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How outpatient substance abuse treatment unit director activities may affect provision of community outreach services

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Abstract

Aims—Community outreach services play an important role in infectious disease prevention and engaging drug users not currently in treatment. However, fewer than half of US substance abuse treatment units provide these services and many have little financial incentive to do so. Unit directors generally have latitude about scope of services, including the level of outreach provided to the community. The current study examines how directors' interactions with external stakeholders affect substance abuse treatment units' provision of community outreach services.

Methods—Cross-sectional logistic and Poisson regression analyses were conducted on a national sample of US outpatient substance abuse treatment units ($N = 547$).

Results—Findings suggest that the amount of time directors spent with licensing and monitoring associations was associated with provision of a greater number of community outreach services, while time spent with professional and occupational associations was associated with provision of off-site human immunodeficiency virus and hepatitis C testing. Several other director attributes and organizational characteristics also emerged as significant.

Conclusions—External stakeholders with whom substance abuse treatment directors interact may influence community outreach through their effects on treatment directors' strategic priorities. Implications for policy and prevention efforts are discussed.

BACKGROUND

Despite widespread efforts by federal agencies and activists to prevent the transmission of chronic blood-borne diseases, human immunodeficiency virus (HIV)/acquired

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immunodeficiency syndrome (AIDS) and hepatitis C (HCV) continue to pose significant threats to public health (Des Jarlais & Semaan, 2008). In the United States, more than 18,000 people with AIDS die each year (CDC, 2011), and HCV is a major contributor to chronic liver disease, with annual associated health care costs of more than \$600 million (Wong, McQuillan, McHutchison, & Poynard, 2000). Currently, over 1.1 million Americans live with HIV/AIDS (Campsmith, Rhodes, Hall, & Green, 2008) and an estimated 4 million have chronic HCV (Amon et al., 2008; Armstrong et al., 2006). While transmission rates for both diseases have stabilized since the mid-1990s (CDC, 2011), 40,000–56,000 individuals continue to be infected with HCV and HIV respectively, each year (Fenton & Valdiserri, 2006; Williams, Bell, Kuhnert, & Alter, 2011).

The incidence of new infections is particularly high among men and women who use illicit drugs (Backmund, Reimer, Meyer, Gerlach, & Zachoval, 2005; Des Jarlais et al., 2007), especially injection drug users (IDUs). Elevated risk of infection among drug users has been attributed to both increased prevalence of HIV/AIDS and HCV as well as a greater propensity to engage in risky behaviours such as sharing drug equipment and having unprotected sex (Carey et al., 2009; Hagan et al., 2001). HIV and HCV prevention services such as rapid testing, behavioural interventions, and needle exchange programs can lower rates of drug equipment re-use and reduce sexual risk behaviors (Edlin, 2004; Holtzman et al., 2009; Semaan et al., 2002). Prevention efforts also play an important role in making infected individuals aware of their disease status and connecting them to appropriate treatment options.

Drug users tend to be medically underserved and difficult to reach in traditional health care settings (Chitwood, McBride, French, & Cornerford, 1999). Outpatient substance abuse treatment units (OSATs) serve the majority (62%) of individuals entering substance abuse treatment in the United States (Grella, Etheridge, Joshi, & Anglin, 2000) and are well-positioned to educate drug users about infectious diseases (Hagan, Strauss, Astone, & Des Jarlais, 2005; Sorenson & Copeland, 2000). Governmental agencies such as the National Institutes of Health (NIH), the Centres for Disease Control and Prevention (CDC), and the Substance Abuse Mental Health Services Administration (SAMHSA) all acknowledge the important role that substance abuse treatment units play in infectious disease control, and actively promote the provision of both testing and community outreach services by OSATs and other treatment units as part of their ‘Seek, Test and Treat’ paradigm for addressing the HIV and HCV epidemics (Kerker & Dore, 2006; Kresina, Hoffman, Lubran, & Clark, 2007; SAMHSA, 2010).

However, despite federal interest in these activities, the provision of HIV and HCV prevention services by OSATs remains uneven (Grella et al., 2000). The majority of OSATs offer some form of HIV and/or HCV testing services on-site (Astone, Strauss, Vassilev, & Des Jarlais, 2003; Pollack & D’Aunno, 2010), but direct provision of off-site testing and other community outreach services is far less prevalent. In fact, research suggests that the breadth and intensity of community outreach services offered by OSATs, measured both by the number of units offering these services and by the number of services offered, has actually decreased over time (D’Aunno, 2006; Pollack, D’Aunno, & Lamar, 2006). Off-site testing and community outreach services play an important role in raising awareness of

infectious disease among street drug users and individuals not currently in treatment (English & the LONGSCAN Investigators, 1997; Porter, Metzger, & Scotti, 2002), and can increase treatment utilization in high-risk populations (Barnett, Manly, & Cicchetti, 1993). However, incorporating such services can be challenging for agencies given limited resources (Bini et al., 2011; Haynes et al., 2011). For example, state health departments often require specific staff training for certification to conduct HIV or HCV testing and, despite their important contribution to the nation's public health, HIV and HCV prevention activities are typically under-reimbursed if they are reimbursed at all (Dore, 1999; Weisz, Donenberg, Han, & Weiss, 1995). Consequently, commitment from unit leadership may be essential to units' decisions to provide these services.

Previous research has identified a range of organizational factors that significantly influence OSAT provision of prevention and outreach services (e.g. per capita income, unit size, etc.) (Strauss, Falkin, Vassilev, Des Jarlais, & Astone, 2002; Wells, Lemak, & D'Aunno, 2006), but the role of organizational leadership is not commonly explored. This is surprising because substance abuse treatment directors, who are responsible for organizational strategy and performance, significantly influence programmatic decisions as well as unit survival (Proctor et al., 2007; Wells, Lemak, & D'Aunno, 2005).

The current study uses data from a national survey of US OSATs to examine how directors' behaviours correlate with OSATs' provision of community outreach services. Specific director behaviours hypothesized to impact service provision include the amount of time directors spend managing relations with external stakeholders such as monitoring or licensing organizations, professional or occupational organizations, other treatment providers, policymakers and members of the local community. Community outreach services previously found effective include offering HIV and HCV testing in high prevalence areas, as well as employing multiple strategies such as reaching out to members of high-risk individuals' sexual and social networks for testing, counseling and care; and utilization of harm-reduction approaches such as needle exchange programs (Janssen et al., 2001; Marks, Crepaz, Senterfritt, & Janssen, 2005).

DIRECTORS' INTERACTION WITH EXTERNAL STAKEHOLDERS

OSATs are typically small organizations that depend heavily on external stakeholders such as referral sources, licensing and accrediting entities, professional associations and legislators for their survival (Alexander, Wells, Jiang, & Pollack, 2008). Directors' interactions with these stakeholders, also known as 'boundary-spanning', may affect the nature of discretionary and under-funded services such as prevention by shaping director priorities. For example, directors who interact with local stakeholders may be more aware of community prevention needs. Many federal agencies and accrediting bodies also emphasize the importance of HIV and HCV prevention (Kerker & Dore, 2006; Kresina et al., 2007; SAMHSA, 2010). Thus, directors' boundary spanning activities are hypothesized to impact OSAT provision of HIV and HCV community outreach services both because they can shape directors' beliefs about the need for HIV and HCV prevention and because they can serve as a way for units to convey their public health commitment to other agencies.

Previous research suggests that directors do take cues about prevention services from their external environments. Data from the 1990 wave of the Drug Abuse Treatment System Survey (DATSS) revealed that directors' participation in professional development activities to learn about trends in substance abuse affected whether units provided HIV/AIDS education (Clapp, 1998). Similarly, two studies utilizing 1988–1995 and 1988–2000 National DATSS (NDATSS) data found that directors' participation in professional development activities predicted treatment units' provision of community outreach services (D'Aunno, Vaughn, & McElroy, 1999; Pollack et al., 2006). However, prior research has not examined how directors' interactions with other stakeholders such as legislators, referral agencies and licensing or accrediting entities affect OSAT provision of prevention services.

The current study extends inquiry into OSAT prevention activities in several ways. First, this study examines how total director time spent with each type of stakeholder affects unit prevention activities. In increasingly resource-constrained environments, directors' interactions with key sources of funding and client referrals may have a greater effect on programmatic priorities than professional development activities. Understanding which relationships are associated with OSAT community orientation can help policy-makers and activists identify ways to encourage prevention activities. Second, prior research has focused primarily on identifying factors affecting OSAT provision of on-site HIV testing and counselling to current clients (Pollack & D'Aunno, 2010; Pollack et al., 2006). Since the majority of people with substance-use disorders do not enter treatment (SAMHSA, 2008), the off-site testing and community outreach activities identified in this study represent an important opportunity for OSATs to engage with prospective clients as well as a potential public health leverage point for disease prevention. While prevention of communicable disease is often viewed as the responsibility of local public health departments, recent cuts have diminished these departments' already scarce resources for providing such services (NACCHO, 2012). Substance abuse treatment providers are also uniquely positioned to work effectively with illicit drug users, a population in which the incidence of new infections remains high (Backmund et al., 2005; Des Jarlais et al., 2007). Given these conditions as well as a growing body of literature demonstrating that multi-modal community outreach activities are more effective than any single strategy (Crepaz et al., 2006; Lyles et al., 2007; Rotheram-Borus, Swendeman, & Chovnick, 2009; Semaan et al., 2002), the current study's focus on a range of prevention activities represents an important next step on a topic last addressed in the mid-1990s (D'Aunno et al., 1999). Finally, to the best of our knowledge, this study is the first to examine factors affecting OSAT provision of HCV testing, a disease that is more prevalent than HIV but whose prevention has received less attention as a programmatic priority for US substance abuse treatment units (Armstrong et al., 2006).

METHODS

Data

The data used for this study were from a nationally representative sample of US OSATs surveyed in 2005 as part of the NDATSS. The NDATSS was a longitudinal study of OSATs conducted by the Institute for Social Research at the University of Michigan. In the NDATSS, an OSAT unit was defined as a physical facility in which the majority of resources

(>50%) were dedicated to treat individuals with substance abuse problems, including alcohol and other drugs, on an outpatient basis. Active duty military, Veteran's Administration, and correctional facility programmes were excluded, as were units that treated only alcohol abuse.

The NDATSS used a stratified, proportional random sample drawn from the Institute of Social Research's sampling frame of the nation's OSAT units. The sample method and procedures of NDATSS have been described previously (Heeringa, 1996). Briefly, the NDATSS used a mixed-panel design, which combined elements from panel and cross-sectional designs. Data were collected from the same national sample of OSAT units sampled and screened in prior waves of the study. These panel units were replenished in subsequent waves with new groups of OSAT units, randomly selected so that the full sample would be representative of the US outpatient treatment systems in a given year. The 2005 sample, representing the sixth and final wave of the NDATSS data, included 566 units, reflecting an 88% response rate. Of these 566 units, interviews with directors were conducted for 547 units.

Several steps were taken to produce reliable and valid telephone survey data, including two pre-tests, substantial interviewer training, extensive checks for consistency within and between sections of the survey instrument, and when necessary, re-contacts with respondents (Groves, 1988). NDATSS data were collected through separate telephone surveys of the administrative director and clinical supervisor at each OSAT unit. Unit directors provided information concerning units' sources of revenue, ownership and affiliation with other organizations. Clinical supervisors provided information about treatment practices and client characteristics. After the data were collected, extensive reliability checks were performed within each survey. Results were also compared between surveys to further confirm validity. These checks revealed very high levels of internal consistency within the NDATSS data.

Levels of item non-response were generally very low, and did not exceed 4% for any single item. Subsequent list-wise deletion reduced the final analytic sample to 489 units. Examination of missing data patterns as well as *t*-test comparisons of the means of all variables used in the analyses did not reveal any statistically significant differences due to item non-response (Lemak & Alexander, 2001). When data are missing at random, multiple imputation yields results that are less biased than complete case analysis (Jones, 2004). Therefore, we conducted multiple imputation using the multivariate normal imputation method within the Stata 11.0 MI module in order to maintain the full sample of 547 units (StataCorp, 2009). A total of 20 imputations were used in order to reduce sampling error (Choi & Ryan, 2006). Sensitivity analyses conducted using the method of multiple imputation by chained equations did not alter the pattern of results (Royston, 2005).

Measures

Provision of off-site testing and other community outreach activities was measured using three variables, two dichotomous and one count, that cumulatively represent a range of HIV and HCV prevention services offered by OSATs outside of their facilities: (1) *off-site HIV testing*, a dichotomous variable set = 1 if directors indicated direct provision of off-site HIV testing to at-risk individuals; (2) *off-site HCV testing*, a dichotomous variable set = 1 if

directors reported directly providing off-site hepatitis testing or immunizations to at-risk individuals and (3) *other community outreach activities*, a count variable with possible values ranging from 0 to 7, indicating how many of the following prevention strategies the OSAT used: talking to drug users on the streets or in places such as crack houses; talking to family members, friends, or acquaintances of drug users; performing hepatitis education outreach among at-risk individuals; distributing condoms; distributing clean needles; distributing bleach solutions in order to clean needles and exchanging clean needles for used ones.

Director boundary spanning behaviour was measured using five count variables based on director reports of the number of hours per week they spent on each activity, with potential responses ranging from 0 to a maximum of 60: (1) engaging in liaison activities with monitoring or licensing organizations; (2) engaging in activities with professional or occupational associations; (3) consulting with and exchanging information with other treatment providers; (4) contributing to policy making at the state or local levels and (5) making public presentations and appearances in the community.

A number of client case-mix variables, director attributes and organizational characteristics were included as covariates to control for potential confounders of focal estimates. Three measures of *client case-mix* were used as proxies for community prevention need: the percentage of clients entering treatment who were IDUs (Heimer, Grau, Curtin, Khoshnood, & Singer, 2007; Tempalski, Cleland, Pouget, Chatterjee, & Friedman, 2010), the percentage of clients entering treatment with co-occurring mental health and substance abuse disorders (Conover et al., 2009; Sherba & Singer, 2010) and the percentage of clients who were homeless upon entry into treatment (Reid, 1999).

Director attributes known to influence unit service provision include *abstinence-oriented ideology of care and educational background*. Previous research has shown that directors' ideologies of care and educational background can influence the types of services OSATs provide (Clapp & Burke, 1997; Hasenfeld & Abbott, 1992). For example, Friedmann, Jiang, and Alexander (2010) found that senior managers' treatment orientation influenced OSATs' likelihood of offering buprenorphine services, while Pollack & D'Aunno (2008) found significant associations between managerial attitudes and dosage patterns in methadone treatment. Similarly, staff professional credentials have been associated with greater adoption of evidence-based practices and new technologies (Green, Rockhill, & Furrer, 2007; Murphy et al., 1991), including prevention (Wells et al., 2006). In this study, *abstinence-oriented ideology of care* was operationalized as a dichotomous variable set = 1 if complete abstinence was reported as the most important treatment goal and *director has advanced educational degree* as set = 1 if director reported having a degree more advanced than a college degree.

Organizational characteristics previously demonstrated to impact service provision in substance abuse treatment units include unit ownership (Ducharme, Mello, Roman, Knudsen, & Johnson, 2007; Olmstead, White, & Sindelar, 2004); methadone maintenance status (Sorenson & Copeland, 2000; Strauss, Astone, Hagan, & Des Jarlais, 2004); affiliation with hospitals or mental health centres (Strauss, Des Jarlais, Astone, & Vassilev, 2003); unit

size and unit location in a nonmetropolitan area. Unit size, operationalized as the number of active clients treated by the unit in the last year, was log-transformed because previous analyses have indicated a non-linear association between unit size and outcomes of interest (Lemak & Alexander, 2001). Unit location in a non-metropolitan area was measured using the Beale urbanicity code, which ranges from 0 (*metropolitan centers with a population of 1 million or greater*) to 9 (*rural areas with fewer than 20,000 residents not adjacent to a metropolitan center*) (Beale, 2003); units were considered to be located in a non-metropolitan area if they were assigned an urbanicity code of 4 or higher.

Analytic strategy

Separate logistic regression analyses were conducted for the dichotomous dependent variables measuring off-site HIV and HCV testing, respectively. A likelihood ratio test indicated that overdispersion was not present in the dependent variable measuring the breadth of other community outreach services; consequently, Poisson regression was identified as the correct model choice for this outcome (Long & Freese, 2006). All analyses used the Huber-White correction to ensure regression coefficients with heteroskedasticity-robust standard errors (Wooldridge, 2006). Finally, Pearson's and phi tests of bivariate correlation followed by tolerance checks (not shown) did not indicate any problematic collinearity among key independent variables. In addition, the mean variance inflation factor (VIF) for all model variables was less than 2.5 (Allison, 1999). However, the percentage of IDUs and the percentage of clients homeless upon entry into treatment were both negatively correlated with unit size (-0.43 and -0.49 , respectively) and had individual VIFs of 3.77 and 3.74 respectively, indicating a loss of precision in estimation for these covariates.

NDATSS developed selection weights to adjust for oversampling of certain types of programs and for survey non-response. Using these weights yielded descriptive statistics with generality to the national population of OSAT units, excluding active military, Veteran's Administration, and correctional facility programs. In the regression models, stratification variables for unit ownership, organizational affiliation, and methadone status accomplished this level of generality.

RESULTS

Descriptive results

Table I provides unimputed and imputed summary descriptive statistics for all model variables. Approximately 47% of OSATs offered off-site HIV testing and 44% of units offered off-site hepatitis testing and/or immunization. On average, OSATs offered only one out of seven possible community outreach services. Separate examination (not shown) of each service indicated that active case finding techniques such as talking with family members, friends, or acquaintance of drug users or talking to drug users on the streets or in places such as crack houses were the most prevalent community outreach activities, followed closely by the distribution of condoms. Community outreach services commonly utilized in needle exchange programs – i.e. exchanging needles, distributing clean needles or bleach solution for cleaning needles – were by far the least common and offered by only 6.5% of units.

On average, directors spent 2.64 h each week engaging in liaison activities with monitoring or licensing organizations, 1.6 h per week on activities with professional or occupational associations, 2.49 h per week consulting with other treatment providers, 1.69 h per week contributing to policymaking at the state or local levels and 2.25 h per week making public presentations in the community.

Multivariate regression results

Results of the final regression models are shown in Table II. Holding other factors equal, director engagement in liaison activities with monitoring or licensing organizations was positively associated with units' odds of offering off-site HIV testing (OR 1.13, $p < 0.05$) and with the breadth of other community outreach services offered (IRR 1.04, $p < 0.05$). Similarly, director activities with professional or occupational associations were positively associated with unit odds of offering both off-site HIV testing (OR 1.39, $p < 0.01$) and hepatitis testing and/or immunizations (OR 1.44, $p < 0.01$). Director time spent making public presentations in the community was significantly associated with the breadth of other community outreach services offered (IRR 1.08, $p < 0.01$), such that every additional hour that directors spent each week making public presentations in the community was associated with an 8% increase in the incidence rate of community outreach services offered by OSATs.

Several covariates also emerged as significant. Having a director who favoured an abstinence ideology of care was negatively associated with the breadth of community outreach services provided (IRR 0.60, $p < 0.01$), i.e., an abstinence ideology reduced the breadth of community outreach services offered by 40%. However, an abstinence ideology of care was also positively associated with units' odds of offering offsite HIV testing (OR 2.91, $p < 0.05$) and hepatitis testing and/or immunizations (OR 3.52, $p < 0.01$). Units whose directors had advanced educational degrees were more likely to provide off-site testing for both HIV and HCV (OR 5.25, $p < 0.01$ for HIV; OR 3.52, $p < 0.01$ for HCV) but did not differ in the breadth of other community outreach services provided.

Private-for-profit ownership was negatively associated with both units' provision of HIV and HCV testing off-site (OR 0.01, $p < 0.01$ for HIV; OR 0.02, $p < 0.01$ for HCV) and with the breadth of other community outreach services provided (IRR 0.56, $p < 0.05$). Methadone maintenance status was positively associated with units' provision of off-site testing (OR 97.41, $p < 0.01$ for HIV; OR 71.93, $p < 0.01$ for HCV) but not significantly associated with provision of other community outreach services. Finally, hospital affiliation did not influence units' odds of providing off-site testing for HIV or HCV, but was negatively associated with the breadth of other community outreach services provided by OSATs (IRR 0.30, $p < 0.01$). Although the percentage of clients who were IDUs and number of clients were negatively associated with each dependent variable, bivariate correlations between these variables and the dependent variables were not significant, indicating that the coefficients in the multiple regressions were likely artefacts of the multicollinearity detected during preliminary analyses rather than true effects.

DISCUSSION

This study examined the impact of directors' boundary spanning activities on OSAT community outreach services, specifically off-site testing for HIV and HCV, active case finding, and harm-reduction interventions such as needle exchange. Three types of boundary spanning behaviours emerged as significant: first, the amount of time directors spent on liaison activities with licensing or monitoring organizations was positively associated with off-site HIV testing as well as with the breadth of other community outreach services provided. Second, the amount of time directors spent with professional and/or occupational associations was positively associated with unit provision of off-site testing for both HIV and HCV. Third, director time making public presentations in the community did not impact unit provision of off-site testing, but was positively associated with OSAT provision of non-testing-related outreach activities such as reaching out to members of high-risk individuals' sexual and social networks to promote testing, counselling, and care, or making bleach and clean needles available to drug users.

The current study findings are consistent with previous research suggesting that external environmental factors affect substance abuse treatment unit behaviour (D'Aunno, Sutton, & Price, 1991). Evaluations conducted by licensing and monitoring organizations serve as important quality signals to health and social service agencies and courts that refer clients to substance abuse treatment (Saufi & Fieldus, 2003), as well as to payers. These entities tend to emphasize prevention; therefore, directors attuned to their preferences may be more likely to devote unit resources to community outreach.

Professional associations also represent an important venue for directors to identify and track macro trends and best practices within the field of substance abuse treatment. Time devoted to these organizations may increase awareness of the increased emphasis on infectious disease testing by federal agencies such as NIH, CDC and SAMHSA (Kresina et al., 2007; SAMHSA, 2010). Involvement in professional associations may also help unit directors identify strategies for providing community outreach, such as grant opportunities. In addition, unit directors who are active in professional associations may have opportunities to share their prevention practices with peers, and thus receive more positive reinforcement for these activities.

Finally, directors who spend more time representing their units within the community may become more aware of local disease prevalence as well as where to focus outreach efforts. Presenting at community events may also help directors identify local partners to support prevention efforts. Community presentations may also facilitate local outreach by destigmatizing behavioural health services.

Several covariates also predicted community outreach. The negative association between directors' abstinence-orientation and unit provision of outreach services such as active case-finding and harm reduction interventions is not surprising, given their ideological conflict with traditional approaches to substance abuse treatment advocated by Alcoholics Anonymous and other 12-step programs. In contrast, directors' abstinence-orientation was positively associated with unit provision of off-site HIV and HCV testing. This finding is

consistent with a recent exploratory study of treatment program administrators within the National Drug Abuse Treatment Clinical Trials Network, which found that almost half of administrators felt that full abstinence from substance use was necessary for patients to succeed in reducing their involvement in high-risk behaviours, but only a very small minority (2%) of program administrators felt that providing medical services such as infectious disease testing would distract clients from focusing on the treatment of their substance abuse disorders (Bini et al., 2011). Efforts to promote the provision of prevention and outreach services among treatment units whose directors have a strong abstinence orientation may therefore be more successful if services are framed within a medical model of care and if they focus on testing and education.

Similarly, the findings that units whose directors have advanced degrees were more likely to offer off-site HIV and HCV testing may reflect greater exposure among these individuals to public health principles and practices. It is possible that continuing education will be an alternative way of promoting public health norms to directors with less formal education. It is also possible, however, that the associations between director degree and likelihood of providing testing in the community reflected slack resources that made it possible both to hire more expensive leadership and to provide uncompensated services.

Previous research suggests that methadone maintenance-treatment units are more likely to provide infectious disease testing and education (Strauss, Astone, Vassilev, Des Jarlais, & Hagan, 2003), but less likely to offer outreach services (Wells et al., 2006). In this study, methadone maintenance-treatment units had significantly greater odds of providing offsite HIV and HCV testing. However, there was no significant difference between methadone maintenance and drug-free treatment units in the provision of other community outreach services. Methadone maintenance-treatment units tend to serve clients with higher prevalence of HIV and viral hepatitis. Particularly with regards to HCV, secondary prevention has been described as more critical in methadone maintenance-treatment units, and primary prevention strategies more useful in drug-free treatment settings (Strauss et al., 2004). The significant differences in off-site HIV and HCV testing between methadone maintenance and drug-free treatment units within our sample suggest the need for increased attention to the provision of these services by drug-free treatment units. In recent years, disease transmission attributable to risky sexual behaviours among drug users has increased, while transmission due to unsafe injection practices have stabilized (Des Jarlais et al., 2007; Lambert, Normand, & Volkow, 2010). This trend suggests the importance of increased prevention and outreach efforts by both drug-free and methadone maintenance-treatment units, as these disease epidemics are not limited to IDUs.

Limitations and future research

Several limitations should be considered when interpreting the study findings. First, the cross-sectional design of the data leaves the direction of causality uncertain. While the current study found director behaviours and attributes to be significantly associated with OSAT provision of community outreach services, it is possible that directors were more likely to obtain these positions if they espoused ideologies of care or possessed professional credentials that were consistent with pressures within units' institutional environments.

Longitudinal study designs will be necessary to fully disentangle these effects. Second, as noted previously, two client case-mix variables and one organizational variable suffered from multicollinearity that limited their interpretation. Post-hoc analyses (not shown) indicated that findings related to the key independent variables were robust even when these covariates were omitted; however, having more detailed information about the extent to which unit service provision reflected client case-mix and/or local community needs would have been useful.

An additional limitation of the current study was the dichotomous nature of several key study variables (i.e. professional credentials, provision of any off-site testing). More granular analysis of how directors' educational training impacts service provision could help identify gaps in current graduate curricula that could be addressed to better promote infectious disease prevention. Similarly, information on not just whether units provided community outreach services but the number of individuals that received them could help identify factors that differentiate units that are actively engaged in prevention from those who adopt services without actively implementing them due to external pressures.

Finally, while nationally representative of the US outpatient treatment system, the data used in this study were collected in 2005 and may not reflect the most recent trends in OSAT service provision. However, the recent recession and corresponding state cutbacks in behavioural health spending (Childrens Bureau, 2011) have made the current analysis increasingly topical. When competition for funding is high, directors tend to engage in more boundary spanning to better position their organizations for survival (Alexander et al., 2008). At the same time, under-reimbursed activities such as prevention now rely more than ever on the commitment of local facility leadership. The most recent available data on environmental constraints experienced by substance abuse treatment units, which was collected prior to the 2008 economic downturn, suggested that funding constraints already prevented many programs from providing hepatitis testing or immunization, despite increasing prevalence of this disease (Bini et al., 2011). Understanding which relationships with external stakeholders are positively associated with OSAT community orientation can help activists and policymakers the most promising venues for encouraging directors to provide such services.

CONCLUSIONS

Although, substance abuse treatment units are heavily influenced by their environments, directors still exercise considerable discretion in the types of services offered. Despite increased emphasis on infectious disease prevention by federal and state agencies, provision of prevention services and particularly community outreach services remains relatively infrequent in the substance abuse treatment sector. Given the staggering societal costs and public health impact of the HIV and HCV epidemics, a better understanding of the factors that influence directors' decision to implement prevention outreach services may be helpful to reducing the transmission of these diseases among substance users in the US

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Table 1

Descriptive statistics.

	Unimputed			Imputed			Min	Max
	Number	Mean (%)	Std Err	Number	Mean (%)	Std Err		
<i>Community outreach services</i>								
HIV counselling and testing within the community	547	47%	-	547	47%	-	0	1
Hepatitis testing or immunization within the community	547	43%	-	547	44%	-	0	1
Breadth of other community outreach services	547	1.14	0.06	547	1.19	0.06	0	7
<i>Director boundary spanning behaviours</i>								
Liaison w/monitoring or licensing orgs (h per week)	547	2.64	0.15	547	2.64	0.15	0	20
Activities w/professional or occupational assoc (h per week)	547	1.60	0.14	547	1.60	0.14	0	21
Consulting with other tx providers (h per week)	547	2.49	0.13	547	2.49	0.13	0	12
Contribute to policymaking at state or local lvl (h per week)	547	1.69	0.09	547	1.69	0.09	0	20
Public presentations in community (h per week)	547	2.25	0.12	547	2.25	0.12	0	15
<i>Client case-mix</i>								
% clients injecting drug users	518	13.14	1.19	547	13.23	1.17	0	100
% clients co-occurring MH and SA	530	45.89	0.97	547	46.60	1.01	3	100
% clients homeless upon entry into treatment	527	11.86	0.95	547	12.16	0.97	0	90
<i>Director attributes</i>								
Favours abstinence ideology	547	80%	-	547	80%	-	0	1
Director has advanced educational degree	547	79%	-	547	80%	-	0	1
<i>Organizational characteristics</i>								
Ownership: private for-profit	547	8%	-	547	8%	-	0	1
Ownership: public	547	34%	-	547	34%	-	0	1
Methadone maintenance	530	8%	-	547	8%	-	0	1
Hospital-affiliated	547	14%	-	547	14%	-	0	1
Mental health centre-affiliated	547	37%	-	547	37%	-	0	1
No. of clients	547	680.81	51.74	547	701.64	0.07	1	7850
Unit located in a non-metro area	547	40%	-	547	40%	-	0	1

Table II

Multivariate regression results.

	Offer HIV counselling and testing off-site			Offer HCV testing or immunizations off-site			Breadth of other community outreach services		
	OR	Std Err	p > z	OR	Std Err	p > z	IRR	Std Err	p > z
	Logistic regression Imputations = 20 Number of obs = 547 Average RVI = 0.0046			Logistic regression Imputations = 20 Number of obs = 547 Average RVI = 0.0553			Poisson regression Imputations = 20 Number of obs = 547 Average RVI = 0.0051		
<i>Director boundary spanning behaviours</i>									
Liaison w/monitoring or licensing orgs (h per week)	1.13	0.06	*	1.06	0.05		1.04	0.02	*
Activities w/professional or occupational assoc (h per week)	1.39	0.12	**	1.44	0.12	**	0.96	0.02	
Consulting with other tx providers (h per week)	1.09	0.07		0.99	0.06		1.04	0.02	
Contribute to policymaking at state or local lvl (h per week)	1.08	0.11		1.06	0.10		1.01	0.02	
Public presentations in community (h per week)	0.95	0.05		1.03	0.05		1.08	0.02	**
<i>Client case-mix</i>									
% clients IDUs	0.95	0.01	**	0.95	0.01	**	0.99	0.00	*
% clients co-occurring MH and SA	0.99	0.01		1.00	0.00		1.00	0.00	
% clients homeless upon entry into treatment	1.02	0.01	*	1.02	0.01	*	1.00	0.01	
<i>Director attributes</i>									
Favours abstinence ideology	2.91	0.89	**	3.52	1.07	**	0.60	0.07	**
Director has advanced degree	5.25	1.89	**	3.52	1.27	**	0.98	0.12	
<i>Organizational characteristics</i>									
Ownership: private for-profit	0.01	0.01	**	0.02	0.02	**	0.56	0.13	*
Ownership: public	1.00	0.26		0.81	0.22		0.97	0.11	
Methodone maintenance	97.41	129.71	**	71.93	87.22	**	0.50	0.22	
Hospital-affiliated	0.83	0.32		1.39	0.53		0.30	0.05	**
Mental health centre-affiliated	1.25	0.32		1.34	0.36		1.15	0.12	
No. of clients (log-transformed)	0.69	0.09	**	0.75	0.10	*	0.83	0.05	**
Unit located in a non-metro area	0.60	0.17		1.06	0.29		1.12	0.11	

Notes:

* p < 0.05;

$\cdot 10^{10} < d$
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