2.9% increase in community and free primary care clinics in San Diego County per year, from 96 clinics in 2008 to 123 clinics in 2017, with a 4% increase after the implementation of the ACA compared to before. There was only an increase of 0.6% community and free primary care clinics per year that offered SUD services, with a 7% decrease after the implementation of the ACA compared to before. There was an increase in mental, behavioral, and neurological conditions as a primary diagnosis; as well as in the number of contacts that patients had with a substance abuse counselor.

Conclusion. The ACA may not have helped increase the supply of SUD services in primary care settings in San Diego, but it may have bolstered and increased the use of SUD services that already existed.

Introduction

In the United States, substance use disorder (SUD) services have traditionally been located and operated separate from medical and general health services because they were not seen as medical problems or had treatment options covered by insurance.[1] But individuals with SUD access health care systems to address other health conditions including HIV/AIDS, Hepatitis C, skin infections, injuries, and heart disease. It is estimated that upto 22% of patients who present to primary healthcare settings have recently used substances.[2,3] Primary care providers can play a key role in screening for SUD, delivering interventions, and referrals to treatment. For example, primary care providers including in-house substance abuse counselors can provide a brief counseling session to persons with milder SUD.[4] The incorporation of SUD services into primary care clinics can reduce levels of substance use and lead to improved health and economic outcomes.[5]

There are several rationales for integrating SUD services, consisting of both screening and treatment, into primary care settings. Referring to a report by Funk and Ivbijaro (2008), the reasons for integrating SUD services with primary care include: “1) the burden of mental disorders is great, 2) mental and physical health problems are interwoven, 3) there is unmet need for these conditions, 4) access to services is enhanced, 5) reduced drug use stigma, 6) cost-effective, 7) and better outcomes”.[7] However barriers to integration include the continued siloed relationship between primary care and behavioral health, the lack of shared information, and inadequate insurance coverage for SUD.[8]

There are multiple models for integrating SUD services into primary care settings, of which many focus on either having primary care providers directly deliver SUD services or having behavioral health professionals as part of the care management team within the primary care setting.[6,9] In SUD service programs that use these models (e.g. SBIRT), primary care providers screen for SUD using evidence based tools (e.g. WHO’s ASSIST) and sometimes in

consultation with support from a behavioral health professional will provide brief interventions themselves, or will make referrals to other more intensive treatment.[8] The time and resource costs for primary care providers to care for a person with SUD is often a significant barrier for primary care clinics to offer SUD services, since payment from insurance plans is often seen as insufficient compared to the amount of services provided. However, previous research has found that improving primary care providers knowledge of Medicaid billing codes could help increase the integration of SUD services into primary care settings, since Medicaid has authorized brief interventions for SUD that can be billed on the same day as evaluation and management codes.[8] Similarly, primary care providers can bill for telephone-based activities that coordinate medical management with other health professionals including SUD specialty services.

Historically SUD services were not included in most insurance plans, and if they were included, limitations were placed on benefits and patients were often charged higher copayments.[10] The Paul Wellstone and Pete Domenici Mental Health Parity and Addiction Equity (MHPAEA) Act of 2008 mandated that plans covering mental and behavioral health must have no more restrictive benefits than those set for physical health.[11] This act began to bring parity between the levels of coverage for SUD services and physical health, but only for persons in non-federal government and group health plans with more than 50 employees who already had SUD treatment as part of their coverage.[11] In 2009, the Children's Health Insurance Program Reauthorization Act of 2009 expanded this parity to government plans for children and their families.[12] However, while SUD services were being bolstered for plans that already had coverage, there wasn't a mandate to provide coverage for SUD services through all plans. With the passage of the Affordable Care Act (ACA) in 2010 and its implementation in 2014, an individual mandate required all citizens to maintain health insurance coverage, Medicaid eligibility was expanded, and all health insurance plans were required to include SUD services

as an essential health benefit.[13] After the ACA, SUD were to be covered like a chronic illness where screenings, brief interventions, assessments, evaluations, and medications are fully covered, with a greater focus on prevention.[14]

The ACA was a critical step towards creating greater parity between SUD services and physical health by including SUD services as an essential health benefit, and encouraged primary care providers to incorporate SUD services into their practices through the expansion of Medicaid and the ability to increase revenue for providing screening, interventions and referrals for SUD in their patients. Our previous research on the impact of the ACA on health service use in people who inject drugs (PWID) found an association between the ACA and an increase in use of SUD treatment as well as primary care services in San Diego.[15,16] While increased use of both SUD treatment and primary care services by PWID in San Diego after the implementation of the ACA alludes to an increase in the demand side of the patient-provider relationship, there is still little known about the supply side. This study could also shed light on the increase in use of SUD treatment that was not explained by an increase in insurance coverage after the ACA.

This analysis seeks to describe community and free primary care clinics in San Diego County and their offering of substance abuse services after the implementation of the ACA. We focus on community and free primary care clinics licensed by the California Department of Public Health because they are part of the healthcare “safety net”, and operate as tax-exempt nonprofit corporations supported by grants, government funds, or contributions in the form of money, goods, or services.[17] Community clinics charge for services based on a sliding scale and free clinics do not require direct payment from the patients for services rendered.[18] These types of clinics are sensitive to the changes introduced by the ACA because they are mainly funded by public programs (Medicaid, Medicare, or federal grants), and are good indicators for its impact on vulnerable populations. Rooted in a commitment to community-based patient-centered care, community and free primary care clinics focus on comprehensive services that

meet the varying needs of their patient populations including PWID who need: substance use disorder screening and treatment, chronic and infectious disease management, patient education activities, and outreach. This integrated approach provides an advantage for case management in-house compared to other healthcare settings where referrals are made outside of clinics, and information may be lost or the patient may never make it to their referral. Throughout this paper, community and free primary care clinics will be referred to as “clinics” or “primary care clinics”, which are to be interpreted as synonymous with community and free primary care clinics.

Methods

Data Source

We used the 2008-2017 publicly available datasets on licensed community and free primary care clinic utilization from California’s Office of Statewide Planning and Development (OSHPD). All licensed community and free clinics by California Department of Public Health (CDPH) are required by Health and Safety Code to complete and submit an Annual Utilization Report of Primary Care Clinics with OSHPD every February 15 for the prior calendar year’s data. The Information Services Division of OSHPD collects data and produces publicly available datasets from annual reports submitted by nearly 7,000 licensed hospitals, long-term care facilities, home health agencies, hospices, and primary and specialty clinics.[19] They have yearly facility level data on licensed community and free primary care clinics including basic clinic identification information and types of community and health services offered, as well as information on encounters by type of provider, primary diagnosis, and payment type.

Measures

Licensed community and free primary care clinics were identified by a unique number assigned to every facility by OSHPD. Facilities were considered to have offered SUD services for a given year if either SUD services were reported as part of the clinic's community service or as a health service (Yes/No). Facilities were considered to have substance abuse counselors for a given year if they reported having any substance abuse counselors as part of their clinical support staff (Yes/No). The caseload for substance abuse counselors was reported as the overall number of contacts by substance abuse counselors in the primary care clinics for a given year. Patient encounters by mental, behavioral, or neurological conditions as the primary diagnosis, of which SUD is included, were reported as a complete category with the total number of encounters a provider had with any of these conditions (within ICD-10 code range F01-F99).

Statistical analysis

Descriptive statistics, consisting of the frequencies and proportions were calculated for community and free primary care clinics overall, and whether they offered SUD services. We calculated the number of patient encounters with a mental, behavioral, or neurological primary diagnosis at clinics overall, and whether they offered SUD services. We also calculated the number of primary care clinics with SUD services and whether they had a substance abuse counselor, and the number of contacts there were with those counselors. To describe changes spanning the ACA, we calculated and compared the numbers and proportions of primary care clinics after the ACA to before the ACA. We also compared the numbers and proportions of primary care clinics that offered SUD services after the ACA to before the ACA. We used January 1, 2014 as the date for the ACA implementation, where assessments after this date were designated as post-implementation and before were marked as pre-implementation.

Results:

Overall, there were 160 community and free primary care clinics in operation within San Diego County at any time between 2008 and 2017. During this span of time, the number of clinics in operation increased an average 2.9% per year, from 96 clinics in 2008 to 123 clinics in 2017. Among these primary care clinics there was a small (0.6%) annual increase in the number of clinics that offered SUD services, compared to a larger (2.3%) annual increase in the number of clinics without SUD services (Figure 4.1).

When looking at primary care clinics pre- and post-ACA implementation, there was a 4% increase in the number of primary care clinics after the implementation (136 clinics; 85%) compared to before (130 clinics; 81%). But there was a 7% decrease in the number of primary care clinics that offered SUD services after the ACA (48 clinics; 35%) compared to before (54 clinics; 42%) (Figure 4.2).

There was an average increase of 20,111 mental, behavioral, and neurological primary diagnosis per year in community and free primary care clinics in San Diego, beginning with 65,928 diagnosis in 2008 to 252,921 diagnosis in 2017. This increase in mental, behavioral, and neurological primary diagnosis seemed to correspond to the implementation of the ACA in 2014. In 2008, mental, behavioral, and neurological conditions were the primary diagnosis for 4% of all patient encounters in primary care clinics in San Diego County. By 2014 this increased to 7%, and to 9% in 2017. The increase (9%) in mental, behavioral, and neurological primary diagnosis was greater in primary care clinics that had substance abuse services from 4% in 2008 to 13% in 2017, compared to the increase (2%) in clinics that did not from 4% in 2008 to 6% in 2017 (Figure 4.3).

Among primary care clinics that offered SUD services, there was an increase of 0.8% clinics per year that had a substance abuse counselor as part of the clinical support staff, from 7

clinics in 2008 to 15 clinics in 2017. The increase in substance abuse counselors happened in 2012 and remained at that new level (except in 2013). These substance abuse counselors also had an average increase of 1,400 more patient contacts per year, from 2,259 in 2008 to 14,275 in 2017 (Figure 4.4).

Discussion:

We found an increase in the supply of community and free primary care clinics after the implementation of the ACA, but a decrease in those offering SUD services. We also found an increase in the supply and use of substance abuse counselors as well as an increase in mental, behavioral, and neurological primary diagnoses. These findings shed light on the changes in access to SUD services in San Diego County following the implementation of the ACA, and emphasize previous research among PWID in San Diego County that found an increase in SUD treatment use after the implementation of the ACA.[15]

Despite finding an overall increase in the number of community and free primary care clinics in San Diego County from 2008 to 2017, we did not find an increase in the number of these clinics that offered SUD services. Literature reflects growing recognition of the importance of SUD services in primary care settings to provide essential SUD screening, brief interventions, and referrals to treatment.[20] With at least 8.5% of California's population suffering from a SUD and upto 22% of patients in primary care practices recently using substances, it is critical that more primary care clinics incorporate SUD screening, intervention, and treatment as part of routine service offerings.[21] The ACA provided $11 billion to bolster and expand community and free primary care clinics, of which $9.5 billion was specifically allocated for building new clinics in medically underserved areas, to expand preventive and primary care services, and to include behavioral health in clinics.[22] This increase in supply of community and free primary care clinics but decrease in the supply of clinics that provide SUD services in San Diego County is

surprising given the ACA was meant to incentivize primary care providers to incorporate SUD services into their practice by allowing for billing and management of SUD and provided funds for community and free primary care clinics to expand.[23,24] Further research is needed into the barriers for primary care clinics to include SUD services as a routine part of their care.

We did, however, find a bolstering and an increase in use of SUD services at community and free primary care clinics that offered them. Among community and free primary care clinics that had SUD services, there was an increase in the supply of substance abuse counselors and an increase in the number of patients who were in contact with a substance abuse counselor. This increase in the supply and use of substance abuse counselors is in alignment with the intent of the ACA, which aimed at improving access to and use of SUD services and primary care by including SUD services as an essential health benefit.[1,3] The increase in the number of patient contacts involving a substance abuse counselor also emphasizes the demand for these types of support services in primary care settings at community and free clinics. Since a substance abuse counselor interfaces with primary care physicians and provides assessment, treatment planning, and case management services, they are uniquely qualified to address patients with SUD and can provide leadership for their care.[25]

There was also an increase in the number of patient encounters that had a mental, behavioral, or neurological condition as the primary diagnosis in community and free primary care clinics in San Diego County, particularly in clinics that offered SUD services. The increase in these types of primary diagnoses, of which SUD are part, supports the intent of the ACA to create greater parity between benefits for mental health and SUD services with benefits for medical or surgical services.[26] The increase in these types of primary diagnoses could be indicative of improved service delivery for persons needing treatment for these types of conditions and a new pathway for financing these services brought by the ACA. Literature has recommended moving away from the previous model of healthcare where mental health,

addiction, and physical health care systems are separate and fragmented, towards an integrated approach where a preventive and harm reducing approach to SUD can be implemented in primary care settings.[26]

The ACA may not have been effective at increasing the amount of community and free primary care clinics that offer SUD services, but it seemed to strengthen the SUD services in clinics that did offer them. Prior to the ACA, insurance was optional, SUD services were not an essential health service, and patients could be denied coverage based on pre-existing conditions (e.g. SUD). The ACA expanded Medicaid, made it illegal for insurers to deny coverage or charge higher rates for pre-existing conditions, required insurance coverage for all citizens and legal residents, and included SUD services as an essential health benefit. Community and free primary care clinics are primarily funded by Medicaid and serve large diverse low-income populations. It is highly likely that the increase in supply and use of substance abuse counselors at community and free primary care clinics as well as the increase in patient encounters with a mental, behavioral, or neurological primary diagnosis, are products of the ACA.

This bolstering of increased use of SUD services at community and free primary care clinics in San Diego County at the facility level also sheds light on previous research about the use of SUD treatment among PWID in San Diego County at the individual level.[15] The authors of the paper found an increase in the use of SUD treatment and insurance coverage among a cohort of PWID in San Diego County after the ACA. They also found that the increase in insurance coverage did not explain the increase in SUD treatment. The increase of SUD treatment found among PWID in San Diego County after the ACA could have been at these community and free primary care clinics, since they do not require insurance coverage and would provide care regardless of insurance status. These community and free primary care

clinics have a history of being a consistent source for community-based and patient-centered care, and may be a place that PWID go for SUD treatment.

This analysis is subject to several limitations. The data is ecological in nature and therefore does not provide a joint distribution of any combination of variables at the individual level, therefore all we know is the marginal distribution of each variable, limiting our ability to make inferences. Data is gathered in aggregate and in categories that do not provide granular information about SUD as a primary diagnosis from more specific ICD-10 codes. These issues could be overcome by using individual-level data from the reporting databases instead of aggregated data. Encouraging OSHPD to collect similar data in primary care clinics to that collected from hospital and emergency departments could create a more robust database.[27] Since this analysis treated the ACA as a point in time, this approach is not able to decipher the impact of other contemporaneous events. If data on primary care clinics in a region comparable to San Diego County that did not experience the ACA were accessible during the same time frame, a potential outcomes model could be formed to create a quasi-experimental study that could measure the direct effect of the ACA.

Conclusion

Findings from this analysis suggest that the supply of community and free primary care clinics increased after the implementation of the ACA, but their offering of SUD services did not increase. There was evidence for a bolstering of SUD services at clinics that offered them and an increased use of these SUD services as well. With the implementation of the ACA and inclusion of SUD services as an essential health benefit on new insurance plans, there are no longer financial limitations prohibiting the integration of SUD screening, therapies, and treatment into primary care settings. Primary care clinics can now include SUD services as a principle part

of their service offerings. Different levels of intervention have been found to be effective for primary care providers to offer SUD services given the resources of each primary care clinic. These range from a low level of resource demand including brief counseling and referrals, to a moderate level including telephone monitoring, or higher levels including case management.[28] There are also interventions that can help improve organizational readiness to enhance perceptions of primary care providers to adopt SUD services and treatments.[28] Additional research into the barriers and limitations for primary care clinics to provide substance abuse services in San Diego County after the implementation of the ACA would help elucidate our findings.

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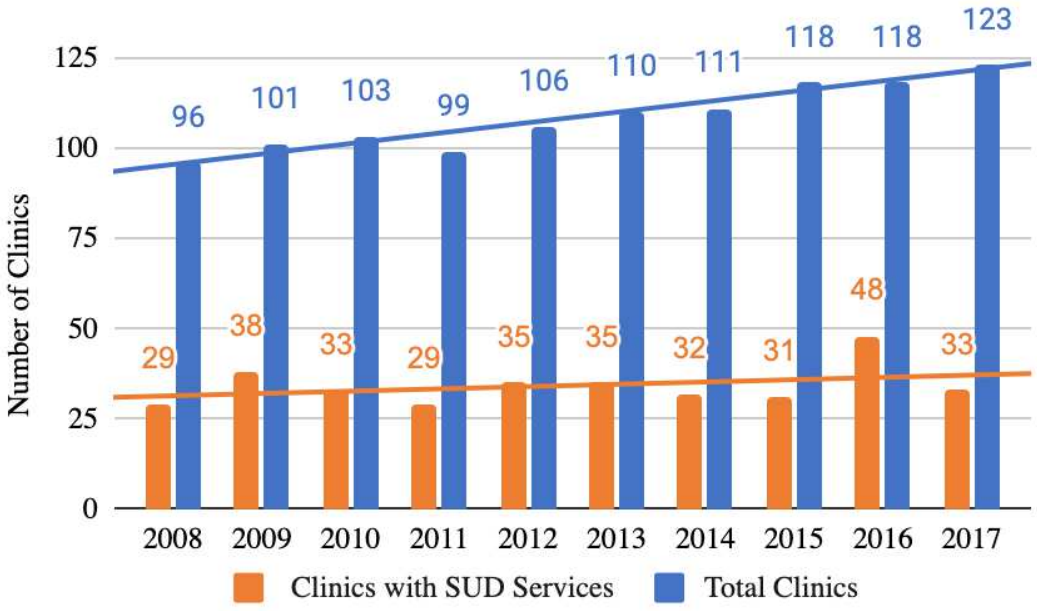

Figure 4.1. Total number of Community and Free Primary Care Clinics in San Diego and those offering substance use disorder (SUD) services from 2008-2017 (data source: Office of State Health Planning and Development).

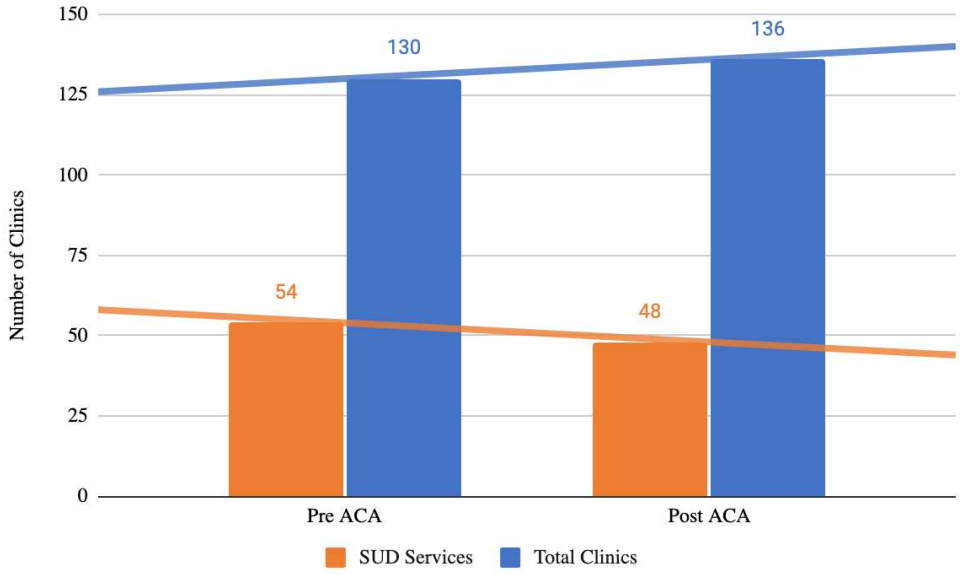

Figure 4.2. Total number of Community and Free Primary Care Clinics in San Diego and those offering substance use disorder (SUD) services pre-ACA and post-ACA implementation on January 1, 2014 (data source: Office of State Health Planning and Development).

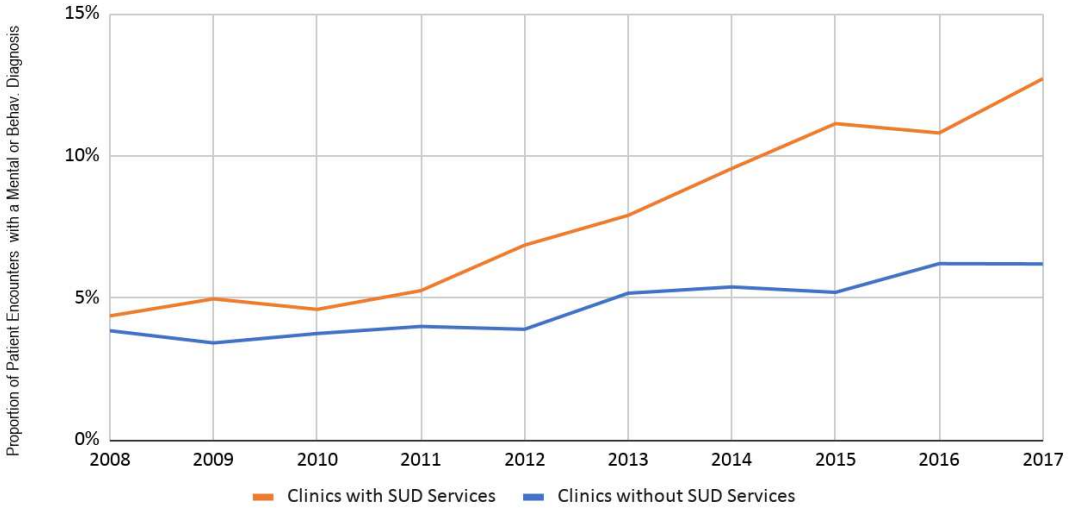

Figure 4.3. Proportion of patient encounters at Community and Free Primary Care Clinics in San Diego County with a mental, behavioral, or neurological primary diagnosis from 2008 to 2017 by whether they offered substance use disorder (SUD) services (data source: Office of State Health Planning and Development).

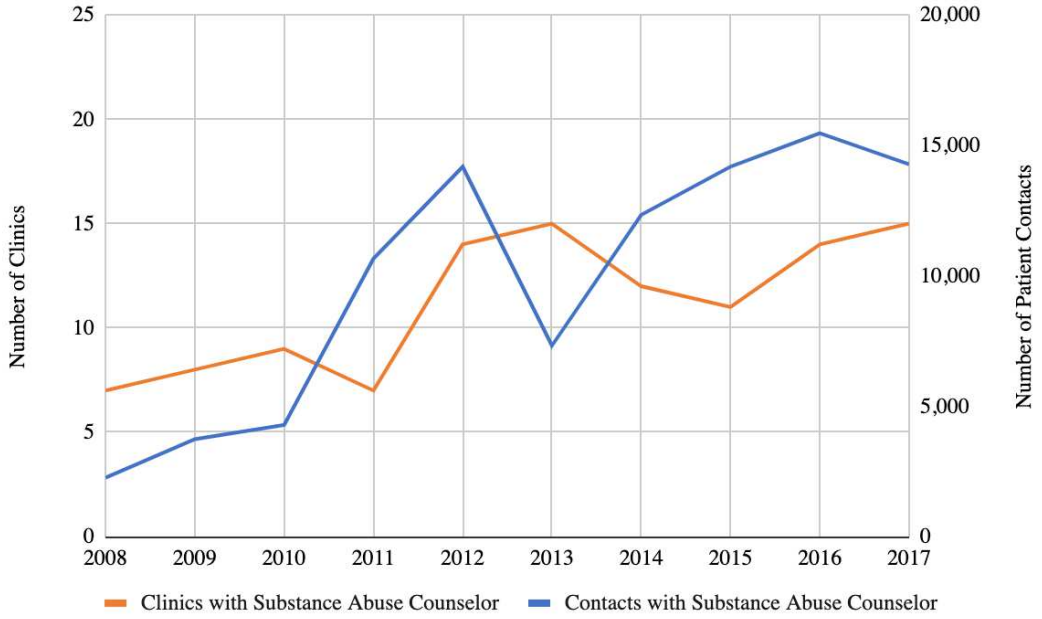

Figure 4.4. Number of Community and Free Primary Care Clinics in San Diego County with a substance abuse counselor and the number of contacts with those counselors from 2008 to 2017 (data source: Office of State Health Planning and Development).

Appendix:

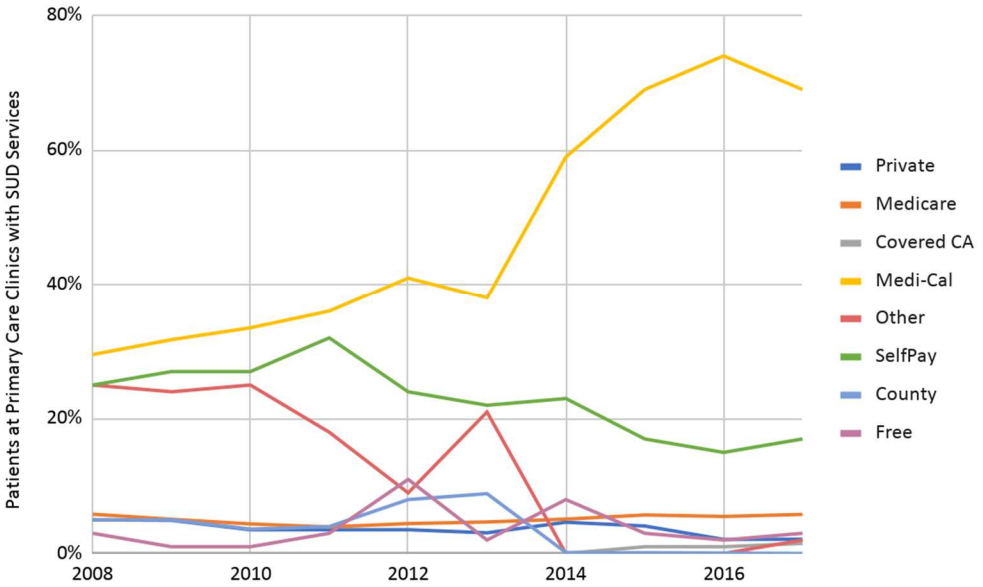

Figure 4.5. Proportion of patients at Community and Free Primary Care Clinics with substance use disorder (SUD) services in San Diego County from 2008-2017 by payment type (data source: Office of State Health Planning and Development).

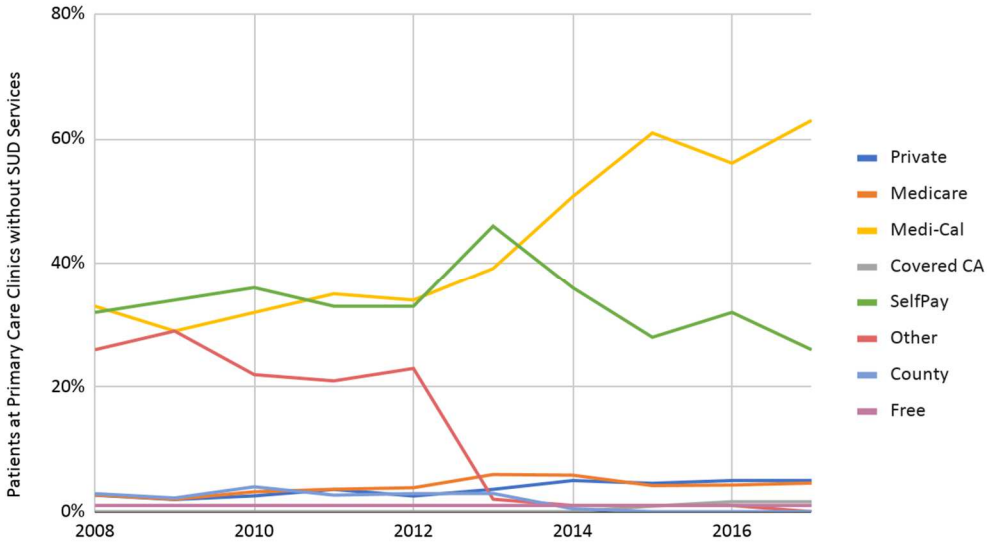

Figure 4.6. Proportion of patients at Community and Free Primary Care Clinics without substance use disorder (SUD) services in San Diego County from 2008-2017 by payment type (data source: Office of State Health Planning and Development).

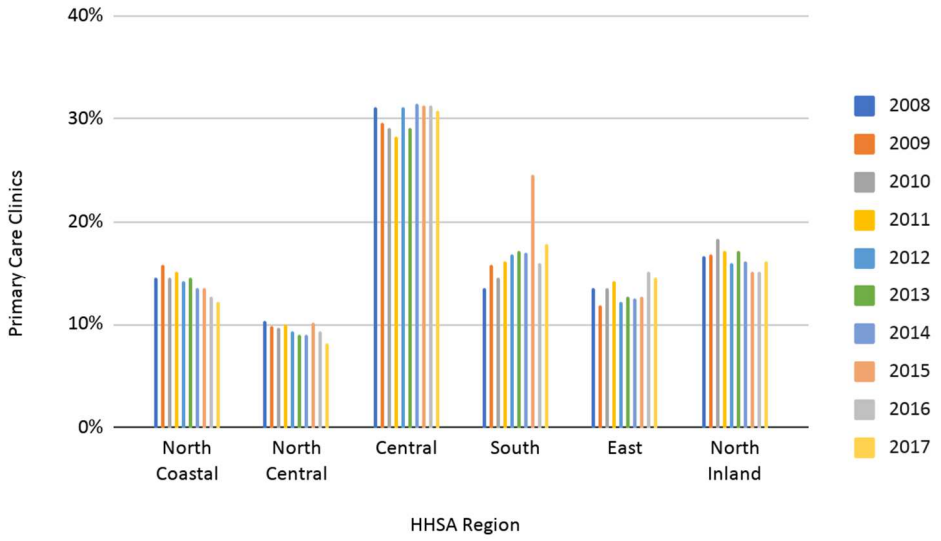

Figure 4.7. Proportion of Community and Free Primary Care Clinics in San Diego County by Health and Human Service Agency (HHSA) Region and year (data source: Office of State Health Planning and Development).

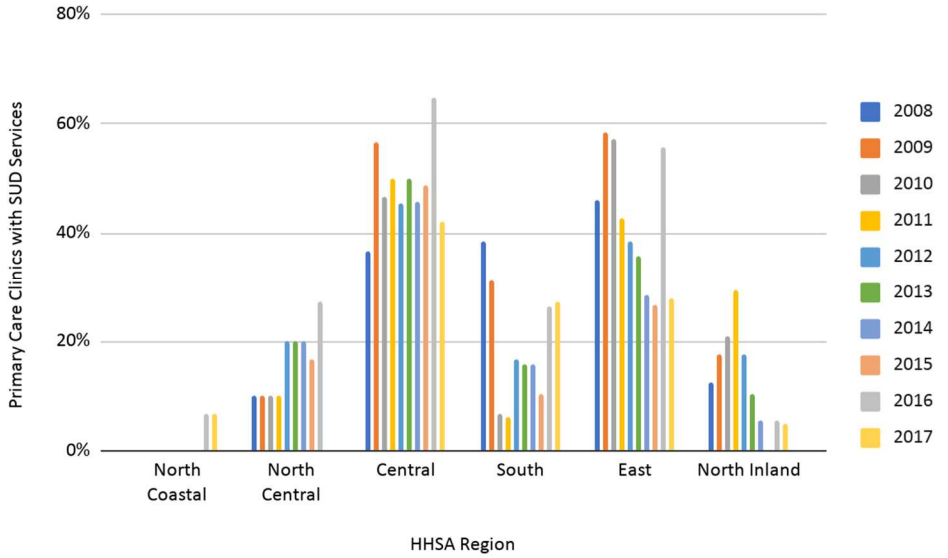

Figure 4.8. Proportion of Community and Free Primary Care Clinics with Substance Use Disorder (SUD) Services in San Diego County by Health and Human Service Agency (HHSA) Region and year (data source: Office of State Health Planning and Development).

Chapter 5: Conclusion

Overview

This dissertation addresses whether there was a change in healthcare utilization among people who inject drugs (PWID) after the implementation of the Affordable Care Act (ACA). Using data from a longitudinal cohort study of PWID in San Diego and facility-level data from licensed community and free primary care clinics in San Diego County, this dissertation addressed three aims: 1) to examine changes in the use of substance use disorder (SUD) treatment by PWID in San Diego after the implementation of the ACA compared to before; 2) to examine changes in primary care use by PWID in San Diego after the implementation of the ACA compared to before; and 3) to understand changes in the offering of SUD services at community and free primary care clinics in San Diego County after the implementation of the ACA compared to before.

Implications

Broadly, this research suggests that the ACA may have been effective at increasing the use of primary care services and SUD treatment among PWID in San Diego who were at increased risks for overdose and infectious diseases.[1,2] This research also suggests that the ACA may have been effective at bolstering SUD services at community and free primary care clinics in San Diego County. Despite a long history in the United States of having optional healthcare coverage that was largely privatized, the implementation of the ACA required health insurance coverage to be maintained, expanded Medicaid coverage, and provided greater publicly funded options. The ACA also built on prior initiatives to incorporate SUD services as an essential part of the service delivery system and a required part of all qualified plans.

Results from chapter 2, the analysis on the impact of the ACA on the use of SUD treatment among PWID in San Diego, show that PWID used more SUD treatment regardless of

whether they received insurance. This could indicate that changes in insurance coverage from the ACA were not responsible alone for the changes in the use of SUD treatment. Those who were uninsured after the ACA and used SUD treatment may have been affected by the ACA's expansion of community and free health centers offering SUD services. Interpreted through the Andersen framework for health service utilization, although the ACA increased insurance coverage among PWID, it was not an enabling factor specifically for using SUD treatment. This implies that there is something else in the ACA that impacted the individual determinants of PWID using SUD treatment, either directly or indirectly through changes to the healthcare system. Further research using a quasi-experimental study design is needed to decipher what mechanisms may have increased SUD treatment use among PWID.

Results from chapter 3, the analysis on the impact of the ACA on primary care use among PWID in San Diego discovered that given the opportunity, PWID will obtain health insurance and use it to access primary care services. These findings corroborate other qualitative studies that found health insurance coverage to be a predictor of health service use.[3-5] Interpreted through the Andersen framework for health service utilization, the ACA's individual mandate directly impacted the insurance status of PWID in San Diego and as an enabling factor was found to help increase their use of primary care services.

Results from chapter 4, the analysis on SUD services at community and free primary care clinics in San Diego County found a decrease in the proportion of clinics with SUD services after the ACA compared to before. This either suggests there are fewer primary care clinics actively screening and treating the proportion of their patient population with SUD or there are a smaller number of clinics serving a larger number of clients. Results from this analysis also found an increase in primary care clinics with SUD services that offered a substance abuse counselor and the increase in patient contacts among those substance abuse counselors after the implementation of the ACA. This suggests that the clinics that do offer SUD services may be

serving an increasing proportion of the SUD population, compensating for those not being served by other providers. Interpreted through the Andersen framework, the ACA may not have impacted the concentration of community and free primary care clinics in San Diego that offered SUD services, but it may have bolstered the amount of community and free primary care clinics in San Diego that have substance abuse counselors as clinical staff. This could have encouraged better rapport with persons who use drugs, and in combination with changes to health insurance coverage at the individual level, would contribute to the increase in use of SUD services at primary care clinics.

The ACA offered a promising solution for increasing access and use of primary care and SUD services for PWID by providing insurance coverage and parity between SUD services and physical health services. However, local actions must be taken to further increase and solidify these improvements including educating and incentivizing providers on how to care for substance using populations. Currently, local public health departments have begun to explore the impact of the drug overdose epidemic through a Center for Disease Control grant funded initiative, Overdose to Action (OD2A), which seeks to obtain high quality and comprehensive perspectives on drug-related morbidity and mortality at a local level, and use this to develop effective prevention programs.[6] The main goals of the OD2A initiative are to coordinate with public safety and community-based partners to rapidly identify overdose threats, reverse overdoses, and link people to effective treatment. One main objective is to provide technical assistance to high-burden communities by improving public insurance mechanisms and working with providers, health systems, and payers to treat addiction. This is accomplished by engaging with diverse populations using data informed presentations with two goals in mind: to change perceptions and to empower community members to work toward solving the opioid crisis. This dissertation contributes original information about healthcare utilization among PWID in San

Diego as well as trends of SUD service offerings at community and free primary care clinics after the ACA, which could be valuable for these presentations.

Limitations

This dissertation has several limitations to consider. Some data used for this dissertation were collected as part of the Study of HIV, Hepatitis C, and Tuberculosis Risk among PWID in San Diego, California. STAHR II is the first longitudinal study among PWID in San Diego and provides a unique opportunity to understand health service use among this vulnerable population. Chapters 2 and 3 draw from the STAHR II study, thus findings for those papers are not generalizable beyond similar populations of PWID. PWID were not randomly sampled. Therefore, it is unclear if our samples were representative of the broader population of PWID in San Diego. The STAHR II study used a targeted sampling method involving direct street and venue-based outreach, targeted advertising, and social networking strategies within targeted populations. Thus, our results are specific to PWID enrolled in the STAHR II study, who may represent a different part of the PWID population in San Diego that are more willing to participate in studies or seek services. PWID that are averse to seeking care or exhibiting their drug using status may have been less likely to participate in this study.

Other data used for this dissertation were collected as part of annual reporting by healthcare institutions in California to the Office of Statewide Health Planning and Development (OSHPD). The sample in chapter 4 represents all community and free primary care clinics in San Diego County. This sample is limited to primary care clinics that provide services for free or based on a sliding scale, and licensed by the California Department of Public Health. Thus, findings for this paper are not generalizable beyond this population of clinics. Data from this paper are collected in aggregate and do not offer the granularity to infer about the nature of individuals because we are not able to decipher the aggregate-level correlations from the

individual-level correlations and can only provide group averages instead of individual likelihoods.

Data for all analyses were self-reported, which may introduce social desirability bias where persons want to represent themselves as more favorable, and recall bias where answers may be imprecise. Although the interview-administered survey in the STAHR II study in chapter 2 and 3 would have allowed for probing to ensure that participants understood the question, and the data in chapter 4 is verifiable by claims data.

We cannot conclusively confirm or refute a causal relationship between the ACA and changes in health service use among PWID in San Diego. There are many additional ecological factors that might diminish the validity of our results. For example, SUD treatment could have been driven by external factors that were not measured in this analysis, such as a health promotion marketing campaign. Nevertheless, these studies provide valuable information on the changes in health service use after the ACA among PWID in San Diego.

Future Directions

This research expands on current knowledge about the impact of the ACA on the use and supply of health services for substance using populations, however, more evidence is needed to determine whether the ACA caused the increases and by what mechanisms.
The studies above lay the groundwork for understanding the use of SUD treatment and primary care services among PWID in San Diego, as well as the supply of SUD services at licensed community and free primary care clinics in San Diego County. Further research is also needed to examine what mechanisms in the ACA caused the change in health service use, why these worked, and how we can further bolster service delivery. Additional research is needed into the missed opportunities for addressing SUD at primary care clinics that do not routinely offer SUD

services. Further information is needed about the barriers that primary care providers experience when trying to offer SUD services.

Findings support the need for interventions that address the structural barriers to health service use among PWID.[5] Intervening at the policy level, the United States should work towards universal health insurance coverage because it has been found that if PWID are provided health insurance they will use primary care services. Current interventions should focus on ways to increase insurance coverage for SUD services among PWID who do not qualify for Medicaid. A public option providing affordable government administered plans for persons over the 138% federal poverty limit could be an effective option for increasing insurance coverage for PWID that did not receive it from other sources.

Conclusion

This dissertation makes an important contribution to PWID and healthcare reform literature as the first study in San Diego to our knowledge to examine changes in health service utilization among PWID and changes in the supply of SUD services at primary care clinics, after the implementation of the ACA. We identified an increase in health service use among PWID after the ACA and a bolstering of SUD services at primary care clinics. Our findings highlight that health service use among PWID evolves in response to changes in health policy and the shape of the health system. Namely, that insurance mandates and inclusion of SUD services in primary care settings may create environments that promote PWID to use preventive healthcare services. While individual factors are often identified in intervention programs, these programs often fail to recognize the broader policy environment that PWID have little control over.

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