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# STRENGTHS AND LIMITATIONS OF PEER-BASED CO-PRODUCTION: THE CASE OF SUBSTANCE USE DISORDER TREATMENT UNITS IN THE UNITED STATES

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ABSTRACT

In our current era, where private organizations are assuming ever greater responsibility for public service provision, social and health service providers also face increased pressure to engage client and patient perspectives in the service production process. This dissertation investigates how providers co-produce services with vulnerable users, and how those endeavors are associated with service offerings and service utilization in the field of substance use disorder (SUD) treatment units, which serve stigmatized client populations whose voices have traditionally been marginalized. Bringing together the literature on human service organizations from social work, deliberative democracy and co-production from public administration, and patient-centered care from the field of medicine, I theorize that SUD clinics adopt two co-production mechanisms: (1) patient-centered care (i.e., directly collaborating with patients in clinical decision-making), and (2) peer co-production (i.e., hiring staff members with lived experience of addiction as proxies of patients' voice). To test my theory empirically, I use the 2017 National Drug Abuse Treatment System Survey—a nationally representative longitudinal split-panel survey of approximately 700 alcohol and drug use disorder treatment facilities in the United States.

The results show that more than a half of treatment centers across the U.S. implemented either patient-centered care or peer co-production mechanisms to incorporate patient's perspectives into care processes. Residential units were more likely to implement patient-centered care and peer co-production methods compared to outpatient units, possibly due to sufficient time for patient-clinician interactions and the tradition for leveraging peers in these settings, respectively. For-profit units, compared to nonprofit and public clinics, were more likely to adopt both co-production mechanisms, not only to reducing staffing costs, but also to

customize services for individual patients in competitive markets. Besides, clinics were much more likely to practice peer co-production when managers believe in peer co-production potentials among staff with lived experience. Lastly, clinics serving more patients with opioid use disorder patients tend to not practice patient-centered care, and clinics serving a greater proportion of prescription opioid use disorder were less likely to implement peer co-production method—signaling differentiated co-production efforts in the SUD treatment field.

This dissertation provides meaningful but limited evidence of associations (and lack of associations) between co-production efforts and service output patterns. Availabilities of various services offered at clinics were not strongly associated with patient-centered care or peer co-production efforts, but with various organizational factors (such as service modality, unit type, and staff and patient compositions, and revenue sources). In terms of service utilization, practicing patient-centered care was correlated with patients' greater utilizations of various harm reduction and supportive services that support patients' long-term recovery, while peer co-production had only few associations with service utilization patterns. The overall lack of associations may signal that co-production efforts in a service delivery phase might not have strong relationships with service offering patterns. Peer co-production mechanism's negative associations with opioid maintenance therapy availability and lack of associations with utilization of various services signal a potentially critical limitation of peer co-production that staff with lived experience may not serve as good representatives of patients' best interests.

Using a strong research design and a nationally representative dataset, this study provides multiple implications for theory, policy, and practice. The dissertation proposes a framework to conceptualize various co-production models and differentiate them from other service production modes. By testing the framework with the nationally representative data, the dissertation also

suggests possible operations of multiple co-production mechanisms in a service field and encourages future research on conditions for and impacts of various co-production efforts in many health and social service fields. In terms of policy implications, the current dissertation provides important suggestive evidence that collaborative process can be an important way to address the opioid crisis, encouraging policy makers and government officials to emphasize and incentivize co-production efforts at SUD clinics. Regarding implications for practice, the dissertation encourages health and social service organizational managers to think about various ways to co-produce with service users. By uncovering the non-clinical functions of staff with lived experience at SUD clinics, this study encourages managers not only to re-consider the functions of staff members with different backgrounds and experience, but also to nurture collaborative and democratic processes among staff members to recognize each other's unique contributions to the care process.

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# Chapter 1 : UNDERSTANDING USER ENGAGEMENT IN HEALTH AND SOCIAL SERVICE PRODUCTION PROCESSES

Since the government took on greater responsibilities for the lives of citizens after the Great Depression in the 1930s and the War on Poverty in the 1960s, the demands for user involvement in diverse public resource allocation processes have been growing (Gutmann & Thompson, 2004; Roberts, 2015). The calls for greater user engagement gain extra merits when private service providers assumed greater public responsibilities, as a way to ensure responsiveness and effectiveness of essential social and health services (Fung, 2009; McQuarrie, 2013; Milward & Provan, 2003; Roberts, 2015; S. R. Smith & Lipsky, 1995). However, many scholars have observed that social and health service users have very limited opportunities to influence the services they depend on as organizations have become more bureaucratized and professionalized (Benjamin & Campbell, 2015; Hardina, Middleton, Montana, & Simpson, 2006; Marwell, 2007; McQuarrie, 2013; Watkins-Hayes, 2009). Because the lack of democratic process in public service-providing institutions and organizations poses threats to citizenship and service responsiveness, concerned scholars from multiple disciplines have investigated the importance, methods, and tensions of user-provider collaborative processes in diverse policy and service settings (Gerteis, Edgman-Levitan, & Daley, 1993; Hasenfeld, 1987; Nabatchi, 2010; Norcross, 2002; Siegler, 1981).

Co-production has received increasing attention as a way to compensate for diminishing public investment by leveraging civil society resources and improving service responsiveness (J. Alford, 2009). Many aspects of the definition of co-production have been contested, including who should be considered participants (e.g., users, providers, peer providers, governments), levels of co-production (e.g., individual, group, collective), phases of the service production

cycle (e.g., service design, implementation, evaluation), purpose of co-production (i.e., public or private benefits), and nature of user engagement (i.e., voluntary or involuntary participation) (Brandsen & Honingh, 2016; J. L. Brudney & England, 1983; Nabatchi, Sancino, & Sicilia, 2017). However, definitions generally agree on the core characteristic of co-production as an effort to engage users in the service production process.

The literature on co-production yields valuable insights and theories regarding what motivates individuals and organizations to co-produce (or not) and the implications of co-production (Eijk & Steen, 2016; Fledderus, Brandsen, & Honingh, 2015). However, the literature has significant gaps. First, scholars have little systemic understanding of the conditions required for organizations to co-produce services and the outcomes of co-production with a representative sample of an organizational field (Pestoff, Osborne, & Brandsen, 2006). Second, scholars rarely discuss the tensions that may arise between users and providers during the co-production process. Third, the co-production literature has paid little attention to fields serving the needs of highly disadvantaged and stigmatized groups such as the disabled, the homeless, or persons with mental health and substance use disorders, who may not have sufficient opportunities to voice their preferences or to influence organizational processes (Carr, 2009; Hardina et al., 2006).

Using the field of substance use disorder (SUD) clinics as a case, this study (1) proposes a theoretical framework to conceptualize multiple co-production methods, (2) investigates associations between clinics' co-production implementation and various organizational and environmental factors, and (3) explores how co-production practices are related with clinics' service outputs. For this study, I use a nationally representative survey of approximately 700 alcohol and drug abuse treatment facilities in the U.S.—the National Drug Abuse Treatment System Survey (NDATSS, 2016).

This chapter lays out the theoretical bases for the rest of the dissertation by reviewing and contesting multiple literatures relevant to user participation in social and health service production processes. The next section will discuss the lack of and the importance of user engagement in health and social service production processes, mainly drawing from the human service organization and deliberative democracy literature. Next, the chapter examines *how* users can participate in service production processes based on a review of co-production literature. Then, drawing from patient-centered care literature from the field of medicine, I explore provider-user tensions within co-production scenarios in health and social service settings and propose a framework to conceptualize various co-production mechanisms. Lastly, I suggest a theory of *peer co-production* with the literatures of human service organizations, social work, mental health care, and substance use disorder services.

**Lack of user engagement in health and social service organizations**

A growing body of literature points out vulnerable users' limited opportunities for having a voice in service production processes they depend on. In some fields, where a professional-driven model was the norm from the beginning (e.g., health service fields), service users have rarely had the opportunity to engage in organizational decision-making processes (Coulter, 2002; McLean, 2000; Tomes, 2006). In these fields, professional staff members possess technocratic authority over patients, and hierarchically organized decision-making processes have been considered objective and efficient (Molly Cooke, Irby, Sullivan, & Ludmerer, 2006).

Even in some fields that started with high aspiration and promises of user representation in organizational processes, service users have had limited authority over the decision-making processes due to multiple environmental changes (Hardina et al., 2006; Hasenfeld, 1987; Marwell, 2007; Reisch & Andrews, 2001; Watkins-Hayes, 2011). Throughout the 20$^{th}$ century,

organizations with civil society origins increased their reliance on external institutional funding—relatively stable and sizable revenue sources compared with local private contributions. With greater dependence, many service organizations were incentivized to adjust their priorities and operations to correspond to funders' preferences and prescribed programs, while reducing their attention to the opinions of local users and community members (Benjamin, 2008; S. R. Smith & Lipsky, 1995). As the economic value-privileging paradigm (i.e., New Public Management) emerged as an organizing principle for the organizations producing contracted public services, organizations with voluntary civil origins were pressured to bureaucratize and to reduce resource intensive and immeasurable activities, such as democratic engagement with vulnerable service users, that do not add economic value (Eikenberry & Kluver, 2004; Hood, 1995; McQuarrie, 2013). The trend toward professionalization—which foregrounds technical expertise and scientific understanding—also under-valued service users' private and contextual knowledge and experience, and organizations replaced lay volunteers and paraprofessionals with more educated and specialized workforces (Molly Cooke et al., 2006; Reisch & Andrews, 2001; Specht & Courtney, 1994).

The lack of user engagement in the health and social service production process is concerning because users' participation has a growing importance in devolved and privatized welfare states, where local governments coordinate networks of public and private actors to ensure efficiency and accountability of privatized services (Milward & Provan, 2003). Privatization can yield more efficient and accountable solutions for services—such as waste and recycling collection services—that a contract can be specified, outcomes are easy to measure, and sufficient market competition exists (Donahue, 1989). However, social and health services often do not satisfy those criteria. Service providers often strive to satisfy users' complex and

multiple goals and objectives beyond the contracted services (Hasenfeld, 2010b; Koppell, 2005). The nature of technologies that these providers are using is often indeterminate, and service outcomes are measured using subjective and moral criteria over a long period (Sandfort, 1999). The level of competition varies based on geography and target population, and competition is almost non-existent in many fields serving marginalized populations (Kissane, 2010; Schlesinger, Dorwart, & Pulice, 1986).

Thus, whether locally contracted public services and resources are responding to the needs of users remains an important question. Despite the innate difficulty of prescribing social and health service contracts, many governments possess limited capacity to manage and monitor the quality and responsiveness of contracted services (Van Slyke, 2003). Instead, many local governments form collaborative governance entities to leverage service providers' capacity to ensure efficient and effective administration of public resources (Ansell & Gash, 2008; K. Emerson, Nabatchi, & Balogh, 2012). However, these inter-organizational efforts may not sufficiently resolve the issue of responsiveness.

In many collaborative governance efforts, end-service users are still significantly removed from decision-making processes and have limited opportunities to voice their concerns. Instead, local service providers and organizational leaders are often invited to speak or work with service providers on behalf of the communities and clients they serve. However, organizations' service priorities may differ from the priorities of the users and communities they serve. For instance, with regard to multiple service needs of urban low-income communities (e.g., assistance with unemployment, housing, and crime prevention), community organization managers may disagree with local residents on the short-term and long-term goals (Kissane & Gingerich, 2004). Furthermore, when providers participate in a collaborative governance

process, they sometimes foreground organizational concerns and interests rather than those of service users. For instance, although many homeless-servicing agencies know that users have substantial needs for emergency shelter and temporary housing services, they have reduced those units and advocated for and expanded availability of permanent housing units, following private and public funding opportunities (Mosley, 2012). Thus, collaborative governance efforts should be complemented with user engagement to assure those unelected (or self-appointed) representatives' legitimacy, accountability, and responsiveness, which need to be constantly checked (Montanaro, 2012; Mosley & Grogan, 2013).

User involvement also offers an invaluable entry point to their private information. Many social and health service fields recognize the impacts of external conditions on users' problems—such as poverty, limited access to health care, education and employment opportunities, availability of affordable housing, and crime (Gerteis et al., 1993; Hasenfeld, 2010b; U.S. Department of Health and Human Services, 2017). Despite the significant advances in scientific understanding of social and health problems, the effectiveness of evidence-based interventions is often conditioned by the social, economic, and physical environments in which service users are situated (Krumeich & Meershoek, 2014; Link & Phelan, 1995). Hence, for social and health service organizations, user engagement is a useful vehicle for eliciting subjective information to adjust population-level solutions to local circumstances. Besides, solutions that are more realistic and mutually consented may induce users' greater adherence and improved outcomes, particularly important for providers under the institutional environment emphasizing performance (Stewart et al., 1995).

In summary, health and social service organizations may offer limited opportunities for users to participate in organizational processes as organizations grow, become professionalized,

and rely more on government funding (Cnaan, 1991). This is a very concerning because user engagement is a structurally and morally imperative mechanism. When private actors assume greater control over public resource allocation and responsibility for public service provision, user engagement is an important way to improve the health and social service systems not just by incorporating concerns and preferences of end users, but also by ensuring responsive and more efficient public resource allocation (J. Alford, 2009; Kettl, 2006; Roberts, 2015).

**Growing demands for deliberative democratic process**

Literature on deliberative democracy provides a valuable starting point for envisioning what to expect from democratic and participatory user engagement in social and health service organizational settings. Deliberative democracy is a dynamic reason-giving process that is accessible to all concerned stakeholders and is aimed at producing a binding decision for a specified period (Gutmann & Thompson, 2004). The literature characterizes citizens as collaborators and co-producers, taking active roles in design and implementation of policy and diverse services, rather than as passive consumers or clients (Denhardt & Denhardt, 2000; Fung, 2009). Scholars argue that through intentional engagement with citizens the deliberative process promotes mutual trust among participants and legitimizes collective decisions, potentially addressing multiple and interdependent issues of modern governance, such as democratic and citizenship deficits (Gutmann & Thompson, 2004; Nabatchi, 2010). Citizens and organizations can learn about each other's situations and needs and develop mutually agreeable solutions (Mansbridge, 1980). At the same time, the deliberative and empowered engagement process can activate users politically by educating them about the service delivery process, raising political efficacy, and nurturing civil skills (Maeve Cooke, 2000; Pateman, 1970; Roberts, 2015).

Recognizing the importance of users' roles in diverse phases of a public service production cycle, governments and service organizations often involve citizens and service users in decision-making processes (Gastil & Levine, 2005; Nabatchi, 2010; Roberts, 2015). The history of such engagement dates back to the mid-20th century. Most famously, the Economic Opportunity Act of 1964 funded diverse Community Action Programs and called for "maximum feasible participation" of residents and representatives from deprived communities (Morone, 1991). Community Action Programs were designed to empower and develop communities through resident engagement and participation in service design and implementation processes through federal government's direct support (Rubin, 1969). While most Community Action Programs were dissolved by the early '70s, the tradition of citizen and service user engagement survived (Naples, 1998). Federal programs are required to have citizen advisory boards under the Federal Advisory Committee Act of 1972, and many publicly funded sub-national-level programs require users' representation in organizational and institutional governance structures (Roberts, 2015).

For instance, community health centers—vital social safety net agencies providing health and social services for millions of uninsured and under-insured in the U.S.—are required to have a "consumer majority governing board" structure in order to qualify for federal grants (Public Health Service Act, 2010). The patient board was originally projected as a channel for understanding community needs and gaining greater legitimacy for health centers operating within poor communities (Sardell, 1988). Many mental health treatment organizations also invite patients and their family members to serve on their advisory board and to take active roles in task forces to voice their preferences in determining organizational process and program offerings (Rogers, Chamberlin, Ellison, & Crean, 1997). Regional homeless service coordinating networks

(e.g., Continuum of Care) are required to involve currently or previously homeless individuals in major decision-making processes (HUD, 2009).

Deliberative democratic process has great potential, not only for mitigating representational gaps in public administration, but also for promoting organizational responsiveness in service provision. However, the utility of the literature comes short, when theorizing and analyzing the processes within service organizations. First, the deliberative democracy process focuses on the participation and influence of *citizens* (i.e., collective members of a state), which may or may not include the actual recipients of services (Gutmann & Thompson, 2004; Roberts, 2015). Due to the potential for biased opportunities for representation and influence, who participate and how they participate are salient topics. When *citizens* are invited to participate, not all *users* will have same opportunities to engage. Involvement in organizational process requires participants' slack resources (e.g., disposable time and income) and certain levels of administrative expertise and civil skills, which are often disproportionately concentrated. Additionally, citizens do not possess users' unique knowledge of how services can be improved. Participatory process often involves *professionalized citizens*, which make the process similar to a collaborative governance process. Although such citizens can speak about field-level changes and implications, their perspectives may be distant from beneficiaries' experiences or concerns (Montanaro, 2012; Mosley & Grogan, 2013).

Second, the deliberative democracy process is often applied to diverse stages of political processes, including problem definition, policymaking, and program implementation phases (Gutmann & Thompson, 2004; Roberts, 2015). Despite its applicability, the deliberative democracy literature does not help scholarly efforts to theorize and investigate the experiences and consequences of deliberative process within organizational settings where services are

delivered. Third, deliberative democracy scholars have paid limited attention to the democratic process within private service organizations (J. Alford, 2009; Fung, 2009; Gutmann & Thompson, 2004; Roberts, 2015). In the new governance era, where the private sector implements and produces the majority of social and health services on behalf of the state, private service organizations are important venues deserving special attention (S. R. Smith & Lipsky, 1995). Due to the limitations of the literature on deliberative democracy in explaining service providers' efforts to engage users in service decision-making processes, an alternative theoretical foundation has received increasing attention: co-production.

**Collaborative and deliberative process within organizations: Co-production**

Co-production was first introduced in the 1970s and 1980s as a vehicle to compensate for diminishing public investment by leveraging civil society resources and capacities (V. Ostrom & Ostrom, 1971; Parks et al., 1981). In a time of economic downturn and government cutbacks, service organizations were asked to "do more and better with less" (J. L. Brudney & England, 1983). Market value-driven reforms expected citizens and users to participate in public service production processes and share responsibility for the consequences, such as the costs and quality of public services they used (Levine & Fisher, 1984). The early focus on the instrumental values of co-production was partially balanced with democratic concerns when the concept gained popularity in the 2000s. As in the 1970s and 1980s, co-production projected multiple pragmatic benefits, including improvement in organizational efficiency and outcomes and user empowerment and satisfaction (Osborne, 1993). The Great Recession stimulated the need to draw on the capacity of civil society and service users, and the new governance structure promoted network-based public service production requiring collaboration between public and private actors, including service users (Nabatchi et al., 2017). In addition, at the time of declining

civic engagement, co-production was perceived as a way to restore accountability, transparency, and responsiveness in the public service production process, leading to democratization of governance (Gastil & Levine, 2005; Nabatchi, 2010; E. Ostrom, 1996).

**Defining co-production.** Despite the growing popularity of and interest in co-production, scholars define and operationalize the concept differently and many aspects of the definition are still up for debate [see Brandsen & Honingh (2016) and Nabatchi et al (2017) for further discussion]. Fortunately, some degree of consensus has been achieved in defining co-production as *an intra-organizational process between professional agents of organizations and lay actors in diverse phases of the public service production process* (J. Alford, 2009; Brandsen & Honingh, 2016; J. L. Brudney & England, 1983; Nabatchi et al., 2017; V. Ostrom & Ostrom, 1971; Parks et al., 1981; Pestoff et al., 2006). The two definitions of co-production offered by Brandsen and Honingh (2016) and Nabatchi, Sancino, and Siocilia (2017) not only demonstrate contested conceptualization efforts within the literature, but also highlight divergent perspectives on two important attributes of co-production: (1) whether collective-level engagement should be considered as co-production, and (2) whether involuntarily participation can be classified as co-production.

Nabatchi, Sancino, and Siocilia (2017) offer a comprehensive definition of co-production as follows:

> an umbrella term that captures a wide variety of activities that can occur in any phase of the public service cycle and in which state and lay actors work together to produce benefits. We noted that (1) state actors need not be government employees but must work directly or indirectly on behalf of the state on a state-related or state-sanctioned activity, and (2) lay actors may serve separately or simultaneously (in differing proportions

> depending on the situation) as citizens, clients, and/or customers. We also explained that coproduction (3) can vary by the number of actors and size; (4) produces personal and/or social benefits that may be independent, overlapping, or have spillover effects; (5) must be voluntary for lay actors; and (6) excludes interorganizational arrangements that do not involve lay actors. (p.7-8)

Brandsen and Honingh (2016) offer a relatively narrow definition of co-production to facilitate the development of a promising and salient niche for the newly emerging literature. They define co-production as "a relationship between a paid employee of an organization and (groups of) individual citizens that requires a direct and active contribution from these citizens to the work of the organization" (Brandsen & Honingh, 2016).

The expanded definition offered by Nabatchi, Sancino, and Siocilia (2017) validates the utility of the co-production concept and principles in various phases of the public administration process, by conceptualizing co-production as occurring on individual, group, and collective levels. One of the contested aspects of the above definition is an inclusion of collective level activities, where lay actors are characterized as citizens. The concept of collective level co-production is close to the idea of deliberative democracy (or citizen participation), which raises the issue of user representation. For instance, community health centers serve primarily low-income patients with income less than 200% of the federal poverty line. However, a significant number of patients (about 10% of all patients) at community health centers pay fees in full (Shin, Sharac, Barber, Rosenbaum, & Paradise, 2015). Unfortunately, against the original intent of a consumer majority governing board, these "non-typical" patients have disproportionately greater chances of serving on the board and are often recruited by managers to become patients after being identified as potential board members (Wright, 2013). Furthermore, even if health centers

recruit low-income patients to serve on the board, such patients are sometimes not perceived as equal decision makers, but rather as information providers with limited authority and power to influence the decision-making process dominated by experts, administrators, and full-paying patients (Wright, 2013).

The distance or delay between user engagement and service provision also imposes challenges for the collective-level coproduction process to realize meaningful changes in the services that users experience. Even if a consensus is reached to implement changes to accommodate users' demands, the momentum can be lost in the process of implementing those changes. Many social and health service organizations are subject to multiple demands from diverse external stakeholders—including funders, regulators, and peer organizations—which may contradict with users' interests and needs and push managers to reconsider the agreed upon adjustments (Hasenfeld, 2010b; Koppell, 2005; S. R. Smith & Lipsky, 1995). Additionally, by exercising discretion over resource allocation and service delivery, front-line staff members create varying service experiences that may not reflect the individual needs of users (Lipsky, 1980). Thus, extra stages between the venues of collective-level coproduction and actualization may introduce barriers for marginalized users with limited knowledge, efficacy, or communication skills to demand desired and available services (Fledderus et al., 2015).

Contrast to Nabatchi, Sancino, and Siocilia (2017), Brandsen and Honingh (2016) try to constrain analysis to the individual level (or group-level at the most) and limit laypersons' location within the organizational boundary. Thus, Brandsen and Honingh's a narrow definition not only provides a focal point for scholars to advance the literature, but also distinguishes co-production from other literatures promoting democratic process within public administration. One of the aspects of this definition that is critiqued is the inclusion of involuntary participation

as co-production. Many early co-production scholars conceptualize co-production as an unrecognized or unlabeled ordinary state in diverse service production settings (e.g., students attend classes and patients come to appointments)(J. Alford, 2009). Brandsen and Honingh (2016) also consider users' unintentional or coerced engagement as co-production as long as their participation allows organizations to achieve intended social benefits efficiently. However, such conceptualization does not align with the democratic promises behind co-production (J. L. Brudney & England, 1983; Gastil & Levine, 2005; Nabatchi et al., 2017). Co-production literature often conceptualizes lay actors as *experts* with regard to their experience and contexts, and expect their *active* participation in the production of services they benefit from (J. Alford, 2009; Brandsen & Honingh, 2016; J. L. Brudney & England, 1983; Pestoff et al., 2006). However, the expectation of laypersons' energetic engagement contradicts the compulsory engagement of users. Especially in the social and health service settings, where service providers often target behavioral changes among users, service users' voluntary cooperation and collaboration are critical to achieving the intended benefits of co-production activities (Whitaker, 1980).

In summary, although there are certain degrees of agreement, co-production still lacks a clear definition. Among many contested aspects of its definition, levels of co-production and lay actors' motives are particularly relevant to this study. Collective level co-production may result in biased representation opportunities and unequal end-service experiences based on user characteristics and capabilities. Involuntary co-production may not satisfy the basic assumptions of co-production. Largely borrowing from generally agreed upon aspects of the definition and specifying co-production level and voluntary participation components, the term co-production is operationalized for the rest of this dissertation as follows:

Co-production is a deliberatively collaborative intra-organizational process between employees of a service organization and affected lay actors—who are engaging in diverse phases of service production processes with a capacity to influence the end-services they benefit from—with the goal of providing more responsive and effective services.

**Gaps in knowledge.** Despite the lack of clear definition, scholars have advanced our understanding of co-production dramatically over the last few decades. Primarily through case studies of successful examples of co-production, scholars have investigated enabling conditions (e.g., policy mandates and communication technology), roles and motivation of lay and organizational participants (e.g., volunteer, staff, and managers), and soft outcomes (e.g., trust and empowerment) (Bovaird, 2007; Pestoff et al., 2006). However, literature on co-production exhibits significant gaps in quantitative evidence to support conceptual theories and findings from "small *n*" studies. Although the literature employs innovative approaches, the subjects of research are often limited to individual-level factors and conditions (O'Brien, Offenhuber, Baldwin-Philippi, Sands, & Gordon, 2017; Riccucci, Van Ryzin, & Li, 2016). Thus, systemic and rigorous quantitative research with an organization's field representative sample could significantly advance co-production literature.

Another crucial gap in the literature is the lack of discussion on the tension between lay actors and employees of service organizations. The literature often focuses too much on the outcomes and benefits of co-production, with less attention to the processes and challenges that hinder collaborative intra-organizational processes. Understanding the tension between co-producers is particularly important in efforts to investigate the co-production process in social and health service fields. In these fields, professionalized staff attend to the complex problems of lay service users, who are often vulnerable and stigmatized. Scholars often characterize health

and social organizations' inclusion of users in organizational processes as tokenized ceremonial practices without substantive collaboration or allocation of decision-making authority (Carr, 2009; Hardina et al., 2006; Meyer & Rowan, 1977). The engagement of users is often a nominal process, fulfilling user representation requirements and legitimatizing the organization's decisions. Co-production literature has not paid enough attention to this innate power imbalance between professional service providers and lay users, which may distort the reality of co-production. Fortunately, many clinically-oriented social and health service fields (e.g., medicine, psychology, social work) have made significant advancement on the conceptualization of this tension (Hasenfeld, 1987; Norcross, 2002; Siegler, 1981).

**Conceptualizing co-production through the lens of patient-centered care**

In the medical service field, the relationship between clinicians and patients has been a major topic of interest. Originally, the field started with a professional clinician-driven care model. However, the field gradually departed from this paternalistic model in the late 20$^{th}$ century, and emphasized patients' agency in clinical decision-making processes. Because both clinician- and patient-driven care poses both opportunities and risks, an alternative approach—*patient-centered care*—emerged by balancing the clinician's authority and the patient's autonomy and became a normative practice mode in many medically oriented service fields (Berwick, 2009; D. Brudney & Lantos, 2011; Gerteis et al., 1993). The literature on patient-centered care highlights tensions in various domains within various service production modes. Based on the location of decision-making authority, three primary types of service provider-user relationships emerge with different values, motives, legitimacy base, strengths and weaknesses: provider-driven service production, user-driven co-production and traditional co-production modes (see Table 1.1). Many scholars use patient-centered care as a classic example of

traditional co-production (Brandsen & Honingh, 2016; Nabatchi et al., 2017), and I will use these terms interchangeably in the remainder of this dissertation.

**Table 1.1 Positioning co-production**

| Domains | Provider-driven service production | Traditional co-production (Patient-centered care) | User-driven co-production |
|---|---|---|---|
| **Location of authority** | • Service providers | • Providers and users | • Providers and users |
| **Values / Motives** | • Beneficence (user's best interest)<br>• Providing effective (ethical) services | • Deliverance, negotiation, transparency<br>• Providing effective and responsive services | • Preserving user's autonomy and agency<br>• Providing responsive (legitimate) services |
| **Legitimacy base** | • Technical expertise (Scientific population-level evidence) | • Leveraging both technical and experiential expertise | • Experiential and contextual expertise (Lived experience) |
| **Nature of relationship** | • Directive | • Collaborative<br>• Mutual dependency | • Collaborative but directive |
| **Limitations/ requirements** | • Fail to incorporate user's preference and contextual information<br>• Require user's adherence | • Time/resource constraints<br>• Require mutual trust and communication channels | • Information burden on users<br>• Require provider's adherence |

**Provider-driven service production mode.** Until the late 20th century, provider-driven care was the norm in the highly professionalized medical service field (Quill & Brody, 1996). Technical expertise and specialized training provided a strong base for the legitimacy of professional clinicians exercising their authority in the care process. Under the professional clinician-driven top-down approach, the nature of the patient-clinician relationship was directive. With beneficent intent, clinicians—who "know what is best for the patient"—assumed major decision-making authority and responsibility in care processes based on technical knowledge about a disease and prescribed solutions (e.g., medications or treatment plans) (Parsons, 1951)..Users are expected to comply with the provider's decisions with little influence over the services they receive (Atkins & Ersser, 2008). The emphasis on evidence-based practices in many social and health service fields resonates with provider-driven service production. For instance, in many mental health service clinics, licensed clinicians define patients' problems based on the diagnostic criteria outlined in the Diagnostic and Statistical Manual of Mental Disorders, and determine treatment plans accordingly.

Professional-driven service production can be not only an effective approach for achieving specifically targeted outcomes (i.e., treating disease and curing patients), but also an ethical approach, in terms of applying scientifically proven methods to users' cases (Gerteis et al., 1993). However, clinician-driven care often fails to incorporate service users' contextual knowledge into care decisions (Coulter, 2002). As users are expected to comply as a passive service recipient, they may be coerced into care programs that they themselves or their caregivers are opposed to (Atkins & Ersser, 2008). Even if clinicians are knowledgeable about the nature and consequences of treatments, they cannot predict or control how service users and their caregivers will experience and cope with those procedures and outcomes. In many social

and health service fields, the relationships between technology and outcomes are indeterminate, as diverse users respond to services differently and multiple socio-political and environmental factors influence outcomes (Hasenfeld, 2010b). Particularly, when treatment's success is largely depended on users' adherence to prescribed directions and solutions, the effectiveness of this provider-driven service model is questionable without meaningful participation of users and incorporation of their preferences and concerns (i.e., social and physical determinants of problems) (Krumeich & Meershoek, 2014; Link & Phelan, 1995). Without better understanding of a users' concerns and context, medical experts' decisions are also prone to bias based on their beliefs about the characteristics and background of service users (Adler & Newman, 2002; Burstin, Lipsitz, & Brennan, 1992). In other words, provider-driven care may ensure technical quality of care, but fails to satisfy the experiential quality of care, which can only be assessed by the user (Berwick, 2009). While the provider-driven service model's effectiveness and legitimacy are widely debated, it is still prevalent in many social and health service fields, including mental health and substance use disorder treatment (Pescosolido, Gardner, & Lubell, 1998; Swartz, Swanson, & Hannon, 2003; Tanenbaum, 2005).

**User-driven co-production mode.** Recognizing health care providers' failure to incorporate patients' preferences and knowledge, a new model emerged emphasizing patients' autonomy and control over care decisions (Beauchamp & Mccullough, 1984; Coulter, 2002; Quill & Brody, 1996). Responsive service provision is a primary goal of the user-driven service production mode with an emphasis on Kant's (1996) notion of agency—i.e., humans are capable of making a choice independent of their desires. Experiential and contextual knowledge of the problem provide a legitimate argument for users to hold major decision-making authority in this mode. Supporters of user-driven service provision argue that competent users' decisions should

be respected in care decision-making processes, and even granted greater authority than providers' decisions (Beauchamp & Mccullough, 1984; Jennings, Callahan, & Caplan, 1988).

Only a small fraction of social and health service fields—mostly membership-based (e.g., cooperatives) or self-help organizations—follow the user-driven model. For instance, in the field of mental health, "consumer-operated services" that offer a limited scope of services (e.g., non-medical and peer-support services) emerged as a care model alternative to traditional provider-driven clinics (Substance Abuse and Mental Health Services Administration, 2011). In many consumer-operated mental health service organizations, users are often encouraged to define their own needs and providers are expected to accommodate users' requests as organizational and program structure permit (Doughty & Tse, 2011; Goldstrom et al., 2006). Even under an environment promoting economic values (i.e., efficacy, standardization, and measurement), many staff members of these clinics strive to preserve patient's autonomy and agency by decoupling their practices (Spitzmueller, 2018).

In the user-driven co-production mode, the user-provider relationship is directive, but also collaborative. The primary roles of the provider are to provide necessary information about current conditions and potential consequences in a neutral manner and to implement the users' preferred options (Berwick, 2009; D. Brudney & Lantos, 2011; Coulter, 2002). Besides, purely user-driven service production efforts may not exist in reality. While users express specific service needs and demand the provider's cooperation and provision of congruent services, users still rely on providers' provision of user-preferred services and self-help group participants need to follow rigid guidelines set by the programs.

Despite the possibility of preserving user's autonomy and providing responsive services, users have to bear the burden of collecting and digesting information in this service mode, which

can be an overwhelming process and often vulnerable to biases (Quill & Brody, 1996). More importantly, simply subscribing to the user's choice without questioning their intent and/or considering their larger social and ideological context can lead to abandonment of service provider's principle of beneficence (D. Brudney & Lantos, 2011). Particularly when users request a procedure that could be harmful or ineffective given the patient's condition, providers can face the dilemma of providing legitimate/responsive care (i.e., care congruent with the patient's will) or ethical/effective care (i.e., evidence-based practice) and may deviate from patient's proposed set of services. For instance, when patients with substance use disorder persistently ask for group therapy after multiple episodes of relapses, clinicians may want to learn about patients' concerns and circumstances and suggest alternative and/or additional services—such as medication-assisted treatment or harm reduction services—to help patients.

**Traditional co-production mode.** Patient-centered care—a prime example of traditional co-production—has received increasing attention as a vehicle for both resolving the limitations and maintaining the benefits of or provider-driven service production and user-driven co-production models. Patient-centered care (or traditional co-production mode) occupies a middle ground between earlier two service modes and differ from them in multiple ways. First, traditional co-production mode starts with the recognition that users and providers they possess expertise and authority in different realms (Charles, Gafni, & Whelan, 1997; Gerteis et al., 1993). In the case of patient-centered care, the professional clinician possesses technical expertise and authority, while the patient has private knowledge of and authority over their body. When the professional's clinical understanding and the patient's private knowledge are combined, a more effective and realistic solution can emerge (Berwick, 2009). Furthermore,

when users share the responsibility for making decisions, they are more likely to adhere to service plans voluntarily (Stewart et al., 1995).

Second, because both users and providers possess important and unique expertise and authority in solving users' complex problems, traditional co-production mode emphasizes a collaborative relationship between the two actors (Epstein & Street, 2011; Stewart, 2001). Under the patient-centered care mode, clinicians invite patients into the clinical reasoning process and facilitate patients' informed decision-making by providing information and answering questions (e.g., sharing available treatment options and costs/risks associated with different choices). In exchange, patients are encouraged to actively engage in clinical decision-making processes and share their non-clinical (e.g., behavioral and environmental) history and preferences with clinicians.

Third, with a better understanding of each other's positions and relevant factors influencing their concerns and preferences, users and providers are expected to find mutually agreeable solutions (Barry & Edgman-Levitan, 2012). Rather than suppressing the expertise and authority of one another, users and providers share responsibility and authority in service decision-making processes, which involves deliberative negotiations and persuasions (Robinson, Callister, Berry, & Dearing, 2008). Ultimately, patient-centered care (or traditional co-production mode) promotes the clinician's efforts to understand the patient's long-term goals and values (D. Brudney & Lantos, 2011). When there is a gap between the patient's preference and the clinician's professional opinion, the patient's beliefs and values become important references for the clinician to judge whether the patient's preference authentically reflects the patient's value systems and will thus produce long-term benefit.

In sum, traditional co-production mode emphasizes both user and provider participants to assume mutual dependency and voluntarily engage in deliberative and collaborative interactions. Beyond this ideal model, a wide spectrum of co-production exists in which the degrees of authority that providers and users share vary depending on the problems they are solving and diverse environmental, organizational, and user conditions. For instance, at a nursing home or an oncologist's office, providers are often willing to learn and incorporate the values and preferences of motivated users (and their caregivers) in making end-of-life decisions (Heide et al., 2003; Teno, Casey, Welch, & Edgman-Levitan, 2001). In the field of special education, teachers collaborate with parents on determining individualized treatment plans based on comprehensive assessment of students' needs and progress (Burke, 2013; Weatherley & Lipsky, 1977). In both cases, service users and providers trust each other's best intent, and make decisions by sharing inputs in a collaborative and deliberative manner.

While traditional co-production mode offers a conceptually attractive solution, multiple questions remain regarding its feasibility and effectiveness. First, traditional co-production is a time and resource intensive practice mode, requiring the investments and commitments of both providers and users. Practicing collaborative process for potentially long periods might be challenging without significant investments and intentional reconfiguration of user-provider encounter structures (Gerteis et al., 1993; Tai-Seale, McGuire, & Zhang, 2007). Besides, users may not have the will, resources, and ability to participate and engage in the service decision-making process (Burroughs, Davies, Cira, & Dunagan, 1999).

Second, traditional co-production can be another form of paternalistic solution that may restrict the user's autonomy (D. Brudney & Lantos, 2011). This form of weak paternalism is a widely debated issue, exemplified by debates about whether providers should coerce users with

mental illnesses or substance use disorders to accept treatment, possibly discrediting the user's ability to reason or their capacity for agency (Breeze, 1998; Conly, 2012).

Third, sharing or redistributing power and responsibility between provider and user is a tall order. Ideally, the authority relationship needs to be a dynamic process, "constantly negotiated and renegotiated between patient and professional in medical consultations" (Atkins & Ersser, 2008). However, providers are still subjects of strong institutional pressures to behave as "(professional) experts" and to subscribe to the scientific paradigm, despite the growing awareness of the importance of user's autonomy and various socio-economic determinants of user outcomes. In particular, the emphasis on effectiveness and safety may discourage providers from sharing decision-making power due to the fear that the user may demand treatment via a practice with weak evidence (Berwick, 2009).

Lastly, achieving a collaborative relationship can be challenging in other service fields, where mutual distrust between providers and users is pervasive. In many fields serving vulnerable and stigmatized individuals (e.g., mental health hospitals, homeless shelters, substance use disorder treatment centers), both users and providers are mutually concerned about how to approach and collaborate with each other (Lloyd, 2013; Merrill, Rhodes, Deyo, Marlatt, & Bradley, 2002). Asymmetric power imbalances between users and providers may aggravate the situation. Based on the previous experience of a users' lack of commitment to an agreed upon plans or organizational rules, providers may discredit the legitimacy of a user's claims and prefer to exercise their technocratic authority. Users may perceive such approaches as stigmatizing, manipulative, and coercive. Thus, the distrust prevents collaborative relationship building. To facilitate the collaborative process, such service fields may need a supplementary or an alternative mechanism that can broker information and trust between users and providers. To

understand how a field with low-level of mutual service user-provider trust can co-produce, this study uses the substance use disorder treatment field as a case—one of the most stigmatized and marginalized group serving field where patients' opportunities to engage and/or voice their preferences might be limited (Carr, 2009; Corrigan, Kuwabara, & O'Shaughnessy, 2009).

**Co-production at substance use disorder treatment centers**

Collaborative service production appeals to both substance use disorder (SUD) treatment service users and providers, but it is difficult to pursue for multiple reasons. Users desire responsive services to satisfy multifaceted and complex SUD treatment and other service needs. However, many SUD service users have low expectations of having any real control over service decisions, as they are often discouraged from raising their voice in the service design and delivery processes in many clinical settings (Carr, 2011; Hardina et al., 2006). SUD patients are often perceived as untrustworthy and manipulative individuals with limited capacity to contribute (Corrigan et al., 2009). Thus, although service providers and clinicians—pressured to produce more relevant and cost effective services by multiple stakeholders—recognize the need for incorporating users' contextual and subjective information into care decisions, collaborating with SUD patients can be challenging and sometimes perceived as "unprofessional" (Carey, 1996; Carr, 2011; Lloyd, 2013). In such situations, staff members with SUD histories are often uniquely situated as brokers to mediate and translate professional clinicians' and service users' different perspectives, knowledge, and preferences (Aldrich & Whetten, 1981).

**Staff with lived experiences of substance use disorders.** The considerable presence of staff members with lived experience of addiction is embedded in the development of the SUD field. Until the mid-20th century, mutual support groups were the primary SUD treatment service mode in the U.S. (White, 2014). Due to the lack of other service options, individuals with SUD

gathered to support each other's recovery and to encourage peers. In the mid-20th century, Alcoholics Anonymous gained national popularity and provided an influential foundation for the SUD treatment field's culture of valuing individuals' first-hand experiences of addiction. Mutual support group organizers strived to nurture voluntary environments in which support group participants co-produced services by sharing their struggles to stay clean, mentoring new members, and motivating peers—a tradition that still resonates with current mutual support groups in the U.S. (Humphreys et al., 2004).

In the 1960s and 1970s, the SUD field experienced major environmental changes that influenced the presence of service providers with addiction history in the SUD treatment field (White, 2014). Following government's increased spending on addiction treatment and subsequent entry of medical service providers into the SUD field, treatment centers were expected to professionalize their workforce. Multiple professional groups challenged the technical authority of lay counselors with addiction histories, and many insurance companies refused to reimburse the services provided by unlicensed clinicians (Hill, 1985; White, 2014). Because many staff members with lived experience failed to satisfy or update licensure requirements, their presence has declined and more educated and licensed non-recovering clinicians have entered the field.

Even in the increasingly professionalized SUD field, staff members with addiction histories are generally thought to add unique value to services. Beyond providing clinical services equally effective as those provided by professional counselors without addiction histories, recovering staff's first-hand experience and knowledge of the physiology, psychology, and culture of addiction are highly valued assets, granting them authority as "subject matter experts" (Argeriou & Manohar, 1978; Blum & Roman, 1985; Humphreys, Noke, & Moos,

1996). Using their contextual expertise, staff with addiction experiences can fill other staff's informational gaps and enrich their sensitivity to SUD patients' circumstances and preferences. Staff with lived experience of SUD can provide unique social and emotional support as well, complementing technical treatment services offered in SUD treatment clinics. As people who have "been there before", staff with SUD experience can relate with patients more easily based on their shared experience of addiction and serve as motivational role models. Patients may also prefer working with staff with lived experience and trust them more, compared with clinicians without addiction histories (Olmstead, Johnson, Roman, & Sindelar, 2007).

**Peer co-production.** I theorize that staff with lived experience of SUD can facilitate co-production by leveraging their unique positions and capacities in the SUD field when there is mutual distrust and power imbalance between service providers and users. I refer to this strategy as *peer co-production* (see an updated theoretical frame in Table 1.2. A new "peer co-production" column is added between traditional co-production and user-driven co-production modes).

**Table 1.2 Locating peer co-production**

| Domains | Provider-driven service production | Traditional co-production (Patient-centered care) | Peer co-production | User-driven co-production |
|---|---|---|---|---|
| **Location of authority** | • Service providers | • Providers and users s | • Providers and users | • Providers and users |
| **Values / Motives** | • Beneficence (user's best interest)<br>• Providing effective (ethical) services | • Deliverance, negotiation, transparency<br>• Providing effective and responsive services | • Mediate power imbalance<br>• Bridge trust and information gaps | • Preserving user's autonomy and agency<br>• Providing responsive (legitimate) services |
| **Legitimacy base** | • Technical expertise (Scientific population-level evidence) | • Leveraging both technical and experiential expertise | • Dual identity (Formal staff & lived experience) | • Experiential and contextual expertise (Lived experience) |
| **Nature of relationship** | • Directive | • Collaborative<br>• Mutual dependency | • Collaborative and representative | • Collaborative but directive |

**Table 1.2 Locating peer co-production (continued)**

| Domains | Provider-driven service production | Traditional co-production (Patient-centered care) | Peer co-production | User-driven co-production |
|---|---|---|---|---|
| **Limitations/ requirements** | • Fail to incorporate user's preference and contextual information<br>• Require user's adherence | • Time/resource constraints<br>• Require mutual trust and communication channels | • Staff with lived experience may not be a good proxy of users | • Information burden on users<br>• Require provider's adherence |

With their dual identity as formal staff members and previous (or potentially future) patients with SUD, staff with lived experience can contribute to providing user-centered services in the SUD treatment centers by mediating dialogues and power relationships between clinicians and service users. The relationship between patients and staff with lived experience may not just collaborative, but also representative. Often characterized as peers of patients, staff with lived experience may be better situated to collaborative with patients in a deliberative manner than clinicians without addiction history. From the perspective of service users with SUD, clinical staff members with lived experience of addiction may be relatively more trustworthy collaboration partners, who can identify with their struggles and provide diverse social and emotional supports (Humphreys et al., 2004; White, 2014). When patients are more willing to share clinical and non-clinical experiences and struggles, staff with lived experience may be able to offer services that can facilitate and support patients' long-term recovery, such as housing and transportation assistance. It is also possible that, because staff with lived experience are better positioned to understand patients' different circumstances and needs, they are more inclined to take a context-sensitive eclectic approach (which can be more relevant and effective) compared to clinicians without addiction histories (Humphreys et al., 1996).

In peer co-production, staff with lived experience may also act as representatives of patients' interests and concerns. From the perspective of professional clinicians, staff with addiction histories can be more reliable and trustworthy information sources than current users, and engageable with lower organizational cost (Fledderus et al., 2015). For instance, many SUD clinics often do not invite patients when discussing their treatment plans, but ask staff with lived experience to offer opinions on the status and service needs of patients. Using their personal recovery experience and information gained from patients and other peers, staff with lived

experience may advocate on behalf of patients and influence care decisions that patients will experience.

Peer co-production can substitute and/or complement co-production efforts at SUD clinics depending on the nature of services, a user's trajectory in the care process, and organizational constraints. Peer co-production can be a substitute when practicing traditional (i.e., patient-centered care) or user-driven co-production is particularly challenging. For instance, practicing patient-centered care or respecting patient's agency might be an unrealistic and potentially unethical expectation for clinicians at inpatient or residential units, where patients with severe SUDs receive intensive treatment services. Although clinicians in such units can still emphasize and practice some degree of patient-centered care or ask patient's preference, service providers may rely more on the accounts of staff with lived experience when making decisions.

At the same time, peer co-production also can complement traditional co-production efforts, when patients can (and should) engage directly with clinicians over their care decisions. For instance, as patients with SUD transition to the recovery phase, clinicians at outpatient units may practice patient-centered care by inviting patients into clinical decision-making processes and sharing decision-making authority. In such instances, peer co-production can be an important vehicle to support patient-centered care by clarifying the patient's concerns and the clinician's intentions and maintaining a working trust between patients and clinicians.

Despite the potentials to preserve and support patients' opportunities to influence service decision-making processes, peer co-production comes with some limitations. First, the "identity limbo" is a constant and real challenge for staff with lived experience, harming their trustworthiness among both provider and user groups (Kalafat & Boroto, 1977). Recovering staff's first-hand experience of SUD and ability to relate to users are unique values that SUD

clinics look for. However, as employees of highly institutionalized clinics, staff with SUD histories may think and behave like other "professionals", and not necessarily reflect patients' perspectives and experiences. Thus, patients may perceive such staff as co-opted agents, who foreground professionals' values and interests and impose more strict and punitive standards (Hecksher, 2007; White, 2014). As the ability of staff with lived experience to understand and relate with patients diminishes, other professionals may discredit their work.

Second, despite having inner-group knowledge and sensitivity, recovering staff's organizational positions may constrain their potential to mediate patients' voices and improve service responsiveness. In many SUD treatment centers, these staff members perform secondary or supportive functions (Leiby, 1978; Wenocur & Reisch, 2002). Hence, peer co-production efforts may have limited efficacy and influence over organization-level changes, which require greater access to power or authority over overall organizational processes (Lipsky, 1980).

Third, staff with lived experience may not reflect true concerns and preference of patients accurately. When they speak on behalf of patients in care decision-making processes, staff with lived experience have significant room to re-interpret patients' interests and needs. In other words, staff with lived experience of addiction may—with their best intent—push forward a limited scope of services "that worked" based on their personal or peers' recovery experiences—that may not necessarily reflect the patients best interests or personal desires. This is particularly concerning given recent developments of innovative and effective treatment options in the field. For instance, there is anecdotal evidence that the peer co-production method may limit patient's use of effective treatment options—i.e., medication-assisted treatments—because many staff with lived experience have a strong commitment toward recovery models that emphasize total abstinence.

Despite the limitations, staff with lived addiction experience may still provide valuable opportunities for vulnerable and often stigmatized SUD service users to influence clinical experiences and decisions. Peer co-production can be observed in many social and health service fields working with stigmatized and marginalized populations. Staff with lived experiences conduct initial intakes and facilitate trauma-informed service provisions at many women's shelters, mental health treatment facilities, and refugee serving organizations (Bateman, Henderson, & Kezelman, 2013; Busch & Valentine, 2000; Campbell, 2012). For instance, when former refugee staff members translate the concerns and preferences of recently arrived refugees, they do not simply render foreign languages into English. They annotate user's statements with contextual information to facilitate politically and culturally sensitive organizational approaches to the needs of newly arrived refugees. At the same time, former refugee staff members can establish working trust with users based on shared experience, helping to assure users' willingness to collaborate with organizations. As refugees settle down and establish working trust with other service providers, translators' work may complement the co-production process that refugees engage in directly with other staff members.

**Dissertation study overview**

The review of multiple literatures highlights the importance of but limited user engagement opportunities in health and social service fields, the attempts to include citizens and service users in organizational decision-making processes, and the tensions in collaborative processes. Synthesizing literatures, the theoretical framework is proposed to differentiate co-production mode from service provider or user-driven service modes. Using the field of SUD treatment as a case, where vulnerable patients often possess little influence over service decisions, an alternative co-production mechanism—peer co-production—is suggested.

In this dissertation, I theorize that the SUD clinics use both traditional (i.e., practicing patient-centered care) and peer co-production mechanisms (i.e., hiring staff with lived experience) to ensure patients' meaningful engagement in and influence over care decisions, which will lead to more responsive (and potentially effective) service provision. To test my theory empirically, I use the 2017 wave of the National Drug Abuse Treatment System Survey (NDATSS)—a nationally representative and randomly sampled survey of SUD treatment programs across the United States (NDATSS, 2016). In early 2016, the NDATSS project team generously agreed to include original survey questions developed for this study, covering topics related to patient-centered care and staff with lived experience (see Appendix A for survey questions).

The second chapter overviews the methodology used, discussing data, sample, variables, and analytic approaches in detail. The third chapter examines various environmental and organizational factors' relationships with clinics' practice of and managers' perceptions on patient-centered care. The fourth chapter investigates how peer co-production efforts are correlated with multiple internal and external attributes of clinics. The fifth chapter explore relationships between clinics' co-production efforts and patterns of service availability and utilization, demonstrating importance of co-production efforts at SUD treatment field. The sixth chapter summarizes findings, discusses study's limitations and implications, and suggests future studies.

This dissertation provides multiple implications for theory/research, policy, and practice/management. First, this study contributes to the literature by demonstrating the organizational characteristics most strongly associated with co-production efforts using a quantitative approach and a nationally representative dataset. By comparing and contrasting

multiple dimensions of service production processes, the dissertation also proposes a framework to better conceptualize co-production and differentiate from other service production modes. Through coupling the framework with the nationally representative data, the dissertation suggests potential operations of multiple co-production mechanisms and encourages future research on conditions for and impacts of various co-production efforts in many health and social service fields.

In terms of policy implications, the current dissertation provides important suggestive evidence that collaborative process can be an important way to address the opioid crisis by improving utilization of responsive and effective services. In addition to multiple current efforts to reduce supply of opioid, increase availability of effective treatment options, and improve service technology (U.S. Department of Health and Human Services (HHS), Office of the Surgeon General, 2016), the findings from this study encourage policy makers and government officials to imagine ways to emphasize and incentivize co-production efforts at SUD clinics to encourage or enable patients' actual utilization of services that can facilitate their long-term recovery.

Regarding implications for management and practice, by highlighting prevalent practice of two co-production mechanisms in the SUD treatment field, the dissertation encourages human and social service organizational managers to think about the ways to co-produce with service users. Depending on environmental contexts, organizational capacities, and service user/providers' characteristics, different co-production mechanisms might be implemented, which need to be further investigated in the near future. Lastly, by uncovering the non-clinical functions of staff with lived experience at SUD clinics, this study encourages managers not only to re-consider the functions of staff members with different backgrounds and experience, but also

to nurture collaborative and democratic processes among staff members to recognize each other's unique contributions to the care process.

## Chapter 2 : METHODOLOGY

This dissertation quantitatively investigates factors associated with determinants and correlates of co-production efforts in substance use disorder (SUD) treatment centers. To fill the gaps in systemic and organizational level evidence and understanding of co-production efforts, this study draws on data from the National Drug Abuse Treatment System Survey (NDATSS)—a nationally representative longitudinal study of SUD clinics in the U.S. (Chen, Wilson, & D'Aunno, 2017). The latest 2017 NDATSS includes additional original survey questions developed for this study regarding clinics' diverse efforts to collaborate with patients in clinical decision-making processes. This chapter outlines the data, variables, and analysis plan for this study.

### Data

Since 1988, the NDATSS has been one of the most comprehensive and representative data sources to examine how SUD treatment services are delivered and financed across the United States (NDATSS, 2016). The current dissertation uses the 2017 wave of NDATSS.

**Target population.** The NDATSS targets organizations that hire multiple employees and offer at least some degree of drug use disorder treatment services, excluding solo practices or units exclusively serving patients with alcohol use disorders (Chen et al., 2017). Units operated by federal agencies and tribal governments are also excluded. So far, the NDATSS has conducted eight waves of surveys in 1988, 1990, 1995, 2000, 2005, 2011, 2014 and 2017. The first six waves sampled only outpatient units, including specially licensed outpatient opioid treatment programs (OTPs) and non-OTPs. Since the 2014 wave, the NDATSS has expanded its sampling frame to include inpatient and residential programs in order to investigate health care reform's impacts on the SUD treatment service field.

**Sample.** The NDATSS employs a split-panel design. To maintain a representative mix of cross-sectional and panel samples, each wave replaces about a quarter of previous wave's sample with new randomly drawn units. National frames are drawn with the list of treatment programs across the United States, managed by Substance Abuse and Mental Health Service Administration annually. The sample is primarily stratified by four unit types (i.e., service modalities): outpatient OTPs, outpatient non-OTPs, inpatient units, and residential units. The 2017 NDATSS sampled 730 programs, including 591 units which had participated in previous waves (222 OTPs, 252 non-OTP, 50 inpatient non-OTPs, and 108 residential non-OTPs) and 98 new units (6 outpatient OTPs, 75 outpatient non-OTPs, 6 inpatient non-OTPs, and 11 residential non-OTPs) (Chen et al., 2017).

**Data collection, reliability, and validity.** The Cornell University's Survey Research Institute (SRI) conducted the 2017 wave. The NDATSS team delivered the sample to SRI for screening eligible units and conducting the surveys. The SRI reached out to both administrative directors and clinical supervisors of sampled agencies and asked for their participation in phone surveys approximately 3-hours long. The surveys cover a broad range of topics, including organizational structure, mangers' perceived competition, staffing, financials, licensing and accreditation, client characteristics, and services and treatments (Chen et al., 2017).

The NDATSS used multiple established methods to improve validity and reliability of the telephone surveys (Groves et al., 2001). The NDATSS team pre-tested the survey with randomly sampled units, and provided additional training for SRI interviewers. The SRI sent a cover letter and made a follow-up phone call to targeted program directors prior to the main survey. Finally, the NDATSS team provided worksheets for survey participants to prepare information for the surveys (D'Aunno, Pollack, Jiang, Metsch, & Friedmann, 2014). During the interview, the

computerized system notifies SRI interviewers of any inconsistent or improbable responses (e.g., the total revenue does not match the sum of different sources) so they can resolve issues with respondents. After collecting the data, the NDATSS team crosschecks responses from directors and supervisors of the same treatment programs to identify any anomalies. Multiple previous studies provide strong evidence for the reliability and validity of the NDATSS data (D'Aunno et al., 2014; Pollack & D'Aunno, 2010).

**Response rate and weighting.** The data collection for the 2017 wave started in September 2016 and ended in May 2017 (Chen et al., 2017). Out of 730 sampled and eligible units, both directors and supervisors of 586 units completed the survey (80.3% response rate). When counting units either a director or supervisor participated and finished any portion of the 2017 wave, the survey response rate was 90.0% (657 units out of 730). Survey weights are constructed for the programs that either a director or supervisor completed any portion of the interview for each wave to mitigate any biases from refusals and non-responses and to maintain representativeness of sample (Chen et al., 2017).

**Primary interest variables**

Most key variables for this study come from the original survey questions, covering topics such as patient participation in clinical decision-making processes and staff with lived experience's presence and influence in intra-organizational processes (see Appendix A for the original survey questions).

**Patient-centered care practice.** To understand how SUD clinics engage patients in clinical decision-making processes, this study uses two variables: (1) whether they invite patients to clinical decision making processes, and (2) patient-centered care factor. The first variable is a dichotomous variable indicating whether patients are "regularly invited to attend [clinical]

planning meetings when their cases are discussed." Treatment plans often dictate the experiences of consumers at SUD clinics, including assignment of counselors and prescription service (or medication) types and intensity. Therefore, the treatment planning process is one potential phase/process for patients to influence service decision and care experience. This variable was captured with an existing survey question.

The second variable—the patient-centered care factor variable—further pinpoints the varying degrees of collaboration in clinical decision-making processes between patients and clinicians. In many health and social service settings, participatory processes are often tokenized ceremonial practices to legitimize organizational decisions without substantive collaboration or reallocation of social and political powers (Carr, 2009; Hardina et al., 2006; Meyer & Rowan, 1977). Simply involving patients and asking them to agree and sign on to already determined goals or plans may not necessarily capture the full potentials of co-production activities, such as closing representational gaps and improving responsiveness. The patient-centered care factor variable is developed based on ten original questions asked of clinical supervisors, capturing their perception of and organizational commitment/support to patient-centered care. In order to control for respondents' social desirability bias, wordings and structures of questions were adopted from two validated instruments: Person-centered Care Assessment Tool (P-CAT) and Shared Decision Making Questionnaire (SDM-Q-Doc) (Edvardsson, Fetherstonhaugh, Nay, & Gibson, 2010; Scholl, Kriston, Dirmaier, Buchholz, & Härter, 2012). P-CAT measures programs' emphases and supports for person-centered care practices, and the Shared Decision Making Questionnaire assesses physicians' degree of patient involvement in clinical processes (see Q1 in the Appendix A for question wordings).

**Peer co-production.** In order to measure SUD treatment units' utilization of staff with lived addiction experience and their relative influence over organizational decisions, this study uses the following three dependent variables: (1) proportion of paid staff members with lived experience of SUD, (2) presence of at least one senior staff with lived experience, and (3) relative influence of staff with lived experience over organizational and strategic decision-making processes.

The proportion of staff with lived experience among the surveyed units is calculated based on existing survey questions on the numbers of recovering staff and total paid staff. Whereas the first variable signals clinics' emphasis and value on experiential expertise, simply employing more staff with lived experience does not necessarily mean they will possesses greater influence over organizational processes. To solicit information about the structural positions that staff with lived experience hold in each program, an original question was added to the 2017 NDATSS asking what proportion of senior positions (i.e., manager or clinical supervisor) are filled with recovering staff from SUD (see Q2 in the Appendix A for question wording). Due to non-normality of the variable with significant zero values, the continuous variable is recoded as a binary variable, indicating whether a unit had at least one senior staff with lived experience.

Lastly, compared to staff in similar positions without substance use disorder history, staff with lived experience may possess discounted credibility or influence due to their history of addiction (Corrigan et al., 2009). To measure these staff's relative influence over organizational decisions, an additional original question asked to what extent staff members with lived experience influence organizational and strategic decision-making processes, compared with non-recovering staff in similar roles (see Q3 in the Appendix A for question wording). The five-

point scale variable is recoded into a binary variable, capturing whether staff with lived experience hold equal or greater levels of influence in organizational and strategic decisions.

**Service availability and utilization.** To demonstrate the importance of co-production efforts, the current study investigates associations between co-production variables and service outputs—specifically availability (binary variables measuring whether unit offered a service or not) and utilization patterns (continuous variables measuring proportions of patients that utilized a service) of the following services: treatment programs (opioid maintenance therapy and outpatient aftercare services), harm reduction services (distribution of materials that inform of ways to prevent overdose, condoms, and naloxone (i.e., an overdose reversing antidote)), ancillary services (routine medical care, transportation assistance, and housing assistance), and opioid use disorder treatment medications (Methadone and buprenorphine).

**Other variables**

Most independent and control variables are generated from existing NDATSS survey questions. The NDATSS captures various organizational attributes, including service modality (outpatient OTP/non-OTP, inpatient, and residential), participation in Accountable Care Organizations or Patient Centered Medical Home networks, revenues from private/commercial insurances, organizational types (for-profit, nonprofit, and public), affiliation with hospitals or mental health organizations, and accreditation status. The survey also asks how managers perceive local competition and 12-step recovery models, and where they get information regarding practice innovation and field-level changes.

The NDATSS also collects information on programs' staff and patient characteristics, including racial and gender compositions. Professionalism-related institutional pressures are captured via the proportions of staff members with medical training (e.g., MDs or RNs) and

academic credentials (e.g., at least a master's degree in any discipline). Total number of full-time and part-time staff is used as a proxy of organization size. Respondents reported information on patient composition as well, including the proportions of patients who are of racial/ethnic minorities, who involuntarily receive services under court orders, and with various pre-conditions (i.e., alcohol, heroin, or prescription opioid use disorders).

To capture attributes of surveyed clinics' residing environment, information from external third-party agencies are used. To capture states' Medicaid expansion status, the NDATSS team uses the Census Bureau's annual reports on health insurance coverage changes in the U.S. (available at http://www.census.gov/topics/health/ health-insurance.html). As a proxy of service demands, the number of SUD admissions in clinics' residing counties is used, available from the National Survey of Substance Abuse Treatment Services (N-SSATS) survey annual reports (available at http://wwwdasis.samhsa.gov/dasis2/nssats.htm). Unsurprisingly, this variable is highly correlated with (corr.>0.8, $p<0.05$) with urbanity variable available in the same N-SSATS report. Thus, interpretations with the variable need to be take this fact into account.

**Analytic approach**

This study examines three main questions: (1) factors associated with clinics' patient-centered care practices, (2) factors associated with clinics' peer co-production efforts, and (3) associations between co-production efforts (i.e., patient centered care and peer co-production) and organizational outputs in service availability and utilization patterns. The following three chapters empirically examine these questions in order.

Each chapter first describes the general features of the sample with weighted descriptive statistics. Because this study asks a unique set of questions of a nationally representative sample, simple descriptive statistics of primary variables provide invaluable information. After

examining distribution, central tendency, and dispersion, variables significantly deviating from the normality assumptions become subjects for further examination and transformation (i.e., log transformation or recoded to binary variables). Detailed analysis plans are further discussed in each chapter. Although parsimonious models are preferred, the ultimate modeling choices are largely driven by statistical characteristics of dependent variables. All analyses were conducted using STATA 14.0. Correlations among co-production and other variables are presented in Appendix B. Only one pair of variables had correlation coefficients greater than 0.5—proportion of staff with lived experience and having any senior staff with lived experience. Models including both variables are tested with and without each variable to prevent any collinearity issue, and results were very similar.

**Imputation.** To preserve sample size and minimize estimation bias due to missing values in predictor variables, missing values for predictor variables were imputed 10 times using a stepwise regression multiple imputation method with IVEware developed by the Institute for Social Research at the University of Michigan (Survey Research Center, 2017). Imputing missing values with available longitudinal information is a more sensitive approach than using a single wave's information, given that units' responses to a question at two different time points tends to be more correlated than similar units' responses in the same wave (Engels & Diehr, 2003). Therefore, data from 2014 and 2017 NDATSSs were used to estimate missing values of the 2017 wave. Unfortunately, a widely used sequential regression multiple imputation method (or multivariate imputation by chained equations, known as MICE) did not converge with multiple categorical variables from the two survey waves. Thus, the use of a stepwise regression model was necessary. While MICE uses all the variables included in the imputation process, the stepwise regression model uses a set of most important predictors to estimate the missing values.

A conservative approach was taken, specifying minimum marginal r-squared should be greater than 0.001 (in a scale of 1) to be included as a predictor (Azur, Stuart, Frangakis, & Leaf, 2011). In other words, missing information was imputed with a set of variables explained greater than 0.1% of variation of targeted variable.

## Chapter 3 : CORRELATES OF PATIENT-CENTERED CARE PRACTICES AT SUBSTANCE USE DISORDER CLINICS

This chapter explores the environmental and organizational factors associated with patient-centered care efforts at substance use disorder (SUD) clinics. The chapter uses two dependent variables as proxies of SUD treatment clinics' patient-centered care practice efforts: (1) whether a SUD treatment unit invites patients into clinical decision-making processes when their cases are discussed, and (2) a patient-centered care factor variable, based on a battery of questions capturing clinical supervisor's belief and support on patient-centered care practice. Multivariate logistic and linear regressions are used to explore associations between dependent variables and various environmental and organizational factors, including residing states' Medicaid expansion status, number of substance use disorder patient admissions in county, service modality, unit ownership, staff and patient characteristics, revenue source, unit affiliation, accreditation status, attributes and perspectives of managers, region, and unit size.

Findings suggest that about 22.9% of the SUD clinics invited patients to participate in clinical decision-making process in 2017—a relatively high number given the difficulties and challenges of collaboration in this field. Clinics' inclusions of patients into clinical processes were significantly associated with units' service modality and patient compositions. The measure of clinical supervisors' emphases on patient-centered care was significantly associated with various organizational factors as well.

### Patient-centered care in the SUD field

In many medically-oriented service fields, patient-centered care has become a normative practice mode. A care model emphasizing clinicians' technical authority in the care decision-making process has been the norm in the medical service field for a long time (Quill & Brody,

1996). However, the field gradually departed from a clinician-driven top-down care service model in the late 20th century, shifting to emphases on collaboration and balance between the clinician's technical authority and the patient's autonomy (Bradley & Kivlahan, 2014; Charles et al., 1997; Epstein & Street, 2011). In a seminal report reflecting degrading care quality and effectiveness under the clinician-driven care model, the Institute of Medicine (2001) emphasized the need for more responsive and inclusive care, defining patient-centered care as "providing care that is respectful of and responsive to individual patient preferences, needs, and values, and ensuring that patient values guide all clinical decisions." (p. 6). In such collaborative relationships, clinicians are expected to share with patients (and their primary caregivers) not only information necessary for making informed decisions, but also authority and control over clinical decisions. In exchange, patients are encouraged to actively engage in clinical decision-making processes and share their non-clinical history (e.g., behavioral and environmental) and subjective and contextual information with clinicians (Charles et al., 1997; Epstein & Street, 2011).

Since the legitimacy of SUD treatment centers and clinicians is under constant threat, adopting medical service field's care mode has been an attractive way to legitimatize clinics and clinicians' practice. During the SUD field's early development, most services are provided by recovering individuals based on their personal experiences, and patients and the public questioned not only service quality and effectiveness, but also provider legitimacy (White, 2014). To strengthen its legitimacy, the SUD field has borrowed organizational characteristics and clinical practices—such as professionalization and evidence-based practices—from the field of medicine (D'Aunno, Sutton, & Price, 1991). Adoption of a disease-focused technocratic approach has helped secure SUD clinicians' authority and autonomy, but has left less room for

patients to contribute to or influence treatment decisions (Adams, Drake, & Wolford, 2007; Bradley & Kivlahan, 2014). As the medical field has transformed its approaches toward more patient-centered care in the last few decades, the SUD field and professionals are under great pressure to utilize participatory practices to ensure the legitimacy of their practices (Bradley & Kivlahan, 2014; Stewart et al., 1995).

In addition, the Patient Protection and Affordable Care Act (ACA) introduced multiple financial and policy incentives to implement patient-centered care and collaboration with patients at SUD clinics. By using a market mechanism and making addiction treatment as essential health benefits, the ACA introduced millions of previously uninsured and underinsured individuals as patients into the SUD field (Buck, 2011; Humphreys & Frank, 2014).[1] Expanded market opportunities and increased competition incentivized SUD service providers to learn patients' concerns and preferences in order to offer more responsive and cost-effective services (Bradley & Kivlahan, 2014; D'Aunno, Friedmann, Chen, & Wilson, 2015). The ACA also rewards health care providers and their networks—e.g., accountable care organizations (ACOs) and patient-centered medical homes (PCMHs)—that lower the levels of potentially preventable readmissions through integrated care provision efforts (Zuckerman & Holahan, 2012). In addition, under the ACA, healthcare service providers are required to conduct and publically report assessments based on patient-centered quality measures—such as patient experience, satisfaction, and engagement—and to satisfy service quality benchmarks (Millenson & Macri, 2012). Experience of Care & Health Outcomes (ECHO) is one of the survey instruments

[1] According to Congressional Budget Office (2013), close to 25 million previously under-insured or uninsured citizens will become potential SUD service users under the ACA by 2020. Both Medicaid coverage expansion in many states and lower health insurance premiums for private plans drove this increase in health insurance coverage.

developed for adults with behavioral disorders with questions including: In the last 12 months, how often did the people you went to for counseling or treatment listen carefully to you? In the last 12 months, were you given as much information as you wanted about what you could do to manage your condition? In the last 12 months, how often were you involved as much as you wanted in your counseling or treatment? (Agency for Healthcare Research and Quality, 2016). These assessments may not directly incentivize individual clinicians' practice, but emphasize institutional focus on providing preference-satisfying quality care that can nudge clinicians to adopt more patient-centered care patterns.

**Theoretical model and hypotheses**

I hypothesize that multiple environmental factors (i.e., policy and professional norm changes) and organizational-level factors (i.e., service, modality, revenue sources, ownership, organizational structure, accreditation status, service types, patient and staff characteristics) are associated with SUD clinics' implementation of patient-centered care practice.

**The Patient Protection and the Affordable Care Act (ACA).** Resource dependency theory maintains that critical resource holders possess power to influence the behaviors of the resource seeker (Pfeffer & Salancik, 1978). Resource holders' influence over seekers becomes stronger when resources are scarce with limited alternatives, the needs for resources are greater, and resource holders control the resource flow (R. M. Emerson, 1962). With expanded market opportunity, SUD clinics relying more on private insurance income might be incentivized to be more responsive to the voices and concerns of patients by inviting them to participate in clinical decision-making processes (Buck, 2011). Especially in areas with large number of substance abuse admissions, SUD clinics might be further motivated to engage with SUD service users. Similarly, clinics located in the states that expanded Medicaid coverage might gain additional

resources to collaborative with patients. Although Medicaid's reimbursement rate is relatively low to private insurances', with significant decrease in uninsured patients, overall increase in Medicaid income would help clinics to be better equipped to work with patients (Neuhausen et al., 2014).

Hypothesis 3-1: SUD treatment centers located in counties with larger numbers of total substance abuse admissions are more likely to implement patient-centered care

Hypothesis 3-2: When SUD treatment centers are located in Medicaid expansion states, they are more likely to implement patient-centered care practices

Hypothesis 3-3: When private/commercial insurance comprise a greater proportion of the operating budget, SUD clinics are more likely to practice patient-centered care

**Change in professional norms.** Changing the norms of professional conduct also encourages SUD service providers' implementation of patient-centered practices through institutional pressures. New institutional theory argues that organizations adapt behaviors and practices perceived as appropriate and acceptable within the institutional environment in order to secure legitimacy—a critical political resource (DiMaggio & Powell, 1983; Wamsley & Zald, 1973). Co-production activities assume that lay citizens and consumers possess expertise and knowledge about the issues affecting their lives, challenging long-standing professional norms (J. Alford, 2009). In many health and social service fields, diverse professional groups strive to secure autonomy and strengthen the legitimacy of their practices through multiple specialized trainings and accredited institutions (Clemens, 2006; Molly Cooke et al., 2006; Specht & Courtney, 1994). As the workforce has gradually professionalized throughout the 20th century, scientific knowledge and professional expertise has led to institutional norms that bound and reproduce professional staff's behaviors and practices, discounting ordinary service users'

personal knowledge and subjective expertise regarding their issues of concern (Hasenfeld, 2000; Powell & Steinberg, 2006). Therefore, some professional clinicians might be discouraged from reaching out to SUD patients for information or preferences, considering such actions as violations of professional norms and expectations. However, given the shift in the medical service field towards institutional norms supporting patient-centered care, staff members with medical service backgrounds and academic credentials may want to legitimize their practices through collaborative practices (Bergeson & Dean, 2006). Considering medical professionals' relatively greater organizational influence and authority within SUD clinics, their entrepreneurial efforts might be strong enough to influence the general method of clinical encounters at the units (Thornton & Ocasio, 2008).

Hypothesis 3-4: SUD clinics with higher degrees of staff with medical training (i.e., medical doctors and registered nurses) are more likely to implement patient-centered care practices

**Service modality and offerings.** Modality of a clinic not only shapes interactions between patients and clinicians, but also attracts patient groups with various co-production capacities. The SUD field comprises a wide range of clinics with various service modes, including outpatient, inpatient, and residential units. Inpatient programs often serve patients with severe addiction issues who are often perceived as incapable of making rational decisions and as requiring temporary restrictions of their rights (Corrigan et al., 2009). Therefore, expecting clinicians at inpatient units to practice fully patient-centered care might be unrealistic. Outpatient units serve patients with relatively mild addiction symptoms and with greater possibility for co-production than inpatient units. However, learning each other's perspectives and concerns might be challenging given a relatively short interaction span between clinicians and patients in a field

where distrust is pervasive (Carr, 2011). Especially in many opioid treatment programs (OTPs), which are specially licensed to dispense opioid maintenance medications, staff and patients rarely interact with each other as patients "pick up" medications and leave. Compared to inpatient and outpatient units, practicing patient-centered care seems more possible at residential units, where recovering patients reside for an extended period.

Hypothesis 3-5: Residential SUD clinics are more likely to implement patient-centered care practices than inpatient, non-OTP outpatient, and OTP outpatient units

**Ownership**. Institutional pressures associated with ownership status can affect SUD clinics' adoption of co-production mechanisms (DiMaggio & Powell, 1983; Scott, 2001). Based on the non-distribution constraint and their mission to serve the public good, nonprofit health and social service organizations are sometimes considered more trustworthy than for-profit or public agencies (Hansmann, 1980). While many health care studies highlighted indifferent behaviors between nonprofit and for-profit organizations, the normative expectation to preserve downward accountability might pressure nonprofit clinics to demonstrate their efforts by involving users in decision-making processes as a means of securing their cognitive-cultural legitimacy (Dees & Anderson, 2003; Scott, 2001; Suchman, 1995). On the other hand, given the goal of providing generalized services following authorized policies and procedures, clinicians at public agencies might be discouraged to co-produce services with SUD patients (Salamon, 1987). Although providing care satisfying patients' experiential quality is important, public units may emphasize provisioning effective and technically legitimate care (Berwick, 2009). For-profit SUD clinics might also be less likely to engage with their patients because such non-economic activities—including establishing rapport, sharing information, and building consensus—require organizational investments that undermine organizational profit margins. Previous research also

shows that for-profit agencies are less likely to provide resources or sufficient autonomy for their frontline staff to engage with users in service delivery processes (Brodkin, 1990; Lens, 2013).

Hypothesis 3-6: Nonprofit SUD clinics are more likely to adopt patient-centered care practices than for-profit or public clinics

**Unit affiliation.** Embedded organizational structure may impact SUD clinics' co-production activities, particularly when they are affiliated with larger hospitals or mental health centers (Boyle, Slay, & Stephens, 2010). In the field of medicine, patient-centered care is a normative practice mode, legitimizing activities of hospitals and professional clinicians (Epstein & Street, 2011). Therefore, SUD clinics owned by medical service providers might adopt patient-centered care practices through internal policies imposed by their parent organizations (Bradley & Kivlahan, 2014; Powell, 1990). Participation in accountable care organization (ACO) or patient-centered medical home (PCMH) programs may also be associated with SUD clinics' patient-centered care efforts. ACO and PCMH are networks of health care service providers responsible for patient outcomes and financial costs associated with their services. Increasing numbers of behavioral service providers (including SUD clinics) are joining these networks, and are encouraged to apply patient-centered care practices—a principal behind ACO and PCMH programs (D'Aunno et al., 2015). Service providers in these provider networks are mandated to measure and report their service quality using patient-centered criteria (Millenson & Macri, 2012). Therefore, to a certain extent, patient-centered care practice implementation is conditioned under ACO or PCMH through normative and regulative institutional pressure (Scott, 2001).

Hypothesis 3-7: SUD clinics affiliated with hospitals and mental health centers are more likely to implement patient-centered care practices

Hypothesis 3-8: When SUD treatment centers participate in ACO or PCMH, they are more likely to implement patient-centered care practices

**Accreditation**. Accreditation is a legitimization mechanism, demonstrating organizational commitment to quality care to larger stakeholder communities, such as service users, funders, and regulators (Powell & Steinberg, 2006; Suchman, 1995). It is also a requirement in the SUD field in order to operate specialized opioid maintenance programs or get reimbursed by insurers—an example of coercive institutional isomorphism (DiMaggio & Powell, 1983). The Joint Commission on Accreditation of Healthcare Organizations (JC) and the Commission on Accreditation of Rehabilitation Facilities (CARF) are two major accreditation bodies in the SUD field, originally rooted in the health care field. Previous studies show that accredited SUD clinics tend to provide more adequate and higher quality clinical services and to implement innovative approaches (D'Aunno & Pollack, 2002; Pollack, D'Aunno, & Lamar, 2006). Considering both accreditation bodies' promotion of patient-centered practices, accredited SUD clinics are expected to operate their practices according to quality standards and clinical procedural expectations (The Joint Commission, 2010).

Hypothesis 3-9: Accredited SUD clinics are more likely to implement patient-centered care practices

**Leadership attributes.** As senior staff members of a clinic, directors' perceptions and experiences can influence clinic's service provision mode. For instance, when perceiving a greater regional competition, directors may promote inclusive patient-clinician interactions not just to provide more responsive services for individual patients, but also to read market trends in their service area (Andrews, D'Aunno, Pollack, & Friedmann, 2014). The opposite scenario is also plausible. When directors sense greater opportunities from a cost-sensitive segment of the

market, they may try to eliminate potentially resource-intensive collaborative processes. Besides, when receiving information on the SUD field's development through professional sources (i.e., professional association conferences, workshops, and newsletters), a director may emphasize a normative and desired practice mode of the field within their clinic to legitimatize their practice (DiMaggio & Anheier, 1990; Laine & Davidoff, 1996).

Hypothesis 3-10: When a director perceives greater competition, a clinic is more likely to implement patient-centered care practices

Hypothesis 3-11: When a director perceives greater competition, a clinic is less likely to implement patient-centered care practices

Hypothesis 3-12: When a director relies more on professional information sources, a clinic is more likely to implement patient-centered care practices

**Patient and staff characteristics**. Whether patients receive SUD treatments voluntarily can also be an important factor in co-production. An increasing number of involuntary patients receive SUD treatment through the criminal justice system, as courts perceive treatment services as a humane alternative to incarceration and a means to reduce re-entry (Miller, 2014). While many suspect lower treatment motivation and less successful outcomes from involuntary patients, the empirical results point in the opposite direction. Compared with voluntary patients, mandated patients show similar and even higher levels of motivation and commitment throughout the treatment process, yielding similar or better treatment outcomes with lower recidivism rates (Gregoire & Burke, 2004; Kelly, Finney, & Moos, 2005). SUD treatment centers might be incentivized to work closely with these doubly marginalized clients, considering their substantial treatment needs for recovery. However, redirecting those resources toward voluntary

patients might be a rational decision for SUD clinics, considering their weak financial and political power and many restrictions over the services that clinicians can offer them.

Hypothesis 3-13: SUD treatment centers with high volumes of involuntary patients are less likely to implement patient-centered care practices

Lastly, the presence of staff with lived experience might be associated with a unit's practice of patient-centered care in a profound manner. Despite their eclectic orientation toward recovery, many staff with lived experience also have a strong commitment toward a particular recovery model emphasizing abstinence (Humphreys et al., 1996; White, 2014). Besides, staff with lived experience may have firm beliefs about which set of practices "work" and which "do not work" based on their own recovery experience, and expect patients to subscribe to their models (Brass, 1984; Stöffelmayr, Mavis, Sherry, & Chiu, 1999). Thus, they may not value inclusion of patients as much as staff members without first-hand experience of addiction.

Hypothesis 3-14: When staff with lived experience compose a greater proportion of clinic staff, SUD clinics are less likely to implement patient-centered care practices

**Variables and analytic approaches**

The 2017 wave of National Drug Abuse Treatment System Survey (NDATSS) (n=657) is used in this chapter, and two dependent variables are used as proxies of patient-centered care practice: (1) whether patients are invited to participate in clinical decision-making processes, and (2) a factor variable capturing clinical supervisors' perceptions on patient-centered care. The first variable was captured via the 2017 NDATSS, which asked, "Are clients regularly invited to attend this planning meeting [a case conference to discuss treatment planning and progress of

individual clients] when their case is being discussed?" [2] A binary variable was generated from this question (Yes =1, No=0).

Although capturing a unit's use of a particular inclusive practice, invitation to participate in clinical decision making is not an optimal measure for how patient and clinicians interact or how organizational procedures support collaborative processes. To supplement the information regarding patient-centered care practice, the patient-centered care factor variable was developed using 10 original survey questions to be answered by units' clinical supervisors (see Appendix A for question wordings, Cronbach's alpha=0.79). This factor variable assesses clinical supervisors' beliefs about patient-centered care (e.g., how much they value patient-client interaction and encourage joint agreement). To control for social desirability bias, the question frames and structures were adopted from two validated measures: Person-centered Care Assessment Tool (P-CAT) and Shared Decision Making Questionnaire (SDM-Q-Doc) (Edvardsson et al., 2010; Scholl et al., 2012).

As predictor and control variables, multiple environmental and organizational-level variables are used. Environmental factors include whether a clinic is located in a Medicaid expansion state at the time of interview and number of substance abuse admissions in its county of residence—available from the 2016 National Survey of Substance Abuse Treatment Services (SAMHSA, 2017). Administrative directors provided important information on operational and managerial aspects of clinics, including service modality (outpatient OTP/non-OTP, inpatient, residential) and unit type (private nonprofit, private for-profit, public). Directors also answered questions on whether a unit is owned by a hospital or mental health facility, whether the unit has an ACO or PCMH agreement, the unit's accreditation status, and whether they perceive the

[2] This is a relatively conservative measure of patient engagement. Other questions include "Does your unit routinely write a formal treatment plan?" and "Do clients approve or sign-off on their own treatment plan?" Approximately 99% of clinical supervisors answered "Yes" to both questions.

regional SUD treatment field as very competitive or not. Multiple continuous variables were derived from the responses of directors, such as revenue sources (proportion of private/commercial insurance incomes), and staff characteristics (number of full/part-time staff, proportion of staff with graduate degrees, and proportion of staff with lived experience of addiction). Lastly, directors shared the extent (1-No extent to 5-A very great extent) to which they rely on professional information sources (e.g., professional publications, conferences, associational meetings, and seminars). Clinical supervisors also shared whether they perceive the 12-step model as effective and the clinic's composition of patient groups (i.e., proportions of alcohol use disorder patients, opioid use disorder patients, prescription opioid use disorder patients, involuntary patients, racial/ethnic minority patients).

For the descriptive statistics, a survey weight developed by the NDATSS team (Chen et al., 2017) was applied. For the first main analysis, predicting factors associated with clinics that invite patients into clinical decision-making processes, multivariate logistic regression analysis was used, given the binary nature of the dependent variable. Multivariate linear regression was used for the second analysis, predicting attributes correlated with the patient-centered care factor variable. Missing values for the predictor and control variables are imputed to preserve sample size and minimize the estimation bias (see Method chapter for detailed discussion on rationale and procedures).

**Results**

In 2017, about 23% of SUD clinics in the U.S. invited patients to clinical decision-making processes when their cases were discussed (see Table 3.1). Roughly 66% of the SUD clinics were non-OTP outpatient units, and residential units comprising 21%, OTP outpatient units comprising 8%, and inpatient units comprising 4%. The majority of clinics was private

non-profit units (57%), and 30% and 13% were private for-profit and public units, respectively. More than a half of the clinics were accredited and about 60% of directors reported a high degree of competition, signaling a highly institutional and competitive environment. Roughly 40% of the units' workforce had a health professional or graduate degree (e.g., medical doctors, registered nurses, doctor's degrees, or master's degrees), and about 33% had first-hand experience of addiction—reflecting the field's unique appreciation of both technical and experiential expertise. About 50% of patients had alcohol use disorder and 33% had opioid use disorder, and 28% had prescription drug use disorder, mirroring the recent opioid epidemic. More than 46% of patients received SUD treatment service following a court order, and about 40% of patients were racial/ethnic minorities.

**Table 3.1 Descriptive statistics of variables**

| | Mean/% (SD) | Range |
|---|---|---|
| **Dependent variables** | | |
| Invite patients to participate in clinical decision-making processes | 22.86 (42.03) | 0 – 100 |
| Patient-Centered Care Factor (score) | -0.08 (0.91) | -4.87 – 1.38 |
| | | |
| **Predictor and control variables** | | |
| Located in Medicaid expansion state | 69.57 (46.05) | 0 – 100 |
| Total substance abuse admission in county (thousands) | 14.04 (22.63) | 0 – 101.27 |
| Service modality | | |
| OTP Outpatient | 8.41 (27.78) | |
| Non-OTP Outpatient | 66.00 (47.41) | |
| Inpatient | 4.38 (20.47) | |
| Residential | 21.21 (40.01) | |
| Unit type | | |
| Private for-profit | 29.75 (45.76) | |
| Private non-profit | 57.11 (49.53) | |
| Public | 13.13 (33.80) | |
| ACO or PCMH in place | 22.19 (41.58) | 0 – 100 |
| Accredited (JC or CARF) | 53.49 (49.92) | 0 – 100 |
| Owned by hospital or mental health facility | 25.07 (43.38) | 0 – 100 |
| Proportion of revenue from private/commercial insurance | 15.49 (23.61) | 0 – 100 |
| Director perceive high competition | 59.58 (49.11) | 0 – 100 |
| Director's reliance on professional information sources | 3.38 (0.71) | 1 – 5 |
| Clinical supervisor endorse 12-step treatment model | 55.57 (49.73) | 0 – 100 |
| Proportion of staff with professional/graduate degree | 39.08 (28.84) | 0 – 100 |
| Proportion of staff with lived experience of addiction | 33.31 (29.51) | 0 – 100 |
| Proportion of AUD clients | 49.74 (26.81) | 0 – 100 |
| Proportion of OUD clients | 32.66 (32.35) | 0 – 100 |
| Proportion of prescription OUD clients | 27.61 (25.42) | 0 – 100 |
| Proportion of involuntary patients | 46.14 (34.76) | 0 – 100 |
| Proportion of racial/ethnic minority patients | 39.48 (31.14) | 0 – 100 |
| Region | | |
| Northeast | 20.97 (40.74) | |
| Midwest | 23.06 (42.15) | |
| South | 29.29 (45.54) | |
| West | 26.68 (44.26) | |
| Number of staff (full- and part-time) | 21.73 (36.90) | 1 – 450 |

Abbreviations: SwLE (Staff with Lived Experience); OTP (Opioid Treatment Program); AUD (Alcohol Use Disorder); OUD (Opioid Use Disorder); JC (Joint Commission); CARF (Commission on Accreditation of Rehabilitation Facilities)

Regression analysis results show associations between two dependent variables and various environmental and organizational factors (see Table 3.2). Compared to non-OPT outpatient units, inpatient and residential units were more likely to invite patients into care decision-making processes. Private non-profit units were marginally less likely to invite patients to these meetings compared to private for-profit clinics. Unexpectedly, clinics serving more patients with alcohol or opioid use disorders were less likely to invite patients to these meetings. The proportion of racial/ethnic minority patient is also positively correlated with clinic's likelihood of engaging patients in care decision-making processes. A different set of factors were associated with the patient-centered care factor variable. As hypothesized, the proportion of revenue from private or commercial insurance and degrees of directors' reliance on professional information sources were positively and significantly associated with the factor score. The proportion of staff with lived experience was also negatively associated with the patient-centered care factor variable, as expected.

**Table 3.2 Regression analysis results**

| | Invite patients to participate in clinical decision-making processes | Patient-Centered Care Factor |
|---|---|---|
| | O.R. (95% CI) | Coef. (95% CI) |
| Located in Medicaid expansion state | 1.38 (0.76, 2.52) | -0.12 (-0.33, 0.09) |
| Total substance abuse admission in county [&] | 0.93 (0.79, 1.08) | 0.02 (-0.04, 0.07) |
| Proportion of revenue from private/commercial insurance[#] | 0.91 (0.70, 1.16) | 0.08 (-0.01, 0.16)^ |
| Service modality (ref. Non-OTP Outpatient) | | |
| OTP Outpatient | 1.43 (0.76, 2.71) | 0.20 (-0.03, 0.43)^ |
| Inpatient | 2.48 (0.98, 6.26)^ | 0.03 (-0.31, 0.38) |
| Residential | 3.56 (1.84, 6.93)*** | 0.16 (-0.09, 0.41) |
| Unit type (ref. Private for-profit) | | |
| Private non-profit | 0.60 (0.35, 1.02)^ | -0.09 (-0.28, 0.11) |
| Public | 0.71 (0.35, 1.42) | -0.19 (-0.46, 0.07) |
| ACO or PCMH in place | 1.23 (0.75, 2.03) | -0.01 (-0.20, 0.17) |
| Accredited (JC or CARF) | 1.33 (0.79, 2.22) | -0.08 (-0.26, 0.11) |
| Owned by hospital or mental health facility | 1.00 (0.58, 1.72) | -0.05 (-0.25, 0.14) |
| Director perceives high competition | 1.01 (0.66, 1.56) | -0.18 (-0.34, -0.02)* |
| Director's reliance on professional information sources | 0.90 (0.67, 1.22) | 0.19 (0.08, 0.30)** |
| Clinical supervisor endorse 12-step treatment model | 0.99 (0.63, 1.55) | 0.03 (-0.13, 0.19) |
| Proportion of professional staff (graduate degree)[#] | 1.04 (0.81, 1.33) | -0.03 (-0.12, 0.06) |
| Proportion of staff with lived experience[#] | 0.90 (0.68, 1.18) | -0.10 (-0.20, -0.00)* |
| Proportion of AUD clients[#] | 0.81 (0.63, 1.04)^ | 0.03 (-0.06, 0.12) |
| Proportion of OUD clients[#] | 0.75 (0.58, 0.97)* | -0.02 (-0.11, 0.08) |
| Proportion of prescription OUD clients[#] | 1.18 (0.91, 1.53) | 0.05 (-0.05, 0.16) |
| Proportion of involuntary patients[#] | 1.15 (0.89, 1.49) | 0.03 (-0.06, 0.12) |
| Proportion of racial/ethnic minority patients[#] | 1.48 (1.18, 1.86)** | -0.02 (-0.10, 0.07) |
| Region (ref. Northeast) | | |
| Midwest | 1.41 (0.77, 2.59) | -0.18 (-0.40, 0.04) |
| South | 1.02 (0.49, 2.14) | -0.16 (-0.42, 0.11) |
| West | 1.14 (0.61, 2.18) | -0.18 (-0.41, 0.05) |
| Number of staff [&] | 0.97 (0.76, 1.24) | 0.03 (-0.06, 0.12) |

^p<0.1, *p<0.05, **p<0.01, ***p<0.001, [&]Log transformed, [#]Standardized

Abbreviations: OTP (Opioid Treatment Program); JC (Joint Commission); CARF (Commission on Accreditation of Rehabilitation Facilities); AUD (Alcohol Use Disorder); OUD (Opioid Use Disorder)

## Discussion

This chapter explored associations between SUD clinics' patient-centered care efforts and various environmental and organizational attributes. Despite difficulties and challenges, about a quarter of the SUD clinics (23%) made efforts to ensure patients' direct engagement in clinical decision-making processes—a positive finding. Further longitudinal or panel analysis seems worthwhile to examine the trend of patient engagement efforts and investigate organizational and policy factors correlated with such efforts.

Whether a unit regularly invites patients into the clinical decision-making process was significantly correlated with the unit's service modality and the patient composition. In terms of service modality, rather than the patient's cognitive ability to engage in a planning process, whether patients and clinicians can find a mutually available time for discussion seemed to matter more. For instance, in many outpatient units, case conferences often occur at the beginning or end of the day, limiting participation opportunities for patients. In contrast, patients are on site in residential and inpatient units and readily available for a conversation with a group of service providers to discuss their needs and concerns. Separate descriptive analyses showed that 26.3% of inpatient and 38.5% of residential units invited patients to participate. It is worthwhile to mention that, despite the possible difficulty in arranging times, 22.5% of OTP and 17.8% of non-OTP outpatient units invited patients to participate in the clinical decision-making process. In other words, although time and physical constraints may hinder practice of patient-centered care—as theorized in the framework—it was not necessarily a fundamental factor blocking collaborative practices.

Although the relationship was marginal, the finding that nonprofit units are less likely to invite patients to clinical planning meetings was noteworthy. Nonprofit units might be under-

resourced to engage with patients. A previous study found that nonprofit and public SUD clinics are often discouraged to implement innovations, potentially due to limited resources to pay for required investments (i.e., hiring a physician) and/or capacities to monitor regulatory requirements (Andrews, 2012). Another possibility is that some for-profit units might be more successful than nonprofit clinics in attracting relatively affluent or employer-insured patients, who are more willing to demand clinicians' attentions and customized care as "consumers". Particularly when managers perceive a greater regional competition, for-profit clinics might be incentivized to be more responsive to the voices and concerns of patients by inviting them to participate in clinical decision-making processes (Buck, 2011; R. M. Emerson, 1962). However, the latter scenario was not supported by a separate analysis with an interaction term between director's perceived competition and unit type. To better understand nonprofit and for-profit units' different tendencies to directly engage patients in clinical decision-making processes, further investigations seem necessary with closer attentions to organizational capacities.

The relationships between the proportions of patients with diverse substance use disorders and whether a clinic invites patients to participate in decision-making processes were unexpected, but thought-provoking. This finding potentially captures clinics' willingness to work closely with certain groups of patients over others. The result shows that clinics serving more patients with opioid or alcohol use disorders are less likely to invite patients to participate in the clinical decision-making process, while the proportion of patients with prescription opioid use disorders has insignificant associations with clinics' engagement with patients. It is possible that prescribing a standard treatment program might be a norm for the former two patient groups (i.e., total abstinence or support group for alcohol use disorder patients and medication-assisted treatment for opioid use disorder patients), thus further interaction with these patients might not

be perceived as a worthwhile investment of the clinic's resources, particularly for the opioid addicted.

Another possibility is the correlation between demographic characteristics of different patient groups and clinics' direct engagement efforts. For a long time, opioid use disorder has been considered as a deviant problem associated with low-income, racial/ethnic minority, and young urban residents, who have been historically projected as "dependent" or "undeserving" (Fraser & Gordon, 1994; White, 2014). However, middle-class, White, and middle/retirement-age suburbanites comprise a significant proportion of the recent surge of prescription opioid use disorder patients, often characterized as deserving, innocent, and willing victims (Cicero, Ellis, Surratt, & Kurtz, 2014). Given a positive association between the proportion of racial/ethnic minority patients and clinics' tendency to directly engage with patients, the current analysis might have captured a complex dynamic involving race/ethnicity of patients, types of addiction, and other factors not captured/analyzed in this study. The possibility of a systemic bias deserves further analysis, particularly with a qualitative lens.

The second regression analysis on the patient-centered care factor variable showed its associations with various organization-level factors. The proportion of commercial insurance income and the factor variable have positive relationship, signaling that SUD clinics (and their clinical supervisors) might value and emphasize patient-centered care processes more as they serve more patients with private/commercial insurance. This interpretation is supported by a separate analysis with an interaction term between the proportion of commercial/private insurance income and managers' perceived competition level. The interaction term had a positive and marginally significant relationship with the patient-centered care factor variable (coef.= 0.16; $p<0.08$; 95% CI: -0.02, 0.33) and the rest of results were almost identical with the second

column of the Table 3.2. In other words, the combination of a perceived regional competition and heavy dependence on commercial insurance might motivate clinics to value and emphasize patient-catered care practices as patients are willing to move businesses elsewhere offering more competitive (possibly responsive and cost-effective) services. The result also supports an alternative approach adopted by SUD clinics. When clinics rely less on commercial insurance income, managers sensing a greater competition might have decided to cut non-economic activities to reduce operating expenses rather than providing more responsive services through engaging patients.

The positive relationship between the patient-centered-care factor variable and managers' reliance on professional information sources was also expected result. As a senior staff of a clinic, an administrative director's orientation toward professionalization might emphasize adoption of a normative practice mode to legitimize the clinic's practice (DiMaggio & Powell, 1983). Interestingly, this director's professionalization variable was not statistically associated with the first dependent variable, whether patients are regularly invited to participate in the clinical decision-making process. Thus, it is possible that the normative pressure might have yielded some symbolic results (e.g., emphasizing patient-clinician collaboration during staff training sessions) without substantive organizational change or innovations (e.g., reducing average caseloads for clinicians to spend more time with patients or changing clinics' operational hours to improve patient's access to care decision-making processes). Nonetheless, it seems important to recognize professional norms as a legitimacy base of the patient-centered care practice (or traditional co-production) and update the earlier frameworks in the first chapter.

Lastly, the analysis highlights a negative relationship between the proportion of staff with lived experience and the patient-centered-care factor variable. This is a concerning result that

staff with lived experience may not value patient-centered care practices at SUD clinics. However, staff with lived experience may have different ways to learn and incorporate patients' concerns. For instance, staff members with first-hand experience of SUD addiction may leverage their experiential knowledge to suggest or encourage the use of services that helped their recovery processes. Also, many staff members with lived experience interact with patients beyond the physical boundary of the clinic, such as on a sidewalk near the treatment center, where they can share a cigarette over a break. The conversations around family issues and the recovery process during such engagements might yield more honest and relevant information reflecting patients' desires and needs. In other words, multiple and innovative ways of co-production may exist in the SUD treatment field beyond patient-centered care practices. The chapter four will discuss one possible alternative mechanism—peer co-production.

## Chapter 4 : CORRELATES OF PEER CO-PRODUCTION MECHANISM AT SUBSTANCE USE DISORDER CLINICS

Since the inception of the substance use disorder treatment field, staff members with lived experience (or staff in recovery) have been essential service provision agents (Olmstead et al., 2007; White, 2014). Staff's first-hand experience and knowledge of the physiology, psychology, and culture of addiction are highly valued assets, granting them authority as "subject matter experts" (Blum & Roman, 1985; Olmstead et al., 2007). In addition to providing a variety of clinical services, staff with lived experience offer essential peer recovery supports—such as emotional, informational, instrumental, and affiliational supports—that staff without first-hand experience of addiction may not be able to offer (Reif et al., 2014).

Despite the large presence and unique contributions of staff with lived experience of SUD, little attention has been paid to the non-clinical roles they can play within clinics. As formal staff members and past (and potentially future) service users, they can not only clarify intentions and address concerns, but also help maintain a working trust between patients and clinicians. Chapter One of this study describes how staff with lived experience can facilitate patient-clinician collaboration by leveraging their dual identities—peer co-production.

The current chapter investigates factors associated with SUD clinic's use of the peer co-production mechanism via three dependent variables: (1) proportion of staff with lived experience of addiction, (2) whether a unit has at least one senior staff with lived experience, and (3) whether staff with lived experience possess equal or greater levels of influence over organizational/strategic decision-making processes. Multivariate linear and logistic regressions are applied based on dependent variables' characteristics. Findings suggest that the use of the peer co-production mechanism is significantly associated with multiple environmental and

organizational characteristics. Particularly, SUD clinics were more likely to implement various peer co-production efforts when directors recognized recovering staff's potentials in facilitating collaboration and providing responsive services.

**Theoretical model and hypotheses**

I hypothesized that multiple environmental and organization-level factors are associated with a clinic's utilization of peer co-production methods.

**The Patient Protection and the Affordable Care Act (ACA).** In addition to granting millions of uninsured/underinsured Americans access to addiction treatment services, the ACA intensified competition in the SUD treatment field. Expanded market opportunities stimulated both entry of newly formed organizations into the field, and expansion of existing health care providers' service domains to include SUD treatment (D'Aunno et al., 2015). With an increased number of service providers in their region, clinics might face a shortage of professional workers to serve increased demand for clinical services. Particularly clinics located in the states that expanded Medicaid—and presumably experienced a greater increase in demand—might be more incentivized to fill clinical positions with staff with lived experience, who are often considered as cheap and easily available alternatives to clinicians with medical training or academic credentials (Olmstead et al., 2007; White, 2014). Although this line of reasoning is a plausible, the opposite relationship is more likely in the long term. As Medicaid requires professional clinicians' direct service provision, supervision, or referral for reimbursement, clinics located in Medicaid expansion states might be incentivized to employ more licensed and/or credentialed staff members to capture market opportunities that expanded Medicaid offers (Andrews et al., 2015).

Hypothesis 4-1: SUD treatment centers located in the Medicaid expansion states are more likely to have a greater proportion of staff with lived experience

Hypothesis 4-2: SUD treatment centers located in the Medicaid expansion states are less likely to have a greater proportion of staff with lived experience

**Service modality.** Outpatient opioid treatment programs (OTPs) are specifically licensed outpatient units offering methadone or buprenorphine-assisted treatment and allowing opioid use disorder patients to maintain their daily routines and responsibilities while in recovery. These clinics might be discouraged from implementing peer co-production due to rigid regulatory requirements and emphasis on service reliability imposed by a certifying agency (SAMHSA, 2015). Compared with outpatient OTPs, outpatient units that are not licensed to provide medication (i.e., outpatient non-OTPs) might be more incentivized to hire clinicians with prior experience of addiction to facilitate behavioral therapy sessions and peer-support groups.

Inpatient units provide more intensive treatment services for patients with moderate to severe SUDs, requiring staff with medical expertise who can evaluate co-occurring disorders and prescribe and monitor medications. As the nature of their operating environment emphasizes subject matter experts' authority, inpatient clinics might not be interested in implementing a peer co-production mechanism. Lastly, compared to inpatient programs, residential programs offer structured but less-intensive treatment services with an extended timeline (e.g., six to twelve months). As venues facilitating patients' re-socialization, residential units offer a comprehensive set of services (e.g., group therapy, job training, and parenting skill training) to prepare patients coping with various difficulties during recovery beyond treatment settings (National Institute on Drug Abuse, 2018). To provide 24-hour support and to manage costs, these units may hire more staff members with lived experience than units adhering to other modalities. Furthermore, as many residential units are operated by recovering SUD patients, staff with lived experience are

expected to have more senior positions with meaningful organizational influence (Segal, 2017; White, 2014).

Hypothesis 4-3: Outpatient non-OTPs and residential units are more likely to have a greater proportion of staff with lived experience, compared with outpatient OTPs and inpatient units

Hypothesis 4-4: Inpatient units are more likely to have at least one senior staff with lived experience, compared with units in other modalities

Hypothesis 4-5: Compared with recovering staff members at other modalities, staff with lived experience at inpatient units are more likely to have equal or greater levels of influence over organizational or strategic decision-making processes

**Ownership**. As demonstration of a clinic's appreciation of lived experience of addiction and commitment to their former patients, non-profit units may offer people with lived experience various employment opportunities and grant meaningful levels of authority in organizational processes. Private for-profit clinics might also be incentivized to hire staff with lived experience in order to lower labor costs, but without a particular intention to share organizational authority with staff with addiction history (Friedmann, Alexander, & D'Aunno, 1999; Friedmann, Lemon, Durkin, & D'Aunno, 2003; Lee, Reif, Ritter, Levine, & Horgan, 2002). To separate out the intention of hiring staff with lived experience, a set of hypotheses will be introduced shortly (hypotheses 4-11, 4-12, and 4-13) with a factor variable measuring managers' perception on recovering staff's peer co-production potentials. Reflecting the sector's bureaucratized and professionalized workforce expectations, public clinics might be discouraged from hiring staff with lived experience because many recovering staff often fail to satisfy educational credential requirements. However, once individuals with addiction history meet the standards and are hired,

they may have greater chances to hold senior positions and have equal or greater influence over strategic decision-making processes, under public unit's efforts to legitimatize organizational decisions (DiMaggio & Powell, 1983).

Hypothesis 4-6: Private nonprofit and for-profit SUD clinics are more likely to hire a greater proportion of staff with lived experience, compared with public clinics

Hypothesis 4-7: Private nonprofit and public clinics are more likely to have at least one senior staff with lived experience, compared with private for-profit clinics

Hypothesis 4-8: Compared with private for-profit clinics, staff with lived experience are more likely to have equal or greater levels of influence over organizational or strategic decision-making processes at private nonprofit or public units

**Unit affiliation and accreditation.** SUD treatment units owned by hospitals or mental health centers may subscribe to the parent organization's medically and psychologically-oriented service mode and perceive peer co-production mechanism as less valuable (DiMaggio & Powell, 1983; Lee et al., 2002). In addition, these clinics might be inclined to hire more professionally trained and licensed clinicians instead of staff with lived experience of addiction. In a similar manner, the accreditation process may deter SUD clinics from implementing peer co-production efforts because the process often requires the presence of staff members with particular credentials to deliver various clinical and medical services (Abraham, Knudsen, Rieckmann, & Roman, 2013; Friedmann et al., 2003). Thus, accredited units may employ more licensed and credentialed staff with medical and academic training, leaving relatively small room for staff with lived experience.

Hypothesis 4-9: SUD clinics owned by hospitals and mental health centers are more likely to have a small proportion of staff with lived experience

Hypothesis 4-10: Accredited SUD clinics are more likely to have a smaller proportion of staff with lived experience than non-accredited units

**Organizational culture and management attitude.** Organizational culture is "a pattern of shared basic assumptions" (p. 6) manifested in organizational values, processes, and structures, and managers' views can be particularly influential in formulating SUD clinics' culture and care mode (Schein, 1992). Particularly, when managers perceive greater potential in staff with lived experience conducting peer co-production, they may show greater acceptance towards the mechanism. Beyond hiring more recovering staff, managers may want to position them in key organizational roles with sufficient opportunities to influence organizational processes. Additionally, when managers support a 12-step approach, they may hire more staff in recovery to promote that particular recovery model. Previous research shows negative associations between manager's endorsement of the 12-step recovery model and offering of mental health services and medication-assisted treatments (D'Aunno, 2006a; D'Aunno et al., 2014; Friedmann et al., 2003). Thus, it is a reasonable to assume that manager's endorsement of mutual support models might be associated with a greater acceptance of peer co-production mechanisms.

Hypothesis 4-11: When directors endorse a 12-step recovery model or perceive a greater potential in peer co-production mechanisms, SUD clinics are more likely to have a greater proportion of staff with lived experience

Hypothesis 4-12: When directors endorse a 12-step recovery model or perceive a greater potential in peer co-production mechanisms, SUD clinics are more likely to have at least one senior staff with lived experience

Hypothesis 4-13: When directors endorse a 12-step recovery model or perceive a greater potential in peer co-production mechanisms, staff with lived experience are more likely to have equal or greater levels of influence over organizational or strategic decision-making processes

**Patient characteristics.** While many treatment options have been developed and introduced into the field, group therapy has firmly remained a primary treatment mode for patients with alcohol addiction (White, 2014). Placing significant value on peer support and lived experience, clinics serving alcohol use disorder patients may hire more staff with lived experience not only to facilitate therapy sessions, but also to offer informal and non-clinical supports and guidance for patients. In such an environment, peer co-production can be a natural mode of service provision.

Hypothesis 4-14: SUD treatment units serving a greater proportion of alcohol use disorder patients are more likely to have a greater proportion of staff with lived experience

Hypothesis 4-15: SUD treatment units serving a greater proportion of alcohol use disorder patients are more likely to have at least one senior staff with lived experience

Hypothesis 4-16: When SUD treatment units serve a greater proportion of alcohol use disorder patients, staff with lived experience are more likely to have equal or greater levels of influence over organizational or strategic decision-making processes

**Variables and analytic approaches**

The current chapter uses the 2017 wave of the National Drug Abuse Treatment System Survey (NDATSS) (n=657). Three dependent variables are used as proxies of the peer co-production mechanism: (1) a proportion of staff members with lived experience of addiction, (2)

whether a unit had at least one senior staff with lived experience, and (3) whether staff with lived experience possessed equal or greater levels of influence over organizational/strategic decision-making process than those without lived experience.

The 2017 wave asked multiple questions of administrative directors related to staffing decisions (e.g., number of full-time and part-time staff members, contractors, etc.). The first dependent variable was drawn from existing NDATSS questions. The survey asked "Of all of your unit's paid treatment staff, how many are staff in recovery from drug or alcohol use disorder? This excludes consultants or independent contractors." The proportion of treatment staff with lived experience is calculated by dividing the number of recovering staff by the number of total (full and part-time) employees of a unit. Although this variable captures important information, simply having more recovering staff does not necessarily guarantee opportunities for them to advocate on behalf of patients or to influence organizational processes to better accommodate patients' needs. Many staff members with lived experience of SUD are often hired as front-line workers with limited authority or power over service and organizational decision-making processes (Carr, 2011).

To compensate for the first dependent variable's limitation, multiple original questions were added to the 2017 wave and asked of administrative directors (see Appendix A for question wordings). The second and third dependent variables were developed to capture information about recovering staff's organizational positions and influence levels at clinics. To develop the second dependent variable, I initially calculated the proportion of senior staff members with lived experience at a clinic, using information on total number of senior managers or clinical supervisors (e.g., Directors, human resource or compliance managers) and total number of recovering managers or supervisors. Due to a significant number of zero values and skewness of

the proportion of senior staff with lived experience variable (63% had no senior staff with lived experience, Kurtosis=2.77), the variable was recoded as a binary variable indicating whether a unit had any senior staff with lived experience of addiction (1=Yes, 0=No). The third dependent variable for this chapter came from the following question: "Although individual personalities matter, in general, compared with staff without a history of substance use disorder, staff in recovery are more likely to influence strategic (organizational) decisions (i.e., target clients, budget, staff composition)." A five-scale variable was recoded into a binary variable indicating whether staff with lived experience have equal or greater influences on units' strategic decisions (1=Yes, 0=No).

In addition to the variables mentioned in the hypotheses, multiple control variables are used in the following analyses. Most variables' descriptions can be found in Chapter Three. The only new variable introduced in this chapter is a factor variable, capturing directors' attitudes towards staff with lived experience's peer co-production potential at their units (Cronbach's alpha=0.82). Directors answered the following five-point scale questions (ranging from (1) strongly disagree to (5) strongly agree) added to the 2017 wave: "Although individual personality matters, in general, compared with staff without a history of substance use disorder,. Staff in recovery… (1) … are better able to understand clients' needs. (2)… are able to develop therapeutic relationships with clients. (3)… are better able to motivate clients. (4)… are better able to inform staff about how best to approach clients. (5) … are more likely to be flexible in their approach to treatment."

Before running main analyses, descriptive statistics were estimated with a survey weight developed by the NDATSS team (Chen et al., 2017). Then, multivariate linear regression was applied for the first main analysis with a continuous dependent variable—a proportion of staff

with lived experience. For the second and third main analyses with binary dependent variables, multivariate logistic regression was employed. In order to preserve sample size and control for estimation bias from missing values, predictor and control variables' missing values are estimated through a step-wise regression multiple imputation process (see Chapter Two for detailed discussion about this process) (Azur et al., 2011; Engels & Diehr, 2003).

**Result**

In 2017, about 33% of the SUD field's workforce had first-hand experience of an alcohol and/or drug use disorder (see Table 4.1). Despite their noteworthy presence in the field of addiction treatment, staff with lived experience held senior positions at only 39% of units, implying that most recovering staff hold lower rank positions. Recovering staff's limited influence over organizational process is echoed in the last dependent variable. At about 45% of the SUD clinics, recovering staff had relatively lower level of organizational influence compared with staff members without a first-hand experience of SUD.

**Table 4.1 Descriptive statistics of variables**

| | Mean/% (SD) | Range |
|---|---|---|
| **Dependent variables** | | |
| Proportion of SwLE | 33.31 (29.51) | 0 – 100 |
| Presence of any senior SwLE | 38.54 (48.71) | 0 – 100 |
| SwLE possess equal or greater influence over strategic decisions, compared to staff without SUD history | 54.77 (49.81) | 0 – 100 |
| **Predictor and control variables** | | |
| Located in Medicaid expansion state | 69.57 (46.05) | 0 – 100 |
| Total SUD patient admission in county (thousands) | 14.04 (22.63) | 0 – 101.27 |
| Proportion of revenue from private/commercial insurance | 15.49 (23.61) | 0 – 100 |
| Service modality | | |
| OTP Outpatient | 8.41 (27.78) | |
| Non-OTP Outpatient | 66.00 (47.41) | |
| Inpatient | 4.38 (20.47) | |
| Residential | 21.21 (40.01) | |
| Unit type | | |
| Private for-profit | 29.75 (45.76) | |
| Private non-profit | 57.11 (49.53) | |
| Public | 13.13 (33.80) | |
| ACO or PCMH in place | 22.19 (41.58) | 0 – 100 |
| Accredited (JC or CARF) | 53.49 (49.92) | 0 – 100 |
| Owned by hospital or mental health facility | 25.07 (43.38) | 0 – 100 |
| Director perceive high competition | 59.58 (49.11) | 0 – 100 |
| Director's reliance on professional information sources | 3.38 (0.71) | 1 – 5 |
| Director's perception on SwLE's peer co-production potential (factor) | 0.11 (0.95) | -2.09 – 2.39 |
| Clinical supervisor endorse 12-step treatment model | 55.57 (49.73) | 0 – 100 |
| Proportion of staff with professional/graduate degree | 39.08 (28.84) | 0 – 100 |
| Proportion of AUD clients | 49.74 (26.81) | 0 – 100 |
| Proportion of OUD clients | 32.66 (32.35) | 0 – 100 |
| Proportion of prescription OUD clients | 27.61 (25.42) | 0 – 100 |
| Proportion of involuntary patients | 46.14 (34.76) | 0 – 100 |
| Proportion of racial/ethnic minority patients | 39.48 (31.14) | 0 – 100 |
| Region | | |
| Northeast | 20.97 (40.74) | |
| Midwest | 23.06 (42.15) | |
| South | 29.29 (45.54) | |
| West | 26.68 (44.26) | |
| Number of staff (full- and part-time) | 21.73 (36.90) | 1 – 450 |

Abbreviations: SwLE (Staff with Lived Experience); OTP (Opioid Treatment Program); AUD (Alcohol Use Disorder); OUD (Opioid Use Disorder); JC (Joint Commission); CARF (Commission on Accreditation of Rehabilitation Facilities)

Multiple factors were associated with the presence of staff with lived experience at SUD clinics (see Table 4.2). As hypothesized, number of regional SUD admissions, director's attitude on peer co-production, and supervisor's endorsement of the 12-step recovery model were positively associated with the proportion of staff with lived experience. Compared with other service modalities, residential units employed significantly higher proportions of staff with lived experience after controlling for various factors. Greater presence of staff members with graduate degrees, patients with prescription opioid use disorders, and racial/ethnic minority patients were negatively associated with the proportion of staff with lived experience.

Fewer associations were identified in the analyses of the second dependent variable. As hypothesized, the odds of having at least one senior staff with addiction history were about a half of among units owned by hospitals or mental health facilities. For-profit units had significantly higher odds of having a recovering senior staff member, compared with nonprofit or public units. Managers' support of the 12-step recovery mode, positive attitude towards peer co-production, and reliance on professional information sources were positively associated with greater odds of having at least one senior staff member with a SUD history. Lastly, only one relationship stood out in the analysis on the last dependent variable. Directors' perceptions of peer co-production were positively associated with the odds of staff with lived experience holding equal or greater levels of influence in organizational/strategic decision-making processes.

**Table 4.2 Regression analysis results**

| | Proportion of SwLE | Presence of any senior SwLE | SwLE equal or greater influence on org. decisions |
|---|---|---|---|
| | Coef. (95% CI) | O.R. (95% CI) | O.R. (95% CI) |
| Located in Medicaid expansion state | -1.51 (-6.91, 3.90) | 1.14 (0.65, 2.00) | 0.72 (0.43, 1.21) |
| Total SUD patient admission in county [&] | 2.20 (0.82, 3.59)** | 0.97 (0.83, 1.12) | 0.99 (0.87, 1.14) |
| Service modality (ref. Non-OTP Outpatient) | | | |
| OTP Outpatient | -5.17 (-10.87, 0.54)^ | 1.05 (0.57, 1.93) | 1.04 (0.61, 1.78) |
| Inpatient | 4.45 (-4.62, 13.51) | 1.79 (0.70, 4.58) | 0.65 (0.28, 1.49) |
| Residential | 10.92 (4.74, 17.11)** | 1.41 (0.75, 2.63) | 0.86 (0.48, 1.55) |
| Unit type (ref. Private for-profit) | | | |
| Private non-profit | -6.07 (-10.95, -1.20)* | 0.60 (0.36, 0.99)* | 1.21 (0.75, 1.94) |
| Public | -5.96 (-12.69, 0.76)^ | 0.49 (0.24, 1.00)^ | 1.20 (0.63, 2.29) |
| ACO or PCMH in place | 2.27 (-2.53, 7.07) | 0.82 (0.50, 0.35) | 0.78 (0.50, 1.21) |
| Accredited (JC or CARF) | -1.32 (-5.96, 3.31) | 0.74 (0.46, 1.17) | 1.28 (0.83, 1.97) |
| Owned by hospital/mental health facility | -4.96 (-10.00, 0.09)^ | 0.47 (0.27, 0.80)** | 0.90 (0.57, 1.43) |
| Proportion of revenue from private/commercial insurance[#] | 0.72 (-1.44, 2.88) | 0.98 (0.78, 1.24) | 1.06 (0.86, 1.30) |
| Director perceives high competition | -1.97 (-6.02, 2.07) | 1.03 (0.68, 1.55) | 1.26 (0.87, 1.82) |
| Director's reliance on professional information sources | 0.88 (-1.92, 3.68) | 1.39 (1.02, 1.90)* | 1.29 (0.98, 1.68)^ |
| Director's perception on SwLE's peer co-production potential | 5.82 (3.77, 7.87)*** | 1.55 (1.24, 1.93)*** | 2.14 (1.73, 2.65)*** |
| Supervisor endorse 12-step model | 6.89 (2.39, 11.39)** | 1.89 (1.21, 2.94)** | 1.01 (0.68, 1.50) |
| Proportion of staff with graduate degree[#] | -7.09 (-9.24, -4.93)*** | 0.65 (0.51, 0.82)*** | 0.99 (0.81, 1.21) |
| Proportion of AUD clients[#] | 1.17 (-1.08, 3.41) | 1.07 (0.85, 1.35) | 1.08 (0.86, 1.34) |
| Proportion of OUD clients[#] | 0.85 (-1.49, 3.19) | 1.03 (0.80, 1.33) | 0.93 (0.74, 1.18) |
| Proportion of prescription OUD clients[#] | -2.51 (-4.92, -0.10)* | 0.88 (0.68, 1.13) | 0.92 (0.71, 1.20) |
| Proportion of involuntary patients[#] | 0.09 (-2.24, 2.42) | 1.03 (0.80, 1.32) | 1.16 (0.93, 1.47) |
| Proportion of racial/ethnic minority patients[#] | -2.77 (-4.94, -0.60)* | 1.04 (0.83, 1.30) | 0.98 (0.80, 1.20) |
| Region (ref. Northeast) | | | |
| Midwest | 0.16 (-5.43, 5.76) | 1.15 (0.65, 2.05) | 0.56 (0.33, 0.95)* |
| South | 0.63 (-6.05, 7.31) | 1.29 (0.64, 2.58) | 0.55 (0.29, 1.03)^ |
| West | 7.66 (1.88, 13.43)** | 1.60 (0.88, 2.89) | 0.69 (0.40, 1.18) |

**Table 4.2 Regression analysis results (continued)**

| | Proportion of SwLE | Presence of any senior SwLE | SwLE equal or greater influence on org. decisions |
|---|---|---|---|
| Number of staff [&] | -7.27 (-9.60, -4.95)*** | 1.36 (1.08, 1.72)* | 0.98 (0.79, 1.20) |

^p<0.1, *p<0.05, **p<0.01, ***p<0.001, [&]Log transformed, [#]Standardized

Abbreviations: SwLE (Staff with Lived Experience); OTP (Opioid Treatment Program); JC (Joint Commission); CARF (Commission on Accreditation of Rehabilitation Facilities); AUD (Alcohol Use Disorder); OUD (Opioid Use Disorder)

**Discussion**

With a unique development of the SUD field and high regards for a person's lived experience of addiction, staff with lived experience comprise an important portion of the SUD treatment field's workforce. Although their presence decreased from 70-80% in the 1980s and 50-60% in the 1990s (White, 2014), staff with lived experience still comprise approximately a third of the SUD treatment field's workforce. They have equal or greater levels of influence at about 55% of units, and about 40% of units had at least one senior staff with addiction history. These statistics possibly signal under-leveraged potentials of staff with lived experience as mediators and translators between patients and staff members at SUD clinics. Recovering staff are often characterized para-professionals or self-trained clinicians, and rarely projected as actors mediating politics within SUD clinics. Given that they are important street-level service providers, how staff with lived experience of SUD influence patient's care experience deserves further investigations.

Regression analyses in this chapter highlight multiple important patterns. First and foremost, many managers seem to recognize the potentials of peer co-production and actively implement the peer co-production mechanism. Directors' positive attitudes toward peer co-production potential of staff with lived experiences is the only variable significantly and consistently associated with all three dependent variables tested in this chapter. Interestingly, this variable had some meaningful but not worrisome levels of correlations with dependent and some independent variables (e.g., corr.=0.35, $p<0.05$ with proportion of staff with lived experience; corr.=0.25, $p<0.05$ with having any senior staff with lived experience; corr.=0.31, $p<0.05$ with staff with lived experience possesses equal or greater influence on strategic/organizational decisions; corr.=0.10, $p>0.10$ with clinical supervisor's endorsement of the 12-step recovery

model) (see Appendix B for a correlation table). It seems that directors recognizing the unique capacities of staff with lived experience intentionally hire more staff with lived experience, strategically position them, and grant more opportunities for them to speak on behalf of patients. This variable adds a unique value to the study, which will be highlighted in the fifth chapter, showing the relationships between service outputs and director's perceived value on recovering staff's peer co-production possibilities are completely mediated through peer co-production efforts. More simply put, directors' recognition of the potential of peer co-production was significantly associated with changes in service availability mainly through granting greater organizational influence/power to staff with lived experience.

It is worth mentioning that a supervisor's endorsement of the 12-step recovery model was associated with having more staff with lived experience and having at least one senior recovering staff. However, the support for the 12-step model was not associated with organizational influence level of staff with lived experience. Although peer-support has been emphasized in the field for a long time, the model does not necessarily ensure recovering staff's opportunities for meaningful influence on care processes, which are often bounded by rigid structures and rules (e.g., completion of the 12 steps in chronological order and emphasis on spiritual features) (Brigham, 2003). In other words, SUD treatment field's long tradition of valuing first-hand addiction experience may legitimatize presence of staff with lived experience, sometimes at senior levels. However, clinic leaders' recognition of recovering staff's unique capacities and intentional use of them appear to facilitate sharing organizational authority toward staff with lived experience—a potentially necessary step to ensure peer co-production mechanisms bring substantial (or meaningful) changes into patient care experiences.

Second, many SUD units seem to follow institutional pressures when implementing (or not implementing) peer co-production efforts. Units owned by hospitals or mental health facilities or which employed more staff with specialized training were less likely to hire staff with lived experience or have a senior staff member with addiction history. In an environment emphasizing technocratic expertise and authority and already hired many staff members with credentials, clinics might be discouraged from leveraging the experiential expertise of recovering staff (DiMaggio & Powell, 1983; Flexner, 1915).

The results also highlight a gradual change in the SUD field. Among the units in which directors relied more on professional information sources, staff with lived experience were more likely to hold a senior position and have a meaningful level of influence. Given the absence of an association with proportion of staff with lived experience, managers' reliance on professional information sources seems to have a more meaningful relationship beyond simply legitimizing organizational process by hiring more staff with lived experience. For instance, managers might be introduced to professional groups' push for patient engagement and act as institutional entrepreneurs to facilitate collaborative efforts through staff with lived experience (Battilana, Leca, & Boxenbaum, 2009). Future qualitative research would be helpful to investigate this pattern more closely.

Third, for-profit units' associations with proportion of staff with lived experience and presence of senior recovering staff suggest these units' two potentially conflicting motives for hiring recovering staff. For-profit clinics might hire staff with lived experience simply for economic reasons as recovering staff are often readily available and less expensive workers compared to clinicians with educational credentials or specialized trainings (Olmstead et al., 2007). It is also possible that these units are responding to patients' needs and demands for peer

support and trying to leverage benefits from peer co-production. In other words, a market mechanism may have forced for-profit units to implement a relatively innovative approach in hiring staff with lived experience as mediators or facilitators of collaborations.

A separate analysis with interaction terms between unit type (i.e., dummy variables for nonprofit and public units) and directors' perceived potentials of peer co-production possibilities produced interesting results. Both interaction terms with nonprofit and public units were significantly ($p<0.01$) and negatively associated with the proportion of staff with lived experience in SUD clinics (coefficients were -6.43 and -9.49, respectively). In other words, for-profit clinics that directors perceive recovering staff's peer co-production potentials tended to hire more staff with lived experience than nonprofit or public units, whose managers also had similar appreciation of staff with lived experiences' peer co-production capacities. Only the interaction term with public units was negatively and significantly associated with the presence of any senior staff with lived experience (odds ratio=0.35, $p<0.01$). And both interaction terms had insignificant ($p>0.1$) relationships with the last dependent variable—whether staff with lived experience possessed greater or equal levels of influence over organizational/strategic decisions. Regardless the motives, the lack of association with recovering staff's influence levels signals that for-profit units' peer co-production efforts may remain as a ceremonial practice without substantive allocation of organizational power structure, which may suppress peer co-production mechanism's potential to instigate organizational structural or procedural changes to better respond to service users' needs and concerns.

This chapter identified one unexpected and a couple of puzzling relationships as well. The total number of SUD patient admission is positively associated with the proportion of staff with lived experience. Most plausible explanation would be that clinics located in counties with

greater total SUD patient admissions tend to hire more staff with lived experience because these clinics are located in urban/metropolitan areas where staff with lived experience are often clustered (the correlation between the county-level admission number and the urbanity variable was greater than 0.8, $p<0.05$). Although effect sizes were relatively small, proportions of racial/ethnic minority patients and prescription opioid use disorder patients were negatively associated with the proportion of staff with lived experience. Previous literature showed that minority patients tend to receive sub-standard services and encounter fewer treatment options (D'Aunno, 2006b). Thus, the current findings might highlight an additional racial disparity in SUD treatment services, racial/ethnic minority patients' inadequate level of access to emotional, informational, and instrumental support from peers (Reif et al., 2014). Multiple explanations may exist behind the negative relationship between proportions of staff with lived experience and patients with prescription opioid use disorder. One plausible scenario is that prescription opioid use disorder patients enter treatment through clinics with fewer staff with lived experience—like outpatient units owned by hospitals. Another possibility is that patients with prescription opioid use disorder may have relatively sufficient opportunities to engage with clinicians directly and do not necessarily need the peer co-production mechanism to influence the treatment process as much as alcohol or heroin use disorder patients. Further investigations on different patient groups' opportunities to engage in care provision processes seem necessary.

# Chapter 5 : ASSOCIATIONS BETWEEN CO-PRODUCTION AND SERVICE OUTPUTS

Chapters 3 and 4 examined the factors associated with substance use disorder (SUD) treatment units' implementation of two co-production mechanisms: patient-centered care practices and peer co-production. This chapter explores the other ends of co-production efforts—their relationships to availability and utilization patterns of various services at SUD clinics. The analysis result not only highlights associations between patient-centered care practices and peer co-production mechanisms and service outputs, but also reveals potentials and limitations of two co-production methods. The following section reviews services that are included in this chapter's analysis, and provides hypotheses on how patient-centered care practices and peer co-production mechanisms can be associated with the availability and utilization patterns of those programs.

## Service availability and utilization

**Treatment programs and medications.** To demonstrate the importance and clinical implications of co-production, this study investigates whether SUD clinics' implementations of patient-centered care practices and peer co-production mechanisms are associated with availability and utilization patterns of opioid aftercare and maintenance services. Engagement in aftercare services has been proven to be effective in preventing patients from relapsing, especially during the critical period shortly after completing treatment services (Lash & Blosser, 1999). Considering the high relapse rates among SUD patients (40-60%) (National Institute on Drug Abuse, 2014), aftercare programs are very important services for promoting long-term recovery. Opioid maintenance therapy is an effective treatment option for maintaining patients in care and reducing their heroin use (Mattick, Breen, Kimber, & Davoli, 2009). Using a long-acting analgesic to opioid (e.g., methadone and buprenorphine), maintenance therapy not only

reduces withdrawal symptoms and future relapse, but also allows patients to maintain their daily lives in the communities in which they reside (Center for Substance Abuse Treatment, 2005). Despite field leadership's call for and development of new medications over the last two decades, less than half of all SUD clinics have adopted medication-assisted treatments (Roman, Abraham, & Knudsen, 2011). The chapter also investigates relationships between SUD clinics' co-production efforts and availability and utilization patterns of two opioid use disorder treatment medications: Methadone and buprenorphine.

**Harm reduction services.** Harm reduction is a pragmatic and evidence-based approach to minimizing preventable harms to drug users and the public (Coffin, 2000; Marlatt, 1996). Unfortunately, harm reduction services are not readily available to many patients, partially due to a long history of abstinence-oriented approaches in the field and concern about side effects (e.g., encouragement of drug use) (Marlatt & Witkiewitz, 2002). The current study will investigate whether the practices of patient-centered care practices and peer co-production are associated with adoption and distribution of three harm reduction services—distribution of condoms, and naloxone (i.e., an overdose reversing antidote), and materials that inform the ways to prevent overdose. Overdose is one of the fastest rising causes of death in the U.S. and SUD patients are at significant risk of getting or transmitting HIV and Hepatitis C compared to a general population (National Institute on Drug Abuse, 2017; Suryaprasad et al., 2014).

**Ancillary services.** Patients with SUD often present multiple secondary problems beyond addiction, including but not limited to homelessness, unemployment, mental illness, and other acute and chronic health conditions (Bassuk, Buckner, Perloff, & Bassuk, 1998; Compton, Gfroerer, Conway, & Finger, 2014; Flynn & Brown, 2008; Grant et al., 2004). Because these issues can aggravate addictive behaviors and lead to relapse, many SUD treatment units provide

various health and social services to meet such needs (Fraze, Lewis, Rodriguez, & Fisher, 2016; Friedmann, Saitz, & Samet, 1998; White, 2014). These supportive services are proven to be effective in patients' functional improvement, treatment retention, and recovery outcomes (Duffy & Baldwin, 2013; Flynn & Brown, 2008; Mclellan et al., 1998). Despite their importance and effectiveness, these non-core health and social services are not readily available for many patients. In 2000, 42% and 88% of SUD treatment units in the U.S. offered housing assistance and mental health care services, and within units offering those services only 22% and 29% of patients utilized them, respectively (Friedmann et al., 1999, 2003). This chapter investigates the associations between co-production mechanisms and patterns of routine health care, transportation assistance, and housing assistance services at SUD treatment centers.

Existing addiction health service research literature shows that multiple environmental and organizational characteristics correlate with availability and utilization of various services. For example, compared with for-profit clinics, public and private nonprofit SUD clinics tend to offer more services satisfying patients' diverse needs, such as routine health care and employment counseling (Friedmann et al., 2003). When accredited, affiliated with hospitals and mental health centers, or participating in an Accountable Care Organization (ACO) or a Patient Centered Medical Home (PCMH), SUD clinics are able to offer a greater range of medical and supportive services for their patients by leveraging existing services and resources of parent or partner organizations (Friedmann et al., 1999, 2003). Private insurance income is positively correlated with SUD clinics' adoption of medication-assisted treatment, while SUD clinics with a high proportion of involuntary patients are less likely to implement medication treatment (Abraham et al., 2013; Ducharme, Knudsen, & Roman, 2006; Roman et al., 2011). Furthermore, when managers endorse the mutual support model, SUD clinics tend to provide a smaller range

of services and offer sub-standard medication (e.g., by prescribing lower dosages) (D'Aunno et al., 2015; Knudsen, Ducharme, & Roman, 2006; Pollack & D'Aunno, 2008). Controlling for these and other factors correlated with co-production efforts in previous chapters, this chapter investigates whether SUD clinics' implementation of patient-centered care practices and peer co-production mechanisms are associated with availability and utilization patterns of the various treatment, supportive, and harm reduction services mentioned above.

**Theoretical model and hypotheses**

**Associations between patient-centered care and service patterns.** Introducing or discontinuing service is an organization level decision, conditional upon multiple organizational and environmental factors, such as increase in regional patient admissions and availability of resources (D'Aunno et al., 2015; Friedmann et al., 2003; Roman et al., 2011). Even after controlling for such factors, patient-centered care may still have a significant relationship with patterns of service offerings. As clinicians better understand patients' concerns through engagement and collaboration, they may advocate for changes to service offerings. For instance, when staff members recognize multiple patients' needs for a harm reduction service or a medication, clinicians and staff members may encourage supervisors, directors, and board members to introduce more responsive services to satisfy such needs (Levesque, Harris, & Russell, 2013).

Hypothesis 5-1: When SUD treatment centers practice or their managers have positive views on patient-centered care, clinics are more likely to offer services that can improve patients' long-term outcomes

Literature on street-level bureaucracy maintains that frontline workers utilize their discretion to mediate and re-interpret prescribed programs and services (Brodkin, 2012; Lipsky,

1980). Particularly in health and social service settings, service providers possess varying degrees of discretion to make adjustments using their field-level knowledge and experience (Hasenfeld, 2010a). As clinicians and patients recognize mutual dependency and each other's expertise in technical and contextual domains, they would be incentivized to engage in deliberatively collaborative processes. With better understanding of each other's concerns and preferences, patients and clinicians may be able to come up with realistic and potentially more beneficial treatment plans using already available organizational resources (Levesque et al., 2013; Stewart et al., 1995).

Hypothesis 5-2: When SUD treatment centers practice or their managers have positive views on patient-centered care, more patients will use services that can improve their long-term outcome

**Associations between peer co-production and service patterns.** Peer co-production mechanisms may not have significant relationships with service availability patterns, which may require sizable organizational fixed asset investments or resource reallocation. Staff members with lived experience of addiction are often hired as front-line staff with limited organizational power to influence such managerial or strategic decisions (Carr, 2011; White, 2014). Although staff members with lived experience bring their experiential knowledge of addiction and ability to relate with patients to the care system, they may not possess expertise in making organizational-level decisions that require knowledge and experience in management and finance (Kalafat & Boroto, 1977; LeRoux, 2008; Stöffelmayr et al., 1999).

Hypothesis 5-3: Practice of peer co-production mechanisms will not have significant relationships with service availability patterns

It is also possible that staff with lived experience may not be interested in providing various services that goes against their belief and experience of addiction and recovery. Multiple philosophies of addiction and recovery co-exist in the SUD treatment field, and staff with lived experience of addiction tend to have an eclectic orientation, recognizing diverse pathways to addiction and recovery (Humphreys et al., 1996; Walters & Rotgers, 2012). However, many recovering staff—particularly older, less-educated, and those with alcohol use disorders—have strong commitment to a disease model of addiction, viewing it as a progressive disease requiring complete abstinence from all substances, including medications (Shipko & Stout, 1993; White, 2014). Therefore, staff with lived experience may oppose introducing evidence-based effective medication-assisted treatment and medications. This potential relationship may expose a critical limitation of peer co-production. Although their experiential knowledge and affinity to SUD patients provided legitimate argument for them to serve as patients' representatives, recovering staff's opinions may not necessarily reflect the interests and concerns of patients, but rather reflect their own beliefs and preferences.

Hypothesis 5-4: Practice of peer co-production mechanisms will have a negative relationship with availabilities of maintenance treatment or medications

Peer co-production mechanisms may have mixed associations with service utilization patterns as well, but in a different way. For most services, staff with lived experience may suggest that patients utilize multiple already existing clinical and non-clinical services as needed (Hecksher, 2007; Humphreys et al., 1996). They are organizational actors with working knowledge of both sides of services (i.e., the needs of patients and the organization's resources and offerings). Once they find a match between patients' needs and programs offered by their clinics, staff with lived experience might try to connect patients to the services or

empower/encourage patients to ask for the services from other staff members. Compared to service suggestions from clinicians without lived experience of SUD, patients might be more willing to follow recommendations from staff with lived experience based on relatively higher trust and more developed rapport (Humphreys et al., 2004; White, 2014). However, when it comes to opioid maintenance and medications, peer co-production is expected to have negative associations with service utilization rates for the same reason stated for the Hypotheses 5-4.

Hypothesis 5-5: When SUD treatment centers practice peer co-production, patients are more likely to use most services that can improve their long-term outcome

Hypothesis 5-6: When SUD treatment centers practice peer co-production, patients are less likely to utilize maintenance treatment or medications

**Variables and analytic approach**

The dependent variables for this chapter include availability and utilization rates of ten services—including treatment programs (opioid maintenance therapy and opioid aftercare), medications (methadone and buprenorphine), harm reduction services (distribution of pamphlet on overdose prevention, condom distribution, and naloxone distribution), and ancillary services (routine health care, transportation assistance, and housing assistance). Availability is a measure of whether a unit offers a service or not (dichotomous variable: 1=Yes, 0=No). Utilization is a measure of the percentage of substance abuse clients who received the service in the last fiscal year (continuous variable: 0-100%). For units that did not provide the services, a value of zero (i.e., 0%) was assigned to the service's utilization rate. Clinical supervisors provided information on medications and treatment and ancillary services, and administrative directors answered questions on harm reduction programs. Five variables describing units' co-production efforts are used as key predictor variables (see chapters 3 and 4 for detailed descriptions on patient-centered

care and peer co-production variables, respectively). Environmental and organizational-level variables—including variables significantly associated with co-production efforts in the last two chapters and previous literature—are primarily employed as control variables throughout this chapter.

Multivariate logistic regression is applied to predict the availability of various services at SUD clinics. For the analysis using service utilization rates as dependent variables, Heckman selection model was used. Originally, the plan was to apply Poisson (or log-linear) regressions, given the nature of continuous variables with a non-zero probability mass at zero. However, units with zero and non-zero utilization rate values had significantly different characteristics, violating a non-selection bias assumption.

**Results**

Availability and utilization rates varied across ten services (see Table 5.1). With respect to harm reduction services, overdose prevention material was available at 68.6% of units, while naloxone was available at 15.7% of units. Methadone and buprenorphine were available at about 10% and 33% of units, and their utilization rates were 70.4% and 15.8% respectively. Statistics on predictor and control variables are discussed in the previous chapters (see Table 5.2). However, it is worth mentioning that the majority of clinics in the U.S. implemented at least one co-production mechanism. When counting units which either invited patients into clinical decision-making processes or hired at least one senior staff with lived experience, 56% of clinics attempted to co-produce with patients—a significantly high number, considering the difficulties and challenges of collaborative efforts.

**Table 5.1 Service availability and utilization**

| | **Availability**, Mean (SD) | **Utilization** among units offering service, % (SD) |
|---|---|---|
| Treatment programs | | |
| Opioid maintenance | 23.78 (42.44) | 54.50 (40.52) |
| Opioid aftercare | 63.00 (48.32) | 32.75 (32.11) |
| Medications | | |
| Methadone | 10.32 (30.44) | 70.39 (36.56) |
| Buprenorphine | 33.64 (47.29) | 15.81 (20.91) |
| Harm reduction services | | |
| Pamphlet on overdose prevention | 68.56 (46.47) | 83.41 (29.19) |
| Distribute condom | 30.50 (46.08) | 72.02 (35.04) |
| Distribute naloxone | 15.66 (36.38) | 59.27 (41.64) |
| Ancillary Services | | |
| Routine medical care | 62.78 (48.38) | 52.03 (33.26) |
| Transportation assistance | 58.62 (49.29) | 45.86 (35.63) |
| Housing assistance | 54.24 (49.86) | 37.29 (32.99) |

**Table 5.2 Descriptive statistics of predictor and control variables**

| | Mean/% (SD) | Range |
|---|---|---|
| Patient-centered care | | |
| Invite patients to clinical decision-making processes | 22.86 (42.03) | 0 – 100 |
| Patient-Centered Care Factor (score) | -0.08 (0.91) | -4.87 – 1.38 |
| Peer co-production | | |
| Proportion of SwLE | 33.31 (29.51) | 0 – 100 |
| Any senior SwLE | 44.12 (49.70) | 0 – 100 |
| SwLE possess equal or greater influence over strategic decisions, compared to staff without SUD history | 54.77 (49.81) | 0 – 100 |
| Located in Medicaid expansion state | 69.57 (46.05) | 0 – 100 |
| Total substance abuse admission in county (thousands) | 14.04 (22.63) | 0 – 101.27 |
| Proportion of revenue from private/commercial insurance | 15.49 (23.61) | 0 – 100 |
| Service modality | | |
| OTP Outpatient | 8.41 (27.78) | |
| Non-OTP Outpatient | 66.00 (47.41) | |
| Inpatient | 4.38 (20.47) | |
| Residential | 21.21 (40.01) | |
| Unit type | | |
| Private for-profit | 29.75 (45.76) | |
| Private non-profit | 57.11 (49.53) | |
| Public | 13.13 (33.80) | |
| ACO or PCMH in place | 22.19 (41.58) | 0 – 100 |
| Accredited (JC or CARF) | 53.49 (49.92) | 0 – 100 |
| Owned by hospital or mental health facility | 25.07 (43.38) | 0 – 100 |
| Director perceive high competition | 59.58 (49.11) | 0 – 100 |
| Director's reliance on professional information sources | 3.38 (0.71) | 1 – 5 |
| Director's perception on SwLE's peer co-production potential (factor) | 0.11 (0.95) | -2.09 – 2.39 |
| Clinical supervisor endorse 12-step treatment model | 55.57 (49.73) | 0 – 100 |
| Proportion of staff with professional/graduate degree | 39.08 (28.84) | 0 – 100 |
| Proportion of AUD clients | 49.74 (26.81) | 0 – 100 |
| Proportion of OUD clients | 32.66 (32.35) | 0 – 100 |
| Proportion of prescription OUD clients | 27.61 (25.42) | 0 – 100 |
| Proportion of involuntary patients | 46.14 (34.76) | 0 – 100 |
| Proportion of racial/ethnic minority patients | 39.48 (31.14) | 0 – 100 |
| Region | | |
| Northeast | 20.97 (40.74) | |
| Midwest | 23.06 (42.15) | |
| South | 29.29 (45.54) | |
| West | 26.68 (44.26) | |
| Number of staff (full- and part-time) | 21.73 (36.90) | 1 – 450 |

Abbreviations: SwLE (Staff with Lived Experience); OTP (Opioid Treatment Program); AUD (Alcohol Use Disorder); OUD (Opioid Use Disorder); JC (Joint Commission); CARF (Commission on Accreditation of Rehabilitation Facilities)

Multivariate logistic regression results show that SUD clinics' efforts to collaborate with patients through patient-centered care and peer co-production methods were associated with some services' availability (see Tables 5.3-5.6 for full results. Table 5.7 summarizes the result by presenting only the relationships between dependent and predictor variables). As hypothesized, patient-centered care variables were positively associated with services availability, but only a two were statistically significant, included providing overdose prevention educational materials and routine health care. Clinical supervisors' positive views and beliefs on patient-centered care was positively associated both variables. The peer co-production mechanism had significant and negative associations with the availability of opioid maintenance therapy and methadone, as hypothesized.

Unsurprisingly, multiple environmental and organizational-level control variables—including service modality, unit type/ownership, patient and staff composition, and proportions of income from private/commercial insurance—were significantly associated with availability of services. For instance, nonprofit or public units were much more likely to offer harm reduction and supportive services, compared to private for-profit clinics. Compared to outpatient non-OTP units, inpatient or outpatient clinics were much more likely to offer routine medical care, but much less likely to make available aftercare programs or harm reduction services. Clinics heavily relying on private insurance income were much less likely to offer harm reduction and supportive services, and methadone, but much more likely to offer aftercare services and buprenorphine.

**Table 5.3 Co-production's association with availability of treatment services**

| | Opioid aftercare | Opioid maintenance |
|---|---|---|
| | O.R. (95% CI) | O.R. (95% CI) |
| Patient-centered care | | |
| Invite patients in care decision-making processes | 0.91 (0.59, 1.40) | 1.32 (0.71, 2.46) |
| Patient-Centered Care Factor | 0.97 (0.79, 1.19) | 1.00 (0.75, 1.34) |
| Peer co-production | | |
| Proportion of SwLE[#] | 0.90 (0.67, 1.20) | 0.61 (0.38, 0.98)* |
| Any senior SwLE | 1.07 (0.68, 1.69) | 1.07 (0.56, 2.05) |
| SwLE equal or greater influence on strategy | 1.14 (0.76, 1.69) | 1.06 (0.60, 1.89) |
| Located in Medicaid expansion state | 0.80 (0.48, 1.35) | 1.08 (0.50, 2.34) |
| Total substance abuse admission in county [&] | 0.99 (0.86, 1.13) | 1.02 (0.83, 1.24) |
| Proportion of revenue from private/commercial insurance[#] | 1.34 (1.05, 1.71)* | 1.13 (0.82, 1.55) |
| Service modality (ref. Non-OTP Outpatient) | | |
| OTP Outpatient | 0.73 (0.42, 1.25) | 7.90 (4.03, 15.49)*** |
| Inpatient | 0.09 (0.03, 0.26)*** | 0.26 (0.08, 0.83)* |
| Residential | 0.49 (0.27, 0.90)* | 0.66 (0.28, 1.56) |
| Unit type (ref. Private for-profit) | | |
| Private non-profit | 0.98 (0.60, 1.58) | 1.55 (0.74, 3.22) |
| Public | 1.04 (0.54, 1.98) | 1.34 (0.52, 3.44) |
| ACO or PCMH in place | 0.81 (0.52, 1.26) | 1.34 (0.74, 2.43) |
| Accredited (JC or CARF) | 1.07 (0.69, 1.66) | 1.71 (0.86, 3.00) |
| Owned by hospital or mental health facility | 0.85 (0.53, 1.37) | 0.66 (0.34, 1.29) |
| Director perceives high competition | 0.81 (0.55, 1.18) | 1.10 (0.63, 1.92) |
| Director's reliance on professional information sources | 1.10 (0.84, 1.43) | 1.31 (0.87, 1.97) |
| Director's perception on SwLE's peer co-production potential (factor) | 0.97 (0.77, 1.21) | 1.00 (0.72, 1.38) |
| Clinical supervisor endorse 12-step treatment model | 0.89 (0.60, 1.31) | 0.70 (0.40, 1.22) |
| Proportion of professional staff (graduate degree)[#] | 1.09 (0.88, 1.36) | 1.00 (0.73, 1.35) |
| Proportion of AUD clients[#] | 0.99 (0.79, 1.22) | 0.69 (0.50, 0.94)* |
| Proportion of OUD clients[#] | 0.91 (0.73, 1.13) | 1.98 (1.42, 2.76)*** |

**Table 5.3 Co-production's association with availability of treatment services (continued)**

| | Opioid aftercare | Opioid maintenance |
|---|---|---|
| | O.R. (95% CI) | O.R. (95% CI) |
| Proportion of prescription OUD clients[#] | 0.99 (0.80, 1.21) | 1.52 (1.11, 2.09)** |
| Proportion of involuntary patients[#] | 1.21 (0.97, 1.51)^ | 0.54 (0.40, 0.75)*** |
| Proportion of racial/ethnic minority patients[#] | 0.98 (0.79, 1.20) | 1.22 (0.89, 1.65) |
| Region (ref. Northeast) | | |
| Midwest | 1.59 (0.93, 2.72) | 0.62 (0.28, 1.35) |
| South | 1.02 (0.55, 1.90) | 0.65 (0.26, 1.61) |
| West | 1.32 (0.77, 2.27) | 0.89 (0.39, 2.05) |
| Number of staff [&] | 1.04 (0.82, 1.31) | 1.50 (1.10, 2.04)* |

^p<0.1, *p<0.05, **p<0.01, ***p<0.001, [&]Log transformed, [#]Standardized

Abbreviations: SwLE (Staff with Lived Experience); OTP (Opioid Treatment Program); JC (Joint Commission); CARF (Commission on Accreditation of Rehabilitation Facilities); AUD (Alcohol Use Disorder); OUD (Opioid Use Disorder)

**Table 5.4 Co-production's association with availability of medications (**

| | Methadone[%] | Buprenorphine |
|---|---|---|
| | O.R. (95% CI) | O.R. (95% CI) |
| Patient-centered care | | |
| Invite patients in care decision-making processes | 1.52 (0.69, 3.36) | 0.85 (0.54, 1.33) |
| Patient-Centered Care Factor | 1.08 (0.74, 1.57) | 0.93 (0.76, 1.15) |
| Peer co-production | | |
| Proportion of SwLE[#] | 0.54 (0.31, 0.95)* | 1.03 (0.79, 1.33) |
| Any senior SwLE | 1.30 (0.60, 2.79) | 1.17 (0.76, 1.81) |
| SwLE equal or greater influence on strategy | 0.85 (0.40, 181) | 1.03 (0.70, 1.81) |
| | | |
| Located in Medicaid expansion state | 0.25 (0.09, 0.75)* | 1.42 (0.85, 1.08) |
| Total substance abuse admission in county [&] | 1.37 (1.06, 1.77)* | 0.94 (0.82, 1.08) |
| Proportion of revenue from private/commercial insurance[#] | 0.52 (0.33, 0.83)** | 1.34 (1.09, 1.64)** |
| Service modality (ref. Non-OTP Outpatient) | | |
| OTP Outpatient | | 2.49 (1.47, 4.22)** |
| Inpatient | | 0.88 (0.40, 1.93) |
| Residential | | 1.28 (0.69, 2.36) |
| Unit type (ref. Private for-profit) | | |
| Private non-profit | 0.92 (0.38, 2.26) | 1.58 (0.97, 2.55)^ |
| Public | 1.29 (0.40, 4.19) | 1.49 (0.79, 2.81) |
| ACO or PCMH in place | 1.57 (0.74, 3.31) | 0.85 (0.55, 1.33) |
| Accredited (JC or CARF) | 9.43 (3.46, 25.72)*** | 1.14 (0.74, 1.74) |
| Owned by hospital or mental health facility | 0.82 (0.33, 2.03) | 0.96 (0.61, 1.52) |
| Director perceives high competition | 0.93 (0.46, 1.91) | 1.06 (0.73, 1.54) |
| Director's reliance on professional information sources | 1.12 (0.65, 1.91) | 1.14 (0.88, 1.48) |
| Director's perception on SwLE's peer co-production potential (factor) | 1.05 (0.67, 1.62) | 0.91 (0.73, 1.13) |
| Clinical supervisor endorse 12-step treatment model | 0.40 (0.20, 0.78)** | 0.87 (0.58, 1.30) |
| Proportion of professional staff (graduate degree)[#] | 0.90 (0.59, 1.36) | 1.19 (0.97, 1.47) |
| Proportion of AUD clients[#] | 0.26 (0.16, 0.42)*** | 1.17 (0.93, 1.47) |
| Proportion of OUD clients[#] | 2.18 (1.47, 3.22)*** | 1.29 (1.03, 1.62)* |

**Table 5.4 Co-production's association with availability of medications (continued)**

| | Methadone[%] | Buprenorphine |
|---|---|---|
| | O.R. (95% CI) | O.R. (95% CI) |
| Proportion of prescription OUD clients[#] | 1.27 (0.85, 1.88) | 1.23 (1.00, 1.51)^ |
| Proportion of involuntary patients[#] | 0.22 (0.14, 0.36)*** | 1.01 (0.81, 1.27) |
| Proportion of racial/ethnic minority patients[#] | 0.79 (0.55, 1.14) | 1.02 (0.83, 1.26) |
| Region (ref. Northeast) | | |
| Midwest | 0.72 (0.27, 1.91) | 0.68 (0.40, 1.14) |
| South | 0.44 (0.14, 1.45) | 0.97 (0.52, 1.80) |
| West | 1.06 (0.38, 2.97) | 0.87 (0.51, 1.48) |
| Number of staff [&] | 1.24 (0.83, 1.85) | 1.46 (1.17, 1.82)** |

^p<0.1, *p<0.05, **p<0.01, ***p<0.001, [&]Log transformed, [#]Standardized, [%]Not controlled for modality and accreditation status because of high collinearity with OTPs.

Abbreviations: SwLE (Staff with Lived Experience); OTP (Opioid Treatment Program); JC (Joint Commission); CARF (Commission on Accreditation of Rehabilitation Facilities); AUD (Alcohol Use Disorder); OUD (Opioid Use Disorder)

**Table 5.5 Co-production's association with availability of harm reduction services**

| | Distribute overdose prevention pamphlet | Distribute Condom | Distribute Naloxone |
|---|---|---|---|
| | O.R. (95% CI) | O.R. (95% CI) | O.R. (95% CI) |
| Patient-centered care | | | |
| Invite patients in care decision-making processes | 1.61 (0.91, 2.85) | 1.21 (0.75, 1.96) | 0.97 (0.56, 1.67) |
| Patient-Centered Care Factor | 1.31 (1.04, 1.66)* | 1.17 (0.93, 1.47) | 1.05 (0.81, 1.36) |
| Peer co-production | | | |
| Proportion of SwLE[#] | 1.16 (0.86, 1.56) | 0.95 (0.71, 1.28) | 1.10 (0.78, 1.36) |
| Any senior SwLE | 1.25 (0.68, 2.29) | 1.24 (0.77, 2.00) | 1.52 (0.89, 2.59) |
| SwLE equal or greater influence on strategy | 0.98 (0.63, 1.54) | 1.42 (0.94, 2.15) | 0.76 (0.47, 1.22) |
| Located in Medicaid expansion state | 1.20 (0.69, 2.11) | 0.84 (0.47, 1.51) | 3.30 (1.53, 7.11)** |
| Total substance abuse admission in county [&] | 1.14 (0.97, 1.34) | 1.32 (1.12, 1.54)** | 1.20 (1.00, 1.43)^ |
| Proportion of revenue from private/commercial insurance[#] | 0.81 (0.65, 1.00)^ | 0.66 (0.49, 0.88)** | 0.97 (0.72, 1.30) |
| Service modality (ref. Non-OTP Outpatient) | | | |
| OTP Outpatient | 1.91 (0.96, 3.80)^ | 1.93 (1.08, 3.45)* | 1.60 (0.83, 3.07) |
| Inpatient | 0.49 (0.20, 1.20) | 0.29 (0.10, 0.89)* | 0.53 (0.18, 1.54) |
| Residential | 0.55 (0.28, 1.09)^ | 0.72 (0.37, 1.39) | 1.35 (0.62, 2.91) |
| Unit type (ref. Private for-profit) | | | |
| Private non-profit | 1.18 (0.68, 2.05) | 2.22 (1.28, 3.85)** | 1.62 (0.85, 3.08) |
| Public | 1.08 (0.52, 2.26) | 2.18 (1.07, 4.47)* | 2.62 (1.18, 5.83)* |
| ACO or PCMH in place | 2.50 (1.35, 4.62)** | 1.53 (0.95, 2.48)^ | 1.28 (0.77, 2.15) |
| Accredited (JC or CARF) | 0.72 (0.44, 1.18) | 1.06 (0.65, 1.73) | 1.21 (0.69, 2.13) |
| Owned by hospital or mental health facility | 1.27 (0.72, 2.23) | 0.80 (0.47, 1.34) | 1.03 (0.58, 1.80) |
| Director perceives high competition | 0.91 (0.58, 1.43) | 0.88 (0.59, 1.33) | 0.76 (0.48, 1.19) |
| Director's reliance on professional information sources | 1.46 (1.06, 2.00)* | 1.27 (0.95, 1.69) | 1.14 (0.83, 1.58) |
| Director's perception on SwLE's peer co-production potential (factor) | 0.92 (0.71, 1.18) | 0.87, 0.69, 1.11) | 1.18 (0.89, 1.55) |
| Clinical supervisor endorse 12-step treatment model | 0.83 (0.51, 1.36) | 1.02 (0.65, 1.59) | 1.09 (0.67, 1.78) |
| Proportion of professional staff (graduate degree)[#] | 0.86 (0.67, 1.09) | 1.11 (0.87, 1.40) | 1.25 (0.94, 1.66) |

**Table 5.5 Co-production's association with availability of harm reduction services (continued)**

| | Distribute overdose prevention pamphlet | Distribute Condom | Distribute Naloxone |
|---|---|---|---|
| | O.R. (95% CI) | O.R. (95% CI) | O.R. (95% CI) |
| Proportion of AUD clients[#] | 0.93 (0.71, 1.20) | 0.88 (0.69, 1.11) | 0.95 (0.72, 1.26) |
| Proportion of OUD clients[#] | 1.08 (0.82, 1.43) | 1.10 (0.86, 1.42) | 1.00 (0.76, 1.31) |
| Proportion of prescription OUD clients[#] | 1.31 (0.99, 1.72)^ | 1.14 (0.90, 1.45) | 1.30 (1.00, 1.68)* |
| Proportion of involuntary patients[#] | 0.86 (0.66, 1.11) | 1.12 (0.87, 1.44) | 1.05 (0.78, 1.40) |
| Proportion of racial/ethnic minority patients[#] | 1.22 (0.94, 1.58) | 1.31 (1.04, 1.64)* | 0.94 (0.73, 1.21) |
| Region (ref. Northeast) | | | |
| Midwest | 0.53 (0.28, 1.02)^ | 0.67 (0.37, 1.22) | 0.58 (0.31, 1.09) |
| South | 0.75 (0.35, 1.61) | 2.19 (1.09, 4.42)* | 0.90 (0.42, 1.91) |
| West | 0.42 (0.21, 0.81)* | 1.66 (0.91, 3.03)^ | 0.31 (0.15, 0.63)** |
| Number of staff [&] | 1.20 (0.93, 1.56) | 1.15 (0.90, 1.48) | 1.44 (1.08, 1.91)* |

^p<0.1, *p<0.05, **p<0.01, ***p<0.001, &Log transformed, #Standardized, %Not controlled for modality and accreditation status because of high collinearity with OTPs.

Abbreviations: SwLE (Staff with Lived Experience); OTP (Opioid Treatment Program); JC (Joint Commission); CARF (Commission on Accreditation of Rehabilitation Facilities); AUD (Alcohol Use Disorder); OUD (Opioid Use Disorder)

**Table 5.6 Co-production's association with availability of ancillary services (**

| | Routine medical care | Transportation assistance | Housing assistance |
|---|---|---|---|
| | O.R. (95% CI) | O.R. (95% CI) | O.R. (95% CI) |
| Patient-centered care | | | |
| Invite patients in care decision-making processes | 0.95 (0.59, 1.51) | 1.25 (0.79, 1.98) | 1.13 (0.72, 1.78) |
| Patient-Centered Care Factor | 1.28 (1.02, 1.59)* | 1.13 (0.91, 1.39) | 1.17 (0.95, 1.44) |
| Peer co-production | | | |
| Proportion of SwLE[#] | 0.90 (0.68, 1.20) | 1.19 (0.90, 1.56) | 1.02 (0.75, 1.39) |
| Any senior SwLE | 1.34 (0.82, 2.18) | 1.08 (0.65, 1.77) | 1.05 (0.63, 1.76) |
| SwLE equal or greater influence on strategy | 1.25 (0.81, 1.91) | 1.18 (0.79, 1.76) | 0.90 (0.60, 1.34) |
| | | | |
| Located in Medicaid expansion state | 1.48 (0.87, 2.52) | 1.06 (0.63, 1.78) | 1.39 (0.93, 2.34) |
| Total substance abuse admission in county [&] | 1.09 (0.94, 1.26) | 0.87 (0.75, 1.00)^ | 0.94 (0.82, 1.09) |
| Proportion of revenue from private/commercial insurance[#] | 0.79 (0.63, 0.98)* | 0.84 (0.68, 1.03)^ | 0.74 (0.60, 0.93)** |
| Service modality (ref. Non-OTP Outpatient) | | | |
| OTP Outpatient | 0.90 (0.51, 1.56) | 1.17 (0.66, 2.08) | 1.43 (0.82, 2.48) |
| Inpatient | 4.33 (1.44, 12.99)** | 0.23 (0.10, 0.56)** | 0.47 (0.20, 1.10)^ |
| Residential | 4.51 (2.15, 9.45)*** | 1.07 (0.56, 2.03) | 2.21 (1.15, 4.26)* |
| Unit type (ref. Private for-profit) | | | |
| Private non-profit | 1.26 (0.77, 2.06) | 1.72 (1.05, 2.80)* | 2.06 (1.27, 3.33)** |
| Public | 1.31 (0.67, 2.58) | 2.82 (1.41, 5.64)** | 1.60 (0.84, 3.03) |
| ACO or PCMH in place | 0.89 (0.56, 1.41) | 1.55 (0.96, 2.51)^ | 1.15 (0.74, 1.81) |
| Accredited (JC or CARF) | 1.50 (0.93, 2.42)^ | 0.95 (0.60, 1.51) | 1.05 (0.67, 1.64) |
| Owned by hospital or mental health facility | 1.67 (1.00, 2.79)* | 1.46 (0.85, 2.51) | 1.22 (0.75, 2.00) |
| Director perceives high competition | 0.83 (0.56, 1.24) | 1.07 (0.72, 1.61) | 0.85 (0.58, 1.25) |
| Director's reliance on professional information sources | 1.01 (0.77, 1.33) | 1.06 (0.80, 1.41) | 1.24 (0.94, 1.63) |
| Director's perception on SwLE's peer co-production potential (factor) | 0.94 (0.75, 1.18) | 0.81 (0.65, 1.03)^ | 1.00 (0.80, 1.26) |
| Clinical supervisor endorse 12-step treatment model | 1.05 (0.70, 1.58) | 1.01 (0.67, 1.53) | 0.91 (0.61, 1.35) |
| Proportion of professional staff (graduate degree)[#] | 1.01 (0.77, 1.33) | 0.94 (0.76, 1.17) | 1.04 (0.93, 1.29) |

**Table 5.6 Co-production's association with availability of ancillary services (continued)**

| | Routine medical care | Transportation assistance | Housing assistance |
|---|---|---|---|
| | O.R. (95% CI) | O.R. (95% CI) | O.R. (95% CI) |
| Proportion of AUD clients[#] | 1.04 (0.83, 1.30) | 0.95 (0.75, 1.19) | 1.08 (0.86, 1.36) |
| Proportion of OUD clients[#] | 0.91 (0.71, 1.16) | 1.21 (0.95, 1.54) | 0.99 (0.79, 1.25) |
| Proportion of prescription OUD clients[#] | 1.35 (1.07, 1.70)* | 1.10 (0.88, 1.38) | 1.24 (0.99, 1.54)^ |
| Proportion of involuntary patients[#] | 1.06 (0.83, 1.34) | 1.03 (0.82, 1.29) | 1.25 (1.00 (1.57)* |
| Proportion of racial/ethnic minority patients[#] | 1.17 (0.93, 1.46) | 1.26 (1.01, 1.57)* | 1.06 (0.85, 1.32) |
| Region (ref. Northeast) | | | |
| Midwest | 0.71 (0.40, 1.26) | 0.76 (0.43, 1.35) | 0.88 (0.50, 1.52) |
| South | 0.52 (0.26, 1.01)^ | 0.53 (0.28, 1.03)^ | 0.66 (0.35, 1.27) |
| West | 0.61 (0.34, 1.11) | 0.64 (0.35, 1.16) | 0.76 (0.43, 1.35) |
| Number of staff [&] | 1.17 (0.92, 1.49) | 1.67 (1.30, 2.15)*** | 1.59 (1.24, 2.05)*** |

^p<0.1, *p<0.05, **p<0.01, ***p<0.001, &Log transformed, #Standardized, %Not controlled for modality and accreditation status because of high collinearity with OTPs.

Abbreviations: SwLE (Staff with Lived Experience); OTP (Opioid Treatment Program); JC (Joint Commission); CARF (Commission on Accreditation of Rehabilitation Facilities); AUD (Alcohol Use Disorder); OUD (Opioid Use Disorder)

**Table 5.7 Co-production's association with service availability: Summary of multivariate logistic regression results**

| | Patient-centered care, OR (95% CI) | | Peer co-production, OR (95% CI) | | |
|---|---|---|---|---|---|
| | Invite patients to clinical processes | Patient-Centered Care Factor[#] | % SwLE[#] | Any senior SwLE | SwLE equal or greater influence on strategy |
| **Treatment programs** | | | | | |
| (1) Opioid aftercare | 0.91 (0.59, 1.40) | 0.97 (0.79, 1.19) | 0.90 (0.67, 1.20) | 1.07 (0.68, 1.69) | 1.14 (0.76, 1.69) |
| (2) Opioid maintenance | 1.32 (0.71, 2.46) | 1.00 (0.75, 1.34) | 0.61 (0.38, 0.98)* | 1.07 (0.56, 2.05) | 1.06 (0.60, 1.89) |
| **Medications** | | | | | |
| (3) Methadone[%] | 1.52 (0.69, 3.36) | 1.08 (0.74, 1.57) | 0.54 (0.31, 0.95)* | 1.30 (0.60, 2.79) | 0.85 (0.40, 181) |
| (4) Buprenorphine | 0.85 (0.54, 1.33) | 0.93 (0.76, 1.15) | 1.03 (0.79, 1.33) | 1.17 (0.76, 1.81) | 1.03 (0.70, 1.81) |
| **Harm reduction services** | | | | | |
| (5) Overdose prev. pamphlet | 1.61 (0.91, 2.85) | 1.31 (1.04, 1.66)* | 1.16 (0.86, 1.56) | 1.25 (0.68, 2.29) | 0.98 (0.63, 1.54) |
| (6) Distribute condom | 1.21 (0.75, 1.96) | 1.17 (0.93, 1.47) | 0.95 (0.71, 1.28) | 1.24 (0.77, 2.00) | 1.42 (0.94, 2.15) |
| (7) Distribute naloxone | 0.97 (0.56, 1.67) | 1.05 (0.81, 1.36) | 1.10 (0.78, 1.36) | 1.52 (0.89, 2.59) | 0.76 (0.47, 1.22) |
| **Ancillary Services** | | | | | |
| (8) Routine medical care | 0.95 (0.59, 1.51) | 1.28 (1.02, 1.59)* | 0.90 (0.68, 1.20) | 1.34 (0.82, 2.18) | 1.25 (0.81, 1.91) |
| (9) Transportation assistance | 1.25 (0.79, 1.98) | 1.13 (0.91, 1.39) | 1.19 (0.90, 1.56) | 1.08 (0.65, 1.77) | 1.18 (0.79, 1.76) |
| (10) Housing assistance | 1.13 (0.72, 1.78) | 1.17 (0.95, 1.44) | 1.02 (0.75, 1.39) | 1.05 (0.63, 1.76) | 0.90 (0.60, 1.34) |

^p<0.1, *p<0.05, [#]Standardized, [%]Not controlled for modality and accreditation status because of high collinearity with OTPs.
Results are controlled for environmental factors (located in Medicaid expansion state, total substance abuse admission in county), organizational structure (service modality, unit type, ACO or PCMH in place, accredited, owned by hospital or mental health facility), revenue sources (private or commercial insurance), manager perception (high competition, endorse 12-step model, rely on professional information sources, perspectives on peer co-production potentials), staff and patient characteristics (staff with medical training, staff with academic credential, AUD patients, OUD patients, prescription OUD patients, involuntary patients, , racial/ethnic minority patients), region, and number of total (full-time and part-time) staff
Abbreviations: SwLE (Staff with Lived Experience); OTP (Opioid Treatment Program); AUD (Alcohol Use Disorder); OUD (Opioid Use Disorder); JC (Joint Commission); CARF (Commission on Accreditation of Rehabilitation Facilities)

Variables describing patient-centered care and peer co-productions also had meaningful associations with service utilization patterns, particularly with harm reduction and ancillary services (see Tables 5.8-5.11 for full results. Table 5.12 summarizes the result by presenting only the relationships between dependent variables and predictor variables). For instance, the predicted proportion of patients utilizing transportation assistance was 10.38% higher among units inviting patients to participate in the clinical decision-making process, while controlling for other factors. Clinical supervisors' belief and emphasis on patient-centered care was correlated with patients' utilization of routine medical care, overdose prevention pamphlet, and methadone.

Peer co-production also had significant and positive relationships with harm reduction and recovery support services. Interestingly presence of staff with lived experience or senior recovering staff were not associated with patients' utilization patterns of services tested here. When staff with lived experience possesses equal or greater level of influence on organizational or strategic decisions, patients were more likely to utilize condoms and transportation assistance.

Various control variables had significant relationships with service utilization rates. For instance, clinical supervisors' endorsement of the 12-step recovery model was negatively associated with patients' utilization of maintenance therapy, but had no significant relationships with their use of three specific medications tested here. Patients at private for-profit units were much more likely to utilize buprenorphine and routine health care services, compared to patients at public or nonprofit clinics.

**Table 5.8 Co-production's association with utilization of treatment services (**

| | Opioid aftercare | Opioid maintenance |
|---|---|---|
| | Coef. (95% CI) | Coef. (95% CI) |
| First-stage estimation of dependent variables | | |
| Patient-centered care | | |
| Invite patients in care decision-making processes | 4.58 (2.10, 7.06)*** | 1.19 (-0.83, 3.21) |
| Patient-Centered Care Factor | 1.88 (0.76, 3.00)** | -0.15 (-1.19, 0.90) |
| Peer co-production | | |
| Proportion of SwLE[#] | 2.43 (0.98, 3.88)** | -1.89 (-3.26, -0.52** |
| Any senior SwLE | -1.07 (-3.44, 1.30) | 6.19 (4.20, 8.17)*** |
| SwLE equal or greater influence on strategy | 3.74 (1.61, 5.88)** | 1.83 (0.01, 3.66)* |
| | | |
| Located in Medicaid expansion state | -6.23 (-11.18, -1.28)* | -0.85 (-3.81, 2.11) |
| Total substance abuse admission in county [&] | -0.41 (-1.75, 0.92) | 0.62 (-0.15, 1.39) |
| Proportion of revenue from private/commercial insurance[#] | 0.99 (-3.47, 5.46) | -5.83 (-7.06, -4.61)*** |
| Service modality (ref. Non-OTP Outpatient) | | |
| OTP Outpatient | -2.97 (-7.28, 1.34) | 30.09 (27.07, 34.78)*** |
| Inpatient | -9.57 (-63.56, 44.43) | -25.30 (-29.75, -20.85)*** |
| Residential | 15.57 (0.12, 31.01)* | -10.35 (-14.19, -6.51)*** |
| Unit type (ref. Private for-profit) | | |
| Private non-profit | -5.96 (-8.71, -3.21)*** | -2.66 (-5.28, -0.05)* |
| Public | -6.28 (-11.20, -1.36)* | 2.02 (-1.47, 5.51) |
| ACO or PCMH in place | 2.28 (-2.03, 6.59) | 0.52 (-1.89, 2.93) |
| Accredited (JC or CARF) | -1.91 (-5.11, 1.30) | 9.89 (7.29, 12.48)*** |
| Owned by hospital or mental health facility | 2.41 (-2.59, 7.41) | -3.45 (-5.94, -0.97)** |
| Director perceives high competition | -4.29 (-7.94, -0.63)* | 0.76 (-1.28, 2.79) |
| Director's reliance on professional information sources | -1.79 (-3.75, 0.17)^ | 0.32 (-1.13, 1.77) |
| Director's perception on SwLE's peer co-production potential (factor) | -0.01, -2.62, 2.60) | 1.19 (-0.01, 2.39)^ |
| Clinical supervisor endorse 12-step treatment model | 6.82 (2.41, 11.23)** | -13.39 (-15.98, -10.80)*** |
| Proportion of professional staff (graduate degree)[#] | 4.91 (3.17, 6.65)*** | -0.82 (-2.05, 0.40) |
| Proportion of AUD clients[#] | 2.65 (1.45, 3.85)*** | -7.69 (-9.06, -6.33)*** |
| Proportion of OUD clients[#] | -0.96 (-3.74, 1.81) | 9.76 (8.29, 11.24)*** |

**Table 5.8 Co-production's association with utilization of treatment services (continued)**

| | Opioid aftercare | Opioid maintenance |
|---|---|---|
| | Coef. (95% CI) | Coef. (95% CI) |
| Proportion of prescription OUD clients[#] | 0.95 (-0.24, 2.15) | 4.74 (3.57, 5.91)*** |
| Proportion of involuntary patients[#] | 0.36 (-2.71, 3.43) | -23.26 (-24.83, -21.68)*** |
| Proportion of racial/ethnic minority patients[#] | 3.99 (2.63, 5.34)*** | 1.19 (0.11, 2.27)* |
| Region (ref. Northeast) | | |
| Midwest | 3.27 (-5.66, 12.20) | 0.12 (-2.70, 2.94) |
| South | -2.76 (-6.41, 0.89) | 2.70 (-0.67, 6.06) |
| West | 7.19 (-0.59, 14.96)^ | -0.31 (-3.34, 2.72) |
| Number of staff [&] | 0.19 (-1.32, 1.71) | 0.87 (-0.49, 2.23) |
| | | |
| First-stage estimation of Mills ratio | | |
| Located in Medicaid expansion state | -0.13 (-0.22, -0.04)** | 0.14 (0.03, 0.25)* |
| Total substance abuse admission in county [&] | -0.03 (-0.06, -0.01)** | 0.03 (0.00, 0.06)* |
| Proportion of revenue from private/commercial insurance[#] | 0.15 (0.11, 0.18)*** | 0.02 (-0.02, 0.06) |
| Service modality (ref. Non-OTP Outpatient) | | |
| OTP Outpatient | -0.10 (-0.20, -0.01)* | 1.14 (1.02, 1.25)*** |
| Inpatient | -0.15 (-1.64, -1.30)*** | -0.36 (-0.51, -0.21)*** |
| Residential | -0.45 (-0.55, -0.35)*** | -0.29 (-0.41, -0.16)*** |
| Unit type (ref. Private for-profit) | | |
| Private non-profit | 0.02 (-0.06, 0.10) | 0.20 (0.10, 0.30)*** |
| Public | 0.11 (-0.01, 0.22)^ | 0.06 (-0.08, 0.19) |
| ACO or PCMH in place | -0.11 (-0.19, -0.04)** | 0.07 (-0.02, 0.16) |
| Accredited (JC or CARF) | 0.07 (-0.01, 0.14)^ | 0.15 (0.06, 0.24)** |
| Owned by hospital or mental health facility | -0.13 (-0.21, -0.05)** | -0.02 (-0.11, 0.08) |
| Director perceives high competition | -0.10 (-0.16, -0.03)** | 0.12 (0.04, 0.21** |
| Director's reliance on professional information sources | 0.04 (-0.00, 0.09)^ | 0.17 (0.11, 0.23)*** |
| Director's perception on SwLE's peer co-production potential (factor) | 0.12 (0.06, 0.19)*** | 0.09 (0.05, 0.13)*** |
| Clinical supervisor endorse 12-step treatment model | -0.07 (-0.11, -0.04)*** | -0.67 (-0.75, -0.59)*** |
| Proportion of professional staff (graduate degree)[#] | 0.04 (0.00, 0.07)* | 0.07 (0.02, 0.11)** |
| Proportion of AUD clients[#] | -0.00 (-0.04, 0.03) | -0.20 (-0.25, -0.16)*** |

**Table 5.8 Co-production's association with utilization of treatment services (continued)**

| | Opioid aftercare | Opioid maintenance |
|---|---|---|
| | Coef. (95% CI) | Coef. (95% CI) |
| Proportion of OUD clients[#] | -0.07 (-0.11, -0.04)*** | 0.37 (0.32, 0.42)*** |
| Proportion of prescription OUD clients[#] | -0.01 (-0.04, 0.03) | 0.26 (0.22, 0.31)*** |
| Proportion of involuntary patients[#] | 0.09 (0.05, 0.13)*** | -0.28 (-0.32, -0.23)*** |
| Proportion of racial/ethnic minority patients[#] | 0.02 (-0.01, 0.06) | 0.08 (0.03, 0.12)*** |
| Region (ref. Northeast) | | |
| Midwest | 0.26 (0.17, 0.35)*** | -0.05 (-0.16, 0.06) |
| South | 0.04 (-0.07, 0.15) | -0.09 (-0.22, 0.04) |
| West | 0.22 (0.12, 0.31)*** | -0.06 (-0.18, 0.06) |
| Number of staff [&] | 0.03 (-0.01, 0.06) | 0.24 (0.20, 0.29)*** |
| Mills (lambda) | 8.94 (-46.61, 64.49) | 30.27 (24.66, 35.88)*** |
| | | |
| Second-stage regression with the inverse Mills ratio | | |
| Patient-centered care | | |
| Invite patients in care decision-making processes | 3.97 (-4.89, 12.83) | 4.11 (-3.26, 11.48) |
| Patient-Centered Care Factor | 2.05 (-2.31, 6.41) | -0.48 (-4.30, 3.33) |
| Peer co-production | | |
| Proportion of SwLE[#] | 2.72 (-3.25, 8.69) | -0.41 (-6.36, 5.55) |
| Any senior SwLE | -0.64 (-9.59, 8.31) | 5.71 (-1.29, 12.71) |
| SwLE equal or greater influence on strategy | 4.22 (-3.52, 11.97) | 2.68 (-3.71, 9.06) |
| | | |
| Located in Medicaid expansion state | -6.77 (-24.54, 11.00) | -3.01 (-10.57, 4.54) |
| Total substance abuse admission in county [&] | -0.67 (-5.49, 4.15) | 0.50 (-1.75, 2.76) |
| Proportion of revenue from private/commercial insurance[#] | -1.63 (-14.35, 17.61) | -6.53 (-11.29, -1.76)** |
| Service modality (ref. Non-OTP Outpatient) | | |
| OTP Outpatient | -2.56 (-17.98, 12.86) | 23.86 (5.74, 41.99)* |
| Inpatient | -19.68 (-212.99, 173.63) | -24.53 (-41.78, -7.27)** |
| Residential | 13.33 (-42.16, 68.82) | -8.93 (--28.06, -10.19) |
| Unit type (ref. Private for-profit) | | |
| Private non-profit | -6.46 (-16.67, 3.74) | -5.51 (-14.31, 3.29) |

**Table 5.8 Co-production's association with utilization of treatment services (continued)**

| | Opioid aftercare | Opioid maintenance |
|---|---|---|
| | Coef. (95% CI) | Coef. (95% CI) |
| Public | -6.25 (-24.42, 11.92) | 2.26 (-9.01, 13.53) |
| ACO or PCMH in place | 0.91 (-14.77, 16.58) | 0.09 (-7.36, 7.54) |
| Accredited (JC or CARF) | -2.26 (-14.09, 9.57) | 7.73 (-1.22, 16.68)^ |
| Owned by hospital or mental health facility | 2.39 (-15.86, 20.63) | -4.83 (-13.33, 3.66) |
| Director perceives high competition | -5.62 (-18.97, 7.73) | 0.13 (-5.84, 6.11) |
| Director's reliance on professional information sources | -1.60 (-9.01, 5.81) | -0.92 (-5.05, 3.22) |
| Director's perception on SwLE's peer co-production potential (factor) | -0.58 (-9.91, 8.74) | 2.42 (-1.99, 6.82) |
| Clinical supervisor endorse 12-step treatment model | 8.42 (-7.26, 24.10) | -14.01 (-22.26, -5.75)** |
| Proportion of professional staff (graduate degree)[#] | 5.57 (-0.49, 11.64)^ | 0.49 (-3.08, 4.07) |
| Proportion of AUD clients[#] | 2.84 (-1.33, 7.00) | -8.22 (-12.80, -3.63)** |
| Proportion of OUD clients[#] | -1.57 (-11.06, 7.91) | 9.41 (4.88, 13.94)*** |
| Proportion of prescription OUD clients[#] | 0.97 (-3.88, 5.82) | 3.80 (0.34, 7.27)* |
| Proportion of involuntary patients[#] | 1.13 (-9.78, 12.04) | -23.38 (-29.79, -16.97)*** |
| Proportion of racial/ethnic minority patients[#] | 4.24 (-0.79, 9.26) | 1.19 (-2.02, 4.39) |
| Region (ref. Northeast) | | |
| Midwest | 4.91 (-24.88, 34.70) | 0.78 (-8.31, 9.86) |
| South | 1.83 (-13.35, 9.70) | -0.24 (-9.83, 9.34) |
| West | 9.76 (-16.33, 35.84) | -4.62 (-13.49, 4.25) |
| Number of staff [&] | 0.51 (-4.66, 5.68) | -0.26 (-5.27, 4.75) |
| Inverse Mills ratio | 21.09 (-177.42, 219.60) | 24.58 (-5.04, 54.21) |

^p<0.1, *p<0.05, **p<0.01, ***p<0.001, [&]Log transformed, [#]Standardized

Abbreviations: SwLE (Staff with Lived Experience); OTP (Opioid Treatment Program); JC (Joint Commission); CARF (Commission on Accreditation of Rehabilitation Facilities); AUD (Alcohol Use Disorder); OUD (Opioid Use Disorder)

**Table 5.9 Co-production's association with utilization of medications**

| | Methadone[%] | Buprenorphine |
|---|---|---|
| | Coef. (95% CI) | Coef. (95% CI) |
| First-stage estimation of dependent variables | | |
| Patient-centered care | | |
| Invite patients in care decision-making processes | -0.22 (-0.94, 2.51) | -1.81 (-5.36, 1.74) |
| Patient-Centered Care Factor | 4.38 (3.02, 5.75)*** | -1.06 (-2.72, 0.60) |
| Peer co-production | | |
| Proportion of SwLE[#] | 3.66 (1.61, 5.72)*** | -0.46 (-2.42, 1.50) |
| Any senior SwLE | -2.83 (-5.47, 0.19)* | 1.95 (-1.24, 5.14) |
| SwLE equal or greater influence on strategy | 0.49 (-1.93, 2.90) | -0.03 (-2.91, 2.86) |
| | | |
| Located in Medicaid expansion state | 0.92 (-3.42, 5.25) | -0.77 (-8.27, 6.73) |
| Total substance abuse admission in county [&] | -1.89 (-3.07, -0.71)** | -0.18 (-1.83, 1.47) |
| Proportion of revenue from private/commercial insurance[#] | -10.02 (-12.71, -7.33)*** | -3.92 (-9.30, 1.46) |
| Service modality (ref. Non-OTP Outpatient) | | |
| OTP Outpatient | | -22.39 (-38.00, -6.78)** |
| Inpatient | | 4.62 (-3.74, 12.97) |
| Residential | | 3.86 (-3.37, 11.10) |
| Unit type (ref. Private for-profit) | | |
| Private non-profit | 4.91 (1.41, 8.42)** | -16.70 (-26.39, -7.00)** |
| Public | -6.20 (-10.61, -1.79)** | -17.81 (-27.34, -8.28)*** |
| ACO or PCMH in place | -6.03 (-9.26, -2.81)*** | -0.88 (-6.06, 4.30) |
| Accredited (JC or CARF) | -15.30 (-22.07, -8.54)*** | -3.01 (-7.85, 1.83) |
| Owned by hospital or mental health facility | -3.58 (-6.70, -0.46)* | 0.72 (-4.12, 5.56) |
| Director perceives high competition | 2.49 (0.02, 4.96)* | 0.41 (-3.38, 4.20) |
| Director's reliance on professional information sources | -4.09 (-5.84, -2.33)*** | -4.90 (-8.18, 1.63)** |
| Director's perception on SwLE's peer co-production potential (factor) | 0.55 (-0.93, 2.03) | 1.94 (-0.54, 4.42) |
| Clinical supervisor endorse 12-step treatment model | -6.51 (-9.88, -3.13)*** | 5.72 (1.14, 10.31)* |
| Proportion of professional staff (graduate degree)[#] | 3.65 (2.09, 5.22)*** | -0.91 (-74.43, 2.62) |

**Table 5.9 Co-production's association with utilization of medications (continued)**

| | Methadone[%] | Buprenorphine |
|---|---|---|
| | Coef. (95% CI) | Coef. (95% CI) |
| Proportion of AUD clients[#] | -1.84 (-5.03, 1.35) | -3.01 (-6.51, 0.49)^ |
| Proportion of OUD clients[#] | -1.44 (-3.40, 0.51) | -0.93 (-6.43 (4.56) |
| Proportion of prescription OUD clients[#] | -0.30 (-1.55, 0.95) | -2.20 (-6.36, 1.95) |
| Proportion of involuntary patients[#] | -10.60 (-15.49, -5.70)*** | -0.79 (-3.12, 1.54) |
| Proportion of racial/ethnic minority patients[#] | 1.49 (0.11, 2.87)* | 0.48 (-1.59, 2.54) |
| Region (ref. Northeast) | | |
| Midwest | -3.72 (-7.29, -0.16)* | 10.41 (2.09, 18.73)* |
| South | -11.25 (-15.70, -6.80)*** | -1.36 (-7.48, 4.76) |
| West | -11.89 (-15.56, -8.22)*** | -0.59 (-6.37, 5.20) |
| Number of staff [&] | -8.84 (-10.66, -7.03)*** | -9.71 (-16.15, -3.27)** |
| | | |
| First-stage estimation of Mills ratio | | |
| Located in Medicaid expansion state | -0.58 (-0.74, -0.42)*** | 0.18 (0.09, 0.27)*** |
| Total substance abuse admission in county [&] | 0.15 (0.11, 0.19)*** | -0.03 (-0.05, -0.01)* |
| Proportion of revenue from private/commercial insurance[#] | -0.37 (-0.41, -0.30)*** | 0.18 (0.14, 0.21) |
| Service modality (ref. Non-OTP Outpatient) | | |
| OTP Outpatient | | 0.51 (0.42, 0.61)*** |
| Inpatient | | -0.07 (-0.22, 0.07) |
| Residential | | 0.11 (0.01, 0.21)* |
| Unit type (ref. Private for-profit) | | |
| Private non-profit | -0.13 (-0.26, 0.01)^ | 0.28 (0.20, 0.37)*** |
| Public | 0.14 (-0.03, 0.32) | 0.22 (0.11, 0.34)*** |
| ACO or PCMH in place | 0.16 (0.05, 0.28)** | -0.09 (-0.17, -0.01)* |
| Accredited (JC or CARF) | 1.28 (1.13, 1.43)*** | 0.06 (-0.01, 0.14) |
| Owned by hospital or mental health facility | -0.09 (-0.21, 0.03) | -0.03 (-0.11, 0.05) |
| Director perceives high competition | -0.04 (-0.14, 0.07) | 0.02 (-0.05, 0.08) |
| Director's reliance on professional information sources | 0.05 (-0.03, 0.12) | 0.07 (0.02, 0.11)** |
| Director's perception on SwLE's peer co-production potential (factor) | -0.03 (-0.09, 0.02) | -0.04 (-0.07, -0.00)* |

**Table 5.9 Co-production's association with utilization of medications (continued)**

| | Methadone[%] | Buprenorphine |
|---|---|---|
| | Coef. (95% CI) | Coef. (95% CI) |
| Clinical supervisor endorse 12-step treatment model | -0.54 (0.04, 0.43)*** | -0.08 (-0.15, -0.02)* |
| Proportion of professional staff (graduate degree)[#] | 0.01 (-0.05, 0.07) | 0.09 (0.05, 0.12)*** |
| Proportion of AUD clients[#] | 0.73 (-0.80, -0.67)*** | 0.09 (0.06, 0.13)*** |
| Proportion of OUD clients[#] | 0.37 (0.32, 0.43)*** | 0.17 (0.13, 0.21)*** |
| Proportion of prescription OUD clients[#] | 0.14 (0.08, 0.19)*** | 0.12 (0.08, 0.15)*** |
| Proportion of involuntary patients[#] | -0.79 (-0.85, 0.72)*** | 0.01 (-0.03, 0.05) |
| Proportion of racial/ethnic minority patients[#] | -0.09 (-0.14, 0.03)** | 0.00 (-0.03, 0.04) |
| Region (ref. Northeast) | | |
| Midwest | -0.08 (-0.22, 0.06) | -0.22 (-0.31, -0.12)*** |
| South | -0.28 (-0.45, -0.10)** | -0.03 (-0.14, 0.08) |
| West | -0.07 (-0.22, 0.09) | -0.07 (-0.17, 0.02) |
| Number of staff [&] | 0.15 (0.09, 0.21)*** | 0.21 (0.17, 0.24)*** |
| Mills (lambda) | -12.80 (-20.67, -4.93)** | -59.82 (-105.93, -13.72)* |
| | | |
| Second-stage regression with the inverse Mills ratio | | |
| Patient-centered care | | |
| Invite patients in care decision-making processes | 0.45 (-9.95, 10.86) | -1.89 (-9.27, 5.48) |
| Patient-Centered Care Factor | 4.98 (-0.69, 10.64)^ | -1.84 (-5.60, 1.91) |
| Peer co-production | | |
| Proportion of SwLE[#] | 4.07 (-3.56, 11.69) | -0.81 (-5.13, 3.50) |
| Any senior SwLE | -3.02 (-13.27, 7.24) | 2.46 (-4.70, 9.59) |
| SwLE equal or greater influence on strategy | 1.28 (-7.52, 10.08) | 0.25 (-4.68, 5.18) |
| | | |
| Located in Medicaid expansion state | 0.24 (-15.37, -15.86) | 0.60 (-12.25, 13.46) |
| Total substance abuse admission in county [&] | -1.80 (-5.71, 2.11) | -0.49 (-2.84, -1.85) |
| Proportion of revenue from private/commercial insurance[#] | -11.06 (-20.72, -1.39)* | -3.87 (-13.23, 5.49) |
| Service modality (ref. Non-OTP Outpatient) | | |
| OTP Outpatient | | -21.06 (-43.84,1.72)^ |
| Inpatient | | 0.56 (-10.65, 11.76) |

**Table 5.9 Co-production's association with utilization of medications (continued)**

| | Methadone[%] | Buprenorphine |
|---|---|---|
| | Coef. (95% CI) | Coef. (95% CI) |
| Residential | | 5.97 (-6.58, 18.52) |
| Unit type (ref. Private for-profit) | | |
| Private non-profit | -4.68 (-8.19, 17.56) | -16.55 (-31.36, -1.75)* |
| Public | -6.64 (-24.10, 10.81) | -17.25 (-31.34, -3.16)* |
| ACO or PCMH in place | -5.67 (-17.50, 5.77) | -0.79 (-6.42, 4.83) |
| Accredited (JC or CARF) | -15.09 (-36.09, 5.91) | -3.54 (-10.79, 3.71) |
| Owned by hospital or mental health facility | -4.38 (-17.22, 8.46) | -0.22 (-6.03, 5.60) |
| Director perceives high competition | 1.87 (-7.68, 11.43) | 0.60 (-4.45, 5.65) |
| Director's reliance on professional information sources | -3.63 (-10.65, 3.39) | -5.18 (-10.25, -0.10)* |
| Director's perception on SwLE's peer co-production potential (factor) | 0.92 (-4.65, 6.50) | 1.41 (-2.21, 5.03) |
| Clinical supervisor endorse 12-step treatment model | -6.61 (-21.22, 7.99) | 6.41 (-1.27, 14.08) |
| Proportion of professional staff (graduate degree)[#] | 4.38 (-1.13, 9.89) | -0.33 (-5.51, 4.84) |
| Proportion of AUD clients[#] | -1.36 (-14.79, 12.06) | -2.46 (-7.48, 2.55) |
| Proportion of OUD clients[#] | -1.98 (-8.85, 4.89) | -0.32 (-9.08, 8.45) |
| Proportion of prescription OUD clients[#] | -0.04 (-4.36, 4.29) | -1.72 (-7.81, 4.37) |
| Proportion of involuntary patients[#] | -12.19 (-35.57, 11.18) | -1.17 (-4.12, 1.79) |
| Proportion of racial/ethnic minority patients[#] | 1.82 (-3.64, 7.28) | 0.72 (-2.34, 3.77) |
| Region (ref. Northeast) | | |
| Midwest | -4.64 (-19.43, 10.15) | 10.02 (-5.30, 25.33) |
| South | -12.70 (-31.07, 5.66) | -1.65 (-10.36, 7.05) |
| West | -11.47 (-25.47, 2.53) | -0.49 (-7.08, 6.10) |
| Number of staff [&] | -8.48 (-15.31, -1.65)* | -9.24 (-19.69, 1.20) |
| Inverse Mills ratio | -13.84 (-46.88, 19.20) | -57.38 (-130.27, 15.52) |

^p<0.1, *p<0.05, **p<0.01, ***p<0.001, [&]Log transformed, [#]Standardized, [%]Not controlled for modality and accreditation status because of high collinearity with OTPs.

Abbreviations: SwLE (Staff with Lived Experience); OTP (Opioid Treatment Program); JC (Joint Commission); CARF (Commission on Accreditation of Rehabilitation Facilities); AUD (Alcohol Use Disorder); OUD (Opioid Use Disorder)

**Table 5.10 Co-production's association with utilization of harm reduction services (**

| | Distribute overdose prevention pamphlet | Distribute Condom | Distribute Naloxone |
|---|---|---|---|
| | Coef. (95% CI) | Coef. (95% CI) | Coef. (95% CI) |
| First-stage estimation of dependent variables | | | |
| Patient-centered care | | | |
| Invite patients in care decision-making processes | 1.41 (-0.22, 3.04)^ | -2.10 (-4.89, 0.69) | 12.90 (8.04, 17.76)*** |
| Patient-Centered Care Factor | 2.37 (1.55 (3.18)*** | 2.16 (0.88, 3.45)** | 3.19 (0.83, 5.55)** |
| Peer co-production | | | |
| Proportion of SwLE[#] | -1.64 (-2.58, 0.69)** | 4.21 (2.52, 5.89)*** | -5.28 (-8.28, -2.28)** |
| Any senior SwLE | -2.33 (-3.99, -0.67)** | -0.77 (-3.43, 1.89) | -1.57 (-5.98, 2.84) |
| SwLE equal or greater influence on strategy | 1.21 (-0.26, 2.69) | 8.67 (6.10, 11.25)*** | 3.28 (-1.07, 7.63) |
| Located in Medicaid expansion state | 0.78 (-1.77, 3.32) | 12.97 (7.96, 17.98)*** | 55.16 (2.80, 107.53)* |
| Total substance abuse admission in county [&] | -0.04 (-0.86, 0.79) | 6.40 (3.08, 9.71)*** | 8.00 (0.36, 15.65)* |
| Proportion of revenue from private/commercial insurance[#] | 1.52 (0.21, 2.83)* | -2.63 (-8.86, 3.61) | -1.49 (-5.09, 2.10) |
| Service modality (ref. Non-OTP Outpatient) | | | |
| OTP Outpatient | -1.39 (-4.93, 2.14) | 19.29 (10.12, 28.46)*** | 23.77 (1.59, 45.95)* |
| Inpatient | 9.47 (5.23, 13.72)*** | -5.37 (-21.54, 10.80) | -3.00 (-30.66, 24.65) |
| Residential | 11.79 (8.65 (14.93)*** | -12.11 (-18.80, -5.42)*** | 44.42 (23.92, 64.91)*** |
| Unit type (ref. Private for-profit) | | | |
| Private non-profit | -2.78 (-5.04, -0.52)* | 12.93 (3.19, 22.67)** | 18.04 (0.79, 35.28)* |
| Public | 0.62 (-2.36, 3.60) | 12.81 (2.59, 23.03)* | 24.86 (-14.70, 64.41) |
| ACO or PCMH in place | -6.53 (-9.61, -3.44)*** | 11.38 (6.40, 16.36)*** | 16.78 (5.20, 28.36)** |
| Accredited (JC or CARF) | 3.93 (1.27, 6.59)** | 4.43 (0.23, 8.64)* | 2.49 (-7.92, 12.90) |
| Owned by hospital or mental health facility | 1.10 (-1.04, 3.25) | -3.10 (-6.92, 0.72) | 1.89 (-4.89, 8.67) |
| Director perceives high competition | 0.25 (-1.61, 2.11) | -1.14 (-4.38, 2.10) | -14.52 (-24.49, -4.55)** |
| Director's reliance on professional information sources | 0.80 (-1.15, 2.75) | 7.97 (4.28, 11.66)*** | 8.76 (1.21, 16.32)* |
| Director's perception on SwLE's peer co-production potential (factor) | 2.62 (1.53, 3.71)*** | -4.42 (-6.15, -2.70)*** | 7.72 (-0.30, 15.74)^ |

**Table 5.10 Co-production's association with utilization of harm reduction services (continued)**

| | Distribute overdose prevention pamphlet | Distribute Condom | Distribute Naloxone |
|---|---|---|---|
| | Coef. (95% CI) | Coef. (95% CI) | Coef. (95% CI) |
| Clinical supervisor endorse 12-step treatment model | 2.84 (1.02, 4.66)** | 0.25 (-3.18, 3.67) | -2.11 (-10.11, 5.89) |
| Proportion of professional staff (graduate degree)[#] | -0.24 (-1.49, 1.01) | -2.10 (-4.29, 0.10)^ | 1.67 (-5.95, 9.29) |
| Proportion of AUD clients[#] | -0.69 (-1.69, 0.31) | -3.55 (-5.88, -1.21)** | -3.59 (-6.91, -0.27)* |
| Proportion of OUD clients[#] | 2.21 (1.14, 3.28)*** | -2.44 (-4.32, -0.56)* | 1.33 (-2.18, 4.84) |
| Proportion of prescription OUD clients[#] | 0.06 (-1.14, 1.26) | 5.66 (3.05, 8.26)*** | 6.09 (-4.38, 16.56) |
| Proportion of involuntary patients[#] | 0.55 (-0.60, 1.70) | -1.12 (-3.60, 1.37) | 0.50 (-3.12, 4.13) |
| Proportion of racial/ethnic minority patients[#] | -2.16 (-3.23, -1.09)*** | 7.76 (4.03, 11.49)*** | -6.43 (-9.87, 2.99)*** |
| Region (ref. Northeast) | | | |
| Midwest | 0.49 (-2.75, 3.72) | -13.72 (-21.03, -6.40)*** | -33.11 (-57.32, -8.90)** |
| South | 3.76 (0.84, 6.68)* | 19.61 (10.32, 28.90)*** | 10.87 (-0.28, 22.01)^ |
| West | 4.02 (0.27, 7.76)* | 8.59 (1.55, 15.64)* | -40.77 (-88.58, 7)^ |
| Number of staff [&] | -1.93 (-3.08, -0.77)*** | 1.14 (-1.76, 15.64) | 3.52 (-12.06, 19.09) |
| First-stage estimation of Mills ratio | | | |
| Located in Medicaid expansion state | 0.12 (0.03, 0.22)** | -0.11 (-0.20, -0.01)* | 0.60 (0.48, 0.71)*** |
| Total substance abuse admission in county [&] | 0.06 (0.04, 0.09)*** | 0.13 (0.11, 0.16)*** | 0.09 (0.06, 0.12)*** |
| Proportion of revenue from private/commercial insurance[#] | -0.10 (-0.14, 0.07)*** | -0.25 (-0.29, -0.20)*** | -0.01 (-0.06, 0.03) |
| Service modality (ref. Non-OTP Outpatient) | | | |
| OTP Outpatient | 0.40 (0.29, 0.50)*** | 0.39 (0.29, 0.49)*** | 0.25 (0.15, 0.35)*** |
| Inpatient | -0.23 (-0.37, -0.08)** | -0.61 (-0.77, -0.45)*** | -0.32 (-0.49, -0.15)*** |
| Residential | -0.18 (-0.29, -0.08)** | -0.21 (-0.32, -0.10)*** | 0.20 (0.08, 0.33)** |
| Unit type (ref. Private for-profit) | | | |
| Private non-profit | 0.10 (0.01, 0.19)* | 0.41 (0.33, 0.50)*** | 0.19 (0.09, 0.29)*** |
| Public | -0.06 (-0.17, 0.06) | 0.39 (0.27, 0.50)*** | 0.48 (0.36, 0.61)*** |
| ACO or PCMH in place | 0.34 (0.25, 0.42)*** | 0.16 (0.08, 0.24)*** | 0.12 (0.03, 0.21)** |
| Accredited (JC or CARF) | -0.23 (-0.31, -0.15)*** | 0.07 (-0.01, 0.15)^ | 0.09 (-0.01, 0.18)^ |
| Owned by hospital or mental health facility | -0.06 (-0.14, 0.03) | -0.02 (-0.11, 0.06) | 0.01 (-0.08, 0.10) |

**Table 5.10 Co-production's association with utilization of harm reduction services (continued)**

| | Distribute overdose prevention pamphlet | Distribute Condom | Distribute Naloxone |
|---|---|---|---|
| | Coef. (95% CI) | Coef. (95% CI) | Coef. (95% CI) |
| Director perceives high competition | -0.07 (-0.14, -0.00)^ | -0.04 (-0.10, 0.03) | -0.11 (-0.18, -0.03)** |
| Director's reliance on professional information sources | 0.22 (0.17, 0.26)*** | 0.15 (0.10, 0.19)*** | 0.08 (0.03, 0.13)** |
| Director's perception on SwLE's peer co-production potential (factor) | -0.07 (-0.11, -0.04)*** | -0.01 (-0.05, 0.02) | 0.09 (0.05, 0.13)*** |
| Clinical supervisor endorse 12-step treatment model | -0.04 (-0.11, 0.03) | 0.07 (-0.00, 0.14)^ | 0.06 (-0.02, 0.14) |
| Proportion of professional staff (graduate degree)[#] | -0.10 (-0.14, -0.07)*** | 0.06 (0.02, 0.09)** | 0.08 (0.04, 0.12)*** |
| Proportion of AUD clients[#] | -0.02 (-0.06, 0.02) | -0.06 (-0.10, -0.03)** | -0.01 (-0.05, 0.03) |
| Proportion of OUD clients[#] | 0.05 (0.00, 0.09)* | 0.03 (-0.01, 0.07) | 0.01 (-0.03, 0.06) |
| Proportion of prescription OUD clients[#] | 0.10 (0.06, 0.14)*** | 0.09 (0.05, 0.13)*** | 0.12 (0.08, 0.16)*** |
| Proportion of involuntary patients[#] | -0.07 (-0.11, -0.03)** | 0.07 (0.03, 0.11)** | -0.00 (-0.05, 0.05) |
| Proportion of racial/ethnic minority patients[#] | 0.09 (0.05, 0.13)*** | 0.16 (0.13, 0.20)*** | -0.02 (-0.06, 0.02) |
| Region (ref. Northeast) | | | |
| Midwest | -0.32 (-0.42, -0.21)*** | -0.25 (-0.35, -0.15)*** | -0.29 (-0.40, -0.19)*** |
| South | -0.09 (-0.21, 0.03) | 0.36 (0.25, 0.48)*** | -0.10 (-0.23 (0.02) |
| West | -0.40 (-0.50, -0.29)*** | 0.26 (0.16, 0.36)*** | -0.57 (-0.69, -0.46)*** |
| Number of staff [&] | 0.08 (0.04, 0.12)*** | 0.11 (0.07, 0.14)*** | 0.19 (0.14, 0.23)*** |
| Mills (lambda) | -31.93 (-47.81, -16.05)*** | 44.36 (11.06, 77.67)** | -3.04 (-3.39, -2.68)*** |
| | | | |
| <u>Second-stage regression with the inverse Mills ratio</u> | | | |
| Patient-centered care | | | |
| Invite patients in care decision-making processes | 1.50 (-3.94, 6.94) | -3.33 (-15.14, 8.48) | 12.06 (-3.74, 27.87) |
| Patient-Centered Care Factor | 2.51 (-0.31, 5.33)^ | 2.35 (-2.60, 7.29) | 2.87 (-4.94, 10.69) |
| Peer co-production | | | |
| Proportion of SwLE[#] | -2.13 (-5.62, 1.36) | 4.10 (-2.69, 10.89) | -7.59 (-18.60, 3.41) |
| Any senior SwLE | -1.81 (-7.31, 3.69) | -0.22 (-9.85, 9.41) | -0.49 (-15.05, 14.08) |
| SwLE equal or greater influence on strategy | 2.02 (-3.01, 7.06) | 10.33 (0.64, 20.01)* | 6.79 (-9.66, 23.23) |
| Located in Medicaid expansion state | 0.76 (-6.88, 8.40) | 14.17 (-2.77, 31.11) | 51.33 (-159.71, 262.38) |

**Table 5.10 Co-production's association with utilization of harm reduction services (continued)**

| | Distribute overdose prevention pamphlet | Distribute Condom | Distribute Naloxone |
|---|---|---|---|
| | Coef. (95% CI) | Coef. (95% CI) | Coef. (95% CI) |
| Total substance abuse admission in county [&] | -0.18 (-2.66, 2.30) | 6.96 (-4.33, 18.24) | 7.48 (-20.76, 35.72) |
| Proportion of revenue from private/commercial insurance[#] | 1.73 (-2.66, 6.12) | -1.86 (-24.90, 21.19) | -0.97 (-11.74, 9.80) |
| Service modality (ref. Non-OTP Outpatient) | | | |
| OTP Outpatient | -1.25 (-12.58, 10.08) | 20.55 (-7.52, 48.62) | 24.19 (-66.31, 114.69) |
| Inpatient | 9.54 (-3.48, 22.55) | -4.84 (-58.76, 49.07) | 6.70 (-89.35, 102.74) |
| Residential | 12.32 (3.04, 21.60) | -11.87 (-33.81, 10.08) | 42.02 (-42.51, 126.54) |
| Unit type (ref. Private for-profit) | | | |
| Private non-profit | -3.38 (-9.79, 3.03) | 14.75 (-19.04, 48.54) | 17.38 (-49.85, 84.61) |
| Public | 0.69 (-7.67, 9.05) | 15.40 (-20.05, 50.84) | 21.77 (-131.98, 175.53) |
| ACO or PCMH in place | -6.87 (-16.75, 3.01) | 13.08 (-2.95, 29.11) | 16.37 (-24.10, 56.83) |
| Accredited (JC or CARF) | 4.25 (-4.50, 12.99) | 6.53 (-6.80, 19.86) | 0.52 (-32.16, 33.20) |
| Owned by hospital or mental health facility | 2.05 (-4.49, -8.59) | -1.84 (-15.55, 11.88) | 5.27 (-11.74, 22.32) |
| Director perceives high competition | 0.03 (-5.25, 5.30) | -2.38 (-12.81, 8.06) | -12.48 (-46.73, 21.78) |
| Director's reliance on professional information sources | -0.89 (-5.47, 7.25) | 8.95 (-2.46, 20.37) | 7.91 (-19.90, 35.73) |
| Director's perception on SwLE's peer co-production potential (factor) | 2.83 (-0.96, 6.61) | -4.80 (-10.52, 0.91) | 6.69 (-24.80, 38.17) |
| Clinical supervisor endorse 12-step treatment model | 3.06 (-2.53, 8.65) | 0.52 (-10.12, 11.15) | -1.65 (-27.59, 24.30) |
| Proportion of professional staff (graduate degree)[#] | -0.15 (-4.06, 3.76) | -2.53 (-9.84, 4.79) | -1.64 (-32.67, 29.39) |
| Proportion of AUD clients[#] | -0.93 (-3.71, 1.85) | -4.54 (-12.82, 3.74) | -3.44 (-12.12, 5.25) |
| Proportion of OUD clients[#] | 2.21 (-0.89, 5.31) | -2.42 (-8.15, 3.33) | 0.48 (-9.77, 10.74) |
| Proportion of prescription OUD clients[#] | -0.07 (-3.61, 3.47) | 6.37 (-1.59, 13.33) | 5.32 (-35.85, 46.49) |
| Proportion of involuntary patients[#] | 0.83 (-2.90, 4.56) | -0.52 (-9.04, 8.00) | 0.90 (-9.71, 11.51) |
| Proportion of racial/ethnic minority patients[#] | -2.34 (-5.36, 0.67) | 8.58 (-3.03, 20.18) | -6.19 (-15.31, 2.92) |
| Region (ref. Northeast) | | | |
| Midwest | 0.19 (-9.63, 10.01) | -15.45 (-39.41, 8.52) | -29.55 (-122.32, 63.21) |
| South | 3.56 (-4.52, 11.65) | 21.03 (-9.06, 51.12) | 15.26 (-16.42, 46.93) |

**Table 5.10 Co-production's association with utilization of harm reduction services (continued)**

| | Distribute overdose prevention pamphlet | Distribute Condom | Distribute Naloxone |
|---|---|---|---|
| | Coef. (95% CI) | Coef. (95% CI) | Coef. (95% CI) |
| West | 3.95 (-8.17, 16.08) | 9.59 (-13.03, 32.21) | -30.11 (-224.25, -164.03) |
| Number of staff [&] | -2.02 (-5.36, 1.31) | 0.78 (-9.11, 10.67) | -0.15 (-62.48, 62.17) |
| Inverse Mills ratio | -33.19 (-89.35, 22.97) | 49.55 (-68.02, 167.13) | 55.24 (-386.41, 496.89) |

^p<0.1, *p<0.05, **p<0.01, ***p<0.001, [&]Log transformed, [#]Standardized, [%]Not controlled for modality and accreditation status because of high collinearity with OTPs.

Abbreviations: SwLE (Staff with Lived Experience); OTP (Opioid Treatment Program); JC (Joint Commission); CARF (Commission on Accreditation of Rehabilitation Facilities); AUD (Alcohol Use Disorder); OUD (Opioid Use Disorder)

**Table 5.11 Co-production's association with utilization of ancillary services (**

| | Routine medical care | Transportation assistance | Housing assistance |
|---|---|---|---|
| | Coef. (95% CI) | Coef. (95% CI) | Coef. (95% CI) |
| First-stage estimation of dependent variables | | | |
| Patient-centered care | | | |
| Invite patients in care decision-making processes | 0.41 (-3.04, 3.86) | 8.71 (5.73, 11.68)*** | 3.45 (1.07, 5.83)** |
| Patient-Centered Care Factor | 4.09 (2.37, 5.80)*** | -0.15 (1.73, 1.42) | 1.25 (0.05, 2.46)* |
| Peer co-production | | | |
| Proportion of SwLE[#] | -1.78 (-3.88, 0.33)^ | 0.06 (-1.73, 1.85) | 0.27 (-1.18, 1.72) |
| Any senior SwLE | 1.61 (-4.99, 1.77) | 5.13 (2.08, 8.17)** | 2.09 (-0.26, 4.44)^ |
| SwLE equal or greater influence on strategy | -5.05 (-8.05, -2.06)** | 7.13 (4.45, 9.81)*** | 3.64 (1.55, 5.74)** |
| | | | |
| Located in Medicaid expansion state | 1.93, -3.79, 7.66) | -2.41 (-7.02, 2.19) | 3.81 (-1.01, 8.62) |
| Total substance abuse admission in county [&] | -0.33 (-2.27, 1.60) | 3.83 (2.16, 5.50)*** | 0.16 (-1.02, 1.34) |
| Proportion of revenue from private/commercial insurance[#] | 1.55 (-1.16, 4.26) | 0.97 (-1.66, 3.59) | -8.68 (-12.67, -4.69)*** |
| Service modality (ref. Non-OTP Outpatient) | | | |
| OTP Outpatient | 4.18 (-1.58, 9.94) | -13.95 (-18.70, -9.21)*** | -4.77 (-10.80, 1.26) |
| Inpatient | -2.52 (-17.08, 12.04) | 29.83 (15.34, 44.31)*** | 1.05 (-9.27, 11.37) |
| Residential | 8.21 (-3.09, 19.51) | 20.03 (14.29, 25.78)*** | 30.38 (20.91, 39.86)*** |
| Unit type (ref. Private for-profit) | | | |
| Private non-profit | -16.50 (-21.96, -11.03)*** | -9.89 (-16.63, -3.15)** | 11.59 (3.58, 19.59)** |
| Public | -15.10 (-21.80, -8.41)*** | -13.02 (-23.39, -2.66)* | 11.56 (4.86, 18.27)** |
| ACO or PCMH in place | -6.67 (-11.43, -1.90) | -0.82 (-6.10, 4.46) | 7.87 (4.35, 11.39)*** |
| Accredited (JC or CARF) | 0.48 (-4.16, 5.13) | -0.83 (-4.84, 3.18) | -0.53 (-3.58, 2.53) |
| Owned by hospital or mental health facility | 1.28 (-3.34, 5.90) | -5.43 (-10.97, 0.11)^ | 2.18 (-1.98, 6.34) |
| Director perceives high competition | -4.25 (-8.20, -0.30)* | 1.37 (-1.98, 4.71) | -7.22 (-10.52, -3.92)*** |
| Director's reliance on professional information sources | -0.13 (-2.92, 2.65) | -0.22 (-2.66, 2.21) | 3.25 (0.20, 6.30)* |
| Director's perception on SwLE's peer co-production potential (factor) | 5.21 (3.09, 7.33)*** | 1.19 (-1.10, 3.47) | -2.62 (-4.10, -1.13)** |

**Table 5.11 Co-production's association with utilization of ancillary services (continued)**

| | Routine medical care | Transportation assistance | Housing assistance |
|---|---|---|---|
| | Coef. (95% CI) | Coef. (95% CI) | Coef. (95% CI) |
| Clinical supervisor endorse 12-step treatment model | -0.64 (-4.59, 3.32) | 3.54 (0.10, 6.99)* | 3.66 (0.95, 6.37)** |
| Proportion of professional staff (graduate degree)[#] | 4.70 (2.02, 7.39)*** | 2.65 (0.54, 4.76)* | -0.56 (-2.20, 1.08) |
| Proportion of AUD clients[#] | -1.58 (-4.13, 0.97) | 1.80 (-0.21, 3.81)^ | 4.66 (2.97, 6.34)*** |
| Proportion of OUD clients[#] | -0.11 (-2.53, 2.30) | -1.37 (-3.97, 1.23) | 4.53 (2.99, 6.06)*** |
| Proportion of prescription OUD clients[#] | -4.14 (-6.95, -1.33)** | -0.82 (-2.86, 1.23) | 5.45 (2.93, 7.96)*** |
| Proportion of involuntary patients[#] | -2.27 (-5.32, 0.78) | -3.14 (-5.16, -1.12)** | 3.24 (0.50, 5.98)* |
| Proportion of racial/ethnic minority patients[#] | 0.16 (-1.84, 2.17) | -0.76 (-3.31, 1.78) | 0.90 (-0.63, 2.44) |
| Region (ref. Northeast) | | | |
| Midwest | 5.12 (-3.48, 13.72) | -1.39 (-6.72, 3.94) | -6.59 (-10.49, -2.69)** |
| South | 1.90 (-6.73, 10.52) | 0.26 (-7.88, 8.40) | -8.44 (-14.58, -2.29)** |
| West | -3.91 (-10.46, 2.64) | -2.35 (-8.63, 3.93) | 1.32 (-3.47, 6.11) |
| Number of staff [&] | -5.08 (-8.25, 1.91)** | -5.88 (-10.79, -0.97)* | 5.41 (0.20, 10.61)* |
| | | | |
| First-stage estimation of Mills ratio | | | |
| Located in Medicaid expansion state | -0.12 (-0.21, -0.03)** | 0.02 (-0.07, 0.11) | 0.14 (0.05, 0.23)** |
| Total substance abuse admission in county [&] | 0.09 (0.07, 0.12)*** | -0.07 (-0.09, -0.04)*** | -0.03 (-0.06, -0.01)** |
| Proportion of revenue from private/commercial insurance[#] | -0.11 (-0.15, -0.07)*** | -0.09 (-0.12, -0.05)*** | -0.17 (-0.21, -0.13)*** |
| Service modality (ref. Non-OTP Outpatient) | | | |
| OTP Outpatient | 0.10 (0.01, 0.20)* | 0.06 (-0.04, 0.16) | 0.24 (0.15, 0.34)*** |
| Inpatient | 0.97 (0.80, 1.14)*** | -0.69 (-0.83, -0.55)*** | -0.39 (-0.53, -0.25)*** |
| Residential | 0.67 (0.56, 0.79)*** | 0.12 (0.01, 0.23)* | 0.46 (0.36, 0.57)*** |
| Unit type (ref. Private for-profit) | | | |
| Private non-profit | 0.13 (0.05, 0.22)** | 0.28 (0.19, 0.36)*** | 0.36 (0.28, 0.44)*** |
| Public | 0.06 (-0.06, 0.18) | 0.51 (0.40, 0.63)*** | 0.24 (0.13, 0.35)*** |
| ACO or PCMH in place | 0.14 (0.06, 0.23)** | 0.23 (0.15, 0.32)*** | 0.09 (0.01, 0.17)* |
| Accredited (JC or CARF) | 0.14 (0.06, 0.22)*** | -0.08 (-0.16, -0.00)* | 0.00 (-0.07, 0.08) |
| Owned by hospital or mental health facility | -0.00 (-0.09, 0.08) | 0.23 (0.15, 0.32)*** | 0.13 (0.05, 0.21)** |
| Director perceives high competition | 0.09 (0.02, 0.16)* | 0.04 (-0.03, 0.11) | -0.10 (-0.16, -0.03)** |

**Table 5.11 Co-production's association with utilization of ancillary services (continued)**

| | Routine medical care | Transportation assistance | Housing assistance |
|---|---|---|---|
| | Coef. (95% CI) | Coef. (95% CI) | Coef. (95% CI) |
| Director's reliance on professional information sources | 0.05 (-0.00, 0.09)^ | 0.06 (0.01, 0.10)* | 0.13 (0.08, 0.17)*** |
| Director's perception on SwLE's peer co-production potential (factor) | -0.03 (-0.07, 0.00)^ | -0.07 (-0.10, -0.04)*** | -0.01 (-0.05, 0.02) |
| Clinical supervisor endorse 12-step treatment model | -0.02 (-0.09, 0.05) | -0.03 (-0.10, 0.04) | -0.00 (-0.07, 0.06) |
| Proportion of professional staff (graduate degree)[#] | -0.11 (-0.15, -0.07)*** | -0.06 (-0.10, -0.03)** | 0.02 (-0.02, 0.06) |
| Proportion of AUD clients[#] | -0.09 (-0.13, -0.05)*** | -0.04 (-0.08, -0.00)* | 0.04 (0.01, 0.08)* |
| Proportion of OUD clients[#] | 0.08 (0.04, 0.12)*** | 0.11 (0.07, 0.15)*** | 0.00 (-0.04, 0.04) |
| Proportion of prescription OUD clients[#] | 0.14 (0.10, 0.17)*** | 0.06 (0.02, 0.09)** | 0.11 (0.07, 0.15)*** |
| Proportion of involuntary patients[#] | -0.11 (-0.15, -0.07)*** | 0.02 (-0.02, 0.06) | 0.12 (0.08, 0.16)*** |
| Proportion of racial/ethnic minority patients[#] | 0.04 (0.01, 0.08)* | 0.12 (0.09, 0.16)*** | 0.03 (-0.00, 0.07)^ |
| Region (ref. Northeast) | | | |
| Midwest | -0.51 (-0.60, -0.41)*** | -0.17 (-0.26, -0.07)** | -0.06 (-0.16, 0.03) |
| South | -0.47 (-0.58, -0.35)*** | -0.35 (-0.47, -0.24)*** | -0.23 (-0.34, -0.12)*** |
| West | -0.33 (-0.43, -0.23)*** | -0.24 (-0.34, -0.14)*** | -0.14 (-0.23, -0.04)** |
| Number of staff [&] | 0.17 (0.13, 0.21)*** | 0.26 (0.22, 0.30)*** | 0.25 (0.22, 0.29)*** |
| Mills (lambda) | -64.86 (-92.60, -37.13)*** | -58.88 (-91.88, -25.89)*** | 45.47 (11.28, 79.67)** |
| | | | |
| Second-stage regression with the inverse Mills ratio | | | |
| Patient-centered care | | | |
| Invite patients in care decision-making processes | 2.55 (-5.31, 10.42) | 10.38 (2.58, 18.17)** | 3.78 (-3.08, 10.65) |
| Patient-Centered Care Factor | 4.11 (0.30, 7.91)* | -0.31 (-4.32, 3.71) | 1.68 (-1.43, 4.79) |
| Peer co-production | | | |
| Proportion of SwLE[#] | -1.94 (-7.06, 3.18) | -0.10 (-5.19, 5.00) | -0.45 (-5.63, 4.74) |
| Any senior SwLE | -1.53 (-9.25, 6.19) | 5.51 (-2.40, 13.44) | 2.71 (-4.45, 9.87) |
| SwLE equal or greater influence on strategy | -5.13 (-11.52, 1.27) | 7.69 (1.13, 14.25)* | 4.09 (-2.41, 10.60) |
| | | | |
| Located in Medicaid expansion state | 4.27 (-6.89, 15.43) | -2.71 (-12.06, 6.64) | 3.42 (-9.96, 16.80) |
| Total substance abuse admission in county [&] | -1.21 (-5.13, 2.70) | 4.24 (0.83, 7.66)* | 0.05 (-3.15, 3.25) |

**Table 5.11 Co-production's association with utilization of ancillary services (continued)**

| | Routine medical care | Transportation assistance | Housing assistance |
|---|---|---|---|
| | Coef. (95% CI) | Coef. (95% CI) | Coef. (95% CI) |
| Proportion of revenue from private/commercial insurance[#] | 2.62 (-2.77, 8.01) | 1.74 (-4.86, 8.34) | -8.65 (-20.80, 3.49) |
| Service modality (ref. Non-OTP Outpatient) | | | |
| OTP Outpatient | 2.96 (-8.74, 14.65) | -15.51 (-25.14, -5.88)** | -5.55 (-23.22, 12.13) |
| Inpatient | -8.22 (-32.99, 16.55) | 31.83 (-2.07, 65.72)^ | 3.34 (-28.14, 34.81) |
| Residential | 3.25 (-18.11, 24.61) | 19.61 (6.70, 32.52) | 32.48 (2.85, 62.10)* |
| Unit type (ref. Private for-profit) | | | |
| Private non-profit | -17.48 (-26.76, -8.20)*** | -11.39 (-25.99, 3.21) | 10.10 (-15.09, 35.29) |
| Public | -16.33 (-28.47, -4.19)** | -15.19 (-37.22, 6.84) | 10.48 (-8.16, 29.13) |
| ACO or PCMH in place | -9.05 (-17.13, -0.98)* | -2.25 (-12.93, 8.42) | 8.71 (-0.05, 17.46)^ |
| Accredited (JC or CARF) | -0.35 (--9.35, 8.65) | -1.73 (-10.07, 6.61) | -0.43 (-7.79, 6.94) |
| Owned by hospital or mental health facility | 1.87 (-6.19, 9.93) | -6.35 (-17.86, 5.17) | 2.30 (-8.56, 13.16) |
| Director perceives high competition | -4.77 (-10.88, 1.34) | 1.55 (-5.11, 8.21) | -7.85 (-16.38, 0.69)^ |
| Director's reliance on professional information sources | -0.36 (-5.55, 4.84) | -0.22 (-5.24, 4.79) | 3.46 (-5.93, 12.85) |
| Director's perception on SwLE's peer co-production potential (factor) | 6.45 (-2.28, 10.62)** | 1.74 (-3.48, 6.95) | -2.36 (-6.22, 1.51) |
| Clinical supervisor endorse 12-step treatment model | -1.17 (-8.29, 5.95) | 2.76 (-4.88, 10.40) | 3.32 (-2.59, 9.23) |
| Proportion of professional staff (graduate degree)[#] | 6.64 (1.16, 12.12)* | 3.05 (-1.15, 7.56) | 0.04 (-3.56, 3.63) |
| Proportion of AUD clients[#] | -0.77 (-5.47, 3.93) | 2.34 (-1.84, 6.52) | 4.79 (0.56, 9.02)* |
| Proportion of OUD clients[#] | -0.57 (-4.71, 3.57) | -1.25 (-6.45, 3.95) | 4.92 (1.43, 8.42)** |
| Proportion of prescription OUD clients[#] | -5.03 (-10.05, -0.02)* | -1.51 (-5.76, 2.73) | 5.49 (-2.29, 13.27) |
| Proportion of involuntary patients[#] | -1.33 (-7.40, 4.75) | -3.83 (-8.39, 0.74) | 2.97 (-5.55, 11.48) |
| Proportion of racial/ethnic minority patients[#] | -0.14 (-3.31, 3.04) | -1.40 (-6.72, 3.93) | 0.85 (-2.99, 4.69) |
| Region (ref. Northeast) | | | |
| Midwest | 9.04 (-5.67, 23.76) | -0.69 (-11.65, 10.26) | -7.66 (-16.58, 1.27)^ |
| South | 4.61 (-10.26, 19.47) | 1.95 (-15.10, 19.01) | -10.04 (-26.65, 6.57) |
| West | -2.49 (-13.60, 8.61) | -1.01 (-14.32, 12.29) | 0.98 (-10.95, 12.91) |
| Number of staff [&] | -6.07 (-11.35, -0.80)* | -7.49 (-18.68, 3.69) | 5.72 (-11.86, 23.29) |

**Table 5.11 Co-production's association with utilization of ancillary services (continued)**

| | Routine medical care | Transportation assistance | Housing assistance |
|---|---|---|---|
| | Coef. (95% CI) | Coef. (95% CI) | Coef. (95% CI) |
| Inverse Mills ratio | -79.72 (-130.04, -29.40)** | -70.01 (-143.31, 3.30)^ | 47.33 (-68.56, 163.22) |

^p<0.1, *p<0.05, **p<0.01, ***p<0.001, [&]Log transformed, [#]Standardized, [%]Not controlled for modality and accreditation status because of high collinearity with OTPs.

Abbreviations: SwLE (Staff with Lived Experience); OTP (Opioid Treatment Program); JC (Joint Commission); CARF (Commission on Accreditation of Rehabilitation Facilities); AUD (Alcohol Use Disorder); OUD (Opioid Use Disorder)

**Table 5.12 Co-production's association with service utilization: Summary of Heckman selection model second-stage regression results**

| | Patient-centered care, coef. (95% CI) | | Peer co-production, coef. (95% CI) | | |
|---|---|---|---|---|---|
| | Invite patients to clinical processes | Patient-Centered Care Factor[#] | % SwLE[#] | Any senior SwLE | SwLE equal or greater influence on strategy |
| **Treatment programs** | | | | | |
| (1) Opioid aftercare | 3.97 (-4.89, 12.83) | 2.05 (-2.31, 6.41) | 2.72 (-3.25, 8.69) | -0.64 (-9.59, 8.31) | 4.22 (-3.52, 11.97) |
| (2) Opioid maintenance | 4.11 (-3.26, 11.48) | -0.48 (-4.30, 3.33) | -0.41 (-6.36, 5.55) | 5.71 (-1.29, 12.71) | 2.68 (-3.71, 9.06) |
| **Medications** | | | | | |
| (3) Methadone[%] | 0.45 (-9.95, 10.86) | 4.98 (-0.69, 10.64)^ | 4.07 (-3.56, 11.69) | -3.02 (-13.27, 7.24) | 1.28 (-7.52, 10.08) |
| (4) Buprenorphine | -1.89 (-9.27, 5.48) | -1.84 (-5.60, 1.91) | -0.81 (-5.13, 3.50) | 2.46 (-4.70, 9.59) | 0.25 (-4.68, 5.18) |
| **Harm reduction services** | | | | | |
| (5) Overdose prev. pam. | 1.50 (-3.94, 6.94) | 2.51 (-0.31, 5.33)^ | -2.13 (-5.62, 1.36) | -1.81 (-7.31, 3.69) | 2.02 (-3.01, 7.06) |
| (6) Distribute condom | -3.33 (-15.14, 8.48) | 2.35 (-2.60, 7.29) | 4.10 (-2.69, 10.89) | -0.22 (-9.85, 9.41) | 10.33 (0.64, 20.01)* |
| (7) Distribute naloxone | 12.06 (-3.74, 27.87) | 2.87 (-4.94, 10.69) | -7.59 (-18.60, 3.41) | -0.49 (-15.05, 14.08) | 6.79 (-9.66, 23.23) |
| **Ancillary Services** | | | | | |
| (8) Routine medical care | 2.55 (-5.31, 10.42) | 4.11 (0.30, 7.91)* | -1.94 (-7.06, 3.18) | -1.53 (-9.25, 6.19) | -5.13 (-11.52, 1.27) |
| (9) Transportation asst. | 10.38 (2.58, 18.17)** | -0.31 (-4.32, 3.71) | -0.10 (-5.19, 5.00) | 5.51 (-2.40, 13.44) | 7.69 (1.13, 14.25)* |
| (10) Housing assistance | 3.78 (-3.08, 10.65) | 1.68 (-1.43, 4.79) | -0.45 (-5.63, 4.74) | 2.71 (-4.45, 9.87) | 4.09 (-2.41, 10.60) |

^p<0.1, *p<0.05, [#]Standardized, [%]Not controlled for modality and accreditation status because of high collinearity with OTPs.
Results are controlled for environmental factors (located in Medicaid expansion state, total substance abuse admission in county), organizational structure (service modality, unit type, ACO or PCMH in place, accredited, owned by hospital or mental health facility), revenue sources (private or commercial insurance), manager perception (high competition, endorse 12-step model, rely on professional information sources, perspectives on peer co-production potentials), staff and patient characteristics (staff with medical training, staff with academic credential, AUD patients, OUD patients, prescription OUD patients, involuntary patients, , racial/ethnic minority patients), region, and number of total (full-time and part-time) staff
Abbreviations: SwLE (Staff with Lived Experience); OTP (Opioid Treatment Program); AUD (Alcohol Use Disorder); OUD (Opioid Use Disorder); JC (Joint Commission); CARF (Commission on Accreditation of Rehabilitation Facilities)

## Discussion

This chapter highlights the associations between two co-production mechanisms--patient-centered care and peer co-production—and service output patterns at SUD treatment centers. Overall, more than a half of clinics co-produce addiction treatment services either through direct patient-clinician collaborations or by hiring staff with lived experience as proxies of patients' concerns and preferences. Although some significant associations with with patient-centered care and peer co-production variables are observed, service availability patterns were mainly associated with other organizational factors—such as service modality, unit type, staff and patient composition, and revenue sources. Heckman selection model results show that patients at patient-centered care practicing clinics were more likely to utilize harm reduction and recovery supportive services. Peer co-production variables also had significant positive associations with patients' use of condoms and transportation assistance.

Patient-centered care variables' lack of associations with service availability is an unexpected finding. Although they may recognize patients' needs for a particular service (i.e., housing assistance) through a series of conversations, clinicians might believe it is a more reasonable decision to refer patients to other health and social service organizations that are already offering the service. Unfortunately, the current dataset does not capture how many patients are referred to other service providers for specific reasons. Although the NDATSS asked the percentage of patients referred to other service providers, the purpose of referrals was not captured, preventing a clear understanding of how SUD units facilitate patients' access to responsive services through inter-organizational collaborations.

Another possibility is that patient-centered care efforts in a service delivery phase may have limited relationships with service offering decisions. Although clinicians recognize

patients' need for new services, there are many stages to go through to provide those services. Service offering decisions require consideration by multiple domains of management (e.g., regional needs assessments, improvement/expansion of technical expertise, financial resources), and patients' and clinicians' desire for new programs might be canceled out with by managerial issues and concerns. Patients' engagement in earlier phases (e.g., service design) may have greater odds of correlation with service availability patterns—a relationship deserving further investigation.

Multiple explanations may exist to explain the limited association between peer co-production and service availability, such as recovering staff's lack of organizational influence or subject matter expertise with respect to managerial decisions. More concerning relationships in the context of the current opioid crisis are between the peer co-production mechanism and maintenance therapy availability. It is possible that that staff with lived experience might be heavily committed to a particular recovery model and indifferent about offering any services other than peer support (Shipko & Stout, 1993; White, 2014). In this case, staff with lived experience might not serve as good proxies of patient's concerns, undermining the core value of peer co-production. It is worth mentioning that the current study does not tell us whether co-production efforts are doing a good job of capturing and responding to patient's needs because the data used for this study does not capture perspectives of staff with lived experience to answer this question.

Interestingly, peer co-production—particularly proportion of staff with lived experience—was negatively associated with methadone's output patterns only, not with buprenorphine. In other words, staff with lived experience may not be opposing to the maintenance approach, but against a particular medication—methadone—potentially due to

perceptions associated with it. Compared to relatively recently approved SUD treatment medications (i.e., buprenorphine) that are often associated with middle-class white patients, methadone maintenance therapy historically has been heavily stigmatized, due to strong federal regulation and associations with low-income racial/ethnic minority SUD patients (Earnshaw, Smith, & Copenhaver, 2013; Hansen & Roberts, 2012). Thus, the current result might have captured recovering staff's ambivalent perspectives on medication assisted treatment. Future studies focusing on patients and clinicians' perspectives are necessary to better understand these relationships.

In terms of service utilization, patient-centered care variables had positive associations with patients' greater utilization of various harm reduction and supportive services, positive results confirming the earlier hypotheses. As clinicians are enlightened with patients' concerns and needs either through collaborating or lived experience, they may encourage or enable patients to utilize available services. Compared to introducing a new service, providing already existing services to patients might be relatively doable and feasible efforts for clinicians and clinics. Leveraging institutional resources and their access to networks, enabling patients to use existing services to satisfy outstanding needs can be a much easier task for clinicians. Patients' increased utilizations of those services might not just satisfy patients' needs, but also help units' business operations, especially when a service can increase the overall number of patients served by the unit (e.g., providing car-pool services for patients to attend treatment sessions) or a service requiring significant infrastructure has been underutilized (e.g., routine health care).

The utilization rate analysis highlights the potential and limitations of the peer co-production mechanism. Peer co-production efforts had associations with greater utilizations of two services—transportation assistance and condom distribution. Although these are important

services contributing patients' wellbeing and continued access to treatment in meaningful ways, results seem to demonstrate peer co-production mechanism's limited relationship with utilization patterns. of services tested in this study.

Interestingly, peer co-production mechanisms were positively associated with utilization rates only when staff with lived experience possessed levels of influence equal to or greater than staff without first-hand experience of addiction. One way of interpreting this trend would be that frontline and senior staff with lived experience did not properly respond to patient's concerns and intentionally did not influence service utilization pattern. However, this seems unreasonable, given the positive association between recovering staff's influence level and utilization patterns. A more likely possibility is that simply having more frontline or senior staff with lived experience was not enough to be associated with patients' utilization of recovery supporting services, which required patients' representatives to possesses meaningful levels of authority in organizational processes. The latter interpretation suggests the need for a more democratic process between staff members with various expertise. Even if the concerns of patients are captured by staff with lived experience, clinics might lose opportunities to provide quality and responsive services if recovering staff do not have opportunities to advocate within clinics or are not integral players within the organizational process.

Another noteworthy finding is that managers' perception on recovering staff's peer co-production potential had an indirect association with utilization patterns of transportation assistance and condoms through influence levels of staff with lived experience. In the analysis in the fourth chapter (see Table 4.2), directors' view on peer co-production possibilities was a strong predictor of peer co-production practices. The current chapter's Table 5.10 and Table 5.11 show that recovering staff's influence level was a significant predictor of two services, but

directors' peer co-production expectation was not. Hence, the associations between directors' peer co-production expectation and outputs of two services are fully mediated through the influence levels of staff with lived experience. This finding also signals that directors might have leveraged a peer co-production in certain service areas intentionally by granting greater authority/power to staff with lived experience. In other words, directors' strong supports are important for peer co-production to have meaningful association with service output patterns.

## Chapter 6 : CONCLUSION

As user inclusion in service production processes has multiple benefits for a devolved and privatized welfare system, there are growing interests and emphases on co-production—efforts to engage users in service decision-making processes. Using the substance use disorder (SUD) treatment field as a case, this dissertation has attempted to (1) provide a theoretical framework for conceptualizing multiple co-production efforts at health and social service organizations, (2) identify environmental and organizational factors associated with patient-centered care and peer co-production efforts, and (3) investigate how patient-centered care and peer co-production practices are correlated with service outputs at SUD treatment clinics in the U.S. This concluding chapter reviews earlier chapters, and discusses various limitations of the study. After discussing implications for theory, policy, and practice/management, the chapter closes with suggestions for future research.

### Summary of Previous Chapters

The first chapter provided a theoretical ground for the study. By synthesizing literature on human service organizations, deliberative democracy, co-production, and patient-centered care, the chapter offered a conceptual framework that differentiates patient-centered care (a prime example of traditional co-production) from provider-driven service provision and user-driven co-production modes. Then, the framework was applied to the SUD treatment field, where patients' empowered involvement in care decision-making processes has been limited. SUD clinics offered unique opportunities not only to explore provider-user tensions within co-production processes, but also to theorize the concept of peer co-production as an alternative to a traditional co-production.

After describing the methodological approach in the second chapter, the third and fourth chapters explored associations between various environmental and organizational factors and SUD clinics' practices and managers' perceptions with regard to patient-centered care and peer co-production mechanisms. Among many relationships discussed in these chapters, multiple notable patterns emerged. First, service modality (e.g., whether the clinics was an outpatient, an inpatient, or a residential unit) mattered for patient-centered care and peer co-production efforts. Compared with units in other service modalities, residential units seem to be the most promising venues for both co-production mechanisms. Physical co-location might offer frequent interaction opportunities for patients and clinicians and labor intensive nature of practice might encouraged clinics to hire more staff with lived experience. Also, compared to private non-profit or public units, for-profit clinics were more likely to implement both patient-centered care and peer co-production methods not just to reduce staffing expenses (e.g., by hiring staff with lived experiences rather than specialized clinicians), but also to customize services (e.g., by learning patients' concerns through listening or hiring staff with lived experiences). For-profit units relying more on private/commercial insurance income and facing a greater regional competition were much more likely to value patient-centered care practices.

Institutional pressures were also correlated with SUD treatment's co-production efforts and managers' tendencies. Units owned by hospitals or mental health facilities seem to be discouraged to adopt the peer co-production mechanism that emphasizes experiential expertise, potentially as parent organizations impose rules and guidelines to promote technocratic authority (e.g., hiring medical professionals). Furthermore, second and third chapters' results hinted that certain patient groups are less or more likely to be exposed to a certain co-production method. Clinics with greater proportions of opioid use disorder patients and prescription opioid use

disorder patients tended not to implement patient-centered care and peer co-production methods, respectively. Interestingly, a presence of racial/ethnic minority patients was positively correlated with SUD treatment units' tendency to invite patients to clinical-decision making processes but negatively associated with hiring more clinical staff with lived experience. Lastly, managers' beliefs in recovering staff's peer co-production potentials was strongly correlated with clinics' use of peer co-production, signaling many units' intentional use of staff with lived experience for responsive and effective service provision. Further research is needed to investigate these possible relationships.

The fifth chapter showed associations between SUD treatment clinics' patient-centered care and peer co-production efforts and their service output patterns. Although some associations with patient-centered care practices were observed, service availabilities were mainly associated with various organizational factors (e.g., service modality, unit type, staff and patient composition, and revenue sources). Peer co-production efforts had almost no association with availability of services, which could be potential evidence of limited influence and power of staff with lived experience in organizational decision-making processes either due to explicit organizational constraints on their input in clinical decision, their own deference to clinical authority, or a sign of recovering staff's disinterest in offering any services beyond peer supports.

Multiple potential explanations emerge with a negative association between proportions of staff with lived experience and availability of medication-assisted treatment. Patients might not prefer to receive these services and staff with lived experience successfully captured and advocated patients' voice. Or, staff with lived experience might not serve as perfect proxies of patients' concerns and needs, particularly in domains where multiple ethos of recovery collide. Varying associations between the presence of staff with lived experience and two medications

(i.e., methadone and buprenorphine) might have captured recovering staff's conflicted perspectives on maintenance therapy. Another possibility is that, even if staff with lived experience captured patient's concerns correctly, peer co-production might inherently limit the scope of service options to the ones that recovering staff experienced (particularly benefited) previously, excluding more recently developed evidence-based effective interventions.

The analysis on service utilization patterns showed a different picture. In the clinics emphasizing and practicing patient-centered care, patients were more likely to utilize available services that can reduce harms and facilitate long-term recovery—i.e., methadone, overdose prevention material, routine health care, and transportation assistance. In contrast, peer co-production mechanism (particularly when staff with lived experience possess equal or greater level of influence on strategic/organizational decisions) had positive and significant associations with utilizations of two services—transportation assistance and condoms. The results highlighted potential limitations of the peer co-production method. Simply hiring more staff with lived experience or employing as a senior staff member were not significantly associated with greater utilization of any services. The lack of associations may reflect the limitation of providing nominal and tokenized representation opportunities without meaningful power redistribution toward staff with lived experience. Or, the lack of associations may signal that simply relying on recovering staff's representative function without interactive and deliberative collaborations with patients would not necessarily lead meaningful changes in service output patterns.

It is important to note that the current result does not tell us which co-production mechanism is better at capturing and responding to patient's concerns because the dataset does not capture patient's preferences. Since patients' preferences and needs are likely to change over time as they go through different life and recovery phases, a combination of multiple

mechanisms could be a useful approach. For instance, in peer co-production practicing clinics, a team of mixed staff with various expertise and experience may schedule conversational sessions with patients to identify any outstanding needs or evaluate patient's satisfaction and progress. Patient-centered care practicing units can also hire staff with lived experience (and grant a meaningful level of organizational power) to suggest and lead clinics' structural or procedural changes to better respond to patient's needs.

**Limitations of the study**

This study has multiple limitations related to its quantitative design with organizational-level data. Stemming from the positivist philosophy, the main goal of multivariate analysis is to articulate a theoretical statement rigorously until it cannot be challenged through alternative empirical studies (R. R. Alford, 1998). Based on the closed-system perspective that subject's objectivity, the multivariate paradigm can reach a reasonable conclusion more economically, efficiently, and consistently with strong validity, generalizability, and applicability than other approaches (Stinchcombe, 1968). However, the main limitation of the quantitative multivariate approach is the potential isolation from "activity-, concept-, and space-time-dependence of social structure" (Bhaskar, 1989). In the social world, subjects have their own values, which can shape their behaviors and introduce complexity and uncertainty to social studies. In addition, due to reliance on observable and testable events, multivariate studies have limited access to deeper understandings of the causes or mechanisms of varying social behaviors (R. R. Alford, 1998).

The organizational-level survey data administered by directors and clinical supervisors is also vulnerable to measurement gaps and biases. The National Drug Abuse Treatment Systems Survey (NDATSS) is a nationally representative study of the SUD treatment field, capturing organization-level average values. However, the dataset does not capture important individual-

level information and variances (e.g., how often and how long individual patients utilized various services) that can show how co-production efforts shaped individual patients' experiences. For instance, although a significant proportion of patients is introduced to a housing assistance service, only a few might be benefited due to strict eligibility criteria and limited available housing stock.

The current study also did not test patterns of various services offered by SUD clinics that might be significantly associated with co-production efforts. For instance, childcare and job training services are important services for patients' continued access to care and recovery (B. D. Smith & Marsh, 2002). Despite potential relationships with co-production efforts, those services' availability and utilization patterns were not captured in the 2017 NDATSS.

Another gap is related to organizational referral information. Originally designed to capture the entire SUD treatment field's trend of service provision and financing schemes, limited information on referrals might not be an issue as long as the survey captures the field's total activities with a representative sample. However, with a specific focus on service responsiveness, limited information on destinations of referrals and whether and how long patients received referred services are serious limitations for this study. Particularly, patients referred to service providers beyond the SUD treatment field are not captured in this study.

The effects of response bias loom large on the questions related to clinics' emphasis on and practice of patient-centered care. Despite the efforts to control for social desirability bias by adopting validated measures' question wordings and structures, supervisors might provide normative answers to these questions. Also, managers may not be the best people to reflect clinic's day-to-day operations and interactions. Missing the perspectives and experiences of

front-line clinicians and patients—the main characters of clinics' co-production efforts—can be a critical limitation of this study.

Lastly, only associational relationships can be discussed with cross-sectional data. Attempts to understand causal relationships might not be worthwhile because this study investigates already complex associations among environmental pressures, organizational structures, perspectives on recovery, modes of service production, and service outputs. For instance, a clinic actively reaching out to homeless communities and patients may be exposed to various co-production opportunities and be inclined to hire more staff with lived experience to better understand the needs and concerns of patients. These efforts may further lead to introduction of efforts to create space to engage with patients and provide more responsive services, such as introducing drop-in centers and mobile health centers. Due to inter-connected relationships among activities and service outputs, the real effect size of true relationships may be very small and statistically insignificant, even if they are identified and estimated accurately. However, controlling for endogenous factors is still important for a clearer understanding of relationships between co-production efforts and service outputs. Future waves of data would be helpful not just for running more rigorous two-stage models with a greater statistical power, but also for investigating long-term trends and relationships among interest variables.

**Implications for theory and research**

Despite multiple limitations, the current dissertation provides multiple contributions and implications for theory/research, policy, and practice/management. Most notability, this study provides a frame for conceptualizing various service production modes. Despite the increasing interest in and attention to collaborative service production processes, the lack of conceptual clarity hinders the advancement and accumulation of co-production literature (Brandsen &

Honingh, 2016). The proposed framework distinguishes various service production modes by contrasting different underlying values, locations of authority, legitimacy bases, and the natures of user-provider relationships and situate traditional co-production mode between provider-driven service production and user-driven co-production mechanisms (see Table 1.1).

The framework also opens up a space to conceptualize alternative ways of user-provider collaboration using the SUD treatment field as a case. Previous co-production studies have investigated features and impacts of co-production efforts between service users and providers, such as collaborations between public officials and citizens in municipal budgeting and between parents and teachers in education (Brandsen & Pestoff, 2006; J. L. Brudney & England, 1983; Nabatchi, 2010). Departing from the earlier trend, I proposed an alternative mode of co-production (i.e., peer co-production) that can compensate for and/or complement a traditional and normative way of co-production (i.e., patient-centered care) (see Table 1.2). This was done by highlighting limitations and requirements of a traditional co-production mode (i.e., need for mutual trust and good communication channels between service providers and users) and leveraging the unique history and characteristics of the SUD field (i.e., significant presence of staff with lived experience and valuing individual's first-hand experience of addiction).

After theorizing operation of various co-production mechanisms, this study empirically tested practice of patient-centered care and peer co-production efforts and how these two mechanisms are associated with service output patterns with a nationally representative survey data of SUD clinics in the U.S. The results highlighted not just prevalent use of patient-centered care and peer co-production mechanisms in the SUD field, but also offered opportunities to update the theoretical frame presented earlier (see Table 6.1. Updates are in italics).

**Table 6.1 Revised theoretical frame (updates in italics)**

| Domains | Provider-driven service production | Traditional co-production (Patient-centered care) | Peer co-production | User-driven co-production |
|---|---|---|---|---|
| **Location of authority** | • Service providers | • Providers and users | • *Staff with lived experience* and users | • Providers and users |
| **Values / Motives** | • Beneficence (user's best interest)<br>• Providing effective (ethical) services | • Deliverance, negotiation, transparency<br>• Providing effective and responsive services | • Mediate power imbalance<br>• Bridge trust and information gaps | • Preserving user's autonomy and agency<br>• Providing responsive (legitimate) services |
| **Legitimacy base** | • Technical expertise (Scientific population-level evidence) | • Leveraging both technical and experiential expertise<br>• *Professional norms* | • Dual identity (Formal staff & lived experience)<br>• *Field's culture of valuing first-hand experiences* | • Experiential and contextual expertise (Lived experience) |
| **Nature of relationship** | • Directive | • Collaborative<br>• Mutual dependency | • Collaborative and representative | • Collaborative but directive |

**Table 6.1 Revised theoretical frame (updates in italics) (continued)**

| Domains | Provider-driven service production | Traditional co-production (Patient-centered care) | Peer co-production | User-driven co-production |
|---|---|---|---|---|
| **Limitations/ requirements** | • Fail to incorporate user's preference and contextual information<br>• Require user's adherence | • Time/resource constraints<br>• Require mutual trust and communication channels<br>• *Limited relationship with service availability patterns in a service delivery phase* | • Staff with lived experience may not be a good proxy of users<br>• *Limited relationship with service availability and utilization patterns in a service delivery phase*<br>• *Managers' recognition of the potential for peers to serve this role* | • Information burden on users<br>• Require provider's adherence |

In the peer co-production mechanism, staff with lived experience seem to possess certain degrees of authority in decision-making processes as representatives of patients and influence (or suppress) changes in service output pattern. Normative institutional pressures played meaningful roles in legitimating patient-centered care and peer co-production practices as well. Professional groups' calls for patient engagement efforts seem influenced SUD clinic leaders' positive views and emphasis on patient-centered care practices. The SUD treatment field's long-tradition of peer-based service provision appears to provide strong support for clinics' use of peer co-production method. In terms of changes in clinical outputs, both patient-centered care and peer co-production mechanisms had very limited associations with service availability patterns in a service delivery phase, where the current study is focusing on. Patient-centered care practices were associated with some services' greater utilization of some harm reduction and support services, but peer co-production method had few relationships with service utilizations. Lastly, peer co-production efforts appears to need managers' strong belief in recovering staff's potentials in relating with patients, understanding patient's needs, and enhancing other staff's sensitivity toward patient's issues.

With the revised framework and empirical evidence of multiple co-production mechanisms, this study demonstrates the need for critical assessments of working conditions and the impacts of different co-production efforts in various settings. Patient-centered care may enable patients to engage and influence care decision-making processes by balancing clinician's technical expertise and patient's experiential expertise. However, directly engaging with patients can be challenging in outpatient units as patients and clinicians may not be able to find a mutually agreeable time to meet. Besides, patient-centered care was not associated with treatment programs' utilizations—core functions of clinics—or service availability in a service

delivery phase. Peer co-production can be an innovative solution to close gaps in trust and knowledge. However, the mechanism showed almost no relevance with service output patterns in a service delivery phase. And, negative associations between the presences of staff with lived experience and availability of opioid maintenance therapy and methadone can signal potentially critical limitation of the peer co-production—discouraging patient's access to evidence-based effective treatment options.

These findings are very useful for managers and administrators for implementing co-production mechanisms discussed in this study or developing new co-production methods. One of the main takeaways from this study is that there is no single perfect co-production mechanism that works in every context. Various ways of collaborating may exist across health and social service fields, due to a combination of influences by different institutional, organizational, and individual level factors. Furthermore, health and social service organizations may implement multiple co-production methods to ensure service users meaningful engagement opportunities and to improve service responsiveness and effectiveness. Therefore, understanding conditions that enable different co-production approaches and the impacts of those efforts are important for leveraging strengths and mitigating weaknesses of different co-production mechanisms.

**Implications for policy**

To address the current opioid crisis, federal, state, and local governments have made multiple efforts, including but not limited to reducing opioid supply (e.g., prescription drugs, fentanyl), expanding availability of evidence-based treatments (e.g., medication-assisted treatment, harm reduction), and improving service technology (e.g., adopting electronic health record systems) (U.S. Department of Health and Human Services (HHS), Office of the Surgeon

General, 2016). In addition to these efforts, this study makes a case that participatory SUD treatment service provision can be an important lever for improving the current situation.

When it comes to intervening and treating SUD patients, the main focus has been patients' access to effective care, which is often defined as patients' admission to a treatment program that offers evidence-based treatment services. To improve patients' access, many strategies have been implemented that expand provider pools (e.g., training more professionals who can prescribe SUD treatment medications) and enable patients to gain access to clinics (e.g., mandating that insurance plans cover SUD diagnosis and treatment services). However, access to clinics carrying out effective treatment options does not necessarily guarantee a patient's utilization of those services. Many medical service studies demonstrated that a proper communication and collaboration between patients and clinicians could be one important lever to improve patient's use of responsive and potentially effective services (Beck, Daughtridge, & Sloane, 2002; Stewart, 1995).

The current study provides some of the first evidence that patient's participation in care decision-making processes is associated with different service utilization patterns in the SUD treatment field. Although a clinic may offer state-of-the-art addiction treatment services, patients cannot benefit from them when they are not informed or engaged in care planning processes with meaningful opportunities to influence the decisions they depend on. Despite some limitations of study mentioned above, the current dissertation provides one of the first suggestive evidences that clinics' patient-centered care efforts might be correlated with patients' greater utilization of multiple harm reduction and ancillary services after controlling for various environmental and organizational attributes. Thus, this study encourages governments and policy makers to think about ways to emphasize and incentivize collaborations between service SUD treatment service

providers and patients to improve patients' utilization of services that may facilitate their long-term recovery.

**Implications for practice and management**

This study started with a recognition that vulnerable service users have limited opportunities to engage and influence the service production process they heavily depend on. As health and social service fields have become more professionalized, bureaucratized, and heavily dependent on external resources, there is concern that lay service users may be sidelined in the decision-making processes without sufficient expertise, formal authorities, or purchasing powers. However, findings from the field show that serving one of the most stigmatized and marginalized populations defies this expectation. Despite the challenges of collaborating with patients, SUD treatment clinics use multiple methods to learn patients' concerns directly and indirectly and such efforts are associated with greater utilization of services that may assist patients' recovery. Thus, this study encourages managers and practitioners to identify innovative and unique ways to collaborate with service users that can compensate and improve current service provision modes.

The prevalence of collaborative service production efforts in the SUD field might enable the imagination of co-production possibilities in many other fields. For instance, building a positive relationship between birth parents and foster parents has been emphasized in the foster care field as an important way to addressing psychological issues (e.g., attachment, identity, and loss) that foster children may have experienced (McWey, Acock, & Porter, 2010; Neil, Beek, & Schofield, 2003). However, due to the risk-averse nature of the child welfare system, case workers might be discouraged to facilitate communication and collaboration between birth and foster parents. In this situation, former foster parents who successfully manage to work with birth parents can serve as mentors or relationship managers to facilitate collaborations—offering not

just deliberative and participatory co-production opportunities, but also representative co-production opportunities for foster and birth parents as their relationships progress. A discovery of new ways of collaboration will more likely come from managers' re-considerations of diverse stakeholders' potentials and capacities to facilitate collaborations with diverse expertise and experiences.

Lastly, co-production practices also provide room to appreciate and encourage collaborative and deliberative processes among staff members with different expertise and capacities. For instance, SUD treatment service is a collective product of diverse staff members' expertise. Medical professionals offer technical knowledge and prescribe necessary medications to reduce withdrawal symptoms and cravings (Knudsen, Abraham, & Oser, 2011). Non-medical clinicians evaluate patients' conditions, coordinate services, and conduct counseling and therapy sessions (Expert Panel on Scopes of Practice in the Field of Substance & of Use Disorders, 2011), while staff with lived experience provide social and emotional supports and advocate for patients (Hecksher, 2007). To coordinate person-centered care decisions in different stages of treatment and different parts of organizations, a team of staff members should recognize the values each member brings to the care process and respect each member's expertise. In other words, co-production requires collaborative and deliberative processes not just between service users and providers, but also among staff members with different backgrounds and experiences. Therefore, beyond providing responsive services, co-production efforts may offer greater opportunities to address democratic and citizenship deficits, starting with service organizations (Gastil & Levine, 2005; Nabatchi, 2010).

**Suggestions for future study**

Co-production is a relatively young area of scholarship with many gaps, and collaboration is a rarely discussed topic in the SUD field. The current dissertation is one of the first quantitative studies investigating factors and service outputs associated with co-production efforts using a representative sample of the SUD treatment field. In addition to producing interesting findings and proposing an alternative framework for conceptualizing co-production, this study suggests some promising areas for future studies.

First, a qualitative study of clinicians' and patients' perspectives on co-production efforts will be important not only to confirm the findings from this study, but also to create an in-depth understanding of the collaborative process at SUD clinics. The current study relies on responses from administrative directors and supervisors. Although they can be economic targets for collecting information about administrative characteristics and service offerings, managers may not be the best subjects to reflect clinicians' efforts to engage patients and learn their concerns. Interviews and focus groups with staff members (with and without lived experience) and patients in various treatment modalities and recovery stages could generate more nuanced understandings with regard to the following questions: How do patient-centered care and peer co-production mechanisms work in the field of SUD treatment? What services and processes do patients want from SUD clinics and clinicians? To what extent do staff members share decision-making authorities with patients? To what extent do patients perceive staff with lived experience as their advocates? How do staff members with diverse expertise and backgrounds collaborate with each other to provide more responsive services for patients? What are the internal policies and rules that facilitate/hinder clinicians' engagement with patients?

Second, more rigorous quantitative studies with longitudinal and multi-level designs are needed. Despite the current sample's representativeness, the cross-sectional nature of the dataset

limited this study's ability to test over time relationships among environmental factors (e.g., economic, political, demographic, etc.), organizational attributes (e.g., modality, patient composition, revenue sources), and practice patterns of SUD clinics. Longitudinal (and preferably panel) data will allow researchers to answer important questions including: How have changes in Medicaid policies influenced patient-centered care practice implementation? What is the relationship between SUD clinics' co-production efforts and medication-assisted treatment service utilization?

With only organizational-level information, how SUD clinics' co-production efforts shaped the experience of patients had to be inferred in this study, leaving significant rooms for error and bias. These relationships can be tested by linking organizational-level and patient-level datasets, such as NDATSS and Medicaid claims data. These studies can answer important questions such as: Are clinics' co-production efforts associated with patients' adherence to various treatment and supportive services? How often are patients referred to other social and health service organizations for specialized services? How much do co-production efforts save SUD clinics from dedicating resources to unnecessary services?

Other promising research questions include: how do health and social service organizations engage with users in various phases of service provision process? How do collaborative efforts in different phases impact on service outputs and user outcomes? The current dissertation focuses on co-production efforts in a service delivery or implementation phase of a SUD treatment service production cycle, which may explain limited associations between patient-centered care and peer co-production efforts' associations with service availability. Many co-production studies demonstrate users' engagement in service design and evaluation phases can make significant impacts on users' experiences (Nabatchi et al., 2017).

Given the potentially greater impact of users' voice in the service designing or assessment phases, investigations across different phases of service production would yield a more complete understanding of how co-production shape the experience of patients in the SUD treatment field.

Lastly, comparative studies across various health and social service fields are promising next steps as well. By proposing a conceptual framework and showing prevalent user-provider collaborations in the SUD field, this study facilitates comparisons, particularly among fields serving disempowered, stigmatized, and marginalized groups. Comparative studies will not just identify unnoticed and/or untapped ways of co-production by reflecting different service fields' practices, but also provide strong evidence for further legitimatizing previously under-valued collaboration methods (e.g., use of staff with lived experience of domestic violence or trauma). Exploring different co-production mechanisms' possibilities and limitations in various contexts will also enable service providers to strategically choose approaches, rather than adopting methods imposed by environmental pressures.

**Appendix A. ORIGINAL SURVEY QUESTIONS CONCERNING CO-PRODUCTION**

Q1. (Supervisor Survey) To what extent you think the following statements correspond to your own experience working in your unit.

| | 1 Strongly Disagree | 2 Disagree | 3 Neither agree or disagree | 4 Agree | 5 Strongly Agree |
|---|---|---|---|---|---|
| The quality of the interaction between staff and clients is more important than getting the tasks done. | | | | | |
| We are free to alter work routines based on clients' preferences. | | | | | |
| Clients are offered the opportunity to receive individualized services. | | | | | |
| Assessment of clients' needs is undertaken very frequently. | | | | | |
| We have to get some basic work done before we think about clients' specific preferences | | | | | |
| We discuss with our clients multiple options for treating their substance use disorder. | | | | | |
| This organization prevents staff from explaining the advantages and disadvantages of treatment options to clients. | | | | | |
| We help our clients understand all information provided. | | | | | |
| We ask our clients which treatment option(s) he/she prefers. | | | | | |
| This organization encourages joint patient-staff agreement on treatment plans | | | | | |

Q2. (Director Survey) Within your unit, what proportions (or numbers) of the following positions are filled by staff in recovery from drug or alcohol use disorder? *Please note, if someone has multiple roles, please count them once in their most senior positions.*

____ % (or ____ of total ____ ) Senior managers / clinical supervisors (i.e. Director, HR/compliance manager)

Q3. (Director Survey) Although individual personalities matter, in general, compared with staff without substance use disorder history, …

| | 1 Strongly Disagree | 2 Disagree | 3 Neither agree or disagree | 4 Agree | 5 Strongly Agree |
|---|---|---|---|---|---|
| Staff in recovery are better able to understand client's needs | | | | | |
| Staff in recovery are better able to develop therapeutic relationships with clients | | | | | |
| Staff in recovery are better able to motivate clients | | | | | |
| Staff in recovery are better able to inform staff about how best to approach clients | | | | | |
| Staff in recovery are more likely to be flexible in their approach to treatment | | | | | |
| Staff in recovery are more likely to influence strategic (organizational) decisions (i.e. target clients, budget, staff composition) | | | | | |

**Appendix B. CORRELATION TABLE**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Proportion of SwLE | 1.00 | | | | | | | | | | | | | | | | |
| 2 Any senior SwLE | .55* | 1.00 | | | | | | | | | | | | | | | |
| 3 SwLE equal or greater influence on strategy | .08 | .10 | 1.00 | | | | | | | | | | | | | | |
| 4 Located in Medicaid expansion state | .11 | .07 | -.02 | 1.00 | | | | | | | | | | | | | |
| 5 Total substance abuse admission in county[&] | .10* | .02 | .00 | .32* | 1.00 | | | | | | | | | | | | |
| 6 OTP Outpatient | -.28* | -.11* | -.08 | .02 | .17* | 1.00 | | | | | | | | | | | |
| 7 Non-OTP Outpatient | .00 | -.11* | .07 | -.01 | -.18* | -.61* | 1.00 | | | | | | | | | | |
| 8 Residential | .35* | .25* | .04 | .03 | .04 | -.32* | -.39* | 1.00 | | | | | | | | | |
| 9 Accredited (JC or CARF) | -.22* | -.14* | -.01 | -.08* | .06 | .32* | -.19* | -.20* | 1.00 | | | | | | | | |
| 10 Director's perception on SwLE's peer co-production potential | .35* | .25* | .31* | .02 | .03 | -.15* | .02 | .14- | -.02 | 1.00 | | | | | | | |
| 11 Clinical supervisor endorse 12-step treatment model | .25* | .20* | .05 | .01 | -.03 | -.24* | .03 | .22* | -.09* | .10 | 1.00 | | | | | | |
| 12 Proportion of professional staff (graduate degree) | -.37* | -.31* | -.05 | .02 | .07 | .11* | .19* | -.39* | .16* | -.15* | -.12* | 1.00 | | | | | |
| 13 Proportion of OUD clients | -.07 | .04 | -.08 | .17* | .24* | .39* | -39* | .00 | .18* | -.07 | -.05 | -.05 | 1.00 | | | | |
| 14 Proportion of involuntary patients | .13* | .06 | .11 | .01 | -.14* | -.47* | .46* | .09* | -.31* | .07 | .12* | -.08* | -.26* | 1.00 | | | |
| 15 Proportion of racial/ethnic minority patients | .01 | .03 | .03 | .08* | .36* | -.03 | .01 | .02 | .03 | .08 | -.02 | -.01 | .01 | .10* | 1.00 | | |
| 16 South | -.10* | -.02 | -.01 | -.53* | -.25* | .01 | -.04 | -.02 | .15* | .04 | -.01 | .01 | -.18* | -.08 | .02 | 1.00 | |
| 17 Number of staff[&] | -.20* | .16* | -.05 | .02 | .10* | .15* | -.34* | .11* | .19* | -.06 | .02 | -.12* | .25* | -.20* | .00 | .00 | 1.00 |

*p<0.05, [&]Log transformed.

Excluding following variables that did not have at least one statistically significant ($p<0.05$) correlation coefficient greater than 0.3 with other variable(s): Invite patients in care decision-making processes; patient-centered care factor; proportion of revenue from private/commercial insurance; ACO or PCMH in place; owned by hospital or mental health facility; director perceives high competition; director's reliance on professional information sources; clinical supervisor endorse 12-step treatment model; proportion of AUD clients; proportion of prescription OUD clients; and dummy variables for inpatient units, public units, private for-profit units, private nonprofit units, Northeast region, Midwest region, and West region.

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