

Diversion as a Pathway to Improving Service Utilization Among At-Risk Youth

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Despite the high rates of mental illness among youth in the juvenile justice system, many justice-involved youth do not receive adequate behavioral health services. We examined differences in health service utilization outcomes between youth who were diverted through a community-based, precomplaint program (Safety Net; $n = 41$), and youth with juvenile justice involvement in neighboring cities ($n = 154$). Individual arrest and health care records were combined to evaluate the rate of health care service utilization before and after initial police contact. A difference-in-differences approach with propensity score weighting was used to evaluate the impact of Safety Net on health service use, including inpatient, outpatient, emergency department (ED), and primary care visits. Compared to their nondiverted counterparts, Safety Net youth had a significant increase in psychiatric outpatient visits (average treatment effect [ATE] of 26%; $p < .05$) and psychiatric outpatient and primary care visits among those with a diagnosed mental illness (ATE of 19% and 12%, respectively); $p < .05$). There were no significant differences in ED or hospitalization outcomes. Results suggest that precomplaint diversion through Safety Net fosters access to outpatient behavioral health and primary care services that address the underlying issues that put youth in contact with police.

Keywords: diversion, mental health, juvenile justice, healthcare service utilization

Complex relationships exist among juvenile delinquency, incarceration, and physical and behavioral health outcomes. Approximately 65% of young people in the juvenile justice system are diagnosed with a psychiatric or substance use disorder (Desai et al., 2006; Ford et al., 2008; Schufelt & Coccozza, 2006); these diagnostic rates exceed those of youth in the general population (e.g., Vaughn et al., 2008). Youth with emerging mental illness often exhibit impulse control problems and externalizing symptoms that may cause small conflicts to escalate into potentially prosecutable behaviors (e.g., disorderly conduct, possession of weapons, assaults) or illicit drug use or possession (Copeland et al., 2007; Loeber et al., 2013).

Research suggests that externalizing disorders, such as conduct disorder and oppositional defiant disorder, are associated with a higher risk of aggressive behavior that can lead to juvenile justice involvement (Hawkins, 2000; Huizinga, 2000). However, the causal relationship between behavioral health and juvenile justice

involvement is difficult to disentangle (Schubert & Mulvey, 2014). For example, a recent study that examined delinquency severity and psychopathology among court-involved youth found that youth internalizing symptoms, such as anxiety and depression, were just as likely to occur among youth with moderate to severe delinquencies as with those who committed minor offenses (Haney-Caron et al., 2019). Another study among a sample of Puerto Rican youth used a predictive analytic model that controlled for 14 confounders that are commonly affiliated with increased delinquency (i.e., attitudes about delinquency, peer relationships, exposure to violence, coercive discipline) and found that depressed youth were significantly more likely to be classified as a high-rate delinquent as compared to being classified as a nondelinquent, indicating a strong relationship between depression and delinquency (Jennings et al., 2019). Additionally, youth with mental illness may have fewer positive peers and less robust support systems, and may engage in fewer positive activities, all of which are considered to be criminogenic risk factors—characteristics that increase risk of offending and reoffending (Andrews et al., 2006; Jennings et al., 2019).

Moreover, studies have shown that entry into the juvenile justice system may exacerbate pre-existing conditions and produce poor outcomes for youth who are detained and in need of mental health treatment. Anoshiravani et al. (2015) found that, among hospitalized youth in California, a higher percentage of detained youth (63%) had primary diagnoses of mental health disorders compared to nondetained youth (19.8%). In the first national description of death in juvenile justice facilities, Gallagher and Dobrin (2006) concluded that suicide was the leading cause of

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death for incarcerated youth and that the suicide rate for incarcerated youth was three times greater than national averages for youth who were not incarcerated. Incarcerated youth also had a higher death rate due to illnesses. This finding could be attributed to the fact that these adolescents may already be at risk before entering the facilities, that their environments exacerbate their health conditions, or both (Leiber, 2002). The authors also found that there was a higher likelihood of death in larger facilities and in facilities with more Black adolescents. The authors speculated that the increased likelihood of death for Black adolescents might be related to both worse conditions and greater mental health needs in the facilities where Black adolescents tend to be admitted versus facilities that admit fewer Black adolescents. It is also possible that Black youth are prone to experience stress related to perceived experiences of racial discrimination in the juvenile justice system, which might lead to their greater mental health needs as well as increased suicide rates (Angold et al., 2002; Del Toro et al., 2019; Jackson, 2019).

Encouragingly, studies indicate that mental health treatment may protect against juvenile justice involvement and recidivism (Foster et al., 2004; Goodkind et al., 2013; McCarter, 2016). Yet despite the high needs of this population and the evidence suggesting its usefulness, the majority of justice-involved youth with mental health needs do not receive adequate behavioral health services prior to or during system involvement (Maschi et al., 2008). A report of the Criminal Justice/Mental Health Consensus Project purported that “if many of the people with mental illness received the services they needed, they would not end up under arrest, in jail, or facing charges in court” (Council of State Governments, 2002, p. 26). Furthermore, at-risk youth who do make it to an initial behavioral health visit may not be engaged in consistent or sustainable services and may instead over-rely on emergency services (Sobolewski et al., 2013; Wilson & Klein, 2000). A 2017 study of service utilization comparing youth with justice involvement and those without showed that justice-system-involved youth had lower rates of outpatient visits and higher rates of emergency service use than non-justice-involved youth (Aalsma et al., 2017).

Juvenile Diversion

The goal of diversion is to deter youth from formal involvement with the juvenile justice system. This complex process depends on several factors, which include but are not limited to offense severity, resource availability, and youth needs (Schwalbe et al., 2012). Given the high rates of mental health issues among youth at risk for incarceration, it is critical that programs designed to divert youth with substantial behavioral health needs have a focus on mental health outcomes and improving access to behavioral health supports and services (Garcia et al., 2015; Maschi et al., 2008). The literature on the effectiveness of diversion in reducing recidivism has indicated mixed outcomes. One meta-analysis on juvenile diversion illustrated that diversion only significantly reduced recidivism if family interventions were involved (Schwalbe et al., 2012). Another study demonstrated that mental health diversion can effectively delay recidivism (Cuellar et al., 2006). The authors also cite earlier studies (e.g., Winick, 2003) that advocate specialty courts that adopt problem-solving rather than punitive or coercive approaches to reducing juvenile delinquency.

Few studies have looked at whether diversion increases access and follow-through with community-based behavioral health treatment. One study on adults showed that adult diversion from jail was correlated with increased counseling visits and emergency department (ED) visits and hospitalization, and decreased residential treatments (Steadman & Naples, 2005). However, it is unclear whether these results would be replicated with a juvenile population. In this study, we investigate whether there were differences in health service utilization outcomes between youth who were diverted through a community-based diversion program with a focus on linkage to services and youth with juvenile justice involvement in neighboring municipalities who lacked access to the diversion program. We hypothesize that youth who were diverted will have greater access to and follow-through with outpatient behavioral health services and less reliance on emergency services.

Method

Safety Net Collaborative

Safety Net (SN) is a collaborative effort in a diverse urban city in the Northeast region of the United States, among the city’s police department, public schools, Department of Human Services—Youth Programs, and a local community health care system. The mission of SN is to foster positive youth development, promote mental health, support safe school and community environments, and limit youth involvement in the juvenile justice system through coordinated prevention, intervention, and diversion services. SN has demonstrated success in reducing juvenile arrests and recidivism as well as increasing access to behavioral health services (Barrett & Janopaul-Naylor, 2016; Barrett et al., 2019; Janopaul-Naylor et al., 2019).

SN has been successful in reducing juvenile arrests in this city by utilizing youth resource officers (YROs) to intervene with youth in a preventative capacity. Within the city’s police department are 10 specially trained police officers who act as YROs in the Youth and Family Services Unit and are assigned to 19 public schools, five city-funded youth centers, and community-based organizations. YROs are trained in juvenile mental health, youth development, trauma, and case management so that they can act in a preventative capacity in working with at-risk youth and families (Barrett & Olle, 2016). YROs serve as the primary case managers for interventions and diversions and link youth to behavioral and physical health services and positive youth development activities, such as sports and mentoring programs. Each YRO is trained to conduct a risk and needs assessment and then collaborate with partners in mental health and in the schools to develop youth service plans, connect youth and families to programs and services, and conduct follow-up visits to monitor follow-through with the service plan.

Youth who commit an arrestable offense can be diverted through the SN collaborative. Because young people who encounter juvenile court are at increased risk for further involvement in the juvenile and adult criminal justice systems (Johnson et al., 2004; Petitclerc et al., 2013), diversion through SN is voluntary, community-based, and precomplaint. The terms and conditions of the diversion are managed by the assigned YRO with input from the family and SN partners, and the process circumvents juvenile

court altogether. Diversion through SN is viewed as an opportunity to implement the services and supports needed to address the underlying issues that put youth in contact with police in the first place. SN has demonstrated success in reducing arrests and recidivism, and we aim to determine if this program promotes increased access to and follow-through with behavioral health outpatient services while decreasing emergency services for those who are diverted.

Participants

Safety Net Participants

We identified 70 adolescents between the ages of 5 and 18 years whose family consented to participate in SN. We excluded 29 SN participants from our final analytic sample who had no electronic health record in the health care system under study, in order to avoid potentially misclassifying cases that may have obtained services within a different health care system. The final sample of SN intervention youth was $n = 41$. In sensitivity analysis we re-estimated our analysis with the full sample of SN participants ($n = 70$).

Comparison Group

We compared the impact of SN against a population of youth, between the ages of 5 and 18, who received services at the local community health care system but did not reside in the city where the SN intervention was located. Control arm patients were identified using targeted limited chart review methods used in a prior study, “scraping” clinical notes in the electronic health records (EHRs) for juvenile justice involvement (Progovac et al., 2021). Specifically, youth were identified by searching physician notes in the EHRs for the following terms: *arrest*, *summons*, *diversion*, or *gang*. Each note identified with these terms was then manually reviewed, with special attention to the three sentences surrounding the identified keyword, to determine whether there was juvenile justice involvement. The first occurrence of juvenile justice involvement in a youth’s record was deemed the index date and served as the reference point to calculate 12-month service use. The comparison group allowed us to account for secular trends, and area- and state-level factors that were not associated with the SN intervention that may differentially impact study outcomes.

Youth diverted through SN were connected to behavioral health services, and follow-up occurred through the YRO and SN team. Youth in the comparison group were also accessing behavioral health services, but the medical record did not specify who had originally made the referrals. There were no different requirements for service use between the SN and comparison groups, only differences in referral and follow-up. Youth diverted through SN were referred and connected to behavioral health services, with follow-up from the YRO and SN team. Youth in the comparison group likewise were not required to use services. They differed from the SN group because they did not receive any YRO- or SN-based referral, connection, or follow-up.

Youth in the comparison group could not have received service referral and follow-up through precomplaint diversion because precomplaint diversion is not available in the cities and towns where the youth in the comparison group lived.

Of the 256 individuals who were identified as having juvenile justice involvement, 102 had no contact with the health system in the post-reference point period. These individuals were excluded from our analytic sample to avoid misclassifying those who potentially used care at other health care systems as nonusers. The final comparison group sample was $n = 154$. In sensitivity analysis, we re-estimated our analysis with the full comparison population ($n = 256$).

Data and Outcome Variables

We used data from the EHR of an urban safety-net academic medical system that provides services to over 140,000 patients annually at multiple hospitals and community clinics. Our study included individuals with one or more visits for mental health or general medical care before and after the intervention. The EHR provides a comprehensive look at health service utilization, including details on psychotherapy, inpatient, outpatient, emergency department, primary care, and medical prescriptions. Data also contains information on a patient’s labs, diagnoses, demographics, location of care, physician notes, and provider type.

Dependent variables were dichotomous and measured health service use in the past 12 months. We assessed any inpatient visit (psychiatric), any outpatient visit (psychiatric or medical), any emergency department visit (all-cause), and any primary care (medical) visit. We did not differentiate emergency department visits by medical and psychiatric need as we did not feel psychiatric codes associated with emergency department visits were valid, because of the causes of medical and psychiatric emergency department visits being closely interrelated and the limited time available for psychiatric diagnosis.

Analytic Methods

Baseline characteristics of the SN and comparison group were compared using chi-square statistics for binary variables and two-sample t-tests for continuous variables. We employed a difference-in-differences (DID) approach with propensity score weighting to evaluate the impact of SN on health service use and ascertain the average treatment effect on the treated (Stuart et al., 2014). This analysis was run on the general population and the subpopulation with a documented diagnosis of mental disorders (ICD-9 codes 290–319 that include anxiety disorder, conduct disorder, depressive disorder, and intellectual disability).

DID is a quasi-experimental approach that allows for causal inference (Angrist & Pischke, 2008; Wooldridge, 2010). This analytic method subtracts the average health service use among SN participants, between the pre- and post-intervention periods, from the average health service use among the comparison group, between the pre- and post-periods. Any remaining difference between the two groups can be attributed to the intervention (Angrist & Pischke, 2008; Wooldridge, 2010). The pre- and post-intervention periods consisted of 12-month intervals. For the intervention group, this signified the time before and after engagement in SN. For the comparison group, the pre- and post-periods indicated the 12 months before and after they were identified in the EHR as having juvenile justice system involvement. In a regression framework, the interaction between an indicator for SN participation and post-period yields our DID estimate. To estimate the impact of SN on service use

outcomes from baseline to year 2 (hereafter post-period; year 1 was considered a phase-in period and removed from analysis), the following logit regression model was specified:

$$\text{logit}\{\text{Pr}(Y = 1|X)\} = \hat{\alpha}_1 X_1 + \hat{\alpha}_2 X_2 + \hat{\alpha}_3 (X_1 * X_2),$$

where Y is our health service use dependent variable, X_1 is SN participation (non-Safety Net participation as referent), and X_2 is time in the postperiod (compared to preperiod). $\hat{\alpha}_3$ is the coefficient of interest as it provides the DID by SN enrollment and time period that identifies the association of the intervention with the health service use outcome. We used the predictive margins method to test for significant within-group changes and estimate predicted probabilities of service use for SN and the comparison groups before and after implementation of the intervention, converting coefficients on interactions into differences in the scale of interest (percentages), and calculating standard errors using the delta method (Ai & Norton, 2003). A p -value of $p \leq .05$ (2-tailed) was considered statistically significant.

We combined our DID approach with propensity score weighting to maximize the comparability between intervention and comparison groups on baseline characteristics. To estimate propensity scores, we specified logistic regression models with an indicator for SN participation as the dependent variable. Covariates in the propensity score model included individual and area-level variables not likely to be impacted by SN (Stuart, 2010). Individual-level variables included age, sex, racial/ethnic minority group (Black, Latino), primary language spoken with clinician (English, Spanish), employed (yes/no), index date, and indicators for behavioral health disorder diagnosis (alcohol use disorder, anxiety disorder, conduct disorder, depressive disorder, learning disability, and substance use disorder) based on ICD-9 codes from the Chronic Condition Warehouse (Centers for Medicare & Medicaid Services, 2017). Area-level variables consisted of percent foreign born, percent in labor force, percent of families in poverty, percent of single female-headed households, and limited supermarket access. We avoided matching on pre-period outcome level and trend and covariates correlated with the outcome level, to prevent the introduction of bias and regression to the mean (Daw & Hatfield, 2018). Propensity score balance was achieved when the standardized difference in means for the covariates were $< 20\%$ and adequate graphical overlap existed between the intervention and comparison groups' propensity scores (Rubin, 2006; Stuart, 2010). To obtain the treatment effect, we used the estimated propensity score to calculate inverse probability treatment weights (IPTW), where weights were equal to the inverse probability of receiving the treatment that was actually received (Harder et al., 2010; Stuart, 2010; Robins et al., 2000). SN participants received a weight of $1/\pi$, and the comparison group received a weight of $1/1-\pi$, where π refers to an individual's propensity score (Harder et al., 2010; Robins et al., 2000). This upweights SN and the comparison groups to represent the full sample population. IPTW were trimmed and stabilized to a mean of 1 (Harder et al., 2010). In secondary analyses, we re-estimated our regression models limiting our population to youth with a need for mental health treatment, defined as having a mental illness diagnosis (anxiety disorder, conduct disorder, depressive disorder, or learning disability) in the 12-month pre-period. As a sensitivity analysis, we re-estimated our primary

analysis among the full SN ($n = 70$) and comparison group ($n = 256$) populations.

Results

Prior to propensity score weighting, there were significant differences between the intervention and comparison groups on demographic and clinical characteristics (see Table 1). In the pre-period, relative to the comparison group, SN participants were younger (14 vs. 15 years old, $p < .001$), less likely to be Latino (10% vs. 34%, $p < .05$), more likely to be Black (39% vs. 11%, $p < .01$) and used English (98% vs. 85%, $p < .05$) more often during their clinical encounters. Those enrolled in SN were also less likely than the comparison group to have a behavioral health disorder diagnosis.

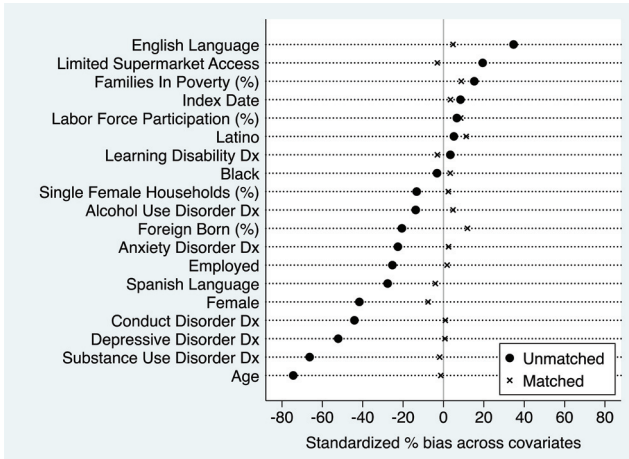
Table 1
Baseline Characteristics of Youth Enrolled in Safety Net and a Comparison Group^a

Characteristic	Safety net %	Comparison %	Sig.
Sample size	41	154	
Outcome			
Any psychiatric outpatient visit	24.4	59.7	***
Any psychiatric hospitalization visit	4.9	9.7	
Any medical outpatient visit	9.8	19.5	
Any primary care visit	85.4	77.9	
Any all-cause emergency department visit	29.3	42.9	
Any medical inpatient visit	0.0	3.3	
Individual-level variables			
Demographics			
Age (mean, SD)	13.7 (2.05)	15.38 (2.34)	***
Female	17.1	31.2	
Race-ethnicity			***
White	46.3	48.7	
Black	39.0	11.0	
Latino	9.8	33.8	
Asian	2.4	2.0	
Other	2.4	4.6	
Preferred language during clinical encounter			
English	97.6	85.1	
Spanish	2.4	14.9	
Any behavioral health disorder diagnosis			
Alcohol use disorder	2.4	5.8	
Anxiety disorder	9.8	16.2	
Conduct disorder	2.4	14.9	*
Depressive disorder	9.8	29.9	**
Learning disability	4.9	3.9	
Substance use disorder (not including alcohol)	2.4	23.4	**
Area-level variables (census block group-level)			
Percent foreign born	29.2	31.5	
Percent in labor force	71.2	70.7	
Percent of families in poverty	13.3	11.5	
Percent single female headed households	15.6	17.2	
Limited supermarket access (mean/SD)	20.4	15.8	

^a Prior to applying propensity score weights.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Figure 1
Covariate Balance Between the Treatment and Comparison Group Before and After Propensity Score Weighting



Note. See the online article for the color version of this figure.

Propensity score weighting successfully balanced SN and comparison groups on baseline characteristics during the pre-period (see Figure 1). Test statistics confirmed the weighted sample bias was within permissible range, and mean bias was reduced from 26% to 5%.

Table 2 presents results from our propensity score weighted DID analysis. The proportion of SN participants having any psychiatric outpatient visits increased from 53% in the pre-period to 57% in the post-period. During the concurrent timeframe, the comparison group decreased from 63% to 41%, resulting in a weighted DID of 26 percentage-points ($p < .01$). There were no other significant differences between the SN and comparison groups on the remaining service use outcomes.

When limiting the sample to youth with a need for mental health treatment (see Table 3), defined as having a mental health

diagnosis (the list of diagnoses included anxiety disorders, conduct disorders, depressive disorders, and intellectual disability) in the 12-month pre-period, similar to our primary analysis, SN participation was associated with an increase in the proportion of youth having any psychiatric outpatient visits, relative to the comparison population (DID = 19 percentage points; $p < .06$). There was also a significant increase in the proportion of SN participants having any primary care visits (DID = 12 percentage-points; $p < .05$). There were no significant differences between the subsamples in the SN and comparison groups on the remaining health service use outcomes. In sensitivity analysis where we included the full SN and comparison group populations, our findings mirrored those of our primary analysis, albeit with a smaller significant effect size (see Table 4).

Discussion

A common contributing factor to youth contact with the justice system is one or more unaddressed mental health problems, which are unlikely to be adequately treated through adjudication (Baglivio et al., 2014). Results of this study indicate that youth diverted through SN exhibited a significant increase in their use of outpatient psychiatry visits when compared to justice-system-involved youth residing in neighboring municipalities with no access to SN. Furthermore, among youth with a diagnosed psychiatric disorder, SN participation was associated with a significant increase in the proportion of youth having any psychiatric outpatient visits as well as any primary care visits, relative to the comparison population. These findings are particularly important given that the goal of SN diversion is to link diverted youth and their families to services and supports that address the issues underlying or influencing youth’s contact with the police. Furthermore, a major component of the diversion program is to follow up with the family to ensure that there is follow-through on the service plan.

Our results did not support our hypothesis that SN participation would be associated with decreased use of emergency services compared to arrested youth and the comparison group. Important

Table 2
Propensity Score Weighted Difference-in-Difference Estimate of Changes in Percentage of Health Service Use After Versus Before Safety Net Participation

Service type	Study arm	Pre-Period	2-year vs. baseline (year 1 postintervention treated as washout period)†		
			Post-period 2-year	Within group difference	Difference-in-differences Safety net vs. Comparison
Mental health (MH) service use	Safety Net	53.4%	57.2%	3.8%	25.9%**
	Comparison	63.0%	41.0%	-22.0%***	—
Inpatient	Safety Net	2.9%	1.8%	-1.1%	1.2%
	Comparison	9.6%	7.3%	-2.3%	—
General health service use	Safety Net	9.5%	4.9%	-4.6%	-6.6%
	Comparison	19.2%	21.2%	2.0%	—
Primary Care	Safety Net	94.3%	92.8%	-1.5%	6.5%
	Comparison	78.6%	70.6%	-8.0%	—
Inpatient	Safety Net	1.7%	2.6%	1.0%	1.3%
	Comparison	3.4%	3.0%	-0.3%	—
Emergency department	Safety Net	22.4%	25.5%	3.1%	1.7%
	Comparison	40.7%	42.2%	1.4%	—

† Year 1 was considered a phase-in period and removed from analysis. ** $p < .01$. *** $p < .001$.

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Table 3

Propensity Score Weighted Difference-in-Difference Estimate of Changes in Percentage of Health Service Use After Versus Before Safety Net Participation Among Those With a Mental Health Disorder Diagnosis^a

Service type	Study arm	Baseline (%)	2-year vs. baseline (Year 1 post-intervention treated as washout period) [†]		
			2-year (%)	Within group difference	Difference-in-differences Safety Net vs. Comparison
Mental health service use					
Outpatient	Safety Net	92.0%	85.1%	-6.9%	18.8%‡
	Comparison	69.7%	44.0%	-25.7%	
Inpatient	Safety Net	—	—	—	—
	Comparison	—	—	—	—
General health service use					
Outpatient	Safety Net	3.8%	7.8%	4.0%	4.3%
	Comparison	21.4%	21.1%	-0.3%	—
Primary Care	Safety Net	93.0%	93.0%	0.0%	12.0%*
	Comparison	80.2%	68.2%	-12.0%	—
Inpatient	Safety Net	—	—	—	—
	Comparison	—	—	—	—
Emergency department	Safety Net	5.9%	1.1%	-4.8%	7.4%
	Comparison	51.8%	39.7%	-12.2%	—

^a Mental health disorder diagnosis (anxiety disorder, conduct disorder, depressive disorder, or learning disability) in the 12-month pre-period.

[†] Year 1 was considered a phase-in period and removed from analysis. [‡] $p < .1$. * $p < .05$.

to note is that our assessment of ED visits did not differentiate between medical and psychiatric visits, so it is possible that psychiatric ED visits were reduced. However, we expected a significant decrease in overall ED visits given SN's attention to the housing, physical and mental health treatment, and substance abuse treatment needs common among juvenile justice-involved youth (Kushel et al., 2002). However, diversion and referrals to outpatient services may have been insufficient to mitigate against factors compelling ED use, such as a lack of continuous relationships with physicians (Sarver et al., 2002) or reliance on the ED as a routine source of care (Wilson & Klein, 2000). These factors related to accessing health care may or may not be addressed by a youth's individual diversion plan, depending on the targets of diversion as well as what youth and parents disclose about their strengths and needs.

Contributions

Results suggest that precomplaint diversion through SN fosters access to and follow-through with outpatient behavioral health and primary care services and supports that are needed to address the underlying issues that put youth at risk of continued contact with law enforcement and the legal system. It is important to note that the gains in service use among the SN group were largely driven by the decrease between the pre- and post-periods for the comparison group and steady rates of treatment for the SN group. Findings in the comparison group are similar to national studies that find high rates of dropout from treatment in marginalized populations (Saloner et al., 2014), suggesting that simply retaining youth in treatment is evidence of an impactful intervention. Future research should examine reasons for dropout of treatment among diversion

Table 4

Propensity Score Weighted Difference-in-Difference Estimate of Changes in Percentage of Health Service Use After Versus Before Safety Net Participation—Full Sample

Service type	Study arm	Pre-period	2-year vs. baseline (Year 1 post-intervention treated as washout period) [†]		
			Post-Period 2-year	Within group difference	Difference-in-differences Safety Net vs. comparison
Mental health service use					
Outpatient	Safety Net	42.0%	45.0%	3.0%	16.4%*
	Comparison	38.4%	25.0%	-13.4%***	—
Inpatient	Safety Net	1.8%	0.9%	-0.9%	0.5%
	Comparison	5.8%	4.4%	-1.4%	—
General health service use					
Outpatient	Safety Net	7.4%	3.8%	-3.6%	-4.8%
	Comparison	11.7%	13.0%	1.2%	—
Primary Care	Safety Net	74.1%	73.0%	-1.2%	3.7%
	Comparison	47.9%	43.1%	-4.9%	—
Inpatient	Safety Net	0.8%	1.6%	0.8%	1.0%
	Comparison	2.0%	1.8%	-0.2%	—
Emergency department	Safety Net	9.7%	20.1%	10.3%	9.4%
	Comparison	24.8%	25.7%	0.9%	—

[†] Year 1 was considered a phase-in period and removed from analysis. * $p < .05$. *** $p < .001$.

and comparison groups as well as changes that may have differentially impacted comparison groups during this study period. Prior research demonstrating SN's effectiveness in reducing juvenile arrests and recidivism (Barrett & Janopaul-Naylor, 2016; Barrett et al., 2019) points to the potential of an interdisciplinary, precomplaint diversion program to improve youth mental health outcomes without compromising public safety. Importantly, these outcomes can be accomplished without youth's deeper involvement in the juvenile justice system.

In terms of specific policy implications, our results are aligned with the ongoing efforts in the field of juvenile justice to emphasize mental health treatment over punitive approaches to reduce juvenile delinquency (Cuellar et al., 2006). Engaging youth in precomplaint diversion—as opposed to postcharge or court diversion—enables youth to maintain clear juvenile records while being offered important social services (McCold, 2003). Precomplaint diversion also allows families to avoid deeper involvement in the juvenile justice system, as it bypasses the need to be in contact with the courts to process the diversion. This finding can be of benefit to communities deciding whether to develop community-based diversion programs versus court-based diversion. While we do not know if the comparison group in this study was mandated to treatment by court, we do know that the voluntary precourt diversion group was able to remain engaged in treatment. This result adds to the literature that coerced treatment through the courts may not be necessary for treatment compliance for youth at risk for delinquency.

Furthermore, precomplaint diversion programs that include behavioral health service involvement can improve access to needed services that can focus on reducing delinquency. If, such as in the SN diversion program, there is a focus on case management and follow-up, there can be a greater chance of follow-through with behavioral health treatment. This finding is particularly important given that treatment retention for at-risk youth has been a challenge for mental health providers (Dembo et al., 2011).

It is inherently difficult to experimentally study juvenile diversion and delinquency outcomes, due to ethical concerns around randomization. We addressed this challenge by using a rigorous propensity score-weighting paradigm that successfully matched baseline characteristics between the SN and comparison group participants. This method enabled us to maximize comparability between both sets of participants' individual and area-level characteristics and therefore account for systematic differences between them.

Limitations

There are several limitations of this study that merit attention. First, we used ED visits as an outcome without separating chief complaints for ED visits into medical and psychiatric categories. We intentionally did not partition this variable, because ED visits for psychiatric reasons may be underreported or obscured by related physical conditions (e.g., injury secondary to substance use). Second, there was a lack of racial and ethnic subgroup analyses due to the low sample size and power. Future studies should conduct subgroup analyses among racial and ethnic groups. Third, the overall sample size was relatively small, and findings may not be generalizable to other health care systems and patient populations. As such, policy implications may be limited. However, our

study can serve as a case study that illustrates the potential promise of a juvenile justice diversion program on health service use. Additionally, contextualizing our study findings within the growing body of literature that demonstrates the promise of police-led diversion programs provides credence for the development and uptake of similar interventions. Fourth, we were unaware of the comparison group's involvement with the juvenile justice system or the outcomes of such interaction, which may have influenced study outcomes. Consequently, the directionality of the potential bias is unknown. To the best of our knowledge, there were no other diversion programs in the health care system's catchment area and it was unlikely that youth, outside of the treatment population in our study, were involved in a comparable program. Future research should leverage data sets that link multiple payers and agencies, such as all-payer claims data sets or state public health data warehouses, to obtain a comprehensive picture of health care service use. Finally, we did not have access to the specific legal charges for individual youth, which would have been helpful to analyze the severity of delinquent acts as they relate to engagement in services.

Future Directions

More research is needed on the possible causal links between diversion and service utilization and improved outcomes into adulthood (e.g., job placement, reduced contact with justice system, etc.). Longitudinal studies that can follow a cohort of diverted youth into adulthood would be well suited to examine these potential pathways. In addition, future research may compare SN participants solely to youth who were diverted in neighboring municipalities (typically through postcharge, postadjudication diversion), which would help distinguish between the outcomes of pre- and postcomplaint diversion. Lastly, future research may prospectively investigate the impacts of increased service utilization on arrest and recidivism rates.

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