Vermont Hub-and-Spoke Model of Care for Opioid Use Disorders: An Evaluation

Submitted December 2017

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This work was funded through the Centers for Disease Control and Prevention's Preventive Health and Health Services Block Grant (NB01OT009090-01) and the Substance Abuse and Mental Health Services Administration's Substance Abuse Prevention and Treatment Block Grant (TI010055-17).

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Foreword

On July 1, 2015, I returned home to Vermont after more than 40 years in Los Angeles. I moved to LA in 1974, after finishing my PhD at the UVM, to accept a position at UCLA to participate in one of the first heroin addiction research grants funded by the newly established National Institute on Drug Abuse (NIDA). It was as a UCLA Research Psychologist that I met my first individuals addicted to opioids.

Over the next 40-plus years, I was fortunate to be involved with many treatment expansion efforts and research projects on a variety of addictions. In the 1970s and early 80s, I treated Vietnam-era opioid users, setting up and managing a network of methadone clinics located in Southern and Central California. I established a nonprofit outpatient-treatment organization in the 1980s to provide evidence-based behavioral treatment to thousands of cocaine and methamphetamine users. In my years of work at UCLA, I conducted clinical research trials on many behavioral treatments (cognitive behavioral therapy, contingency management, physical exercise, mindfulness meditation, and others). In addition, I participated in over a dozen clinical trials of medications for opioid, cocaine, methamphetamine, and alcohol dependence. During this 20-plus year period, in the office next to mine was Dr. Walter Ling, whose work led the development and FDA approval of buprenorphine.

Beginning around 2000, I started working with the state of California and the county of Los Angeles to evaluate the addiction treatments in their large treatment systems. Over the next 15 years, I became very involved in developing strategies for evaluating the usefulness of various forms of addiction treatment for different drug-use populations. About this same time, I became involved in a variety of international research, evaluation, and training efforts in many parts of the world, including Vietnam, South Africa, Egypt, Saudi Arabia, Iraq, Iran, Israel, and Palestine. Much of this work was done as part of a system-development effort sponsored by the World Health Organization (WHO) and the United Nations Office on Drugs and Crime (UNODC). This international work provided an excellent opportunity for me to learn about different models of service development and evaluation and how different societies treated individuals with addiction.

Over 40 years of life in LA was enough, and so I returned home to Vermont with no particular plan for continuing to work in addiction. However, within a month of moving into my home in Brandon (Sudbury, actually), I met with UVM addiction leaders (Drs. Higgins and Pierattini) and agreed to take a part-time job to “help out” with opioid addiction work at UVM. Soon after I accepted this position, I met with Vermont Department of Health Commissioner Dr. Harry Chen, Deputy Commissioner Barbara Cimaglio, Vermont Blueprint for Health Director Beth Tanzman, and other stakeholders to learn about Vermont’s efforts to address the opioid epidemic. It was in these meetings that I first learned of the hub and spoke (H & S) system of medication-assisted treatment (MAT). Over the next year, I traveled around Vermont and talked with doctors, nurses, social workers, counselors, and dozens of people in treatment. I was very curious about the system Vermont was building and what the people who were delivering and receiving the services thought about them.

I worked with Barbara Cimaglio and others at the Division of Alcohol & Drug Abuse Programs (ADAP) to design a set of data-collection activities to evaluate the impact of the services in the H & S system. We were particularly interested in evaluating the services from the

perspective of the consumers—the individuals who are addicted to opioids and receiving these services. We intended this patient-centered evaluation approach to provide a perspective that would complement other evaluation efforts of the Department of Health and the research/evaluation efforts by the team at the Vermont Blueprint for Health.

The opioid epidemic is the deadliest public health crisis of the 21st century in the United States. Conducting this evaluation has been an immersive personal exercise for me in understanding how the lives, families, and communities of the Vermonters drawn into addiction have been affected. Additionally, I have learned how the treatment services delivered through the H & S system have given assistance and hope to these individuals. Although I have had some valuable help from expert research colleagues and an excellent research assistant, I have personally interviewed over 100 of the participants in this evaluation. I went into this evaluation with a great deal of curiosity but no preconception of what I would find.

After spending the past 12 months talking with and collecting information from opioid addicted individuals, in and out of treatment, and some of their family members, I think I have a reasonably good understanding of the H & S system of services. The Vermont H & S system is grounded in good science, deep compassion, and genuine respect for the individuals who deliver and use the services. The experience of conducting this evaluation and witnessing the extraordinary help it has provided to thousands of Vermont citizens has made me proud to be a Vermonter.

Acknowledgments

I am grateful to Steve Higgins and Bob Pierattini, from UVM, who said “we know you will find ways to help with the opioid problem.” They gave me an office and salary support and sent me out to help. I also want to thank John Brumsted, MD, Chief Executive Officer of The UVM Medical Center and CEO of the UVM Health Network, for waiving overhead charges on the evaluation funding and allowing me to use the entire amount of the award for evaluation activities. Beth Tanzman, from the Vermont Blueprint for Heath, and Barbara Cimaglio and Harry Chen have done much of the heavy lifting in pulling together the resources and expertise to build the H & S system. Gov. Peter Shumlin made it clear there was support from the top of Vermont government to build treatment for people with opioid use disorders. Gov. Phil Scott has continued these policies and has sustained a focus on the opioid problem in Vermont.

Anne Van Donsel, John Searles, and Shayla Livingston, from the Department of Health, have been supportive and engaged with this evaluation effort, every step of the way. In particular, Anne has been very encouraging and patient when I doubted my ability to actually get this information down on paper and stretched out the timeline for this report. When I needed to get oriented to the H & S system, Tony Folland generously introduced me to dozens of people and shared his wealth of perspective on the services.

John Brooklyn, who is arguably the principal architect of the H & S system, has endlessly answered questions, explained procedures, and responded to my rambling emails. Other

individuals who have been critically important to helping me conduct this evaluation are Dana Poverman, Howard Center; Chris Lukonis, Jason Gogan, and Lance Woods, BAART; Nels Kloster, Habit OPCO; Faith Stone, West Ridge Center; Pam Farnham, UVM; Jennifer King, SVMC; Theresa Vezina, Vermont Cares; Tom Dalton and Grace Keller, Safe Recovery; George Fjeld, Brandon Medical Center; Emily Glick and Will Porter, Bristol Medical Clinic; and Sanchit Maruti and his staff at the UVM Addiction Treatment Program.

When I began to consider doing this evaluation, I sent an email to my long-time colleague, Mickey McCann, whom I worked with during my entire 40 years in Los Angeles. Mickey agreed to come to Vermont and help with interviews because he has a genuine affection for people who struggle with addiction and he has an incredible ability to get anyone to talk with him about the many illegal and self-damaging behaviors that occur in addiction. He braved January in Vermont, including a late-night drive on Route 9, over the mountain, during an ice storm. Tracy Rieckmann, from Oregon Health Sciences University, provided expertise on the qualitative research methods and data collection. Sarah Cousins did a nearly endless series of data analyses with precision and obsessive attention to detail. Kris Langabeer was very patient in editing and revising all of the manuscript drafts. Andrew Stoner assisted with data collection. Regina Pearce was the research assistant who was in the middle of the action and directed traffic and was the first contact for many of the individuals who participated in the interviews. Without her good cheer and unlimited flexibility to get things done, this would have been a much more difficult experience.

Finally, it has been a great honor to have the opportunity to meet and talk with the people directly affected by the 21st century opioid epidemic. On many occasions after an interview, I would find myself shaking my head and thinking: “How is it possible that this intelligent, decent, sensitive, wonderful person has become addicted to opioids?” Once addicted, many of these people engaged in behaviors that violated their core values and were far outside their standards of behavior. Many expressed that opioid addiction led them to do things that they did not understand and left them with a great deal of shame and guilt. It was profoundly encouraging and gratifying to learn how much the services in the Vermont H & S system have helped these people understand their addiction and take the actions needed to rebuild their lives. I thank these people for sharing their stories with me.

Executive Summary

Vermont has been significantly impacted by the opioid epidemic. In response, Vermont developed a statewide system to expand medication-assisted treatment (MAT) with methadone and buprenorphine. MAT has strong empirical support as the most effective form of treatment for opioid use disorders (OUDs; U.S. Department of Health and Human Services, Office of the Surgeon General, 2016). Vermont's innovative treatment system is the Care Alliance for Opioid Addiction, also known as the "hub-and-spoke" system (Brooklyn and Sigmon, 2017; Simpatico, 2015).

The Hub-and-Spoke Model

Vermont's opioid treatment service system is organized by geographic regions—Northwest, Northeast, Central, Southeast, and Southwest. Each region has a "hub," which is a licensed specialty outpatient treatment program (OTP) with the authority to dispense buprenorphine and methadone to treat individuals with OUDs. "Spokes" are medical practices that provide office-based opioid treatment (OBOT) with buprenorphine.

Patients are assessed to determine the most appropriate treatment placement (i.e., in the hub with methadone or buprenorphine treatment or with spoke providers for treatment with buprenorphine). Hubs have an extensive staff of addiction-trained MDs, nurses, and counselors who provide intensive specialty care addiction treatment. Spokes are primary care settings that are staffed by at least one buprenorphine-prescribing physician who is supported by a "MAT team" consisting of a registered nurse (RN) and a master's-level licensed counselor. Patients transfer between hubs and spokes when appropriate.

In October 2016, the Vermont Department of Health awarded the University of Vermont (UVM) Center for Behavior and Health, in the Department of Psychiatry, a grant to evaluate the Vermont hub-and-spoke (H & S) system for the treatment of OUDs. The objectives of the evaluation are:

Primary objective:

To gain preliminary information (quantitative and qualitative) on the impact of participation in the Vermont H & S system and to assess the usefulness of these services to opioid users.

Secondary objectives:

- To determine when and why individuals with opioid use disorders in Vermont (1) avoid treatment or (2) discontinue treatment prior to completion or discharge.
- To determine from the perspective of the individuals in treatment the most helpful and positive aspects, as well as the least helpful and most challenging aspects, of treatment.
- To understand family members/significant others' perspectives on the strengths and weaknesses of treatment.
- To collect data/information on the extent to which the H & S system is providing adequate access to opioid care throughout the state of Vermont.

The evaluation uses a patient-centered perspective to ensure the evaluation addresses and measures outcomes that are meaningful for individuals with OUDs. The findings will inform Vermont health policy leaders and the public of the impact of the H & S system on the lives of people with OUDs.

Description of the H & S System

The conceptual rationale of the H & S system is described. As the H & S system has been implemented "on the ground" in the designated five regions of Vermont, there has been substantial variation in the configuration of the services and the adequacy of service coverage.

Methods

Part 1: Quantitative Evaluation. Quantitative data on drug use and functioning were collected from 80 individuals receiving treatment in the H & S system. Patients were self-selected and from all regions in the state. Participants had to have been receiving continuous treatment for at least 6 months at the time of the interview. The groups were stratified to include 40 patients on methadone in the hubs and 40 on buprenorphine in spokes; each group was 50% male and 50% female. Participants reported use and functioning on the domains below for the 90 days prior to the date of the interview (T_2) and, in retrospect, the 90 days prior to entering treatment in the H & S system (T_1).

- Drug and alcohol use
- Opioid use
- Injection use
- Education/employment
- Criminal justice involvement
- Family and relationship functioning
- Health and healthcare utilization
- Multiple areas of mental health functioning
- Opioid overdose
- Satisfaction with life areas

In addition, patients were asked about stigma and their views of the treatment received and its overall effectiveness.

A comparison group of 20 individuals currently not in treatment, 10 of whom had received treatment for OUDs in the past and 10 who had not, were also interviewed. Participants reported use and functioning on the domains above for the 90 days prior to the date of the interview (T_2) and, in retrospect, the comparable 90-day period in the previous year (T_1). Participants were also asked why they were currently not in treatment and, if they had received treatment in the past, why they had discontinued treatment.

Part 2: Qualitative Evaluation. Qualitative data provides the "voice" of participants in and out of treatment and of family members/significant others of those in treatment. Three types of qualitative information were collected:

1) Open-ended questions at the end of the quantitative interview;

2) In-depth qualitative interviews with 24 individuals in H & S treatment (equally distributed by gender and H & S service locations) on perception of care and the factors that facilitated or obstructed care; and
3) Interviews with 12 family members/significant others to determine how participation in treatment is viewed by family members and significant others of patients in treatment.

Part 3: Access and wait lists for services. Program managers from the Vermont Blueprint for Health were interviewed about waiting lists in spokes and access to MAT within their geographic regions. In addition, a sample of 18 spoke sites were contacted to understand patient access to these sites. This process was not intended to be a definitive study of access to MAT care in the spokes in Vermont; it was meant to highlight spoke access issues.

To understand the overall impact of the Vermont H & S system, these results should be viewed in combination with the results of the qualitative component of the evaluation, as well as state treatment data, Medicaid claims, data collected and analyzed by the Blueprint for Health, and comparisons with other state OUD treatment systems. No single set of data can address whether the H & S system "works." All of the different sets of data, plus input from clinicians and other stakeholders (e.g., police, education, system personnel) have to be viewed together to assess the impact of this major, innovative treatment effort. Also, note that this is a pilot study with a convenience sample. This has several methodological implications, which are discussed below.

Findings

Regional Variations

Central Vermont appears to have the most integrated and collaborative sector of the H & S system. The Northeast region has suboptimal access to spoke services and is disproportionally served by hubs. The Northwest region has a new hub and good spoke access in Franklin County. There is increasing, but still insufficient spoke access, in Chittenden County, and there are only two spoke providers and no hub in Addison County. Chittenden County has the largest hub in the state. In the Southwest region, there is a hub in Rutland, but drive times to Bennington County limit the number of people receiving hub services, and more people are served in large spokes. The Southeast region has both hub and spoke services easily available.

Quantitative Results: Patient Functioning and Satisfaction

The quantitative evaluation shows significant positive impact of MAT treatment for OUDs as delivered in the Vermont H & S system. The primary goal of OUD treatment is to reduce illicit opioid use, and, indeed, most participants reported dramatically reduced opioid use. Participants in both settings, hub participants with methadone and spoke participants with buprenorphine, reduced their opioid use, drug injection, other drug and alcohol use and made many improvements in their lives during the time they had been in treatment. Participants treated in the spokes perceived their improvement more positively than did participants in hubs.

In-Treatment and Out-of-Treatment Groups. The demographic characteristics of the 100 opioid users interviewed for the quantitative aspect of the evaluation (80 in treatment and 20 out of treatment) were very similar. Participants had, on average, a 14-year history of opioid use at the time of the interview.

Out-of-treatment participants showed no statistically significant change between T_1 and T_2 in any measure of functioning, including drug use, over a 12-month period.

In contrast, the in-treatment group had statistically significant positive changes in nearly every measure between the time of treatment admission (T_1) and the interview for this study (T_2), an average period of approximately 30 months. Average days of opioid use decreased from 86 of 90 days to 3 of 90 days, a reduction of 96%. Days of injection use decreased by 93%. Alcohol, tobacco, and illicit drug use, with the exception of marijuana, all showed statistically significant reductions from T_1 to T_2.

Those in the H & S system reported large and statistically significant changes between T_1 and T_2, including reductions in overdoses, emergency department visits, illegal activities and arrests/contacts with police, and days of family conflict. They also had significant reductions in ratings of depression, anxiety, and anger/irritability, and improved ratings of satisfaction with life. The only measured domain that did not show positive change over the treatment period was employment status.

Differences between Hub and Spoke Groups. Participants in the H & S system are triaged into either a hub or a spoke, based on clinical assessment. Those with higher acuity OUDs are treated in hubs, those with lower acuity, in spokes. Despite the triage process, there were few differences between participant characteristics in the hubs and spokes. Hub participants were more likely to inject, use heroin/fentanyl, and be hepatitis-C positive. Reductions in opioid use, injection, and other substance use were comparable in hubs and spokes as were improvements in other areas of functioning. Spoke participants reported more satisfaction with their treatment experience and the perceived effectiveness of treatment than did those treated in the hubs.

Gender Differences. Most background/demographic characteristics were similar for men and women. A higher proportion of females reported they had histories of mental illness, were more likely to have children, and used opioids for a shorter period. The response to treatment was comparable for males and females. Females reported higher perceived stigma.

Qualitative Results

Quantitative open-ended questions—Out-of-Treatment Group. Fifteen of the 20 out-of-treatment participants intended to enter treatment, but described waiting lists and transportation as obstacles. The 10 participants who had previously received MAT reported positive views of treatment, and 9 out of 10 intended to return to MAT.

Quantitative open-ended questions—In-Treatment Group. The 80 in-treatment participants reported being very grateful to have access to MAT and were very positive about their treatment

experience. Almost all reported they would refer a friend to the treatment site (hub or spoke) where they received treatment.

Hub themes:

- Participants reported that the best parts of hub treatment services were the counselor and the medication.
- About 80% of the hub participants were critical of the hub-clinic environment, citing disruptive and counter-therapeutic "drug talk" by patients, and the clinic procedures.
- About 25% felt that treatment was "cookie cutter," with little individualization of care.
- Participants would like to see increased access to mental health and vocational services.

Spoke themes:

- 70% of participants cited the doctor and/or their relationship with the doctor as the most important element of treatment.
- Participants reported that they benefitted from receiving MAT in the same setting as their medical care.
- Mental health and employment help were the services they would most like to see added.

In-depth Qualitative Interviews with Opioid Users in Treatment. Twelve participants provided in-depth interviews. The qualitative interviews provided a deeper understanding of participants' views of treatment. One very consistent message was that treatment is life-saving and that being in treatment has improved their lives tremendously.

Hub participant themes:

- Participation in MAT produced many profound benefits in several domains of patients' lives.
- The hub "environment" was a powerful influence on participants' treatment benefits. For some, the clinic environment provided a positive influence, and for others, a negative influence.
- Hub staff were major factors in creating the overall perception of the hub experience, both positive and negative.
- Hub procedures and routines were generally viewed as creating an impersonal, arbitrary, and somewhat unpleasant experience. Standing in long lines for dosing was viewed as a dehumanizing and degrading experience.
- Counseling provided at the hubs was generally viewed as helpful in promoting successful recovery. The high rate of counselor turnover was cited as problematic.
- Participants treated at the hubs reported substantial perceptions of stigma around addiction.

Spoke participant themes:

- Participation in MAT had profound benefits in many domains of patients' lives.

- The spoke environment was a powerful positive influence on participants' self-esteem and attitude toward treatment.
- Participants reported that clinic staff provide a positive treatment experience.
- Receiving MAT at spokes was very similar to receiving routine medical care.
- Counseling services were viewed as helpful and useful in promoting successful recovery.
- Buprenorphine was viewed as very positive and important.
- Participants felt minimal stigma at spokes, but they reported they experienced stigma when they accessed medical services in the larger healthcare system.

Family Members/Significant Others (FM/SOs) Interviews. FM/SOs were grateful that the state of Vermont has been so forward thinking in developing the H & S system. FM/SOs clearly articulated that they want to learn how to help their family member and better understand addiction and its treatment.

- FM/SOs were very appreciative and grateful that Vermont has developed services for people with OUDs. In general, they reported that treatment was available and accessible.
- They reported that there were no services for FM/SOs and no attempt to engage or educate FM/SOs about addiction.
- FM/SOs who were associated with individuals in hubs expressed concern around perceived harassment by staff, bad influences from other patients, and a high rate of counselor turnover.
- FM/SOs clearly articulated a need for access to mental health services for their family members with concurrent psychiatric disorders.

FM/SOs suggested that treatment could be strengthened with more targeted counseling services that include the addition of family services, job placement assistance, and discharge planning.

Access to Medication-Assisted Treatment (MAT)

Access to MAT for individuals with OUDs varies by region. Hubs report the number of people waiting for services and average wait time each month, and have shown substantial decreases in both over the last two years. However, spokes are medical facilities that do not typically maintain wait list data. Still, there were anecdotal reports that individual doctors and primary care organizations maintain informal waiting lists for spokes.

The Blueprint for Health managers (BP managers) and spoke staff interviewed reported that many opioid users in Vermont were not accessing treatment due to distance and other logistical issues. They reported a need for more prescribers, additional spokes, and possibly more hubs. In some practices, capacity is limited and there are policies that can make it difficult to be admitted.

BP managers reported good access throughout most of the state and recognized the rapid expansion of the spoke network. They reported that the integration of treatment for OUDs into primary care settings is gathering momentum and becoming routine in many places. Some BP managers felt that some spokes were unnecessarily rigid in not accepting patients directly into treatment but were instead referring all new inquiries to hubs for induction and stabilization.

Several observed that some spokes took up to a month to schedule new patients for admission due to "clinic policies." In these spokes, BP managers suggested that more flexibility and urgency in rapid admissions would substantially facilitate the treatment entry of new patients.

Interviews of approximately 20% of the spokes revealed significant differences in policies, procedures, and practices. Many spokes operate only as maintenance sites for stabilized patients, while others have become more operationally independent and conduct their own initial assessments and induct new patients onto buprenorphine without referral from a higher level of care. Some spokes reported maintaining waiting lists, but these were the exception.

Recommendations

- Continue to increase spoke capacity
- Add hub locations/or medication units to improve access and reduce high clinic censuses
- Develop an addiction workforce plan for Vermont
- Establish a workgroup to improve clinical elements of treatment within the H & S system. Actions to consider include:
    - Provide access to mental health services
    - Provide vocational services to individuals who need employment assistance
    - Develop a family members/significant others component for the H & S system
    - Develop clinical materials/protocols to address patient use of stimulants and benzodiazepines, and misuse of alcohol while on MAT
    - Provide encouragement for and assistance with tobacco cessation
    - Develop materials to explain the typical course of MAT, the positive and negative considerations of medication termination, and post-MAT continuing care
    - Review and revising the patient placement instruments (Treatment Needs Questionnaire and Office Based Opioid Treatment Stability Index) to improve placement of individuals in the H & S system
    - Review and develop an H & S system protocol on cannabis screening and response to positive screens
    - Review and consider addition of newer forms of MAT for OUDs such as the extended release forms of buprenorphine.
- Conduct a prospective evaluation of the H & S system, with randomly selected participants and an intent-to-treat design.

Summary

The Vermont Hub-and-Spoke System of Care for Opioid Use Disorders is an innovative and constructive public health response to the opioid epidemic of the 21st century in the United States.

The H & S system has markedly expanded access to MAT and improved participants' lives. Participants report dramatic reductions in opioid use and injection as well as reduced use of alcohol and illicit drugs, except for cannabis. They use hospital EDs less frequently and report

significantly reduced contact with the police and illegal activities. Family life, housing stability, and emotional health have also improved substantially.

Vermont's response to the opioid crisis is a credit to the political and public heath leadership in the state. Although there is still work to be done, there is no question that the services provided within this model have saved many lives and have allowed many Vermonters to discontinue opioid use and improve their lives.

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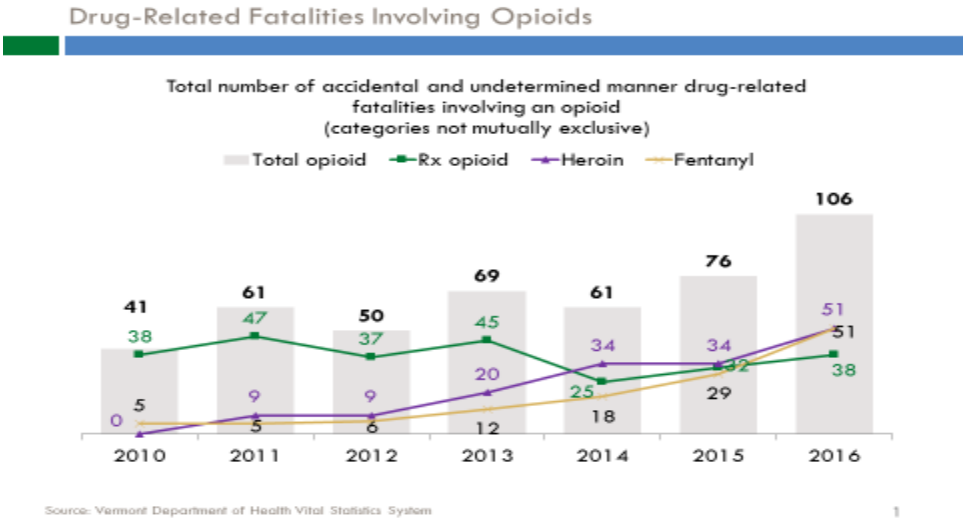
Chapter 1: Introduction

Opioid overdose deaths in the United States have risen dramatically in the past decade, and some experts predict continuing increases in deaths for the next decade (Blau, 2017). Opioid-related consequences (e.g., criminality, infectious diseases, overdoses, premature death) have resulted in economic costs of $56 billion annually (Brooklyn & Sigmon, 2017). In much of the United States, there is a severe shortage of opioid treatment availability, and in many areas, use of medication-assisted treatment (MAT) is minimal (Murthy, 2016).

Vermont has been significantly impacted by the opioid epidemic. Figure 1 illustrates the increase in overdose deaths from three categories of opioids in the state over the past 7 years.

Figure 1. Drug-Related Fatalities Involving Opioids



Over the past decade, Vermont has developed a statewide program to expand treatment for individuals with opioid use disorders (OUDs). The effort has prioritized the expansion of MAT (with methadone and buprenorphine emphasized) because these medication-based treatments have strong empirical support (U.S. Department of Health and Human Services, Office of the Surgeon General, 2016). The strategy for expanding access to these medications has employed an innovative treatment network, the Care Alliance for Opioid Addiction, which has become known as the "hub-and-spoke" system (Simpatico, 2015). This initiative began in January 2013, and as of July 1, 2017, Vermont was divided into five geographic regions within which there were seven hub clinics and 77 spoke sites. (A 6th region and 8th hub were added in St. Albans in July 2017).

The system has garnered considerable national interest, with a number of other states (e.g., California) adopting this approach to expand care for individuals with OUDs.

Data are being collected to assess the usefulness of Vermont's approach. A team led by the Vermont Medicaid office has documented some of the cost implications of hub-and-spoke (H & S) service expansion. The Vermont Department of Health, Division of Alcohol and Drug Abuse Programs, provides an ongoing measurement of the number individuals in treatment for OUDs, the type and location of their treatment, and other data from SAMHSA's Treatment Episode Date Set (TEDS). Figures 2 and 3 show the dramatic increases in patients receiving MAT in hubs and spokes from 2013/14–2017.

Figure 2. Hub Census Over Time (Source: Treatment Episode Data Set)

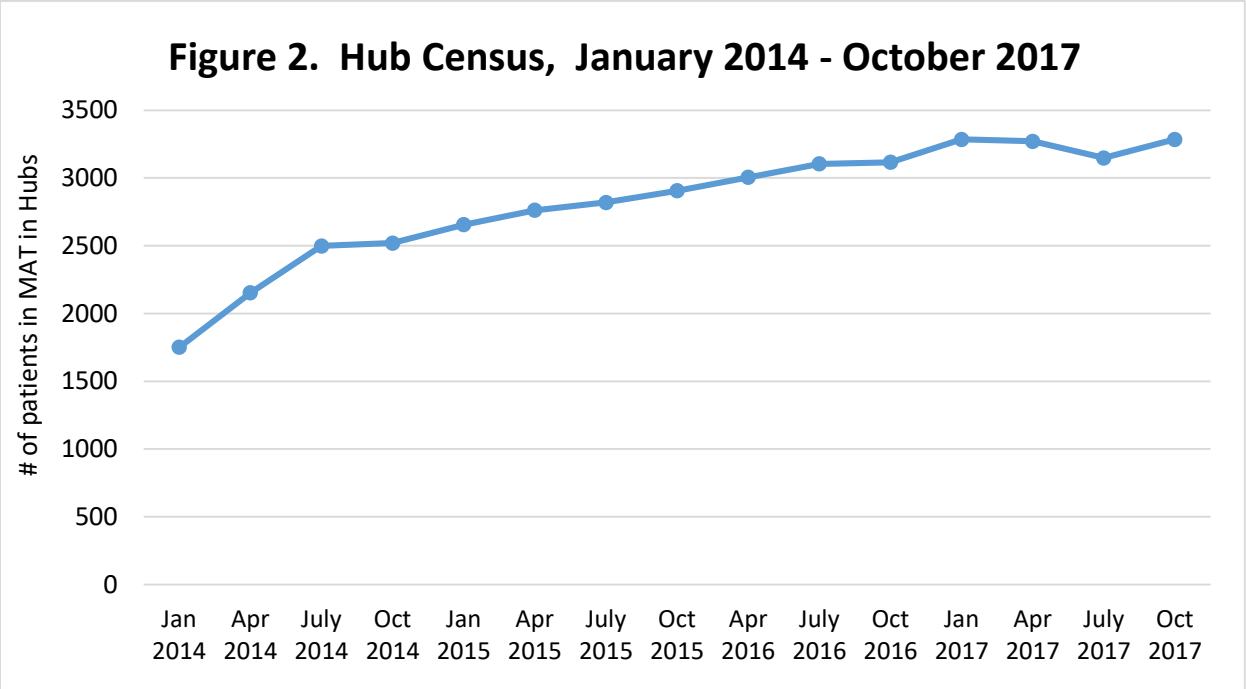
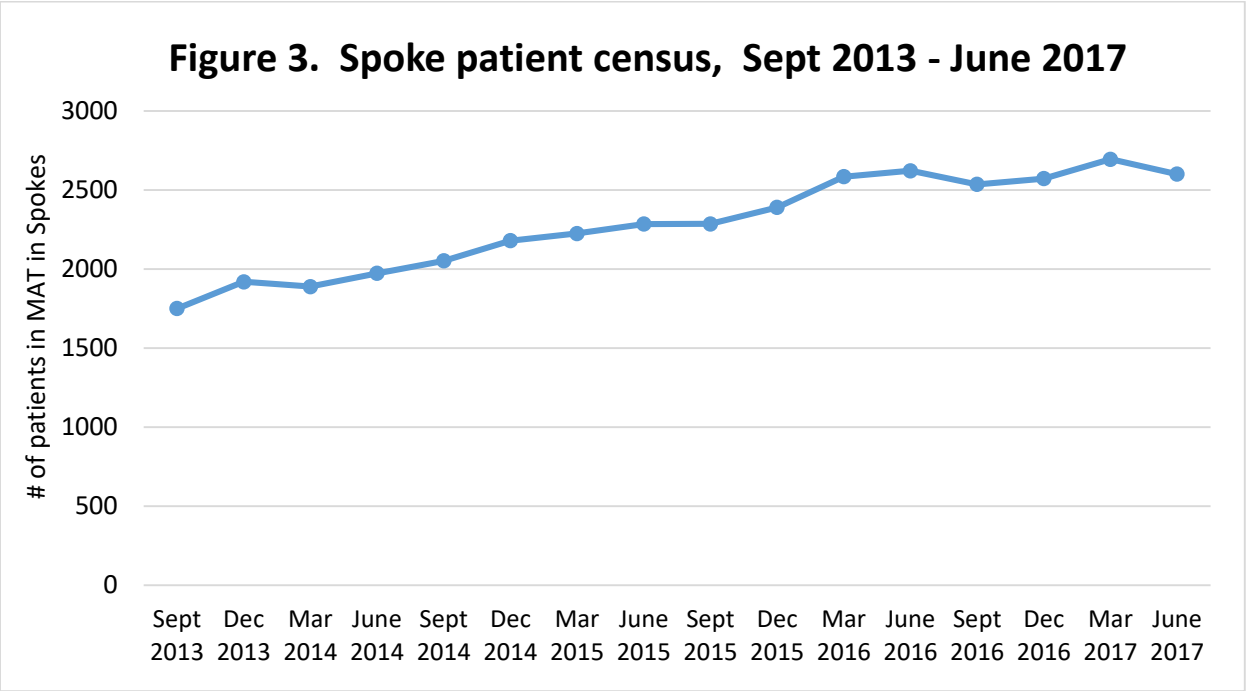


Figure 3. Spoke Census Over Time (Source: Medicaid Claims)



It is clear from the figures above that Vermont has greatly expanded access to MAT over the past 5 years, a service expansion that is a major accomplishment. However, to date, there has been no in-depth clinical evaluation of the services in the H & S system.

For this reason, in October 2016, the Vermont Department of Health awarded the University of Vermont (UVM) Center for Behavior and Health, in the Department of Psychiatry, a grant to conduct an evaluation of the Vermont hub and spoke (H & S) system for the treatment of OUDs. This evaluation project, ("Evaluation of the Vermont Hub-and-Spoke System for the Treatment of Opioid Use Disorders"; Richard A. Rawson, PI; Grant # 03420-A17021S) was funded through the Centers for Disease Control and Prevention's Preventive Health and Health Services Block Grant (NB01OT009090-01) and the Substance Abuse and Mental Health Services Administration's Substance Abuse Prevention and Treatment Block Grant (TI010055-17).

Evaluation Objectives

Primary objective:

To gain information (quantitative and qualitative) concerning the impact of participation in the Vermont H & S system and to assess the usefulness of these services to opioid users in Vermont.

Secondary objectives:

To determine under what circumstances and for what reasons opioid-dependent individuals in Vermont (1) fail to access treatment in the Vermont H & S system or (2) discontinue treatment in the H & S system.

To determine from the perspective of the individuals in treatment, the most helpful and positive aspects of treatment, as well as the least helpful and most challenging aspects of treatment in the H & S system.

To gain some perspective from family members/significant others about the strengths and weaknesses of treatment for individuals in the H & S system.

To collect data/information on the extent to which the H & S system is providing adequate access to opioid care throughout the state of Vermont.

This evaluation reflects the consumer's point of view, a perspective that was chosen to ensure that the evaluation addresses and measures outcomes that are meaningful for individuals with OUDs. In addition, it has been documented that patient-centered care is associated with high levels of treatment satisfaction (McMillan et al., 2013; Rathert, Wyrwich, & Boren 2012), and patient satisfaction is strongly associated with positive treatment outcomes (Carlson & Gabriel, 2001).

The UVM team, together with the evaluation team at the Vermont Department of Alcohol and Drug Abuse Programs (ADAP) has designed an evaluation that consists of two distinct components:

The first component is a quantitative evaluation of clinical functioning of a cohort of 80 individuals in treatment within the H & S service system. Patients in treatment from across the state (50% male and 50% female) were included in this evaluation, with 40 individuals receiving methadone treatment services from the "hub" clinics (specialized opioid treatment programs [OTPs] from which only hub patients on methadone were included) and 40 individuals receiving buprenorphine treatment services from "spokes" (e.g., primary care clinics). The evaluation design employs many of the standard metrics for measuring clinical outcomes of addiction treatment services but also includes data on the factors of treatment that patients value or, conversely, do not find useful. A comparison group of 20 individuals, currently not in treatment, were interviewed to gain some perspective on why individuals with OUDs are not participating in treatment.

The second component is a qualitative study of information collected from the 80 participants described above, plus in-depth interviews with 24 individuals in H & S treatment (equally distributed by gender and H & S service locations) about their perceptions of their care and the factors that facilitated or obstructed care. Similar qualitative information was collected from 12 family members/significant others of patients in treatment to gain perspective on how participation in H & S treatment is viewed by family members and significant others of patients in treatment.

We believe this evaluation provides a useful, but clearly limited perspective on how individuals receiving OUD treatment in the Vermont H & S system are functioning in many areas of their lives, as well as how they view their progress in treatment and the services they receive.

One additional aspect of this project, which is not technically part of the evaluation, is an exploration of the accessibility of MAT for individuals with OUDs in Vermont. An important metric of treatment accessibility is the waiting lists compiled by each hub and reported to ADAP. These reports show substantial reductions in the number of people waiting for services and reductions in wait times in the past 24 months. In many parts of the state, treatment in the hubs can be initiated without significant time on a formal waiting list. However, there are anecdotal reports from individual doctors and primary care organizations (the "spokes") that they have informal waiting lists for services at the spokes that are not included in the "official" hub waiting list data. These "informal lists" are often kept by the office receptionist, a MAT team member, or the prescriber.

To explore these anecdotal reports, evaluation staff queried the 14 Blueprint managers about their knowledge of waiting lists in spokes and access to MAT care within their geographic region. If these managers reported that they did not have this information in a particular region or for a specific spoke "catchment area," a UVM representative contacted a sample of spoke sites in that region. The result of this process is not a definitive study of access to MAT care in the spokes in Vermont, but the information collected can provide health leaders with a more complete picture of access to MAT in Vermont in 2017.

Summary

The evaluation findings provide new information to Vermont health policy leaders and the public of the impact of the H & S system on the lives of people with OUDs. The information collected from patients in treatment and their family members, as well as individuals not currently in treatment, could be used to improve the care provided to individuals with OUDs. Finally,

collection of information on the accessibility of medication-assisted treatment in the state offers a more complete picture of access to hub and spoke services in Vermont.

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Chapter 2: A Description of the Vermont Hub-and-Spoke Conceptual Model, and the Current Hub-and-Spoke System "On the Ground": Five Regions and Five Variations

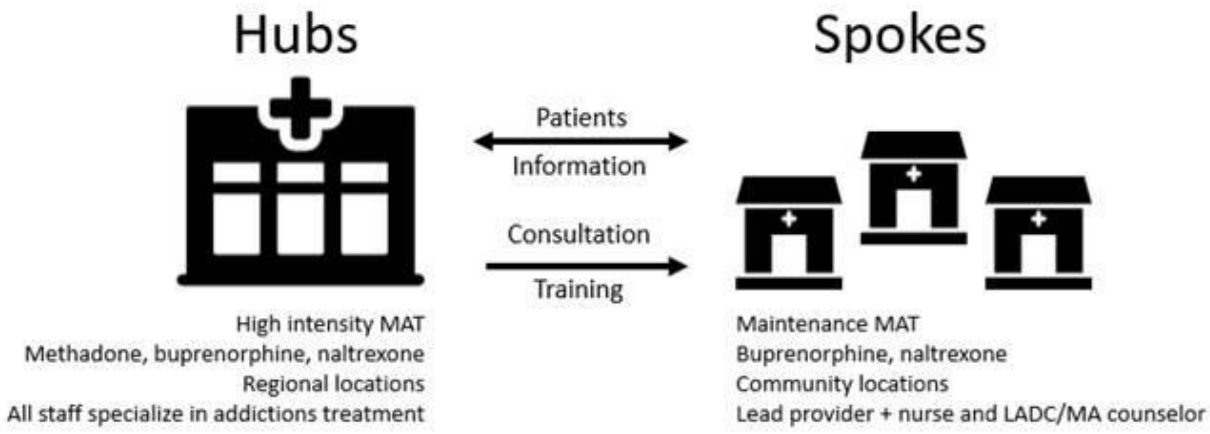
Vermont has emerged as a leader in the country in the expansion of MAT use for the treatment of OUDs by developing a hub-and-spoke (H & S) service delivery configuration (Brooklyn & Sigmon, 2017; Simpatico, 2015). Beginning in 2011, Medicaid officials, leaders in public health and addiction medicine, university personnel, and politicians collaborated to respond to the emergence of a severe opioid addiction problem in Vermont. This public health crisis included high rates of prescription opioid misuse and increasing heroin use throughout the state. Vermont created an innovative system to increase treatment capacity and expand the range of services provided to affected individuals. The result is the "Care Alliance for Opioid Addiction," which has become known as the "hub-and-spoke" system (Simpatico, 2015). A central feature of this system is the use of the opioid pharmacotherapies methadone and buprenorphine (also known as "medication-assisted treatment" [MAT]).

The Hub-and-Spoke Conceptual Model

Vermont's opioid treatment service system is organized by geographic regions—Northwest, Northeast, Central, Southeast, and Southwest. Each region has a "hub," which is a licensed specialty outpatient treatment program (OTP) with the authority to dispense buprenorphine and methadone to treat individuals with opioid use disorders (OUDs). "Spokes" are medical practices that provide office-based opioid treatment (OBOT) with buprenorphine.

Hubs assess patients' medical and psychiatric needs and determine the most appropriate treatment placement (e.g., in the hub with methadone or buprenorphine treatment or with spoke providers for treatment with buprenorphine). Hubs have an extensive staff of addiction trained MDs, nurses, and counselors who provide intensive specialty care addiction treatment. Spokes are staffed by at least one buprenorphine-prescribing physician who is supported by a "MAT team" consisting of a registered nurse (RN) and a master's-level licensed counselor. Patients may transfer between hubs and spokes based on their needs. Figure 4 illustrates the hub-and-spoke conceptual model.

Figure 4. Hub and Spoke System for Addictions Treatment



The Hub: Staffing and Functions

Hubs provide both medical and clinical counseling services. Each hub has board-certified addictionologists, staff physicians, advanced practice nurses, and registered and licensed practical nurses. They provide intake medical assessments and physicals; make referrals for further testing or treatment of medical conditions; establish contact with primary care physicians, psychiatrists, and specialists for further care; induct and stabilize clients on buprenorphine or methadone, and when needed, adjust dose and taper schedules; conduct urine drug testing; screen for pregnancy and provide birth control information; provide safety assessments; conduct annual physical exams; treat acute medical conditions; provide testing for HIV and hepatitis C; and train staff and conduct weekly rounds with clinical staff. Behavioral treatment staff include licensed clinical social workers, alcohol and drug counselors, and case managers. Patient retention in treatment is a major priority of hubs, and special attention is given to patients as they transfer across treatment settings (e.g., hub to spoke, residential to spoke, correctional facilities to the hub, etc.).

The Spoke: Staffing and Functions

Spokes are staffed by one or more waivered buprenorphine prescribers and a MAT team, with one full-time equivalent (FTE) RN and one FTE counselor per 100 buprenorphine patients. The embedded RN and counselor help the physician manage patients, and these MAT teams can be shared among community physicians, with the FTE split based on the number of patients per practice. RNs meet with new patients, review treatment contracts and consents, arrange insurance authorization, conduct urine drug testing, handle random callbacks for diversion prevention, provide medication refills, and check prescription history in the Vermont Prescription Monitoring System (VPMS). The counselors, or case managers, coordinate counseling services; manage acute crises; provide supportive counseling or check-ins; help with housing, insurance, and travel issues; and manage waits for service. The case manager is the initial contact for incoming patients and handles outgoing referrals to the spokes from the hubs. The MAT team meets with the physician(s) to discuss cases, develop treatment plans, and monitor progress.

Screening tools

The Treatment Needs Questionnaire (TNQ) identifies the most appropriate treatment setting (i.e., hub or spoke) for each patient (Brooklyn & Sigmon, 2017). The instrument was developed by clinicians in Vermont to provide H & S clinicians guidance in patient placement, in the absence of any established, validated instrument. Higher scores on the TNQ are associated with individuals with greater clinical complexity. Individuals who score 0–9 on the TNQ are directed to the spokes, individuals who score 10–15 are sent to either spokes with a board-certified addiction physician or to the hub, and those who score $\geq$16 are treated at the hub. A NIDA-funded validation trial for the TNQ is currently underway by UCLA researchers. The TNQ is included in the Appendices.

Another tool has been developed to assist clinicians in office-based outpatient treatment settings (OBOTs), which, in this project, are referred to as “spokes.” This tool, the OBOT Stability Index (OSI), allows spoke clinicians to conduct ongoing assessments concerning the stability of their patients on buprenorphine to ensure treatment in spokes is appropriate (Nordstrom et al., 2016). Higher scores on the OSI indicate that patients may be having clinical difficulties that could be better managed in the hubs. This instrument is also being validated in a UCLA study in California.

Learning Collaboratives

A series of learning collaboratives (Nordstrom et al., 2016), led by faculty from Dartmouth College and more recently by a team from UVM, provides in-person lectures and webinars to clinicians in each of the H & S regions in Vermont. Attendees include hub and spoke physicians and MAT staff. Topics covered in the learning collaboratives are safe prescribing, use of evaluation tools, creation of treatment plans, responses to positive drug screens, counseling or office visit noncompliance, and diversion control. These learning collaborative meetings have been extremely useful in creating "networks" of care in each of the geographic regions of Vermont.

The Current Hub-and-Spoke System "On the Ground": Five Regions and Five Variations

The hub-and-spoke model of service configuration described in Brooklyn and Sigmon (2017) and summarized above, provides a general conceptual framework for how specialty OUD services in hubs can be interfaced with OUD services delivered in primary care and other non-specialty care spoke settings. The H & S model is fundamentally a conceptual model with principles that guide the intensity of care by setting. However, the manner in which the medications are used, as well as other clinical practices in each of the five regions of Vermont, have some unique characteristics. In addition, the H & S model in Vermont is not a static system. Elements are added/changed as specific needs are identified and strategies to address those needs are developed. For example, one term that is commonly used around Vermont is the "super spoke." Although the term does not have a formal definition, some of the large buprenorphine practices around the state have this unofficial designation. These practices generally have large buprenorphine caseloads (100 or more) and imbedded MAT support staff and can provide a more intensive level of buprenorphine treatment than standard spokes. Because the physicians who operate these super spokes generally have extensive experience in prescribing buprenorphine, their practices are somewhat like hubs in that they induct patients onto buprenorphine and maintain more challenging patients than many of the less experienced prescribers.

Access to care varies by region as does the number of people receiving MAT. The H & S service configuration and the penetration of MAT are illustrated in Figures 5 and 6.

Figure 5. Distribution of Opioid Treatment Hubs and Spokes in Vermont (July 2017)

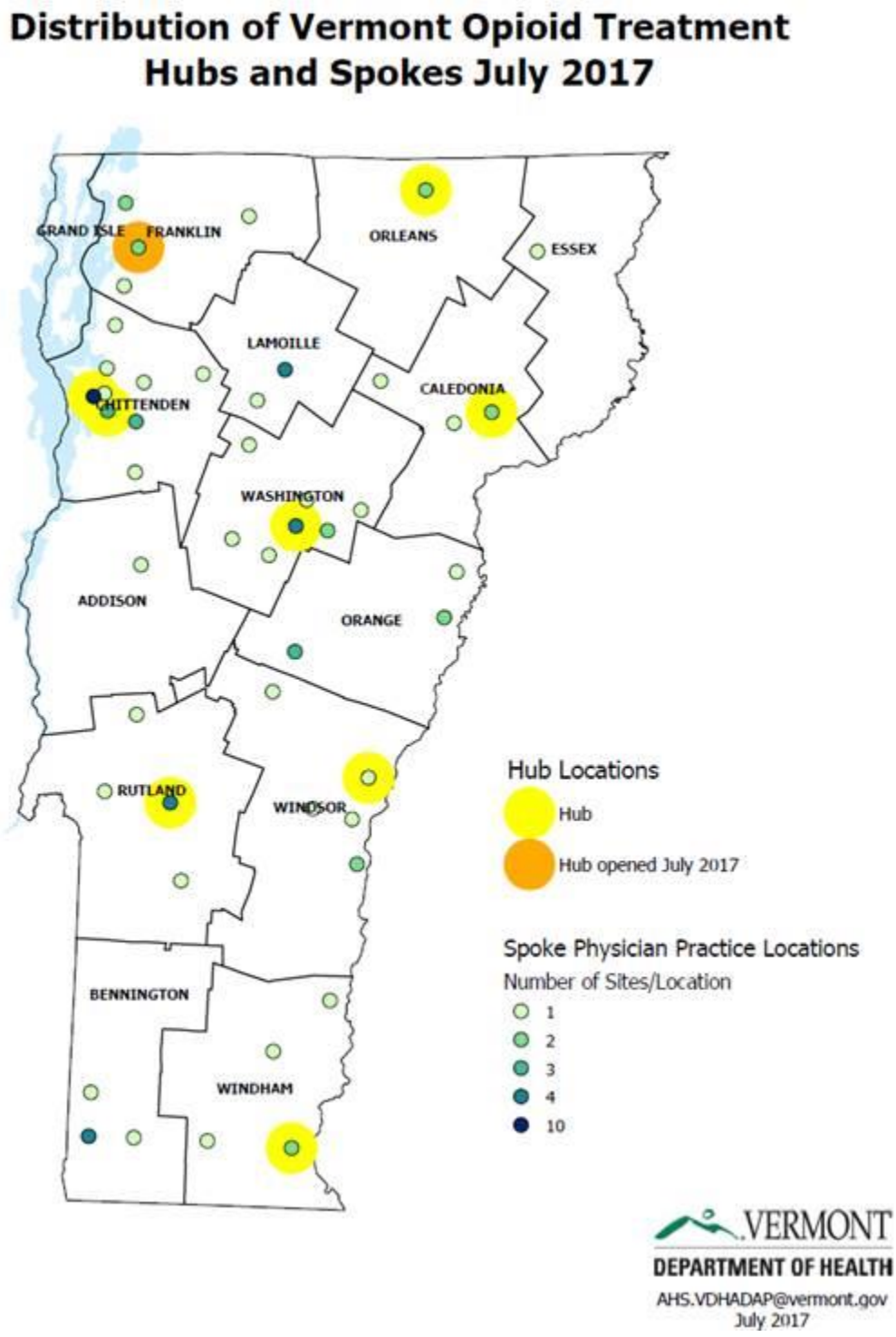
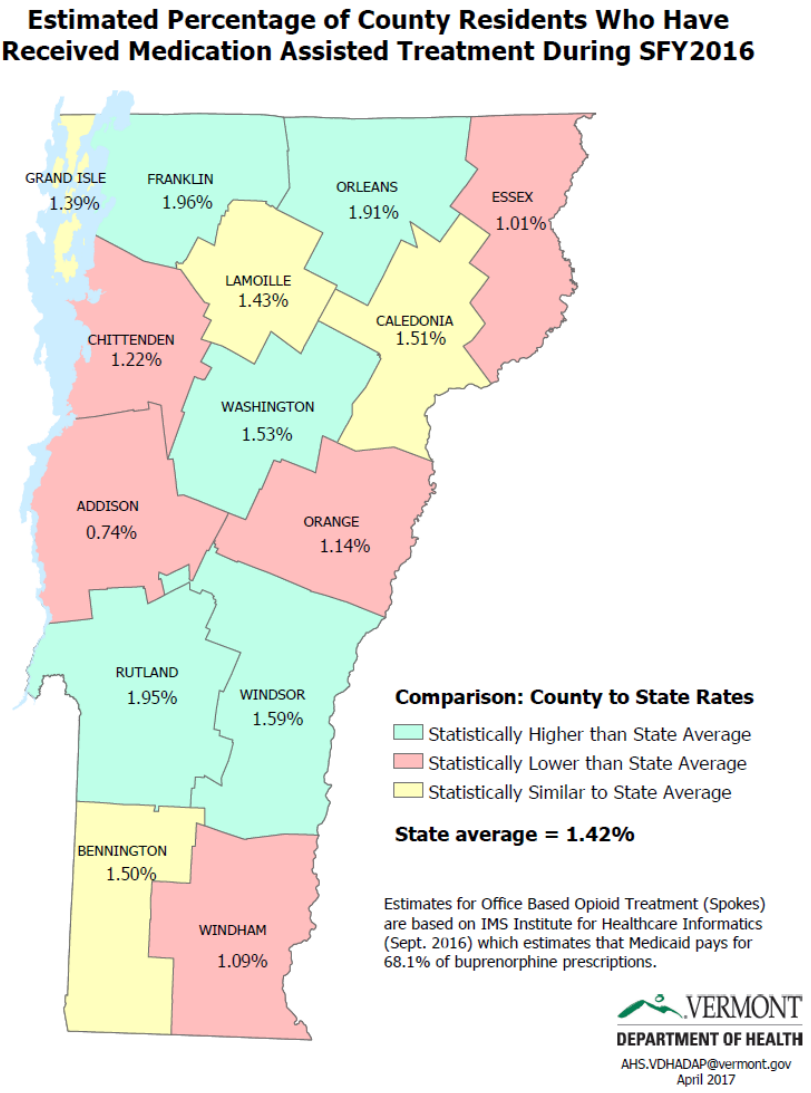


Figure 6. Estimated Percentage of County Residents Who Have Received Medication-Assisted Treatment During State Fiscal Year 2016.



The following description is a snapshot of the "on the ground" H & S system in Vermont as of July 1, 2017. The information was collected from a variety of sources and is not intended as a systematic study or evaluation of the various service configurations. The purpose of this section is to reflect the diversity of the ways that the H & S model is being delivered in the five regions of Vermont.

Central Vermont region: Washington, Lamoille, Orange counties

The service elements of the Central Vermont region represent the simplest service configuration of H & S services in the state. The BAART clinic located in Berlin is the hub, and spokes are located throughout the region's three counties. There are two super spokes in this region. The learning collaborative process has been very active in this region and has created an interactive network of services that represent an excellent example of the H & S network.

Northeast region: Essex, Orleans, and Caledonia counties

The Northeast region includes two OTP hub clinics (in St. Johnsbury and Newport). This is the most rural and least populated region in the state of Vermont and has the fewest spokes of any region. Because of this shortage of spokes and prescribers, the two hubs play a larger role in buprenorphine service delivery in this region than in other regions. The shortage of spokes and the more restrictive visit schedule required when buprenorphine is used in the hubs (compared to spokes) reduces access to buprenorphine treatment and likely results in suboptimal buprenorphine access in this region.

Southeast region: Windsor and Windham counties

In Southeast Vermont a unique arrangement between Habit Opco (an OTP/methadone provider) and Brattleboro Retreat (BR) has created a hub that is divided into three components. The Habit Opco clinic in Lebanon, New Hampshire, is a hub that provides methadone and buprenorphine. The Habit Opco site in Brattleboro Vermont is a hub that provides only methadone services. The Brattleboro Retreat, the largest psychiatric hospital and mental health provider in Vermont, provides buprenorphine services (with inpatient and outpatient induction and ongoing intensive outpatient buprenorphine care). The BR outpatient service interacts with spoke providers throughout the Southeast region. There is one other super-spoke practice in this region.

Southwest region: Rutland and Bennington counties

In the Southwest region, the West Ridge Center for Addiction Recovery in Rutland provides hub services and interacts with a network of spokes in the region. The driving distance from Bennington to Rutland is approximately 1 hour (and longer in winter weather), so there is a super spoke in Bennington where a more intensive level of buprenorphine treatment is provided, with the additional service requirements of frequent visits, urine testing, and other clinical parameters that are similar to those of an OTP. This program, the "Intensive Medication-Assisted Treatment (IMAT) Program," is operated by the Southern Vermont Health Care System, together

with the United Counseling Services organization in Bennington. There are two other super-spoke facilities in this area.

Northwest region: Franklin, Grand Isle, Chittenden, and Addison counties

The Northeast region includes four counties that, in aggregate, constitute almost 50% of the population of Vermont. The Howard Center, with locations in Burlington and South Burlington, is the hub for this region. These two hub sites, located approximately three miles apart, provide methadone and buprenorphine to more than 1,000 patients. This aggregate hub is far larger than any other hub in the state.

The development of spokes in Chittenden County has been slower than in many other parts of the state, resulting in waits for care. In the past 12 months, there has been a concerted effort to expand spoke capacity in Chittenden County. Additional capacity is also being added in the form of a new hub in Franklin County (opened in July 2017) and the UVM Addiction Treatment program (see below).

At present, Addison County has the most limited H & S capacity in the state, with one super spoke in Bristol and a newly opened spoke in Middlebury.

***The UVM Addiction Treatment Program*.** The Addiction Treatment Program (ATP), a program of the UVM Department of Psychiatry, is located on campus in Burlington. The ATP team includes physicians from addiction psychiatry, general psychiatry, and family medicine waivered to prescribe buprenorphine, as well as licensed professionals in nursing, alcohol and drug counseling, mental health counseling, and clinical social work. The staff is experienced in providing MAT to patients in all phases of treatment and across levels of acuity, as well as in educating, training, and supporting colleagues with varying levels of experience in addiction treatment. The ATP is particularly focused on serving as a resource for spokes in Chittenden County and offering newly waivered physicians technical assistance and guidance with challenging patients. In addition, the ATP readily accepts referrals of patients from spokes in cases where the physician and team do not feel capable of managing those with serious behavioral or psychiatric disorders and/or those continuing to use drugs. The ATP, led by Sanchit Maruti, MD, has recently assumed leadership of the learning collaborative program in Vermont.

Franklin County Hub. In July 2017, an OTP hub opened in St. Albans to serve people in northwestern Vermont. The hub is accepting existing MAT patients who live in Franklin and Grand Isle counties, who were previously receiving MAT in Chittenden or Orleans counties, as well as new patients. It is estimated that this new hub will allow the transfer of up to 100–200

patients from the Chittenden county hubs and will augment the extensive buprenorphine treatment capacity developed in Franklin County.

Inpatient/Residential Programs

Although not formally part of the H & S system, residential addiction withdrawal and treatment programs in Vermont have played a significant role in the promotion of the H & S system. These programs, including Brattleboro Retreat (in Brattleboro), Serenity House (in Wallingford), and Valley Vista (in Bradford and Vergennes), are an integral part of the system of care for individuals with OUDs. For many individuals with complex needs (e.g., co-occurring serious psychiatric disorders, alcohol or other drug problems, and/or court requirements for an initial period of inpatient care, etc.), admission into these facilities is a first step into treatment. All facilities have physician and treatment teams that provide patients with information and encouragement to initiate MAT. Patients can be inducted onto buprenorphine while in these residential settings and subsequently be transferred to outpatient care in spokes or hubs. In addition, if patients in MAT in the H & S system develop serious alcohol or benzodiazepine dependence while on MAT for opioid use, they can be admitted to these facilities for medically supervised withdrawal and stabilization.

Other SUD Treatment Services in Vermont

In addition to the H & S system of care for individuals with OUDs, there are additional comprehensive SUD services available in Vermont. Outpatient and residential facilities provide evidence-based care for individuals with substance use disorders (SUDs) other than OUDs, such as those with primary alcohol, psychostimulant, and/or cannabis use. Those recovering from SUDs may access services in recovery centers, which provide a wide variety of recovery support services, including peer recovery services, 12-step programs, other self-help services, and vocational and educational support. A new role for the recovery centers is provision of post-MAT support services to assist patients if/when they and their treatment teams decide to discontinue MAT. Presently, the extent to which these post-MAT services are being provided is unclear, but they are likely to play an important role in the future.

Vermont also has an array of sober living facilities / halfway houses / transitional housing facilities. These facilities vary greatly in expertise and clinical support. Some provide supportive housing for individuals on MAT, although this is not the norm.

MAT services outside the H & S system. In much of the United States, buprenorphine treatment is provided in very large "specialty" practices that offer a very low level of service (i.e., no counseling and/or other support services). These practices are based upon cash reimbursement from patients. While these practices do exist in Vermont, it is unknown how many patients receive care in these settings/practices.

Summary

Vermont has developed a conceptual model for organizing and delivering MAT to individuals with OUDs across the state. This innovative model has resulted in a substantial expansion of MAT. While the conceptual model provides a set of organizing services and treatment principles and procedures, the service delivery system in Vermont has shown great flexibility in adapting and adding/modifying services to maximize access to treatment and to meet the needs of patients.

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Chapter 3. The Methodology for the Evaluation of the Vermont Hub-and-Spoke System of Care

Part 1. The Quantitative Study of Patient Functioning and Satisfaction with Treatment Provided in the Vermont Hub-and-Spoke System of Care

To date, there is limited information on the clinical effectiveness of services delivered within the H & S system in Vermont. When evidence-based practices (EBPs) are disseminated and implemented (in this case, MAT with support services), it is often assumed that the use of these EBPs ensure that positive outcomes will be achieved. However, evidence-based SUD treatment is delivered within a specific service delivery context and drug use environment, to a particular patient population, and by a specific group of clinical practitioners. These factors can influence whether a specific clinical intervention produces the expected benefit/outcomes, whether the benefit/outcomes can be improved, and how they can be improved. Even though the implementation of MAT for opioid dependence via the H & S system has a solid, evidence-supported rationale, it is still important to evaluate the impact of the service on the lives of the individuals receiving them.

The quantitative component of this evaluation is designed to provide empirical information on patient sociodemographic characteristics, drug-use background variables, and a battery of measures of functioning at a previous time point (the time of treatment admission) and at the current time (during treatment in the H & S system). Comparing the measures of functioning at these two time points allows analysis of the changes associated with treatment in the H & S system. To provide some perspective on these changes, a parallel group of individuals with OUDs who were not in treatment were measured at two points in time as a comparison group. In addition to measures of functioning, quantitative information on patient perceptions of stigma associated with treatment, satisfaction with the treatment services received, and perception of quality of life as a result of treatment were collected. The results of the quantitative component of the evaluation are presented in Chapter 4.

Quantitative Study Design

The quantitative evaluation in this project involved administering a battery of questionnaires to 80 individuals in MAT and 20 individuals not in treatment in the H & S system. This component was designed to provide information to policy makers and clinicians on the impact of the H & S system on the lives of individuals receiving MAT services and provide information about the strengths and weaknesses of the system and its services.

Method

For the in-treatment group, 80 participants were recruited using flyers posted at treatment sites (40 hub and 40 spoke patients). Twenty out-of-treatment participants were recruited through flyers posted in the community or at syringe-services programs. The out-of-treatment group consisted of 10 opioid dependent individuals who had never accessed treatment and 10 opioid dependent individuals who had previously received treatment in the H & S system but discontinued treatment.

Individuals interested in participating in the evaluation were told to call a study recruitment number at UVM. A project research assistant explained the evaluation and reviewed study inclusion and exclusion criteria. If the individual agreed to participate in the study and met all inclusion and no exclusion criteria, a time and place for the evaluation interview was scheduled. Typically, the interviews were scheduled in a private office in a hub clinic, primary care office, UVM office, or a syringe-services program. Each participant received a $40 gift card to reimburse them for their time (approximately 1.5 hours). Participants were assured that the data collected would be confidential and would not be stored with names or other identifying information.

When individuals volunteered to participate in the study and signed the informed consent, an experienced researcher administered a battery of standardized questionnaire/survey instruments (See Data Collection Battery below). Questions were read to the participant and responses were recorded on a paper form. All participants were assigned a participant number; there was no identifying information on the data forms. The principal investigator (PI) maintained a ledger with the participants' names and assigned participant numbers in a locked office.

The data collection battery had four sections. The first section, answered by all 100 participants, collected socio-demographic characteristics.

The second section contained questions that were asked twice of the 80 in-treatment participants. The questions posed to the 80 patients in the H & S system concerned behavior and functioning, and were asked in regard to two time points to allow a T_1-T_2 comparison: T_2, or

Current Functioning, was patient functioning in the previous 90 days, and T_1, or *Time-of-Treatment-Entry Functioning*, described behavior during the 90 days immediately prior to the most recent treatment admission as recollected by the patient. For the T_1 time point, we asked these 80 participants how they would have answered the questions at the time they entered treatment (i.e., "Please answer these questions as you would have answered them for the 90-day period before treatment entry"). This T_1-T_2 strategy allowed a "pretreatment/during-treatment" comparison of functioning. See below for methodological considerations inherent in this design.

A similar battery of data was collected from the out-of-treatment participants. With these individuals, we also used two time points: T_2, or *Current* (previous 90 days), and T_1, or *12 Months Earlier* (data from the 90-day period preceding a time point 12 months earlier). For the T_1 time point, these out-of-treatment participants were asked to answer the questions as if they had been asked the questions 12 months previously (i.e., "Please answer these questions as you would have on [*date 12 months earlier]* for the 90 days prior to that date). For example, if the interview was conducted on March 1, 2017, the "Current", "T_2" period was December 2016 to Feb. 28, 2017. The "pre" "T_1" period for this participant was December 2015 to Feb. 28, 2016. The T_1-T_2 comparison for the 20 out-of-treatment individuals provided a perspective on the changes in functioning of active opioid users over a 12-month time period and some information about why they were not participating in treatment.

To assist individuals in both groups with providing accurate self-reports (for the "pre" periods) we used time-line follow-back (TLFB) methods developed by researchers who conduct longitudinal research (Sobell, Sobell, Klajner, Pavan, & Basian, 1986), in which the participant is asked to anchor their recollection by using holidays, birthdays, and other dates of significance. In the example above, we would ask the participant to try to remember how they had been doing around the Christmas and New Year's holidays and would probe for other reminders to assist them in remembering their situation for the earlier time period. Hjorthøj, Hjorthøj, and Nordentoft (2012) in a review and meta-analysis found the TLFB methods validly detect use of illicit substances when comparing self-report to biological samples.

The third section of the battery, asked only of the 80 in-treatment participants, consisted of a set of questions about the participants' views of their treatment, their perspectives on the most important elements of treatment, and the extent to which they experienced stigma when in treatment.

The fourth section of the battery included five open-ended questions about perception of current treatment experiences in the H & S system for the 80 participants in treatment. The 20

out-of-treatment individuals were asked four open-ended questions about why they were not in treatment, if they would enter treatment if changes were made to the system, and if so, what changes.

We recognize that a pretreatment/during-treatment self-report study using a retrospective methodology is not as rigorous a design as a prospective repeated-measures design. A discussion of the methodological considerations and limitations appears on Pages 38–41. Recruitment of participants started after Institutional Review Board (IRB) approval and receipt of the Certificate of Confidentiality (Oct. 16, 2016).

Participants

In-treatment participants

"In-treatment participants" were 80 individuals currently receiving methadone or buprenorphine in one of the H & S sites who volunteered for study participation and provided informed consent. All participants had to have been in treatment for more than 6 months to qualify for the study. The number of participants selected from the five H & S regions of Vermont were based on the population of each of the five regions, which resulted in the following distribution of participants: Southeast, 12; Central, 12; Northeast, 12; Southwest, 16; and Northeast, 28. In each region, 50% of the participants were in treatment at hubs and 50% in spokes, and an equal number of men and women were recruited.

All participants recruited in the hubs were receiving methadone, and those recruited in spokes were receiving buprenorphine. Although there are patients in treatment with buprenorphine in the hubs, they were not included in this evaluation, resulting in a 100% congruence between medication and site (hubs: methadone; spokes: buprenorphine).

Once the consent had been signed, participants could complete the study at the initial visit or schedule time with the researcher to complete the study questionnaire within 7 days. Participant interviews were conducted in person, in a private office provided by the hub or spoke. Participants were recruited on a first-come, first-served basis until the specific cell numbers were met (e.g., in Southeast Vermont, 3 men and 3 women were recruited at each hub and spoke). Participants were not selected by treatment staff. Upon completion of the questionnaires, participants were given a choice of a $40 gift card from a local grocery store or gas station.

Inclusion Criteria

Individuals (both males and females, N=80) were considered eligible to participate in the study if they were:

- receiving MAT for OUDs in the H & S system for more than 6 months;
- 18 years of age or older;
- able and willing to provide informed consent to participate; and
- alert, aware of time and place, not experiencing psychotic symptoms, rational, and not severely intoxicated in the opinion of the interviewer.

Exclusion Criteria

Individuals were excluded if they were unwilling or unable to provide informed consent to participate or were significantly impaired by mental health symptoms or intoxicated at the time of the interview, as assessed by the interviewer.

Out-of-treatment participants

The 20 out-of-treatment participants were recruited from syringe-service programs and other community locations (places that allow public posting, e.g., libraries, laundromats, gas stations, etc.) in the cities of Burlington, Rutland, and St. Johnsbury. Flyers described the study, including the $40 gift card compensation for completing the questionnaire, and informed candidates that they would be eligible if they either: (1) had never been in H & S system treatment (n=10); or (2) if they had been in MAT treatment in a hub or spoke within the previous 3 years, but were no longer in treatment (n=10). All consenting and data-collection procedures were identical to those described above.

Inclusion Criteria

Individuals (both males and females; N=20) were considered eligible to participate in the study if they:

- were individuals who self-reported having an OUD and had <u>not been</u> in treatment for at least 12 months;
- were 18 years of age or older;
- either:

    - received MAT within the past 3 years (n=10), but were now not in treatment, or
    - had never received MAT (n=10);
- were able and willing to provide informed consent to participate; and
- were alert, aware of time and place, not experiencing psychotic symptoms, rational, and not severely intoxicated.

Exclusion Criteria

Individuals were excluded if they were unwilling or unable to provide informed consent to participate or were significantly impaired by mental health symptoms or intoxicated at the time of the interview, as assessed by the interviewer.

Informed Consent

Every study participant signed a valid, IRB-approved current version of the study informed-consent form prior to study participation. In compliance with IRB and institutional policies, the original signed informed consent form for every participant was kept in a locked, secure location that was only accessible to the PI and study monitors. Each study participant was given a copy of the signed consent form.

Data Collection Battery

The questionnaires used to collect data from the in-treatment group (N=80) and the out-of-treatment group (N=20) are included in the Appendix. The in-treatment group questionnaire had four sections and the out-of-treatment group questionnaire comprised three of the four sections used for the in-treatment group (i.e., Sections 1, 2, and 4 were parallel for both groups). Sections 1 and 2 were based on the Addiction Severity Index (ASI; McLellan et al., 1992). The demographic and life history section included many of the categories of information in the ASI. Similarly, the drug history section and domains of functioning section included all the domains of the ASI. The inquiry data window was increased from 30 days to 90 days to allow for a broader behavior sample.

For the 80 in-treatment participants, the data collection exercise consisted of the following:

Section 1 - Socio-demographic characteristics and drug/alcohol use

Demographic information: age, gender, marital status, race/ethnicity, education, employment, health/mental health status, family/social relationships, housing status, number of children, and distance from treatment setting.

Drug and alcohol use: history of drug and alcohol use, injection history, and treatment history.

Section 2 - Participant Functioning - T_1, *Time of Treatment Entry Functioning* and T_2, *Current Functioning*

Areas of Functioning:

a. Drug and alcohol use
b. Opioid use
c. Injection use
d. Education/Employment
e. Criminal justice involvement
f. Family and relationship functioning
g. Health and healthcare utilization
h. Multiple areas of mental health functioning
i. Overdose
j. Satisfaction with life areas

Section 3 - Other Data Collection Instruments

a. Stigma Questionnaire: Substance Abuse Perceived Stigma Scale (SAPSS; Luoma et al., 2007). An 8-item rating scale questionnaire that measures the extent to which an individual has experienced stigma about his/her substance use.
b. Addiction Treatment Services Assessment: Modified from the South Africa Addiction Services Assessment. A 9-item scale evaluating specific components of the treatment experience for individuals in treatment (Myers et al., 2016).
c. Treatment Effectiveness Assessment (TEA): This is a 4-item patient-centered assessment of the benefits of treatment for substance use disorders (Ling, Farabee, Liepa, & Lu, 2012).

Section 4. Open-ended Questions

The 80 in-treatment participants were asked:

a. What do you like about this treatment clinic/office?
b. What do you dislike about this treatment clinic/office?
c. What services help you the most?
d. What services would you like to have added to your treatment?
e. What are the biggest obstacles to your involvement in treatment?

The data collection for out-of-treatment individuals paralleled the format above, minus Section 3. In addition, the following open-ended questions were posed to individuals (n=10) with no history of methadone/buprenorphine treatment:

a. Please provide the reasons why you have never entered methadone/buprenorphine treatment.
b. Have you ever unsuccessfully tried to enter methadone/buprenorphine treatment? If yes, what happened?
c. Are there treatment policies or rules that prevent you from entering methadone/buprenorphine treatment? If yes, please describe them.
d. Are there any changes to any aspect of methadone/buprenorphine treatment which would make you willing to enter treatment? If yes, please describe them.

Individuals (n=10) with previous, but not current, methadone/buprenorphine treatment were asked:

a. Why did you discontinue your treatment with methadone/buprenorphine?
b. Did you feel the methadone/buprenorphine treatment was helpful to you? Why or why not?
c. What was most useful and least useful to you in methadone/buprenorphine treatment?
d. Would you ever consider going back into methadone/buprenorphine treatment? Why or why not?

Data Management and Analysis

All survey data were entered into SPSS by a trained research assistant. Thirty-three percent of the data were randomly verified by a senior research assistant to ensure integrity of

the data. Correlations, means, standard deviations, and ranges were used to provide a description of study participants. Paired sample t-tests provided a description of changes from pretreatment to the current time point. Due to small sample size, data were not normally distributed. Nonparametric tests were utilized for small sample size and skewed data to determine statistical significance. Statistically significant changes between matched-pair pretreatment and current results for continuous data were analyzed using the Wilcoxon signed-rank nonparametric test. In addition, the Mann-Whitney U test was utilized to determine differences in continuous variables between hub and spoke participants, as well as differences between men and women. In addition, associations were examined using a chi-square and Fisher's Exact Test to assess p-values of small cell sizes for categorical data.

Methodology Limitations

Self-Report and Longitudinal Reports

All data were collected by self-report in private interviews. Although verification with urine or hair testing may have been ideal, self-report has been found to result in sufficiently valid data. In a critical review of self-reported drug use, Darke (1998) found self-reports to be valid when compared to biomarkers, collateral interviews, and criminal records, and concluded that self-reports result in accurate descriptions of drug use, related problems, and the natural history of drug use. Similarly, in a large-scale study, Denis et al. (2012) found self-reported drug use on the ASI in an outpatient treatment setting to be accurate when compared to urinalysis results.

Participants in this evaluation were assured of confidentiality in the consent process, and in the absence of treatment, legal, or personal consequences, there was no compelling reason to provide inaccurate data. Weatherby et al. (1994), in an examination of the validity of self-reports in injection drug users concluded, "urinalysis may not be necessary if respondents are asked about their drug use in a nonthreatening manner, and if they are assured of the confidentiality of their results." The interviewers in this evaluation took great care to establish not only the assurance of confidentiality but also an air of non-judgmental acceptance.

The questionnaire was administered by the PI or Michael McCann, both of whom have more than 40 years of experience talking with people with addictions and collecting sensitive personal information in clinical and research settings. The questionnaire was administered in a conversational style, and while each question was asked exactly as written in the questionnaire, there were many probing follow-up questions and requests for clarification. When individuals with SUDs are asked to describe aspects of their lives and drug use, and even their illegal behavior,

by a non-judgmental, compassionate, and interested interviewer, a majority of interviewees respond openly and are very willing to share their experiences. No interview method or style can ensure that participants provide accurate information, but participants were reminded that to help Vermont improve assistance to people with addiction, it was important to get as accurate a picture of their functioning as possible. It is likely that some minimization of negative behaviors did occur, but to the extent that people with OUDs describe their lives and behavior accurately, we believe the data collected have a high degree of validity.

Evaluation Design

The data from the quantitative component of the evaluation indicate how opioid users being treated in the Vermont H & S system are functioning. This was not a controlled research trial to assess the efficacy or effectiveness of the H & S system. Data from the out-of-treatment group are presented alongside (although not statistically compared with) the data from the in-treatment group. The out-of-treatment participants do not represent a true control group, but rather represent opioid-dependent individuals in the community who are not currently in treatment. They are presented as a comparison group to provide a perspective/frame of reference on the changes made by individuals in treatment.

To understand the overall impact of the Vermont H & S system, these results should be viewed in combination with the results of the qualitative component of the evaluation, as well as state treatment data, Medicaid claims, data and analysis done by the Blueprint for Health, and comparisons with other state OUD treatment systems. No single set of data can address whether the H & S system "works." All of the different sets of data, plus input from clinicians and other stakeholders (e.g., police, education, system personnel) have to be viewed together to assess the impact of this major, innovative treatment effort.

The Sample and Sampling Strategy

The data in this section of the report include the functioning of 40 individuals in treatment with methadone in hubs and 40 individuals being treated with buprenorphine in spokes. At the time of interview, all participants had been receiving MAT for a minimum of 6 months. All participants volunteered for the study in response to flyers and announcements in the H & S treatment sites, and there was no attempt to select patients, aside from the geographic and gender stratification described in the method section.

Study sampling strategy may have resulted in some systematic biases. It is possible that in-treatment participants who were "doing better" may have been more willing to discuss their

treatment experience, and consequently the sample may represent a segment of the treatment population with better than average functioning.

Alternatively, in this data set, as with previous data sets with individuals with SUDs, participants who were employed/working were more likely to be "doing better" on many measures of functioning (Huang et al., 2011), compared with patients in treatment who were unemployed. We believe that our sample included fewer employed patients than what was representative of the overall in-treatment population. Employed patients appeared less interested in participation in the interviews because they had less time available. Treatment staff reported that many working patients receiving care in the hubs make clinic visits very early (6 a.m.) for dosing and are in a hurry to get to work. In addition, patients on methadone who are doing well typically have take-home medication and attend the clinic on fewer days than patients who are not doing well. Although there were early-hour opportunities for study participation, most hub participants in the study wanted appointments at 8 a.m. or later, and most attended the clinic daily (i.e., they were not getting take-home doses), which suggests they were patients who had some current problems in treatment (e.g., were using drugs). Therefore, we believe that the study sample contains fewer working patients than is representative of the entire hub population and this may suggest a bias toward participants who were doing less well than average.

Similarly, in spokes, patients doing well may earn a schedule that requires only one physician visit per month. Patients doing less well (e.g., positive urinalysis tests, not working, unstable housing) are required to receive services at least weekly. Many individuals scheduled evaluation interviews at the same time as routine clinic visits, so those doing better and only attending once per month had fewer opportunities for participation. As with recruitment for the hubs, patients treated in spokes who were performing poorly visited the clinic more frequently, so the study sample may under-represent higher functioning patients, if there was a recruitment bias based on patient availability.

For both hub and spoke patients, it is possible that the $40 gift card was less of an incentive for individuals who were working than for those who were not. This is an additional factor suggesting that participation in the study may have been less attractive to working (and perhaps better functioning) patients. In summary, we really do not know if the sample that participated in the evaluation was representative of the entire in-treatment population. All we can say for sure is that we selected our sample on a first come-first served basis, stratified by treatment site and gender.

Part 2: The Qualitative Study of Patient and Family Members/Significant Others Perspectives about Treatment Provided in the Vermont Hub-and-Spoke System of Care

Qualitative methods allow collection of information in the "voice" of participants in treatment and their family members/significant others. This section describes the qualitative methodology used in the H & S evaluation. These data were collected during patient interviews to get participants' perspectives on the treatment they received, the settings where they received it, and the personnel who delivered their care. In addition, a small group of family members/significant others of patients in treatment were also provided an opportunity to discuss their views on treatment in the H & S system. The results from these data collection exercises are presented in Chapter 5.

The qualitative data in this chapter come from three sources:

1. Open-ended questions from the quantitative questionnaire. At the end of the questionnaire described in Part 1 of this chapter, participants were asked five open-ended questions. The 20 out-of-treatment participants were asked 4 different questions than the 80 in-treatment participants. The in-treatment group participants were asked to express their opinions on multiple aspects of the treatment they were receiving. The out-of-treatment group participants were asked a set of questions regarding their reasons for currently not being in treatment.
2. In-depth qualitative interviews with opioid users in treatment. This protocol was developed to collect in-depth information from 24 H & S patients (12 from hubs and 12 from spokes) on H & S treatment services experiences, factors that were most important to their treatment, obstacles to treatment gains, and how treatment could be improved. We provide quotes from patients to allow the voices of participants to be included in the H & S evaluation. These were different individuals than those in the quantitative study (Part 1).
3. Family member/significant other interviews. Structured interviews were conducted with 12 family members/significant others (FM/SOs) of H & S patients. These individuals were not FM/SOs of participants in either Part 1 or Part 2. FM/SO participants were recruited via flyers at MAT sites, other SUD counseling service programs (e.g., Turning Point programs) and email notifications to community coalitions (e.g., Brandon Cares). The questions addressed FM/SO perceptions of the benefits and shortcomings of the

treatment that the patient they knew received and the additional services that might be useful for themselves or their FM/SO. FM/SOs were also asked if they were currently participating in the treatment activity or had in the past.

Open-Ended Questions from the Quantitative Questionnaire: Methods

At the end of the 45-minute quantitative questionnaire, participants were asked their views on treatment in the H & S system. (The questionnaire administration methods, participants, and questions for this component are described in Part 1 of this chapter.)

In-Depth Qualitative Interviews with Opioid Users in Treatment

To complement the quantitative data presented in Chapter 4 and provide informative context, 24 participants in treatment received in-depth qualitative interviews. These provide individual participants' perspectives on how they view the H & S treatment experience, with particular attention on aspects of treatment that could facilitate treatment participation and recovery, as well as aspects that may obstruct treatment participation and/or interfere with recovery.

Study Design, Participants, Methods

Individual participant interviews were completed at two hubs (one each in Chittenden and Washington counties; n=12 participants) and from six spokes (Rutland County [1], Addison County [1], and Chittenden County [4]); n=12). An equal number of H & S participants were male (6) and female (6). Participants were recruited through flyers with researcher contact information at the H & S sites. The interview method was described during a screening phone call, and if the candidate met inclusion criteria, appeared eligible, and agreed to participate, an interview was scheduled. Volunteers were recruited on a first-come, first-served basis. Participants reviewed and signed consent forms in person before the interviews began. Each participant was assigned a unique ID number, and any identifying information revealed during the interviews was removed from all transcripts and notes. Participant-identifying information was kept separate from the interview data. All interviews were conducted in a private space or group room at the sites. Study participants received $30 compensation in the form of a gift card to their choice of a local grocery store or gas station for their involvement in this study.

Interview participants (n=24)

Inclusion Criteria

Male and female individuals were eligible to participate if they were:

- Currently enrolled as outpatients (≥18 years of age) receiving medication-assisted treatment for OUDs at H & S sites for at least 6 months, and
- able and willing to provide informed consent to participate.

Exclusion Criteria

Individuals were excluded if they were unwilling or unable to provide informed consent to participate.

Interview guides were used to probe for participant perceptions of the characteristics of the H & S system (e.g., treatment quality, engagement, adaptability); impact of services and the perceived effectiveness of services (e.g., patient needs and resources, transitions in care, outcomes, quality of life, and productivity); organizational dynamics (e.g., clinic/spoke settings, networks and communication, culture and treatment climate); provider characteristics (e.g., knowledge and beliefs about MAT, link to other providers and services); and the overall treatment process. The interview guide is included in the Appendices. Interviews lasted 45–60 minutes.

Data Management and Analysis

Interviews were audio-recorded and transcribed, reviewed, and summarized by a trained research assistant. Digital field notes, audio files, transcripts, and documents were password protected and stored on a secure network. Qualitative analysis software (Atlas.ti™) was used to organize the data and facilitate coding and apply thematic analysis. The analysis examined the H & S service experience and participants' recovery and treatment process. Iterative analyses assessed convergence of participants' dimensions on study measures.

Family Members/Significant Others Interviews

Family members/significant others (FM/SOs) interviews provided an initial glimpse of how families perceive the impact of treatment on the functioning of their target FM/SO and to inform clinicians and policy makers about the experience of family members in interacting with the H & S system.

Study Design

The basic qualitative data-collection methods were identical to those described in the section above to collect qualitative information from the 24 participants in treatment but were applied to 12 FM/SOs of individuals receiving care in the H & S system.

Participants and Method

The 12 FM/SOs were recruited by posting flyers at the hub and spoke sites; FM/SOs included parents, siblings, and significant others. No attempt was made to stratify this sample by treatment site, geography, or gender. Participants meeting eligibility criteria were admitted to the study on a first come, first-served basis and consisted of five mothers, two fathers, one spouse, one significant other, and three siblings. Four were interviewed in the Newport area, four in Rutland, and four in Burlington. Six of the participants were FM/SOs of patients receiving care in hubs and six in spokes.

FM/SOs were individuals who currently resided with or had recently (last 6 months) lived with the study participant. FM/SOs were interviewed at the UVM office or hub/spoke sites in a private location. Participants were not asked to identify the family member receiving services, just their relationship with this person. Participants were asked about their perceptions of (a) treatment access, (b) family member participation in treatment, (c) communication with staff and providers, (d) what they would recommend changing to improve services.

Potential participants called the RA at the UVM office for the study, who coordinated the schedule for interview times. Consent forms were reviewed and signed, in person, before the interviews were started. Study participants and family members who participated in the qualitative portion of the study received $30 compensation in the form of a gift card to their choice of a local grocery store or gas station for their involvement in this study. Interviews were 30–45 minutes in duration.

Family interview participants (n=12)

Inclusion Criteria

Individuals eligible to participate in this portion of the study were males and females:

- who agreed to participate in the study and were family members or significant others of individuals with OUDs currently receiving MAT in one of the participating clinics;
- who resided with the participant at some point over the last 6 months; and
- who were able and willing to provide informed consent to participate.

Exclusion Criteria

Individuals were excluded if they were unwilling or unable to provide informed consent to participate.

All data-management and analysis methods were identical to those described in the previous qualitative component.

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Chapter 4. Results of the Quantitative Study of Patient Functioning and Satisfaction with Treatment Provided in the Vermont Hub-and-Spoke System of Care

This results section initially presents data from the in-treatment group (n=80) along with comparable data from the out-of-treatment group (n=20). This is followed by parallel data from individuals in treatment in the hubs (n=40) and those in treatment in the spokes (n=40). Finally, we discuss differences between female and male participants.

The data for the quantitative component of the evaluation were collected from January 6, 2017–June 20, 2017. The 80 in-treatment participants were interviewed in six hubs (there were no interviews in Newport, VT, or Lebanon, NH), and spoke participants were interviewed in all five H & S regions of the state in 14 different spoke practices. The 20 out-of-treatment participants were interviewed in Rutland, St. Johnsbury, Montpelier, and Burlington, VT. Sixteen of the 20 out-of-treatment participants were interviewed in syringe-services locations.

Part 1. In-Treatment Group and Out-of-Treatment Group Data

This section reviews data from all 100 individuals who completed quantitative questionnaires. In some sections, data are presented in aggregate, and in others they are separated between the 20 out-of-treatment and 80 in-treatment group participants. Tables 1–16 present all questionnaire data collected in tabular form. Some data categories are presented graphically in in Figures 7–19.

Data from the out-of-treatment group and the in-treatment group are shown, with the out-of-treatment group providing a frame of reference for the in-treatment group. However, as discussed in Chapter 3, neither group was selected at random, and the sample size precludes statistical comparison. Pretreatment (T_1) measures of functioning are compared with the T_2 (the time of the interview) measures for the 80 in-treatment group participants.

Data from the out-of-treatment group may provide some perspective on changes (or lack of changes) in functioning for individuals with OUDs who were not in treatment. The data from the 80 individuals reflect the changes in functioning and attitude of the individuals being treated for OUDs in the Vermont H & S system.

Participant Demographics

Table 1 contains the demographic characteristics of the 100 opioid users interviewed for the quantitative aspect of the evaluation. The data are very similar for the in- and out-of-treatment groups and are discussed below in aggregate.

Table 1. Demographic Characteristics of all Participants by Treatment Status

	In Treatment (n = 80)	Out of Treatment (n = 20)	Total (N = 100)
Age (in years), *M* ± SD	38.2 ± 11.1	35.0 ± 8.1	37.6 ± 10.6
Age, %			
18 to 25	7.5%	15.0%	9.0%
26 to 35	40.0%	50.0%	42.0%
36 to 45	30.0%	20.0%	28.0%
Over 45	22.5%	15.0%	21.0%
Gender, %			
Male	50.0%	50.0%	50.0%
Female	50.0%	50.0%	50.0%
Race, %			
Non-Hispanic White	95.0%	95.0%	95.0%
Latino or Hispanic	3.8%	0.0%	3.0%
American Indian or Alaska Native	1.2%	5.0%	2.0%
Marital Status, %			
Single	46.2%	50.0%	47.0%
Married/Living together as married	32.5%	30.0%	32.0%
Divorced	21.3%	20.0%	21.0%
Education (in years), *M* ± SD	12.6 ± 2	12.4 ± 1.2	12.5 ± 1.9
Education, %			
Less than 12th Grade	18.8%	15.0%	18.0%
12th Grade	42.4%	55.0%	45.0%
Some College	28.8%	30.0%	29.0%
Bachelor's Degree	7.5%	0.0%	6.0%
Advanced Degree	2.5%	0.0%	2.0%
Parole or Probation (% yes)	26.3%	30.0%	27.0%

Figure 7. Participant Age Distribution (n=100).

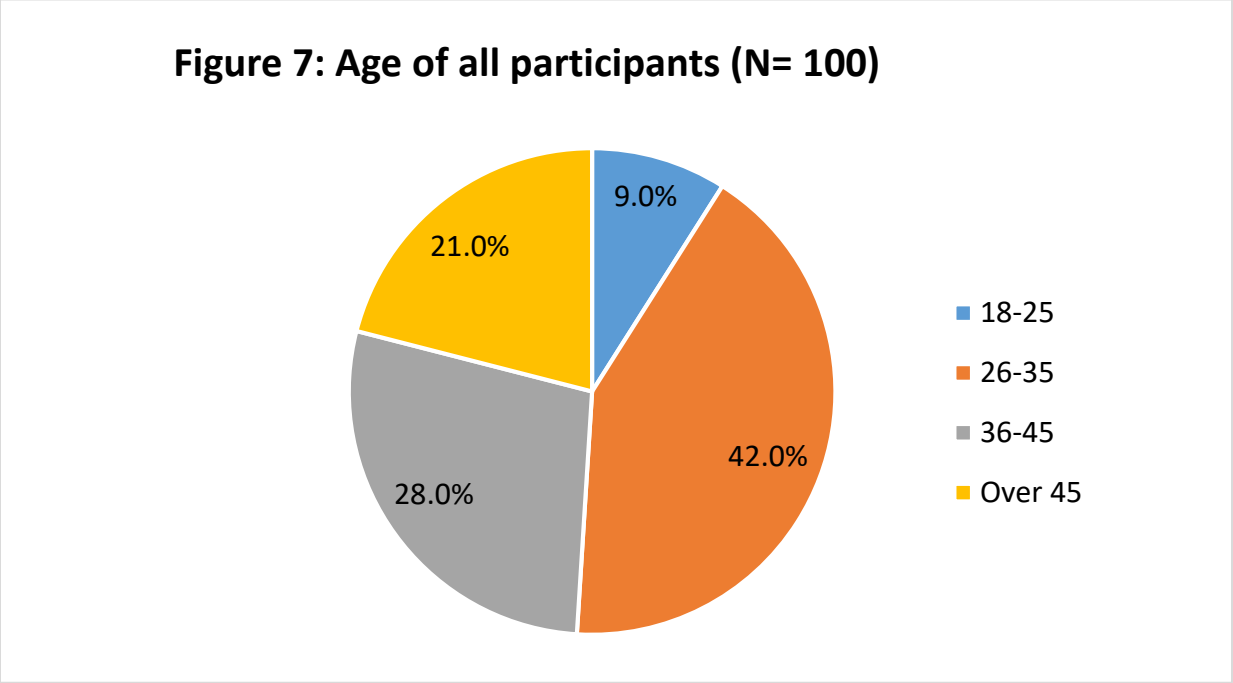

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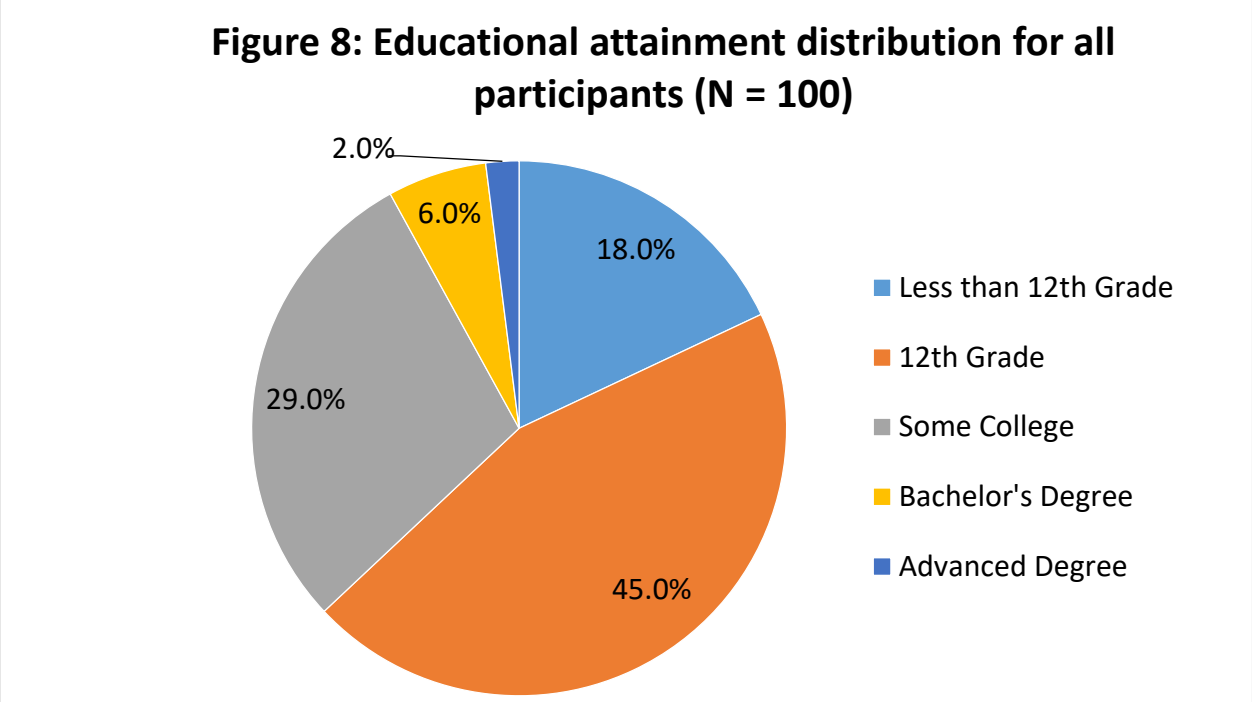
Figure 8. Educational Attainment Distribution (n=100).



Family/Social Relationships/Housing Status

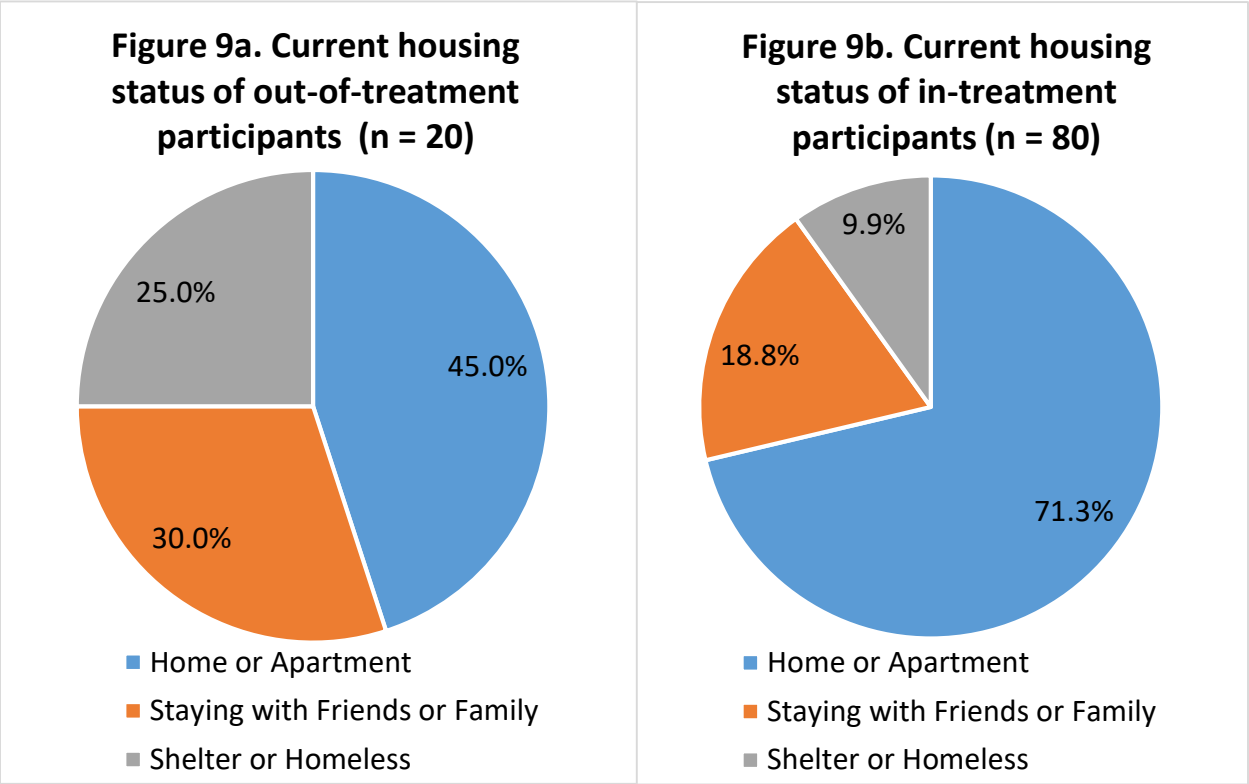
The in-treatment and out-of-treatment groups are discussed separately in this section. Among those participants who were currently in a relationship, 80.0% of the out-of-treatment participants reported being in a relationship with a current or former drug user, whereas this percentage was 62.5% for the in-treatment group. The majority of in-treatment participants in relationships with current/former drug users (83.3%) reported that their significant other was also in treatment; members of the out-of-treatment group in relationships with current/former drug users reported that only 37.5% of their significant others were in treatment. About 75% of each group had children, and those with children had a mean of 2.4 children (range 1–8); 47.5% of the in-treatment group and 28.6% of the out-of-treatment group retained custody of at least one child.

Those individuals in treatment had a more stable housing situation than those out of treatment. See Table 2 below for a summary of participants' family/social relationships and housing status. Figures 9a and 9b illustrate differences in housing status.

Table 2. Family/Social Relationships and Housing Status of all Participants by Treatment Status

	In Treatment (n = 80)	Out of Treatment (n = 20)	Total (N = 100)
1. Have a significant other (% yes)	60.0%	50.0%	58.0%
2. Significant other is a current or former drug user (% of those with a significant other saying "yes")	62.5%	80.0%	65.5%
Significant other is in treatment for drug use (% of those with a significant other with a drug use history saying "yes")	83.3%	37.5%	73.7%
3. Participants who have children (% yes)	73.8%	70.0%	73.0%
For those with children, the mean number of children, *M* ± SD	2.4 ± 1.5	2.5 ± 1.1	2.4 ± 1.5
Range	1-8	1-4	1-8
Children live with participant (% yes)	47.5%	28.6%	43.8%
4. Current housing status (% yes)			
Home or apartment	71.3%	45.0%	66.0%
Staying with family or friends	18.8%	30.0%	21.0%
In a shelter or homeless	9.9%	25.0%	13.0%

Figures 9a and 9b. Housing Status.



Health Conditions

If a participant reported a lifetime mental health diagnosis or was ever prescribed medication by a physician for a mental health condition, the participant was categorized as having a mental health condition. Participants were queried to confirm that the report of a mental health condition was based upon a professional assessment rather than self-diagnosis. This method is less reliable than conducting a *Diagnostic and Statistical Manual of Mental Disorders* (DSM; American Psychiatric Association, 2013) assessment using the Structured Clinical Interview for DSM (SCID) or other structured assessment, but the scope of the project made a SCID

assessment infeasible. As indicated in Table 3, almost 50% of participants reported a history of psychiatric illness.

Participants were also asked about infectious disease testing and reported high rates of testing for HIV (93.8%) and hepatitis C (92.5%). Nearly one third (32.3%) reported being positive for hepatitis C and only 1 of the 100 participants was HIV+. See Table 3 for participant data for these selected health conditions.

Table 3. Health of All Participants by Treatment Status

	In Treatment (n = 80)	Out of Treatment (n = 20)	Total (N = 100)
Mental Health Condition, (% yes)	47.1%	45.0%	46.6%
Tested for HIV (% report "yes")	93.8%	95.0%	94.0%
HIV Results, among those tested, %			
Positive	1.3%	0.0%	1.0%
Negative	94.7%	100%	95.7%
Unknown	4.0%	0.0%	3.2%
Tested for Hepatitis C (% report "yes")	92.5%	95.0%	93.0%
Hepatitis C Results, among those tested, %			
Positive	33.8%	26.3%	32.3%
Negative	63.5%	73.7%	65.6%
Unknown	2.7%	0.0%	2.1%

Drug Use and Treatment History Information

Non-opioid substance use history

Participants reported significant histories of non-opioid substance use, as shown in Table 4. Over 90% of participants reported tobacco, alcohol, and cannabis use at a mean age of first use of 14 or younger; 97 of the 100 participants had a history of cocaine use. Hallucinogens and sedative/tranquilizers were used by more than 70% of the sample and 60% had used amphetamines. Clearly, most individuals in this study were not naïve to drug use prior to using opioids. Most had experimented with a series of other drugs and alcohol leading up to their involvement with opioids. It should be noted, however, that a substantial subset of participants (n=39) began opioid use by the age of 16 (Table 5), suggesting that their opioid-use initiation was more contemporaneous with the onset of other drug use.

Table 4. Non-opioid Substance Use History of all Participants by Treatment Status

	Number Who used (of 100)	In Treatment (n = 80)	Out of Treatment (n = 20)	Total (N = 100)
Tobacco Age first used, *M* ± SD	93	13.8 ± 3.4	12.5 ± 2.7	13.5 ± 3.3
Alcohol Age first used, *M* ± SD	96	14.0 ± 3.6	13.7 ± 4.1	13.9 ± 3.7
Cannabis Age first used, *M* ± SD	96	14.0 ± 2.8	13.5 ± 3.6	13.8 ± 3.0
Hallucinogens Age first used, *M* ± SD	73	16.9 ± 2.9	16.3 ± 2.1	16.8 ± 2.8
Cocaine Age first used, *M* ± SD	97	19.3 ± 5.4	19.1 ± 4.7	19.2 ± 5.2
Sedatives/tranquilizers Age first used, *M* ± SD	71	21.4 ± 7.2	18.1 ± 4.3	20.7 ± 6.8
Amphetamines Age first used, *M* ± SD	60	19.9 ± 6.7	21.3 ± 7.7	20.3 ± 6.9

Opioid use history

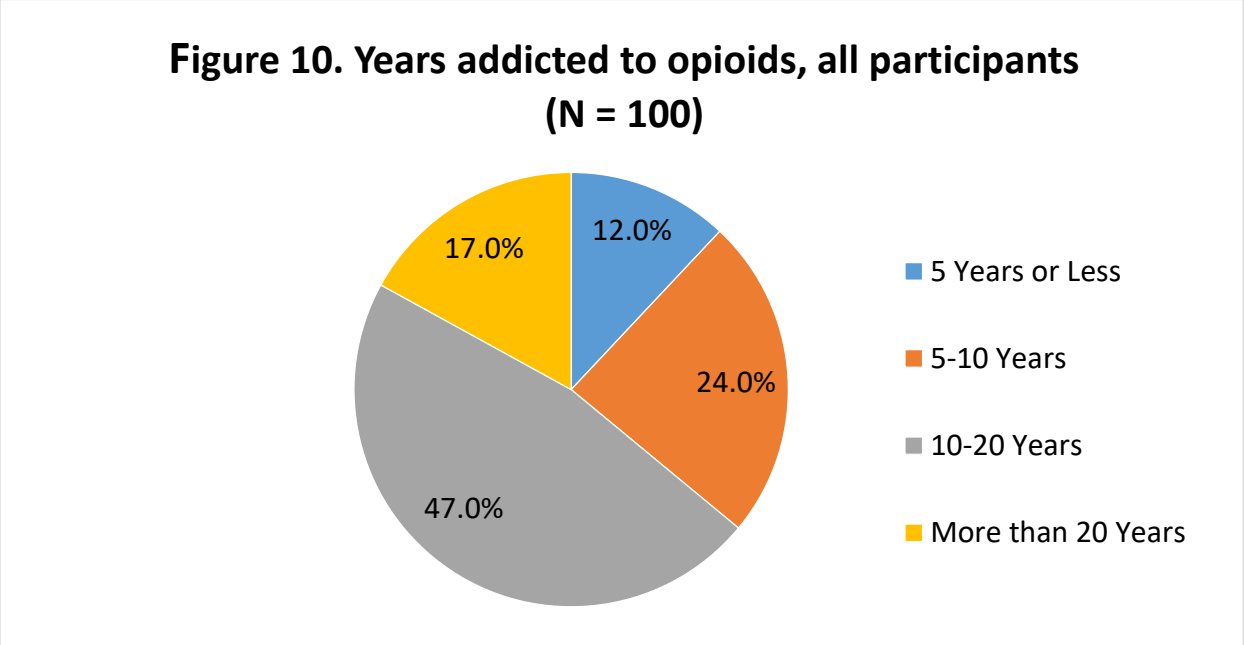
Table 5 below presents participant history of opioid use. Most of the participants in the study began opioid use with prescription medications (84 of 100 participants). Most then progressed to illicit opioids as the primary opioid used at the time of the interview (92 of 100 participants). Use of methadone or buprenorphine that was not prescribed or dispensed to the participants was common, at 81 of 100 participants. Of these participants, 73 used buprenorphine only, 2 used methadone only, and 6 used both buprenorphine and methadone. One individual reported buprenorphine as the first opioid ever used.

Prescription opioids were primarily administered by oral and intranasal methods, but when participants transitioned to illicit opioids, injection became the primary route of administration. Age of first injection was, on average, 2 years after the first use of illicit opioids, and 86 of 100 reported heroin as the first drug injected. The average time between first opioid use and the interview date was 14 years.

Table 5. Opioid-Use History of all Participants by Treatment Status

	Number Who Used (of 100)	In Treatment (n = 80)	Out of Treatment (n = 20)	Total (N = 100)
Prescription Opioids without a doctor's prescription				
Age first used, *M* ± SD	98	21.8 ± 8.6	19.4 ± 5.8	21.3 ± 8.2
Illicit Opioids				
Age first used, *M* ± SD	92	25.7 ± 9.9	22.4 ± 8.9	25.0 ± 9.7
Opioid Treatment Medication, without prescription.				
Age first used, *M* ± SD	81	27.3 ± 10.0	28.6 ± 8.7	27.6 ± 9.7
Opioid Injection				
Age first injected, *M* ± SD	70	27.3 ± 11.7	26.9 ± 10.3	27.2 ± 11.2
% of participants that used opioids before the age of 18	47	46.3%	50.0%	47.0%
% of participants that reported using prescription opioids prior to illicit opioids or medication	84	82.5%	90.0%	84.0%
Years of opioid use, *M* ± SD	100	14.7 ± 8.5	12.8 ± 7.5	14.3 ± 8.3
Range	--	1-44	2-30	1-44
Years addicted to opioids, %				
5 years or less	12	10.0%	20.0%	12.0%
5 to 10 years	24	25.0%	20.0%	24.0%
10 to 20 years	47	47.5%	45.0%	47.0%
More than 20 years	13	17.5%	15.0%	17.0%

Figure 10 shows the distribution of opioid-use durations.



Treatment history

Table 6 presents information on the treatment history of the 80 in-treatment participants. One third (33.8%) of in-treatment participants were in treatment for the first time, and most participants had considerable treatment experience, with a mean of 2.3 previous treatment episodes. Study participation required a minimum treatment duration of 6 months, and the group had a mean treatment duration of nearly 3 years, which suggests significant treatment experience. However, when divided into duration groups of 6–12 months, 1–3 years, and more than 3 years of treatment, approximately a third of the sample were in each of these duration categories.

To understand the challenges of participating in treatment, treatment participants were asked how long it took them to travel for treatment. The mean travel time was slightly less than 20 minutes, with a range of 5 minutes to 2 hours. See Table 6 below.

Table 6. Treatment History of In-treatment Participants

	In Treatment (n = 80)
No prior treatment episodes, %	33.8%
Previous treatment episodes, *M* ± SD	2.3 ± 3.0
Months in treatment, *M* ± SD	33.2 ± 29.4
Months in treatment, %	
Six to 12 months	32.5%
Between 1 and 3 years	36.3%
More than 3 years	31.2%
Drive time to treatment center in minutes, *M* ± SD	18.9 ± 16.8
Range in minutes	5-120

Measures of Changes in Functioning

Non-opioid substance use

Out-of-treatment group

Table 7 compares the number of days (out of 90 days) of non-opioid substance use for the 20 out-of-treatment participants over a 12-month period (12-month prior use, T_1, vs. Time 2 use, T_2).

Table 7. Non-opioid Use Among Participants Out of Treatment

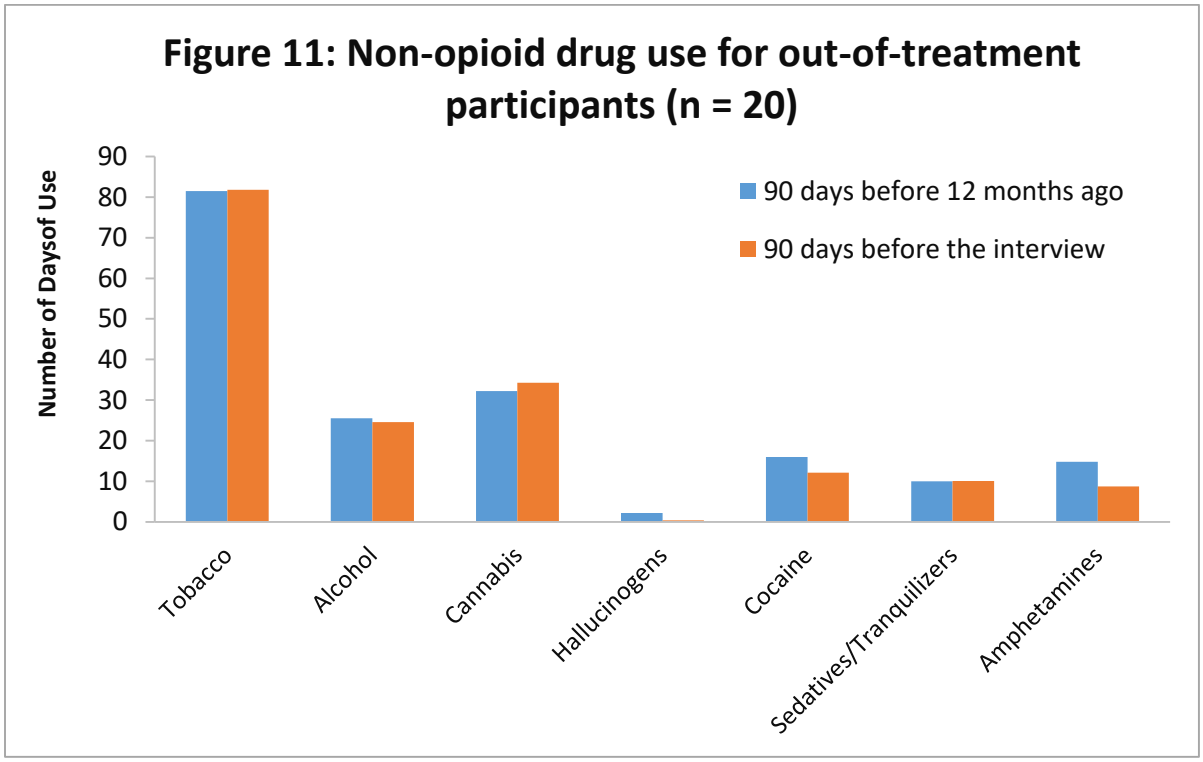
	Out of Treatment (n = 20)
In the past 90 days (mean # of days)	
Tobacco	
T_1, *M* ± SD	81.5 ± 24.3
T_2, *M* ± SD	81.8 ± 22.6
% currently using any amount	95.0%
Alcohol	
T_1, *M* ± SD	25.5 ± 36.2
T_2, *M* ± SD	24.6 ± 32.7
% currently using any amount	65.0%
Cannabis	
T_1, *M* ± SD	32.2 ± 39.6
T_2, *M* ± SD	34.3 ± 3.0
% currently using any amount	75.0%
Hallucinogens	

Table 7. Non-opioid Use Among Participants Out of Treatment

	Out of Treatment (n = 20)
T_1, *M* ± SD	2.2 ± 7.1
T_2, *M* ± SD	0.4 ± 1.4
% currently using any amount	10.5%
Cocaine	
T_1, *M* ± SD	16.0 ± 32.5
T_2 *M* ± SD	12.1 ± 21.9
% currently using any amount	45.0%
Sedatives/ tranquilizers	
T_1, *M* ± SD	10.0 ± 21.8
T_2, *M* ± SD	10.1± 23.8
% currently using any amount	50.0%
Amphetamines	
T_1, *M* ± SD	14.8 ± 28.7
T_2, *M* ± SD	8.7 ± 21.8
% currently using any amount	31.6%

Note: T_1 is the 90 days prior to the 12-month period before the interview with the out-of-treatment participants.

As seen in Figure 11 below, the days of drug use between T_1 (blue bar) and T_2 (orange bar), a 12-month period, remains relatively unchanged for individuals who were not currently in treatment.



In-treatment group

Table 8 compares the days (out of 90) of non-opioid substance use for the 80 in-treatment participants from treatment initiation (T_1) to the time of the interview (T_2).

The change in days of use from T_1 to T_2 varies by substance. There was a substantial reduction of use in all substance use categories, except tobacco and cannabis. Hallucinogen use was low at both T_1 and T_2.

The magnitude of the reductions was unexpected, as participants said their primary treatment goal was to reduce and avoid the impact of opioid use on their lives rather than "total sobriety" or general "recovery." However, many participants reduced many types of substance use. Cannabis use remains an ongoing part of the lives of a substantial number of participants.

Table 8. Non-opioid Substance Use Among Participants in Treatment

	In Treatment (n = 80)
In the past 90 days (mean # of days)	
Tobacco	
T_1, *M* ± SD	72.1 ± 32.4[a]
T_2, *M* ± SD	63.1 ± 39.7
% currently using any amount	77.5%
Alcohol	
T_1, *M* ± SD	20.0 ± 31.9 [a]
T_2, *M* ± SD	6.7 ± 20
% currently using any amount	33.8%
Cannabis	
T_1, *M* ± SD	31.9 ± 40.5
T_2, *M* ± SD	29.0 ± 39.2
% currently using any amount	47.5%
Hallucinogens	
T_1, *M* ± SD	2.1 ± 12 [a]
T_2, *M* ± SD	0.0 ± 0.3
% currently using any amount	1.3%
Cocaine	
T_1, *M* ± SD	18.1 ± 28.9 [a]
T_2, *M* ± SD	5.1 ± 14.8
% currently using any amount	27.5%
Sedatives/ tranquilizers	
T_1, *M* ± SD	16.3 ± 31.3 [a]
T_2, *M* ± SD	2.8 ± 14.2
% currently using any amount	12.5%
Amphetamines	

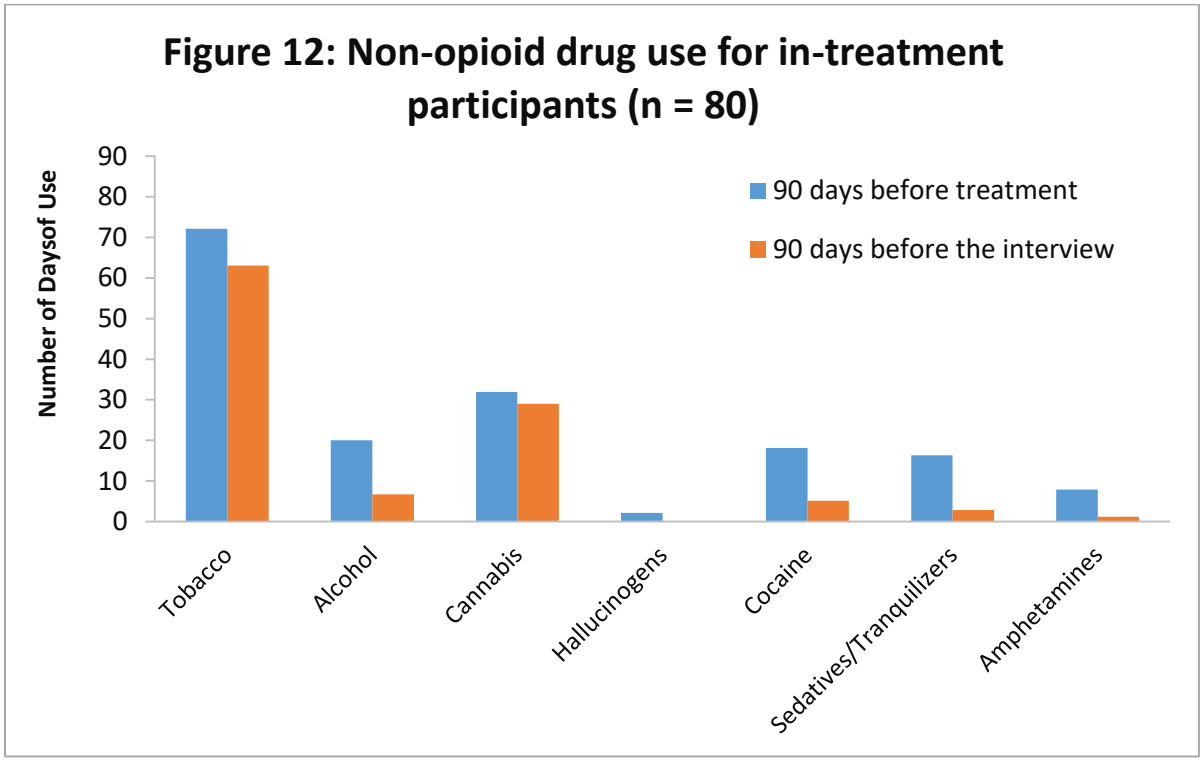
Table 8. Non-opioid Substance Use Among Participants in Treatment

	In Treatment (n = 80)
T_1, *M* ± SD	7.9 ± 22.8 [a]
T_2, *M* ± SD	1.2 ± 1.00
% currently using any amount	3.8%

Note: T_1 is the 90-day period before treatment among in-treatment participants.
[a] There was a significant decrease in use at T_2 among *in-treatment* participants compared to T_1 (N=80), p<.01; Wilcoxon signed-rank test

As seen in Figure 12, the days of drug use between T_1 (blue bar) and T_2 (orange bar), a period of about 3 years, shows reductions in alcohol, cocaine and benzodiazepines for individuals currently in treatment.

Figure 12: Non-opioid Substance Use for In-Treatment Participants



Opioid use

Out-of-treatment group

Table 9 compares the days (out of 90) of opioid use for the 20 out-of-treatment participants over a 12-month period (12-month prior use, T_1, vs. Time 2 use, T_2).

All participants reported opioid use on over 70% of days at both T_1 and T_2, with some minor modifications in the type of opioid used. At T_2, 45.0% were using prescription opioids, 60.0% were using illicit opioids, and 80.0% were using addiction treatment medications. As discussed in Chapter 6, most out-of-treatment users interviewed were attempting to enter treatment at the time of the interview and reported buying buprenorphine on the street in the interim. Injection rates were similar at T_1 and T_2.

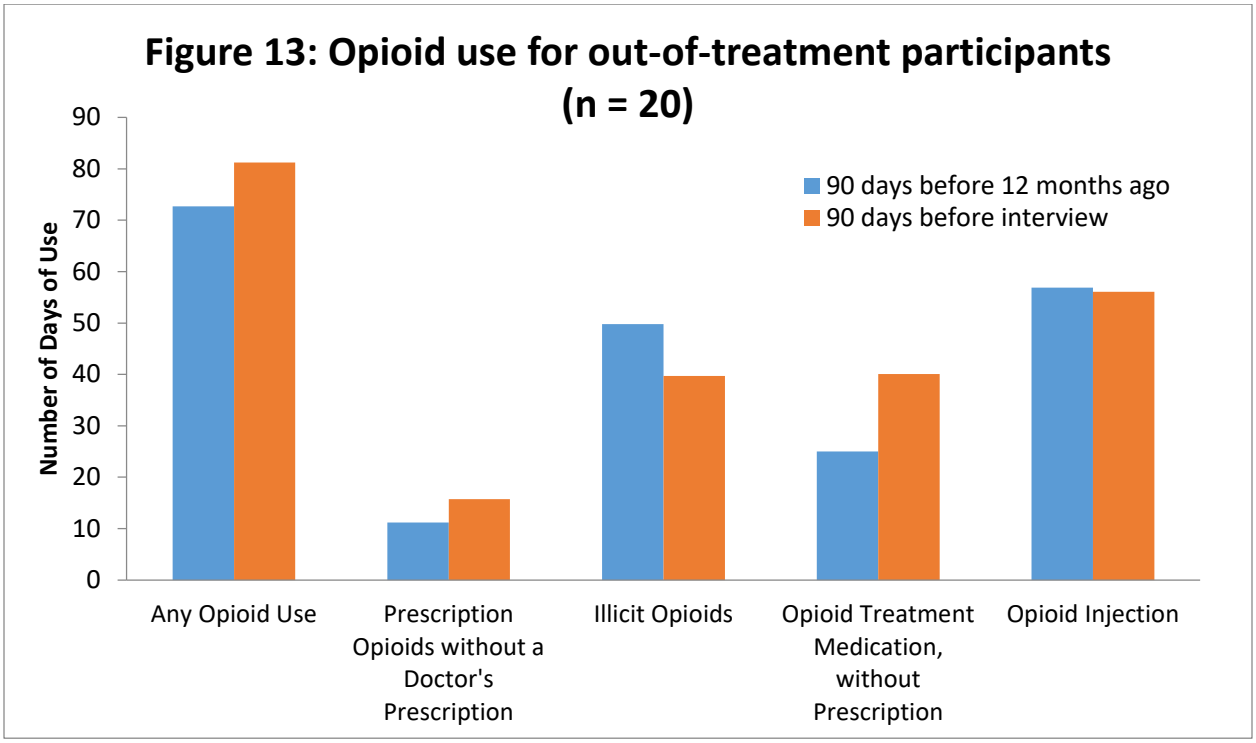
Table 9. Opioid Use Among Participants Out of Treatment

	Out of Treatment (n = 20)
In the Past 90 Days (mean # of days)	
Any Opioid Use	
T_1, *M* ± SD	72.7 ± 30.7
T_2, *M* ± SD	81.2 ± 17.0
% currently using any amount	100%
Prescription Opioids without a doctor's prescription	
T_1, *M* ± SD	11.2 ± 22
T_2, *M* ± SD	15.7 ± 29.2
% currently using any amount	45.0%
Illicit Opioids	
T_1, *M* ± SD	49.8 ± 39.9
T_2, *M* ± SD	39.7 ± 39.7
% currently using any amount	60.0%
Opioid Treatment Medication, without prescription	
T_1, *M* ± SD	25.0 ± 36.7 [a]
T_2, *M* ± SD	40.1 ± 36.5
% currently using any amount	80.0%
Opioid Injection	
T_1, *M* ± SD	56.8 ± 40.9
T_2, *M* ± SD	56.1 ± 37.3
% currently injecting in past 90 days	85.0%
% of participants reporting no opioid use in the past 90 days at T_2	0.0%
% of participants reporting no opioid or other drug use, excluding tobacco, alcohol or cannabis, at T_2	0.0%
% of participants reporting no substance use, excluding tobacco, at T_2	0.0%

Note: T_1 is the 90 days prior to the 12-month period before the interview with the out-of-treatment participants.

[a] There was a significant increase in the T_2 days using opioid treatment medication with a prescription compared to T_1 among *out-of-treatment participants* (n = 20), $p<.05$; Wilcoxon signed-rank test

The out-of-treatment sample may not be representative of all out-of-treatment opioid users, as this is a small sample and many of the participants were recruited at syringe exchanges. However, even among those recruited with these limitations, none of the out-of-treatment study participants had substantially modified opioid use (or other drug use) over the 12-month reference period. See Figure 13 below.



In-treatment group

The core goals of treatment in the H & S system are to reduce patient opioid use and improve overall health and functioning. Table 10 and Figure 11 show the impact that treatment in the H & S system has had on patient opioid use.

Opioid use was reduced dramatically for participants in treatment. When these individuals were out of treatment, virtually all of them were using opioids every day (M=85.8 days). Opioid use was reduced to an average of 3 days in the previous 90 at the time of the interview (T_2).

There was a similar reduction in days of injection from M=43.2 days (T_1) to M=3.4 days (T_2). Participants were asked "on a day when you injected, approximately how many times did you inject." The response to this question found a mean of 2.8 injections per day when injecting. At T_1, the in-treatment sample was injecting opioids on 43.5 days in the 90-day window. Therefore, during the 90 days prior to treatment, each participant would have injected on average

121.5 times (2.8 injections per day X 43.5 days). The days of injection dropped to approximately 3.4 days in the T_2 window or 9.5 injections (2.8 injections per day X 3.4 days). Therefore, in the T_1-T_2 90-day windows, the number of injections was reduced from 121.5 injections to 9.5 injections, approximately a 12-fold reduction. Clearly, participation in MAT is associated with a very important and substantial reduction in injection frequency and associated risk for transmission of infectious diseases.

MAT with methadone and buprenorphine was associated with very large reductions in opioid use and drug injection (see Table 10 and Figure 14).

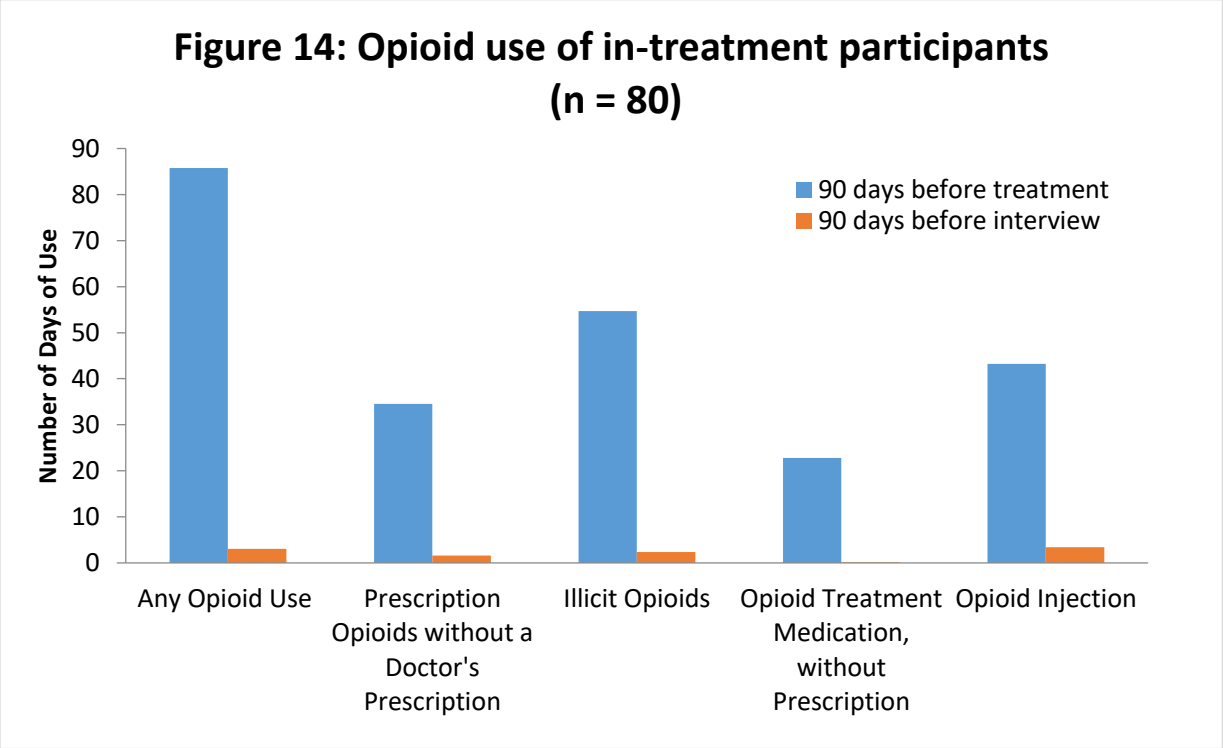
Table 10. Opioid Use Among Participants In Treatment

	In Treatment (n = 80)
In the Past 90 Days (mean # of days)	
Any Opioid Use	
T_1, *M* ± SD	85.8 ± 13.9 [a]
T_2, *M* ± SD	3.0 ± 12.8
% currently using any amount	15.0%
Prescription Opioids without a doctor's prescription	
T_1, *M* ± SD	34.5 ± 35.7 [a]
T_2, *M* ± SD	1.6 ± 10.3
% currently using any amount	11.3%
Illicit Opioids	
T_1, *M* ± SD	54.7 ± 39.1 [a]
T_2, *M* ± SD	2.3 ± 12
% currently using any amount	6.3%
Opioid Treatment Medication, without prescription	
T_1, *M* ± SD	22.8 ± 31.2 [a]
T_2, *M* ± SD	0.1 ± 0.7
% currently using any amount	3.8%
Opioid Injection	
T_1, *M* ± SD	43.2 ± 42.4 [a]
T_2, *M* ± SD	3.4 ± 14.1
% currently injecting in the past 90 days	11.3%
% of participants reporting no opioid use in the past 90 days at T_2	85.0%
% of participants reporting no opioid or other drug use, excluding tobacco, alcohol or cannabis, at T_2	62.5%
% of participants reporting no substance use, excluding tobacco, at T_2	30.0%

Note: T_1 is the 90-day period before treatment among in-treatment participants.

[a] There was a significant decrease in use among *in-treatment* participants at T_2 compared to T_1 (N=80), p<.001; Wilcoxon signed-rank test.

Figure 14. Opioid use of in-treatment participants.



The bottom two panels of Table 10 present the number of individuals who self-report T_2 90-day abstinence from illicit drug use and alcohol use. Of the 80 individuals in the in-treatment group, 85.0% (n=68) reported no opioid use at T_2. Additionally, 62.5% (n=50) of these participants reported 90-day abstinence from all drug use except tobacco, alcohol, or cannabis. Excluding tobacco, 30.0% (n=24) reported abstinence from alcohol and all drugs. Clearly, participation in MAT is associated with a substantial reduction in almost all self-reported substance use and a dramatic reduction in opioid use.

There are limitations associated with these data, including the accuracy of self-report and the small and non-random sample. However, even in view of these limitations, the results are extremely positive and consistent with the impressions of the interviewers. Most in-treatment study participants were very successful in reducing opioid and other illicit drug use.

Other Areas of Functioning

The remainder of the functioning analysis includes only the in-treatment group due to the small sample size and minimal change of the out-of-treatment group.

Medical services/overdose

Table 11 and Figure 15a show changes in utilization of selected medical services from T_1 to T_2. Utilization of emergency departments decreased significantly from T_1 to T_2. At T_1, 38 participants (47.5%) had at least one ED visit; this was reduced to 18 participants (22.5%) at T_2. In aggregate, at T_1 participants made 282 ED visits in the 90-day window, compared with 31 visits at T_2. H & S participation was associated with a significant reduction in ED use. Other measures of medical service utilization did not change significantly.

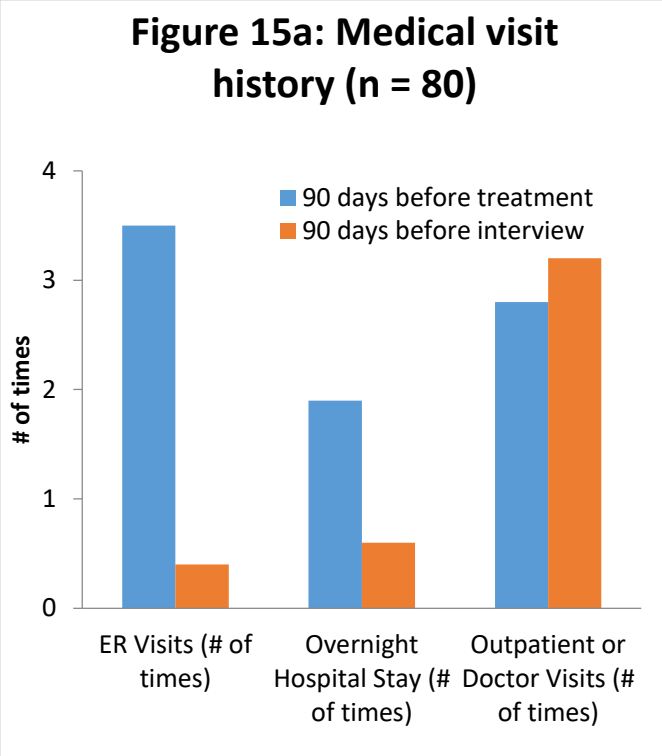
As illustrated in Table 11 and Figure 15b, overdoses also decreased: 20 participants (25.0%) reported overdosing at least once during the 90 days prior to entering MAT, compared with 0 during the 90 days prior to the interview. As strategies for overdose prevention are discussed and debated, it is important to recognize that treatment participation with MAT has a profound impact in reducing opioid overdoses. Although 15.0% of this group reported actively using opioids, they reported no overdoses at T_2.

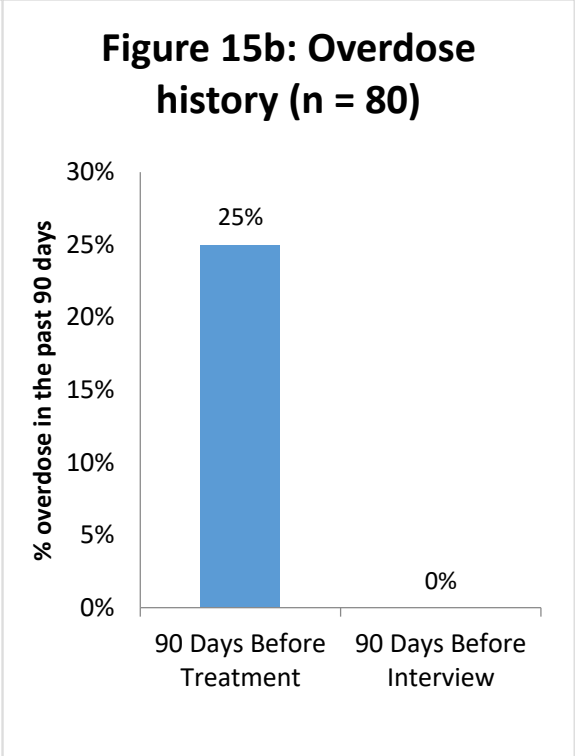
Table 11. Medical Visits and Overdose History Among Participants In Treatment

	In Treatment (n = 80)
In the Past 90 Days	
ED Visits, # of times	
T_1, *M* ± SD	3.5 ± 8.6 [a]
T_2, *M* ± SD	0.4 ± 1.0
Overnight hospital, # of days	
T_1, *M* ± SD	1.9 ± 6.5
T_2, *M* ± SD	0.6 ± 5.6
Outpatient or doctor's visits, # of times	
T_1, *M* ± SD	2.8 ± 5.8
T_2, *M* ± SD	3.2 ± 5.9
Lifetime Overdoses, *M* ± SD	1.5 ± 2.8
Overdose (% yes in the past 90 days)	
T_1	25.0%
T_2	0.0%

Note: T_1 is the 90-day period before treatment among in-treatment participants.

[a] There was a significant decrease in the T_2 number of ER visits compared to T_1 among *in-treatment participants* (n = 80), $p < .001$; Wilcoxon signed-rank test





Employment and School Participation

Table 12 shows change in days of school attendance or employment activity at T_1 and T_2. This measure showed very little change from T_1 to T_2. Employment and education status appears to be the domain that is least affected by treatment. As mentioned above in the section on the participant sample, working patients may have been less likely to have the time to participate in the interview and, therefore, may be under-represented.

Table 12. Work and School Days Among Participants in Treatment

	In Treatment (n = 80)
In the Past 90 Days	
School or Other Training, # of days	
T1, *M* ± SD	1.4 ± 5.6 [a]
T_2, *M* ± SD	5.0 ± 15.1
Worked, # of days	
T_1, *M* ± SD	25.6 ± 30.9
T_2, *M* ± SD	27.7 ± 31.7

,

Criminal Justice Involvement

Table 13 and Figures 16a and 16b show changes in participants' involvement with the criminal justice system from T_1 to T_2. As illustrated in Figure 16a, the mean number of police stops/arrests decreased significantly from T_1 to T_2 (days of incarceration also were reduced, but this reduction was not statistically significant). At T_1, 32 individuals (40.0%) had been stopped or arrested by police during the previous 90 days. At T_2, this was reduced to 11 individuals (13.8%).

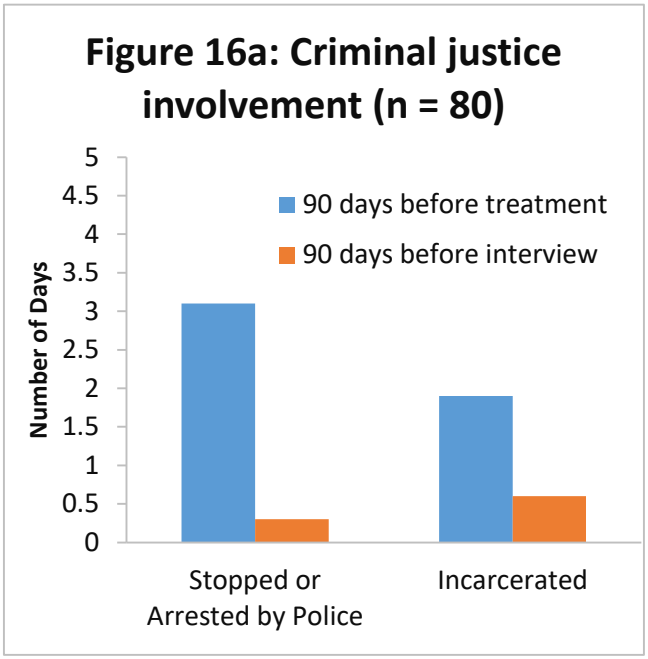
Self-reported days of illegal activities also had a 10-fold reduction from T_1 to T_2, as illustrated in Figure 16b and Table 13. When interviewers queried participants, there was remarkable openness about the fact that prior to treatment, some type of criminal activity (e.g., shoplifting, stealing from friends and family, drugs sales) was a routine and necessary event. For most, however, when they were able to discontinue their illegal opioid use, their involvement in illegal activities was no longer a necessary (or desired) activity.

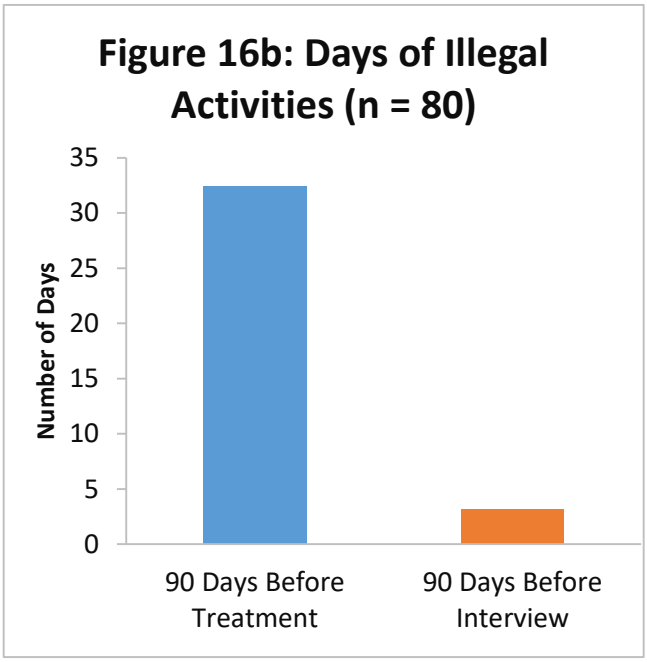
Table 13. Criminal Justice Involvement Among Participants in Treatment

	In Treatment (n = 80)
In the Past 90 Days	
Stopped or arrested by police, # of days	
T_1, *M* ± SD	3.1 ± 10.1 [a]
T_2, *M* ± SD	0.3 ± 1.0
Illegal Activities, # of days	
T_1, *M* ± SD	32.4 ± 38.3 [a]
T_2, *M* ± SD	3.1 ± 24.4
Incarcerated, # of days	
T_1, *M* ± SD	1.9 ± 6.5
T_2, *M* ± SD	0.6 ± 5.6

Note: T_1 is the 90-day period before treatment among in-treatment participants.

[a] There was a significant decrease in the T_2 number compared to T_1 among *in-treatment participants* (n = 80), p<.001; Wilcoxon signed-rank test





Family Conflict and Mood

Table 14 and Figure 17 show changes in participants' rates of family conflict and mood from T_1 to T_2. All measures (family conflict, days of depression, days of anxiety and days of irritability/anger) showed substantial and significant reductions. Treatment participation was associated with large and statistically significant improvements in mood and decreases in family conflict.

Table 14. Conflict and Mood Among Participants in Treatment

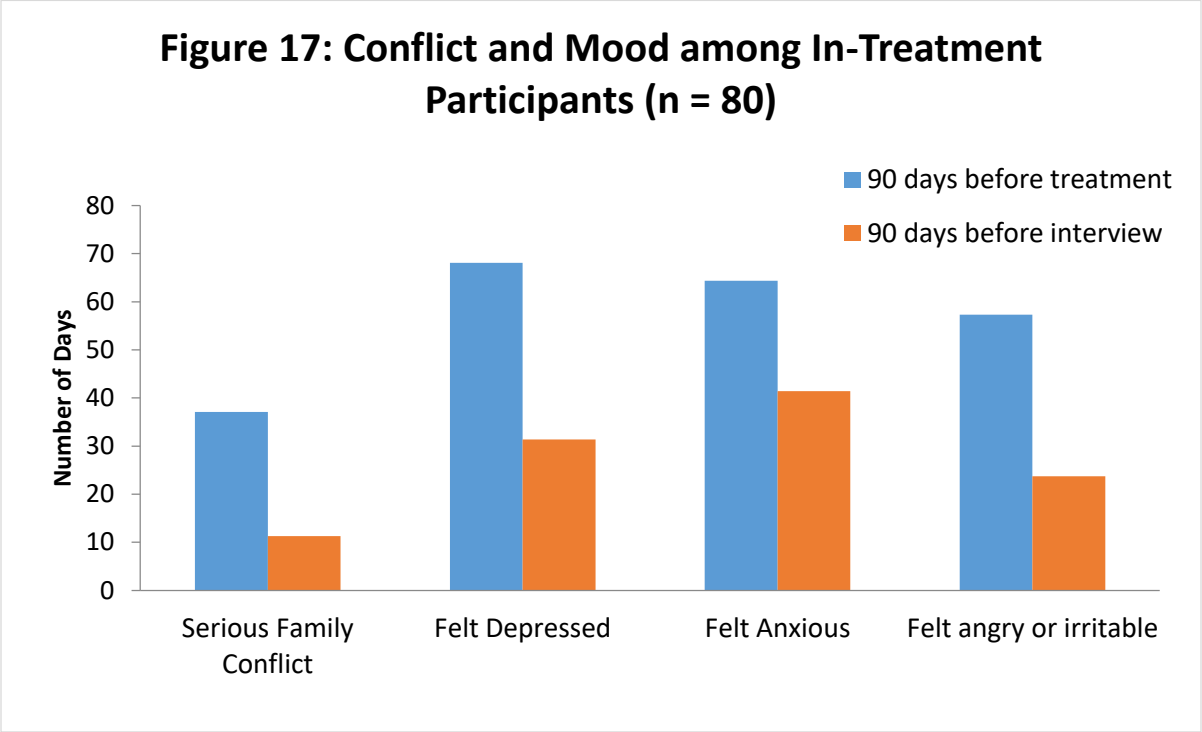
	In Treatment (n = 80)
In the Past 90 Days	
Serious Family Conflict, # of days	
T_1, M ± SD	37.1 ± 36.4 [a]
T_2, M ± SD	11.3 ± 24.4
Felt depressed, # of days	
T_1, M ± SD	68.1 ± 31.4 [a]
T_2, M ± SD	31.4 ± 33.4
Felt anxious, # of days	
T_1, M ± SD	64.4 ± 33.8 [a]
T_2, M ± SD	41.4 ± 36.6
Felt irritable or angry, # of days	

Table 14. Conflict and Mood Among Participants in Treatment

	In Treatment (n = 80)
T_1, M ± SD	57.3 ± 31.9 [a]
T_2, M ± SD	23.7 ± 28.6

Note: T_1 is the 90-day period before treatment among in-treatment participants.

[a] There were significant decreases in mean days of serious conflict, depression, anxiety or irritability from T_1 to T_2 among *in-treatment participants* (n = 80), p<.001; Wilcoxon signed-rank test



Satisfaction-with-Life Scores

Satisfaction-with-life scores are presented for both the in-treatment and out-of-treatment groups.

Out-of-treatment group

Table 15 and Figure 18 show changes in participants' rates of selected life satisfaction measures from T_1 to T_2. As seen below, ratings of satisfaction with all areas of life measured were

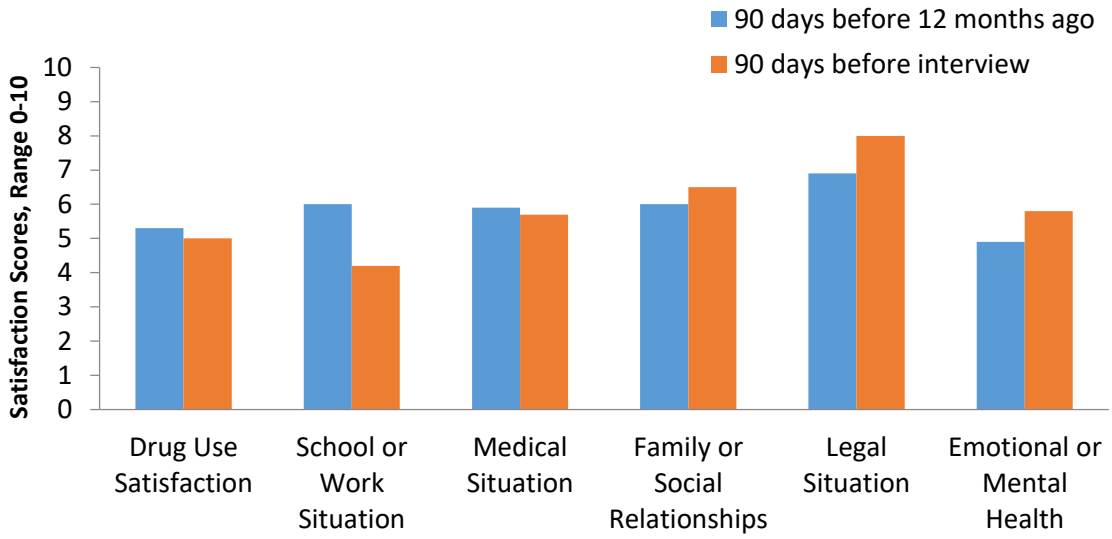
in the middle range of the scale and showed very little change from T_1 to T_2 for the 20 out-of-treatment participants.

Table 15. Satisfaction Scores Among Participants Out of Treatment

	Out of Treatment (n = 20)
Satisfaction Scores, Range 0 - 11	
In the past 90 days (mean score)	
Drug Use Situation	
T_1, *M* ± SD	5.3 ± 3.9
T_2, *M* ± SD	5.0 ± 3.6
School or Work Situation	
T_1, *M* ± SD	6.0 ± 3.9
T_2, *M* ± SD	4.2 ± 3.8
Medical Situation	
T_1, *M* ± SD	5.9 ± 3.6
T_2, *M* ± SD	5.7 ± 3.2
Family or Social Relationships	
T_1, *M* ± SD	6.0 ± 3.4
T_2, *M* ± SD	6.5 ± 3.7
Legal Situation	
T_1, *M* ± SD	6.9 ± 4.1
T_2, *M* ± SD	8.0 ± 3.8
Emotional or Mental Health	
T_1, *M* ± SD	4.9 ± 3.6
T_2, *M* ± SD	5.8 ± 3.6

Note: T_1 is the 90 days prior to the 12-month period before the interview with the out-of-treatment participants.

Figure 18: Satisfaction scores of out-of-treatment participants (n = 20)



In-treatment group

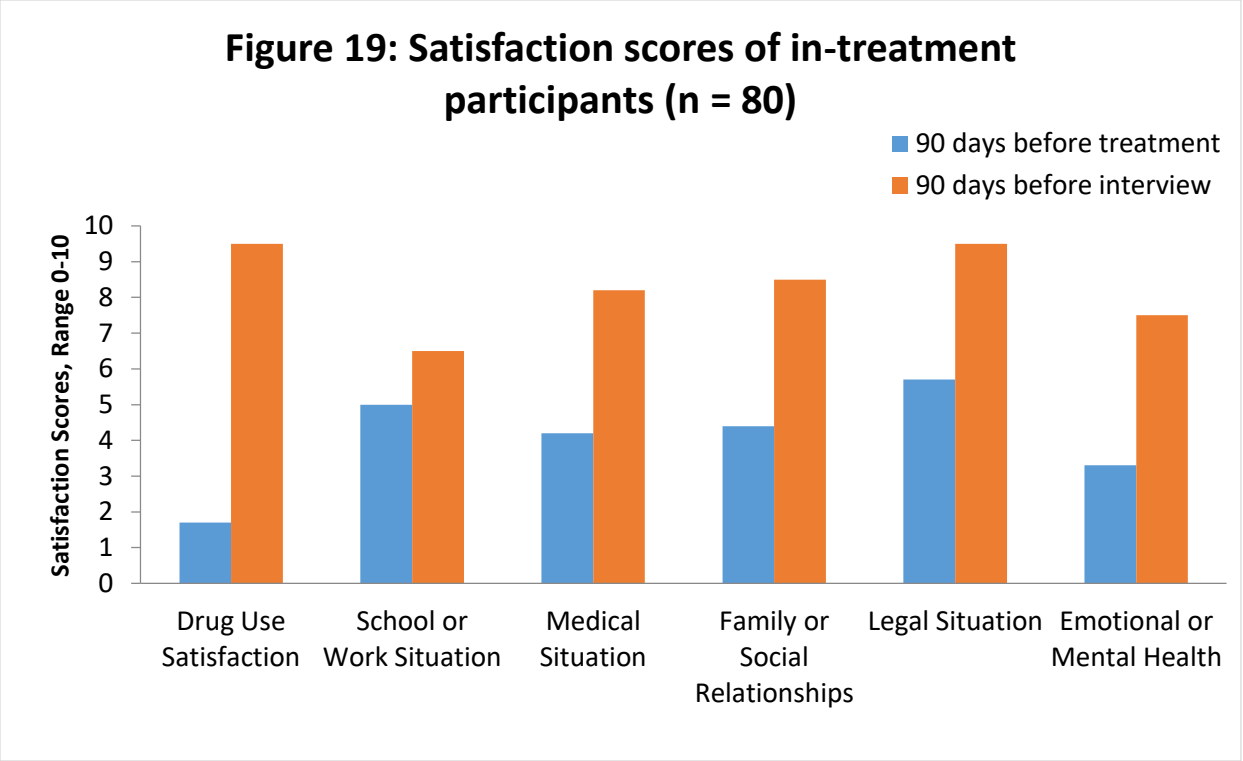
Table 16 and Figure 19 show changes in of participants' rates of selected life satisfaction measures from T_1 to T_2. The T_1 ratings for the in-treatment participants are comparable with the out-of-treatment participant scores illustrated in Figure 18. However, at T_2 these ratings improved to close to the top of the rating scale, with ratings of 8's and 9's for 4 of the 6 domains. As seen below, the in-treatment group showed improvement in all six domains, with the drug use and criminal justice domains showing the greatest improvement and the school or work situation domain showing the least improvement.

Table 16. Satisfaction Scores Among Participants in Treatment

	In Treatment (n = 80)
Satisfaction Scores, Range 0 – 11	
In the past 90 days (mean score)	
Drug Use Situation	
T_1, *M* ± SD	1.7 ± 1.3 [a]
T_2, *M* ± SD	9.5 ± 2.3
School or Work Situation	
T_1, *M* ± SD	5.0 ± 3.3 [a]
T_2, *M* ± SD	6.5 ± 3.3
Medical Situation	
T_1, *M* ± SD	4.2 ± 2.9 [a]
T_2, *M* ± SD	8.2 ± 2.6
Family or Social Relationships	
T_1, *M* ± SD	4.4 ± 3.5 [a]
T_2, *M* ± SD	8.5 ± 2.8
Legal Situation	
T_1, *M* ± SD	5.7 ± 3.8 [a]
T_2, *M* ± SD	9.5 ± 2.6
Emotional or Mental Health	
T_1, *M* ± SD	3.3 ± 2.7 [a]
T_2, *M* ± SD	7.5 ± 3.0

Note: T_1 is the 90-day period before treatment among in-treatment participants.

[a] T_2 satisfaction among *in-treatment* participants is higher compared to T_1 (N=80), $p<.01$; Wilcoxon signed-rank test



Summary

The results presented in this section of the report suggest that individuals with OUDs who were not in treatment showed very little change in drug use, functioning, and satisfaction with their lives from T_1 to T_2. Those in treatment in the H & S system showed significant positive change in almost all domains. Substance use other than cannabis and tobacco was greatly reduced, with the greatest reductions in opioid use. Eighty-five percent (85%) of in-treatment participants reported abstinence from opioid use for the 90-day period prior to the interview, an indication that MAT, as delivered in the H & S system in Vermont, is a highly effective approach for reducing opioid use. Functioning in many areas of their life were greatly improved; participants showed reductions in overdoses, ED visits, police contacts, family conflict, and improvements in mood and satisfaction with almost all areas of life. The domain that showed the least improvement was work/school participation and satisfaction.

Part 2. Hub Participants vs. Spoke Participants Comparison

This section focuses on the results of the 40 hub participants and the 40 spoke participants, followed by the combined total in tabular form (Tables 17–33). Some data are presented graphically (Figures 20–24).

Statistical comparisons of hub and spoke groups at each time point and from pretreatment (T_1) to the time of interview (T_2) were conducted. The sample size of 40 per group, with a $p<.05$ significance level, is only able to detect a large effect size. Due to the small sample size, a type II alpha error (i.e., not detecting a true difference due to inadequate sample size) is possible. Therefore, while statistically significant findings were reported, there may be other differences that were not detected due to sample size.

Another limitation of a comparison of hub and spoke participants is that many of the patients treated in hubs and spokes were placed into those settings based on Treatment Needs Questionnaire (TNQ) scores. The TNQ was used to guide opioid users with greater severity problems into hubs and those with lower severity into spokes. Consequently, differences in treatment response between participants treated in hubs versus spokes may not be a function of the treatment site (i.e., hub or spoke) per se, but may also be influenced by patient variables (i.e., severity of addiction at admission). Despite this, changes over time among patients in these two settings may provide useful information. These data may serve as a preliminary dataset that provides a foundation for a more complete and scientifically rigorous assessment of the H & S model of care.

Participant Demographics

Demographic characteristics and drug histories (Tables 17–23) are based on data collected at the time of the interview (T_2).

Table 17 shows demographic characteristics of the sample of in-treatment opioid users. There were no meaningful differences in the demographic characteristics of the participants in the two groups.

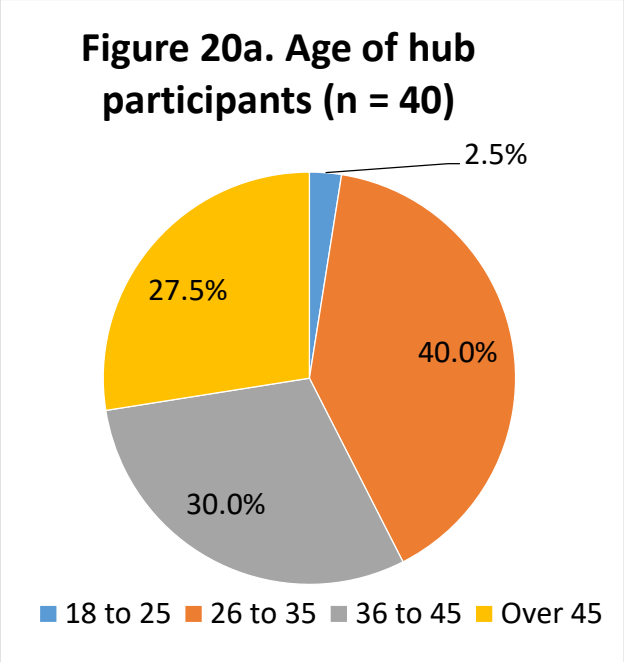
Table 17. Demographic Characteristics of Participants, by Hub and Spoke

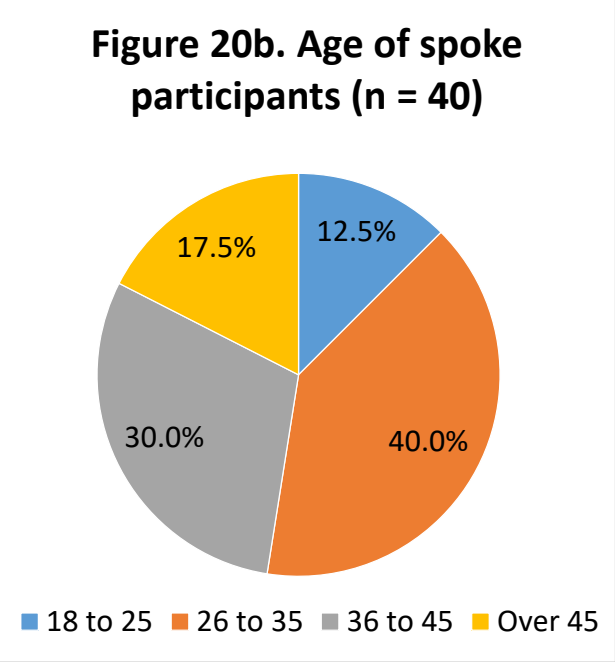
	Hub (n = 40)	Spoke (n = 40)	Total (N = 80)
Age (in years), *M* ± SD	39.9 ± 11.1	36.5 ± 10.9	38.2 ± 11.1
Age, %			
18 to 25	2.5%	12.5%	7.5%
26 to 35	40.0%	40.0%	40.0%
36 to 45	30.0%	30.0%	30.0%

Table 17. Demographic Characteristics of Participants, by Hub and Spoke

	Hub (n = 40)	Spoke (n = 40)	Total (N = 80)
Over 45	27.5%	17.5%	22.5%
Gender, %			
Male	50.0%	50.0%	50.0%
Female	50.0%	50.0%	50.0%
Race, %			
Non-Hispanic White	97.5%	92.5%	95.0%
Latino or Hispanic	0.0%	7.5%	3.8%
American Indian or Alaska Native	2.5%	0.0%	1.2%
Marital Status, %			
Single	42.5%	50.0%	46.2%
Married/Living together as married	40.0%	25.0%	32.5%
Divorced	17.5%	25.0%	21.3%
Education (in years), *M* ± SD	12.5 ± 2	12.7 ±2	12.6 ± 2
Education, %			
Less than 12th Grade	12.5%	20.0%	18.8%
12th Grade	45.0%	40.0%	42.4%
Some College	32.5%	25.0%	28.8%
Bachelor's Degree	2.5%	12.5%	7.5%
Advanced Degree	2.5%	2.5%	2.5%
Parole or Probation (% yes)	32.5%	20.0%	26.3%

Figures 20a and 20b below compare age distribution for the two groups, illustrating a comparable age distribution in the two settings.





Family/Social Relationships/Housing Status

Table 18 shows the data on family/social relationships and housing status at T_2. As seen below, the two groups did not significantly differ in these measures, except for the percentage of participants' significant others who were either current or previous drug users. A higher percentage of participants in the hubs had a significant other with a drug use history (77.8% vs. 42.3%) than those in the spokes.

Table 18. Family-Social Relationships and Housing Status of Participants at T_2, by Hub and Spoke

	Hub (n = 40)	Spoke (n = 40)	Total (N = 80)
1. Have a significant other (% yes)	67.5%	52.5%	60.0%
Significant other is a current or former drug user (% of those with a significant other saying "yes")	77.8%	42.9%	62.5%[a]
Significant other is in treatment for drug use (% of those with a significant other with a drug use history saying "yes")	81.0%	88.9%	83.3%
2. Participants who have children (% yes)	77.5%	70.0%	73.8%
For those with children, the mean number of children, *M* ± SD	2.5 ± 1.4	2.4 ± 1.7	2.4 ± 1.5
Range	1-6	1-8	1-8
Children live with participant (% yes)	38.7%	57.1%	47.5%
3. Current housing status (% yes)			
Own home or apartment	67.5%	75.0%	71.3%
Staying with family or friends	20.0%	17.5%	18.8%
In a shelter or homeless	12.5%	7.5%	9.9%

[a] *Hub* participants more often than *spoke* participants reported a significant other who is a current or former drug user (n=80), $p<0.05$

Health Conditions

Table 19 shows participant status for selected health conditions at T_2. Rates of history of mental illness were comparable between hubs and spokes; rates of HIV testing were very high and HIV prevalence very low in both groups. Fewer spoke participants were positive for hepatitis C than participants in the hubs (22.9% vs. 43.6%). This is likely related to the somewhat lower rate of injection drug use among spoke participants (See Table 25).

Table 19. Health of Participants at T_2, by Hub and Spoke

	Hub (n = 40)	Spoke (n = 40)	Total (N = 80)
Mental Health Condition, (% yes)	44.8%	48.7%	47.1%
Tested for HIV (% report "yes")	92.5%	95.0%	93.8%
HIV Results, among those tested, %			

Table 19. Health of Participants at T_2, by Hub and Spoke

	Hub (n = 40)	Spoke (n = 40)	Total (N = 80)
Positive	0.0%	2.6%	1.3%
Negative	91.9%	97.4%	94.7%
Unknown	8.1%	0.0%	4.0%
Tested for hepatitis C (% report "yes")	97.5%	87.5%	92.5%
Hepatitis C results, among those tested, %			
Positive	43.6%	22.9%	33.8% [a]
Negative	51.3%	77.1%	63.5%
Unknown	5.1%	0.0%	2.7%

[a] *Hub* participants more frequently reported a positive hepatitis C result (n=80), p<.05, than *spoke* participants

Drug Use and Treatment History Information

Non-opioid and opioid-use history

Tables 20, 21, and 22 present participant substance use history (Table 20: Non-opioids; Table 21: Opioids; Table 22: First opioid used).

As seen in Table 20 below, despite the use of the Treatment Needs Questionnaire, which attempts to direct more severe and chronic users into the hubs, there was little difference in substance use history between the hub and spoke groups.

Table 20. Drug History of Participants, by Hub and Spoke

	Number Who Used (out of 80)	Hub (n = 40)	Spoke (n = 40)	Total (N = 80)
Age first used				
Tobacco				
M ± SD	73	13.7 ± 3.5	14.0 ± 3.4	13.8 ± 3.4
Alcohol				
M ± SD	76	13.5 ± 3.7	14.4 ± 3.5	14.0 ± 3.6
Cannabis				
M ± SD	76	13.5 ± 2.9	14.5 ± 3.7	14.0 ± 2.8 [a]
Hallucinogens				
M ± SD	60	17.0 ± 3.7	16.8 ± 1.9	16.9 ± 2.9
Cocaine				
M ± SD	77	20.2 ± 6.5	18.4 ± 4.1	19.3 ± 5.4
Sedatives/Tranquilizers				
M ± SD	55	23.6 ± 8.4	19.2 ± 4.9	21.4 ± 7.2
Amphetamines				
M ± SD	45	21.4 ± 4.4	18.2 ± 4.4	19.9 ± 6.7

[a] *Hub* participants' median age of first use of cannabis was significantly younger than *spoke* participants (n=80), p<.05; Mann- Whitney U

Opioid use history differed by group (Table 21); only 1 hub participant, compared to 7 spoke participants, had an opioid use history of 5 years or less. This difference suggests that individuals with a shorter opioid use history were directed to and/or selected treatment in spoke settings.

Table 21. Opioid Use History of Participants, by Hub and Spoke

	Number Who Used	Hub (n = 40)	Spoke (n = 40)	Total (N = 80)
Age first used				
Prescription Opioids without a doctor's prescription				
M ± SD	79	23.1 ± 9.3	20.1 ± 7.9	21.8 ± 8.6
Illicit Opioids				
M ± SD	74	26.2 ± 10.1	25.0 ± 9.7	25.7 ± 9.9
Opioid Treatment Medication without prescription				
M ± SD	62	28.6 ± 10.1	26.2 ± 10	27.3 ± 10.0
Opioid Injection				
M ± SD	52	28.4 ± 13.4	26.0 ± 9.5	27.3 ± 11.7
% of participants using opioids before the age of 18	37	45.0%	47.5%	46.3%
% of participants using prescription opioids prior to illicit opioids or medication	66	80.0%	85.0%	82.5%
Years addicted to opioids, *M* ± SD				
M ± SD	80	15.4 ± 8.1	14 ± 8.9	14.7 ± 8.5
Median		13.0	12.0	13.0
Range		4-44	1-42	1-44
Years addicted to opioids, %				
5 years or less	8	2.5%	17.5%	10.0%
5 to 10 years	20	30.0%	20.0%	25.0%
10 to 20 years	38	47.5%	47.5%	47.5%
More than 20 years	14	20.0%	15.0%	17.5%

As seen in Table 22 below, it appears that more hub participants began opioid use with heroin/fentanyl (22.5%) than did spoke participants (7.5%). However, this difference was not statistically significant.

Table 22. First Opioid of Participants, by Hub and Spoke

	Hub (n = 40)	Spoke (n = 40)	Total (N = 80)
% who report as first opioid used			
Prescription opioids	75.0%	90.0%	82.4%
Heroin/Fentanyl	22.5%	7.5%	15.0%
Buprenorphine tablets without prescription	2.5%	0.0%	1.3%
Prescription opioids and heroin used together at first use	0.0%	2.5%	1.3%

Treatment history

Table 23 presents treatment history of the 80 in-treatment participants. Overall, the treatment history of those in hubs and spokes were comparable. Travel distances to the hubs and spokes were comparable for both groups.

Table 23. Treatment History of Participants, by Hub and Spoke

	Hub (n = 40)	Spoke (n = 40)	Total (N = 80)
No prior treatment episodes, %	27.7%	40%	33.8%
Previous treatment episodes, *M* ± SD	2.3 ± 2.7	2.3 ± 3.3	2.3 ± 3
Previous treatment episodes if episodes >0, *M* ± SD	3.1 ± 2.8	3.8 ± 3.1	3.5 ± 3.1
Months in Treatment			
M ± SD	29.1 ± 20.5	37.3 ± 36	33.2 ± 29.4
Median	24.0	24.0	24.0
Months in Treatment, %			
Six to 12 months	27.5%	37.5%	32.5%
Between 1 and 3 years	42.5%	30.0%	36.3%
More than 3 years	30.0%	32.5%	31.2%
Drive time to treatment center in minutes			
M ± SD	19.3 ± 14.3	18.6 ± 18.8	18.9 ± 16.8
Median	15.5	15.0	15.0
Range	5-75	5-120	5-120

Measures of Changes in Functioning

Non-opioid use

Table 24 shows the change in days of drug or alcohol use (out of 90) between T_1 and T_2. The reduction in drug-use days from the time of admission (T_1) until the time of the interview (T_2) was statistically significant for the entire sample of 80 participants for all categories of drugs except cannabis and hallucinogens (the baseline level of hallucinogen use was very low). Among the 40 hub participants, significant reductions occurred in all categories except cannabis and hallucinogens. Among the 40 individuals in the spokes, there was a significant reduction in days of alcohol, cocaine, and sedative/tranquilizer use.

Of note is that among hub participants, although there was a decrease in days of use in most categories, with cannabis, there was a slight increase in the number of days of use. For those in the spokes, there was a reduction in the number of cannabis-use days, but this did not achieve statistical significance.

Table 24. Other Substance Use of Participants, by Hub and Spoke

	Hub (n = 40)	Spoke (n = 40)	Total (N = 80)
In the past 90 days (mean # of days)			
Tobacco			
T_1, *M* ± SD	81.1 ± 27.3	63.3 ± 40.3	72.1 ± 32.4 [a]
T_2, *M* ± SD	72.5 ± 33.9	54.1 ± 43.4	63.1 ± 39.7
% currently using any amount	87.5%	67.5%	77.5%
Alcohol			
T_1, *M* ± SD	18.4 ± 31.2	21.6 ± 33	20.0 ± 31.9 [a,b]
T_2, *M* ± SD	2.9 ± 7.2	10.4 ± 27.1	6.7 ± 20.0
% currently using any amount	32.5%	35.0%	33.8%
Cannabis			
T_1, *M* ± SD	34.8 ± 42.6	29.0 ± 38.7	31.9 ± 40.5
T_2, *M* ± SD	38.2 ± 41.2	19.9 ± 35.4	29.0 ± 39.2
% currently using any amount	57.5%	37.5%	47.5%
Hallucinogens			
T_1, *M* ± SD	3.9 ± 16.9	0.3 ± 1.0	2.1 ± 12 [a]
T_2, *M* ± SD	0.1 ± 0.5	---	0.0 ± 0.3
% currently using any amount	2.5%	0.0%	1.3%
Cocaine			
T_1, *M* ± SD	26.8 ± 35.7	9.3 ± 16.1	18.1 ± 28.9 [a, b]
T_2, *M* ± SD	8.3 ± 19.6	2.0 ± 6.2	5.1 ± 14.8
% currently using any amount	32.5%	22.5%	27.5%
Sedatives/Tranquilizers			
T_1, *M* ± SD	18.5 ± 35.0	14.1 ± 27.5	16.3 ± 31.3 [a, b]
T_2, *M* ± SD	0.3 ± 1.6	5.2 ± 19.8	2.8 ± 14.2
% currently using any amount	7.5%	17.5%	12.5%

Table 24. Other Substance Use of Participants, by Hub and Spoke

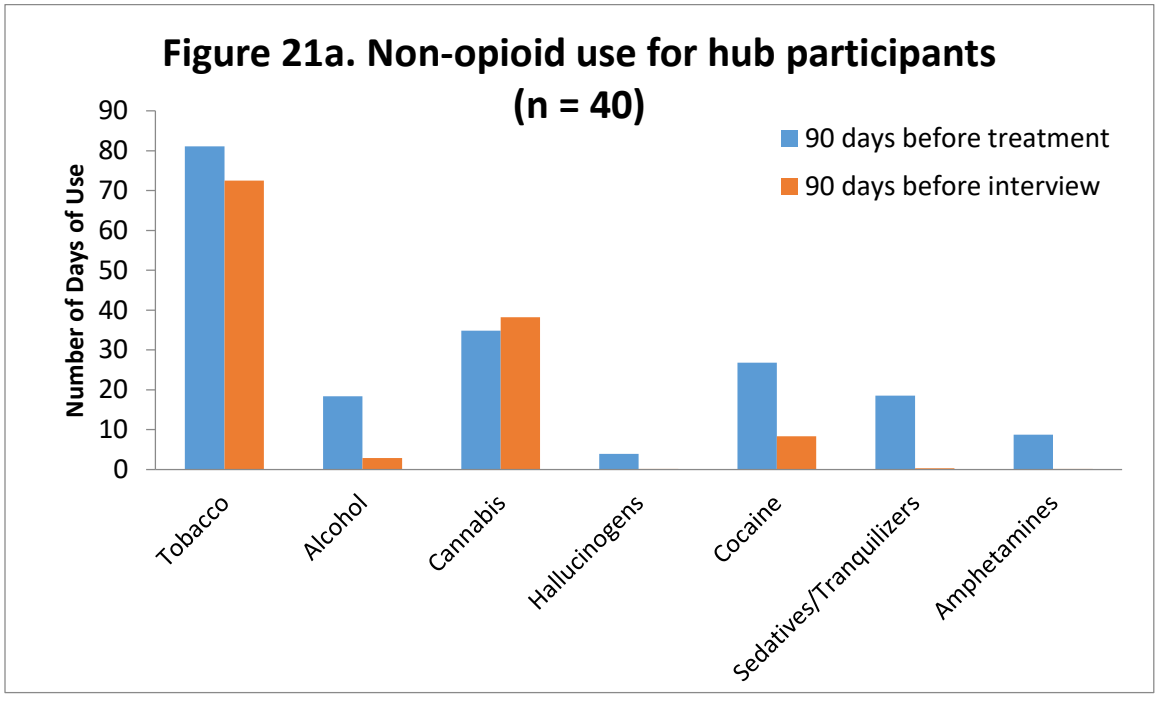
	Hub (n = 40)	Spoke (n = 40)	Total (N = 80)
Amphetamines			
T_1, *M* ± SD	8.7 ± 24.1	7.2 ± 21.7	7.9 ± 22.8 [a]
T_2, *M* ± SD	0.1 ± 0.8	2.3 ± 14.2	1.2 ± 10.0
% currently using any amount	2.5%	5.0%	3.8%

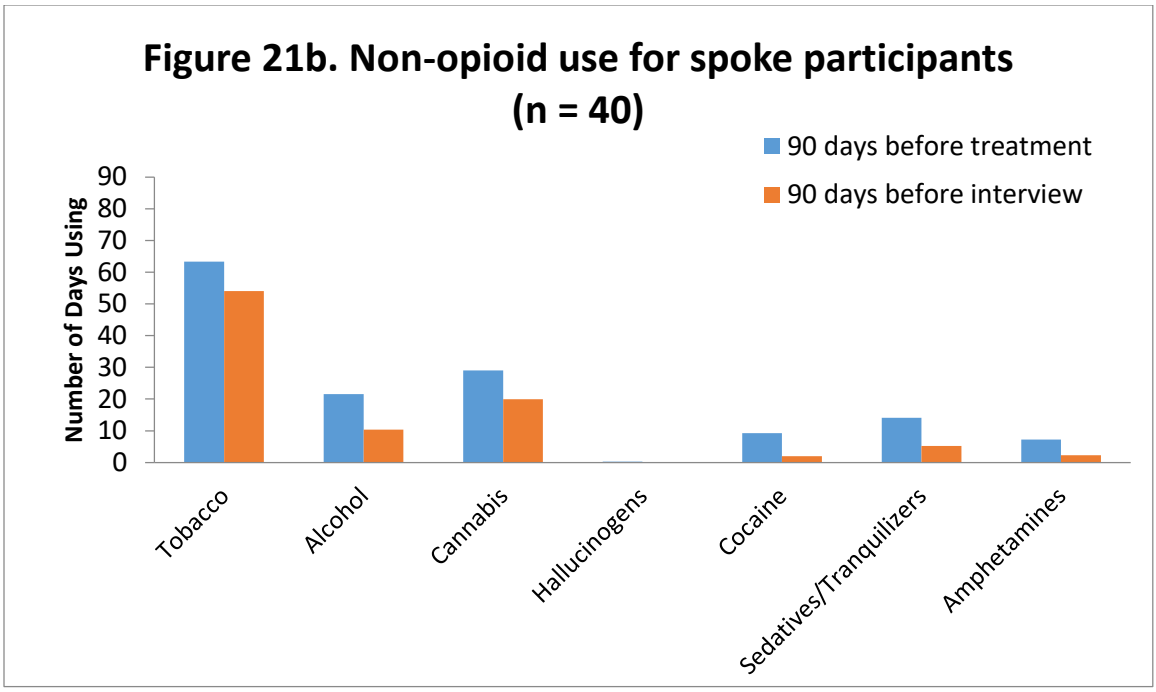
Note: T_1 is the 90-day period before treatment.

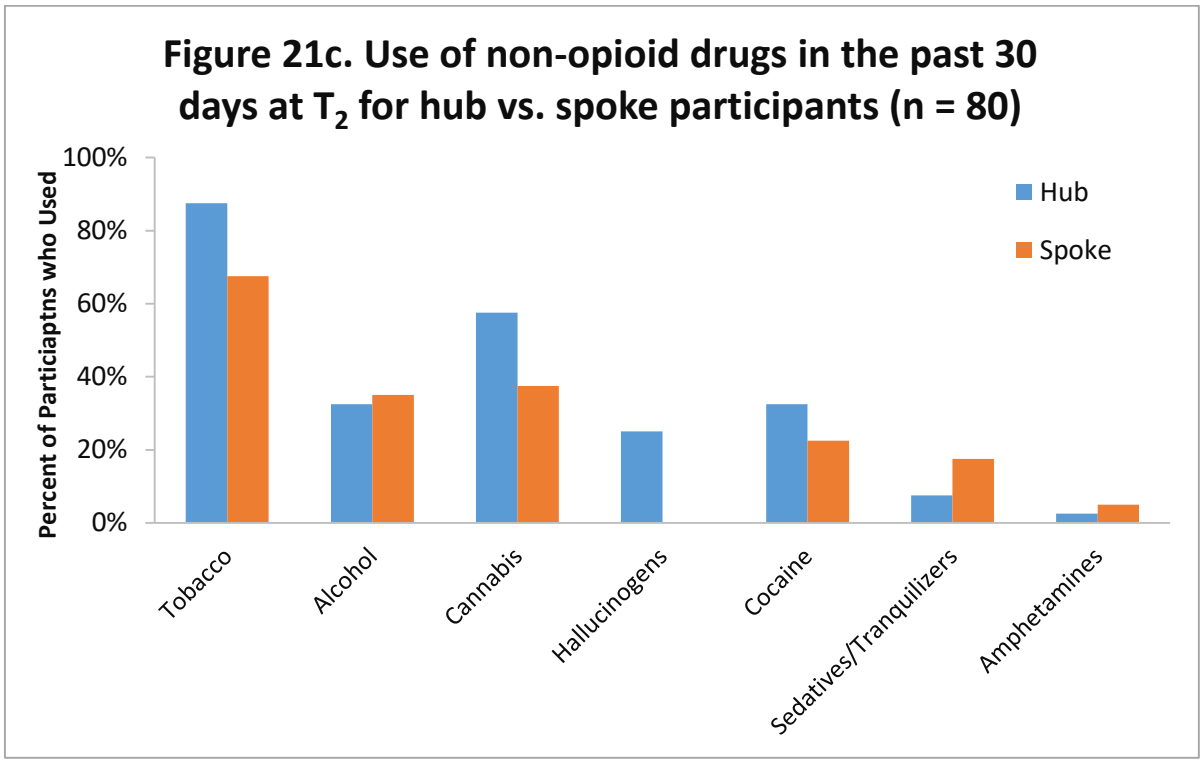
[a] There was a statistically significant decrease in the T_2 mean number of days compared to T_1, among *hub* participants (n = 40), p<.05; Wilcoxon signed-rank test

[b] There was a statistically significant decrease in the T_2 mean number of days used compared to T_1, among *spoke* participants (n = 40), p<.05; Wilcoxon signed-rank test

Figures 21a and 21b show the reduction from T_1 to T_2 in days of drug use for participants in hubs and spokes. Figure 21c shows the percentage of participants using alcohol or non-opioid drugs on ANY days in the past 90 days at T_2. A lower percentage of spoke participants reported any tobacco use and any cannabis use than did hub participants. However, about 10% more spoke patients reported continued sedative/tranquilizer use.







Opioid use

There was a similar reduction in the use of all categories of opioids for participants in both hubs and spokes (See Table 25). Although participants in the hubs used heroin/fentanyl and injected on more days at T_1, there were no statistically significant differences in the reduction in

opioid use days or days of injection use between the participants in the hubs and spokes. In addition, the percentage of individuals reporting opioid use at T_2 was also comparable. Abstinence from all substances other than tobacco varied at 40.0% of spoke patients versus 20.0% of the hub participants. This difference is likely accounted for by the higher rate of ongoing cannabis use among hub participants.

Table 25. Opioid Use of Participants, by Hub and Spoke

	Hub (n = 40)	Spoke (n = 40)	Total (N = 80)
In the Past 90 Days (mean # of days)			
Any Opioid Use			
T_1, *M* ± SD	87.0 ± 14.5	84.6 ± 13.3	85.8 ± 13.9 [a, b]
T_2, *M* ± SD	2.1 ± 8.5	3.8 ± 16.1	3.0 ± 12.8
% currently using any amount	15.0%	15.0%	15.0%
Prescription Opioids without a doctor's prescription			
T_1, *M* ± SD	35.7 ± 35.7	33.3 ± 36.5	34.5 ± 35.7 [a, b]
T_2, *M* ± SD	0.5 ± 1.8	2.8 ± 14.5	1.6 ± 10.3
% currently using any amount	12.5%	10.0%	11.3%
Illicit Opioids			
T_1, *M* ± SD	67.4 ± 34.0	42.0 ± 40.2	54.7 ± 39.1 [a, b]
T_2, *M* ± SD	1.6 ± 8.2	3.1 ± 14.9	2.3 ± 12.0
% currently using any amount	5.0%	7.5%	6.3%
Opioid Treatment Medication, without prescription			
T_1, *M* ± SD	21.3 ± 30.2	24.3 ± 3.5	22.8 ± 31.2 [a, b]
T_2, *M* ± SD	0.0 ± 0.2	0.2 ± 1.0	0.1 ± 0.7
% currently using any amount	2.5%	5.0%	3.8%
Opioid Injection			
T_1, *M* ± SD	57.5 ± 40.6	28.9 ± 39.6	43.2 ± 42.4 [a, b]
T_2, *M* ± SD	4.5 ± 14.0	2.4 ± 14.2	3.4 ± 14.1
% currently injecting	15.0%	7.5%	11.3%
% of participants who currently report that they have not used any opioids in the past 90 days	85.0%	85.0%	85.0%
% of participants who currently report that they have not used any opioid or other drugs, excluding tobacco, alcohol or cannabis, %	57.5%	67.5%	62.5%
% of participants who currently report that they have not used any of these other drugs, excluding tobacco, %	20.0%	40.0%	30.0%

Note: T_1 is the 90-day period before treatment.

[a] There was a statistically significant decrease in the T_2 mean number of days compared to T_1, among *hub* participants (n=40) p <.001; Wilcoxon signed-rank test

[b] There was a statistically significant decrease in in the T_2 mean number of days compared to T_1, among *spoke* participants (n=40) p <.001; Wilcoxon signed-rank test

Other Areas of Functioning

Medical Services/Overdose

Table 26 shows utilization of selected medical services and overdose information. Although hub participants had higher utilization of the ED than spoke patients at T_1, the reduction in ED visits was statistically significant in both groups. There was a reduction in the number of overnight hospital stays, but this reduction was not statistically significant. Hub patients were more likely to have overdosed in the 90 days before admission at 32.5%, than those in spokes at 17.5%. The overdose frequency fell to zero at the T_2 measurement point for both groups.

Table 26. Medical Visits of Participants, by Hub and Spoke

	Hub (n = 40)	Spoke (n = 40)	Total (N = 80)
In the Past 90 Days			
ED Visits, # of times			
T_1, *M* ± SD	5.2 ± 11.4	1.9 ± 3.8	3.5 ± 8.6 [a, b]
T_2, *M* ± SD	0.6 ± 1.3	0.2 ± 0.4	0.4 ± 1.0
Overnight hospital, # of days			
T_1, *M* ± SD	3.2 ± 11.7	0.5 ± 1.8	1.9 ± 6.5
T_2, *M* ± SD	0.9 ± 3.6	0.1 ± 0.3	0.6 ± 5.6
Outpatient or doctor's visits, # of times			
T_1, *M* ± SD	2.7 ± 6.0	2.9 ± 5.8	2.8 ± 5.8
T_2, *M* ± SD	2.0 ± 2.2	4.4 ± 7.8	3.2 ± 5.9
Lifetime Overdoses, *M* ± SD	1.6 ± 3.3	1.4 ± 2.2	1.5 ± 2.8
Overdose (% yes in the past 90 days)			
T_1	32.5%	17.5%	25.0%
T_2	0.0%	0.0%	0.0%

Note: T_1 is the 90-day period before treatment.

[a] There was a significant decrease in the T_2 mean number of ER visits compared to T_1 among *hub participants* (n = 40), p<.05; Wilcoxon signed-rank test

[b] There was a significant decrease in the T_2 mean number of ER visits compared to T_1 among *spoke participants* (n = 40), p<.01; Wilcoxon signed-rank test

Employment and School Participation

Table 27 presents the number of days of school attendance or employment from T_1 to T_2. Days of school attendance over the treatment period showed a small increase for both groups. However, the increase in school or training days was only statistically significant among the hub group. Days worked for hub participants decreased 25%, whereas they increased 37% for spoke participants. While the statistical significance of these changes is borderline, the difference may have some clinical significance. The structure of hubs, with daily or near daily visits required, are

less conducive to working standard hours than the structure of spoke services, which requires less frequent physician visits.

Table 27. Work and School Days of Participants, by Hub and Spoke

	Hub (n = 40)	Spoke (n = 40)	Total (N = 80)
In the Past 90 Days			
School or Other Training, # of days			
T_1, *M* ± SD	0.3 ± 1.9	2.5 ± 7.5	1.4 ± 5.6 [a]
T_2, *M* ± SD	3.9 ± 14.6	6.1 ± 15.7	5.0 ± 15.1
Worked, # of days			
T_1, *M* ± SD	24.0 ± 32.7	27.2 ± 29.4	25.6 ± 30.9
T_2, *M* ± SD	18.0 ± 29.3	37.4 ± 31.3	27.7 ± 31.7

Note: T_1 is the 90-day period before treatment.

[a] There was a significant increase in the current mean number of days in school or other training compared to pre among *hub participants* (n = 40), p<.05; Wilcoxon signed-rank test.

Criminal Justice Involvement

Table 28 presents several measures of participants' involvement with the criminal justice system. There was a significant reduction in the number of police contacts/arrests for hub participants from T_1 to T_2. Spoke participants had fewer contacts/arrests at T_1 and had a non-statistically significant decrease in the measure. A similar pattern was found for incarceration, although the reductions were not statistically significant. At the time of the interview (T_2), only 2 of the 80 participants had spent any days incarcerated during the previous 90 days. Both groups showed a statistically significant decrease in the number of days engaged in illegal activities.

Table 28. Criminal Justice Involvement of Participants, by Hub and Spoke

	Hub (n = 40)	Spoke (n = 40)	Total (N = 80)
In the Past 90 Days			
Stopped or arrested by police, # of days			
T_1, *M* ± SD	4.1 ± 10.6	2.1 ± 9.6	3.1 ± 10.1[a]
T_2, *M* ± SD	0.4 ± 1.1	0.3 ± 1.0	0.3 ± 1.0
Illegal activities, # of days			
T_1, *M* ± SD	30.6 ± 38.9	34.1 ± 38.1	32.4 ± 38.3[a,b]
T_2, *M* ± SD	3.2 ± 12.1	3.1 ± 14.3	3.1 ± 13.2
Incarcerated, # of days			
T_1, *M* ± SD	2.8 ± 7.6	1.0 ± 5.0	1.9 ± 6.5
T_2, *M* ± SD	1.3 ± 7.9	0.0 ± 0.2	0.6 ± 5.6

Note: T_1 is the 90-day period before treatment.

[a] There was a significant decrease in the T_2 mean number of days compared to T_1 among *hub* participants (n = 40), p<.001; Wilcoxon signed-rank test

[b] There was a significant decrease in the T_2 mean number of days compared to T_1 among *spoke* participants (n = 40), p<.001; Wilcoxon signed-rank test

Family Conflict and Mood States

Table 29 presents the rates of family conflict and three measures of mood states. There was a substantial reduction in the days with family conflict and feelings of depression, anxiety, and irritability/anger for all participants, with no apparent difference between hubs and spokes. Involvement in the hubs and spokes is associated with improvement in family functioning and important emotional states.

Table 29 Conflict and Mood of Participants, by Hub and Spoke

	Hub (n = 40)	Spoke (n = 40)	Total (N = 80)
In the Past 90 Days			
Serious Family Conflict, # of days			
T_1, *M* ± SD	37.0 ± 36.4	37.2 ± 36.8	37.1 ± 36.4 [a,b]
T_2, *M* ± SD	14.0 ± 28.4	8.7 ± 19.7	11.3 ± 24.4
Felt depressed, # of days			
T_1, *M* ± SD	75.2 ± 37.9	60.9 ± 33.4	68.1 ± 31.4 [a,b]
T_2, *M* ± SD	33.1 ± 33.4	29.8 ± 34.1	31.4 ± 33.4
Felt anxious, # of days			
T_1, *M* ± SD	68.8 ± 32.3	60.0 ± 35.1	64.4 ± 33.8 [a,b]
T_2, *M* ± SD	40.3 ± 36.9	42.5 ± 36.6	41.4 ± 36.6
Felt irritable or angry, # of days			

Table 29 Conflict and Mood of Participants, by Hub and Spoke

	Hub (n = 40)	Spoke (n = 40)	Total (N = 80)
T_1, *M* ± SD	57.5 ± 33.2	57.1 ± 31	57.3 ± 31.9 [a,b]
T_2, *M* ± SD	25.8 ± 33.1	21.6 ± 23.6	23.7 ± 28.6

Note: T_1 is the 90-day period before treatment.

[a] There were significant decreases in T_2 mean days of serious conflict, depression, anxiety or irritability compared to T_1 among *hub* participants (n = 40), p<.001; Wilcoxon signed-rank test

[b] There were significant decreases in T_2 mean days of serious conflict, depression, anxiety or irritability compared to T_1 among *spoke* participants (n = 40), p<.01; Wilcoxon signed-rank test

Satisfaction with Life Scores

Table 30 presents ratings of satisfaction in six life areas for both groups and both time points.

Table 30. Satisfaction Scores of Participants, by Hub and Spoke

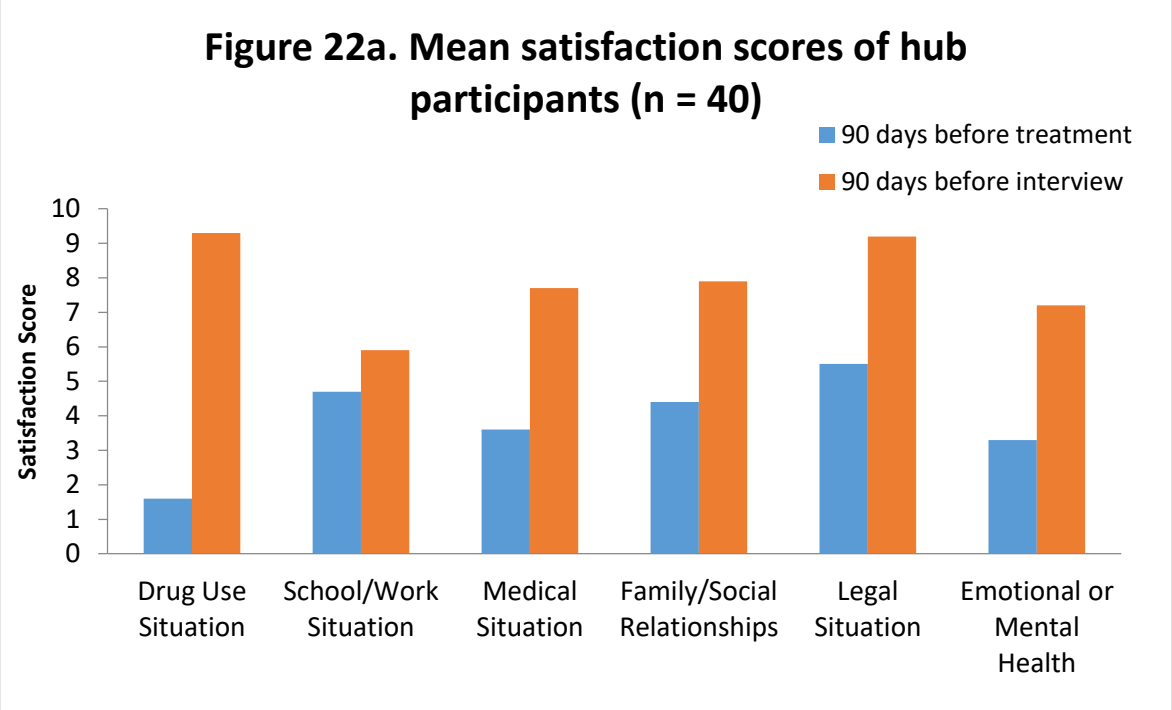
	Hub (n = 40)	Spoke (n = 40)	Total (N = 80)
Satisfaction Scores, Range 0 - 11 In the past 90 days (mean score)			
Drug Use Situation			
T_1, *M* ± SD	1.6 ± 1.1	1.8 ± 1.2	1.7 ± 1.3 [a, b]
T_2, *M* ± SD	9.3 ± 2.6	9.8 ± 2.0	9.5 ± 2.3
School or Work Situation			
T_1, *M* ± SD	4.7 ± 3.4	5.2 ± 3.2	5.0 ± 3.3 [b]
T_2, *M* ± SD	5.9 ± 3.5	7.1 ± 3.0	6.5 ± 3.3
Medical Situation			
T_1, *M* ± SD	3.6 ± 2.7	4.9 ± 2.9	4.2 ± 2.9 [a, b]
T_2, *M* ± SD	7.7 ± 2.9	8.7 ± 2.3	8.2 ± 2.6
Family or Social Relationships			
T_1, *M* ± SD	4.4 ± 3.8	4.5 ± 3.3	4.4 ± 3.5 [a, b]
T_2, *M* ± SD	7.9 ± 3.4	9.0 ± 1.9	8.5 ± 2.8
Legal Situation			
T_1, *M* ± SD	5.5 ± 3.6	5.9 ± 4.1	5.7 ± 3.8 [a, b]
T_2, *M* ± SD	9.2 ± 2.5	9.9 ± 2.6	9.5 ± 2.6
Emotional or Mental Health			
T_1, *M* ± SD	3.3 ± 2.7	3.3 ± 2.8	3.3 ± 2.7 [a, b]
T_2, *M* ± SD	7.2 ± 2.9	7.9 ± 3.0	7.5 ± 3.0

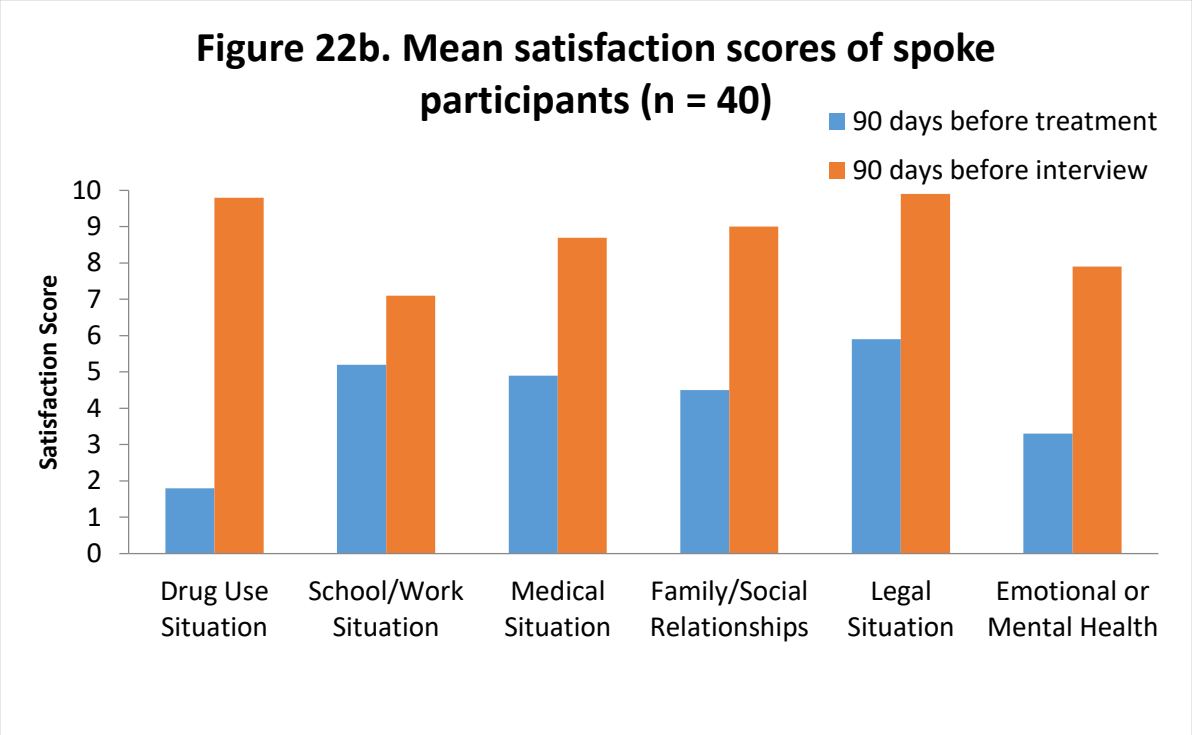
Note: T_1 is the 90-day period before treatment.

[a] T_2 mean satisfaction score shows a statistically significant increase compared to T_1 among *hub* participants (n = 40) p <.001; Wilcoxon signed-rank test

[b] T_2 mean satisfaction score shows a statistically significant increase compared to T_1 among *spoke* participants (n = 80) p <.05; Wilcoxon signed-rank test

Patients in treatment reported substantially improved satisfaction with their lives (Figures 22a and 22b). Both the hub and spoke groups reported very substantial improvements in satisfaction with drug use. There were statistically significant improvements in all six domains for spokes and all domains other than work/school situation for hubs. This is consistent with the reduction in days of school or of work in Table 27.





Stigma Questionnaire Responses

Table 31 presents the responses to a subset of items from the Substance Abuse Perceived Stigma Scale (Luoma et al., 2012). There were no statistically significant differences between the hub participants and spoke participants in any of the 8 domains of stigma.

Table 31. Stigma Questionnaire Responses of Participants, by Hub and Spoke

	Hub (n = 40)	Spoke (n = 40)	Total (N = 80)
Cumulative Score			
M ± SD	12.7 ± 7.7	10.9 ± 6.7	11.8 ± 7.3
Stigma Domains % reporting *Frequently or Always*			
1. Worried others view me unfavorably because I'm in treatment	38.5%	35.0%	36.7%
2. Heard others say offensive things about individuals in treatment	56.4%	50.0%	53.2%
3. Avoided telling family that I am treatment	12.8%	15.0%	13.9%
4. Avoided telling others outside of my immediate family that I am in treatment	25.6%	35.0%	30.4%
5. Treated as less competent by others when they learned that I am in treatment	30.8%	25.0%	27.8%
6. Shunned or avoided when it was revealed that I	12.8%	10.0%	11.4%

Table 31. Stigma Questionnaire Responses of Participants, by Hub and Spoke

	Hub (n = 40)	Spoke (n = 40)	Total (N = 80)
am in treatment			
7. Treated unfairly by others when they learn that I am in treatment	35.0%	22.5%	28.8%
8. Embarrassed to go to clinic/MDs office to receive treatment	20.0%	7.5%	13.8%

Note: Five-point scale ranged from *never* (0) to *always* (4), Range 0 to 24.

Treatment Site Questionnaire

Table 32 and Figure 23 present the data from the treatment site questionnaire. Participants reported very positive treatment experiences in hubs and spokes, with nearly all participants expressing satisfaction on all items. Almost all would refer a friend to their treatment site. Participants' most negative perception was related to the timeliness of the treatment admission process, and this same perception was reflected in the qualitative interviews in Chapter 5. Many individuals reported waiting many months to access treatment. Participants in this evaluation were admitted, on average, almost 3 years before the time of the interview. These negative perceptions may be related to the early stages of the H & S system development. As discussed in Chapter 6, progress has been made in reducing the wait time for treatment entry.

The only statistically different item in the site question was spoke participants' response to "People care about whether I am doing better." This item, together with items "Staff spend enough time with me" and "I have a say in deciding about my treatment" reflect a theme that was detected in qualitative interviews (Chapter 5). Patients treated in the spokes felt they had a closer, more collaborative treatment relationship with their treatment staff than did participants treated in the hubs.

Table 32. Treatment Site Questionnaire Statements by Hub and Spoke Participants

	Hub (n = 40)	Spoke (n = 40)	Total (N = 80)
Percentage of participants responding agree/strongly agree			
1. The amount of time I had to wait for treatment admission is acceptable to me	55.0%	59.0%	57.0%
2. Location of treatment center is convenient	71.8%	79.5%	75.6%
3. Staff treat me with respect	90.0%	90.0%	90.0%
4. Staff spend enough time with me	82.5%	97.5%	90.0%
5. I have a say in deciding about my treatment	67.5%	82.5%	75.0%
6. Less likely to use alcohol or other drugs because of this treatment	95.0%	90.0%	92.5%

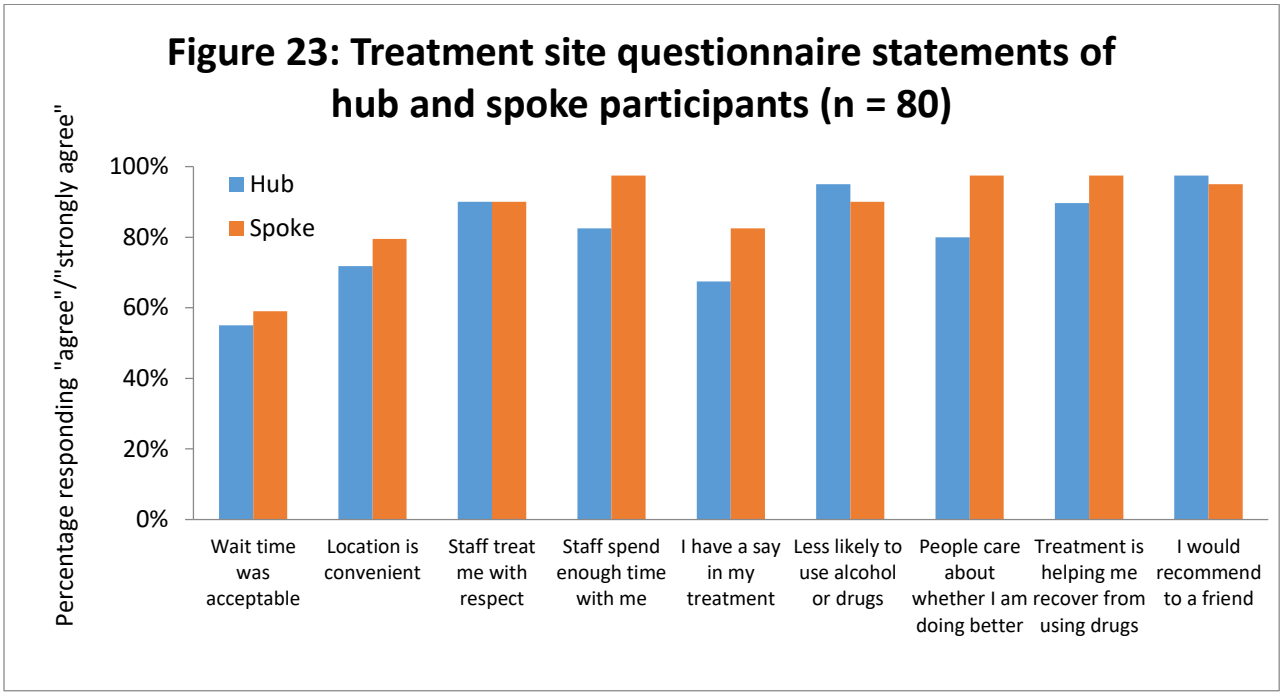
Table 32. Treatment Site Questionnaire Statements by Hub and Spoke Participants

	Hub (n = 40)	Spoke (n = 40)	Total (N = 80)
7. People care about whether I am doing better	80.0%	97.5%	88.8%[a]
8. Treatment is helping me to recover from using drugs and alcohol	89.7%	97.5%	93.7%
9. I would recommend this treatment center to a friend	97.5%	95.0%	96.3%

Note: Five-point scale ranged from *strongly disagree* (1) to *strongly agree* (5)

[a] *Spoke participants* more often than *hub participants* reported that "people care about whether I am doing better" (n=80), p <.05.

Figure 23 illustrates the responses from the Treatment Site Questionnaire.



Treatment Effectiveness Assessment (TEA)

Table 33 presents the scores from the Treatment Effectiveness Assessment (TEA). The TEA is a questionnaire designed to evaluate the benefits of treatment from the perspective of the individual in treatment. This instrument provides a patient-centered perspective on the overall effectiveness of the treatment received. Spoke participants reported a significantly higher overall rating of treatment effectiveness than did those in the hubs (Table 33).

Individuals in spokes and hubs rated the effectiveness of treatment for their substance use very highly, with 80% in both groups rating it at 8/10 or above. Individuals who received treatment in the hubs and spokes view MAT as being extremely effective in reducing drug use.

However, in the three other domains, spoke participants scored their treatment significantly higher than did hub participants. Of spoke participants, 45.0% rated treatment as very effective in improving overall health versus 20.0% of the hub participants; 70.0% of spoke participants gave high scores for improved ability to be accountable in personal responsibilities (e.g., working, taking care of children, paying bills, etc.), verses 45% of hub participants. Finally, 72.5% of spoke participants gave treatment a score of 8 or above on the Community Membership domain (obeying laws, maintaining a driver's license, etc.) as compared to 47.5% of the hub participants.

Table 33. Treatment Effectiveness Assessment Scores of Participants, by Hub and Spoke

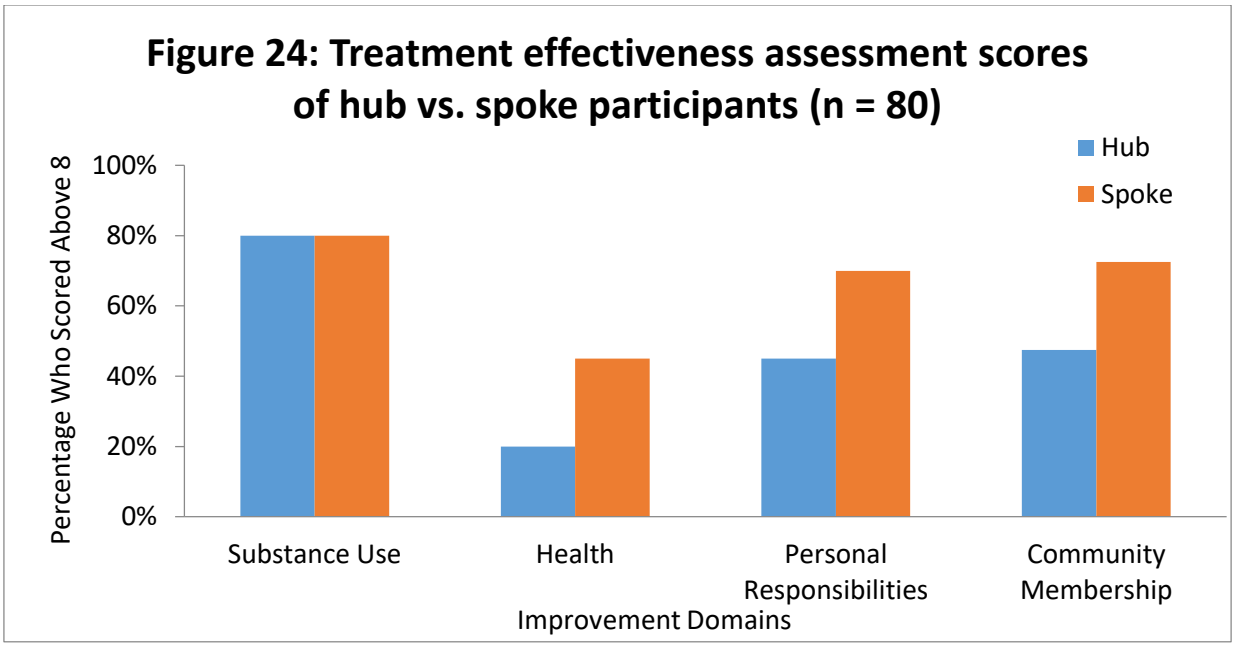
	Hub (n = 40)	Spoke (n = 40)	Total (N = 80)
Cumulative Score (Maximum possible: 40)			
M ± SD	31.4 ± 6.3	34.4 ± 6.3	32.9 ± 6.4
Improvement Domains, % scored above 8			
Substance Use	80.0%	80.0%	80.0%
Health	20.0%	45.0%	32.5% [b]
Personal Responsibilities	45.0%	70.0%	57.5% [b]
Community Membership	47.5%	72.5%	60.0% [b]

Note: Visual analog scale ranged from *none* (1) to *much better* (10).

[a] *Spoke* participants reported a higher median TEA score than did *hub* participants (n=80), p <.01; Mann-Whitney U

[b] *Spoke* participants more often than *hub participants* reported an improvement score of 9 or 10 in the domains of health, personal responsibility, or community membership (n=80), p <.05

Figure 24 illustrates the percentage of scores above 8, representing a very high degree of improvement based on a 1–10 scale, for each of the four domains contributing to the TEA score.



The TEA is intended to be administered only during or after a treatment experience. There is no pretreatment administration and examination of change scores. If the hubs had a more clinically complex patient population than the spokes, the pretreatment difference might be reflected in these score differences. However, the TEA asks individuals in treatment: How much has treatment helped you with: 1. Drug use; 2. Health; 3. Personal responsibilities; 4. Community membership? It does not ask for an assessment of these areas in general, but rather, "How much has treatment helped you with…." For this reason, the different perceptions by participants treated in hubs and spokes is an interesting and potentially important difference in the response to treatment in the two treatment settings.

Summary

This section presented data comparing participants who have received treatment in the hubs and spokes in the following areas: demographics; family and health questions; drug use and treatment history; self-reported drug use and four other measures of functioning currently and at an earlier time point; and measures of satisfaction with life. The background and demographics of participants in the two settings were quite similar, as was their drug-use history. Participants in both settings reported substantial reductions in all opioid use and in most other categories of substance use. Participants in both settings reported comparable and substantial improvements in health service utilization, criminal justice system involvement, family conflict, and mood. Participant measures of satisfaction with domains in their life were similar and very positive. Stigma measures show that participants perceived moderate but comparable levels of stigma at

both sites. Participant ratings of their satisfaction with their treatment setting suggest that participants treated in spokes felt that they had more involvement in the treatment decision-making than did those in the hubs. Finally, the Treatment Effectiveness Assessment, a tool to measure a patient-centered perspective of treatment benefits, indicated an equivalent rating in the two settings with regard to drug-use reductions, but in three other domains, spoke patients more favorably rated the help they received in their treatment settings as compared to the ratings given by hub participants.

Part 3: Gender Considerations

The female/male ratio in MAT in Vermont is close to 1:1, and the study sample mirrors that with 50.0% females (n=40) and 50.0% males (n=40) in each the hub and spoke sample groups. Data were analyzed for noteworthy differences based on gender for any of the data domains. Basic demographics (e.g., age, education, etc.) were similar for females and males. More females had children (90.0%) than did males (57.5%) and more females had custody of children and responsibility for child care (55.6%) than did males (34.8%). Females were more likely to report histories of mental health diagnoses (65.7%) than did males (27.3%). Many drug history variables were comparable between women and men; however, females had significantly shorter (12.7 years) histories of opioid use than did males (16.7 years). Females and males had comparable treatment histories, except males had been in treatment 27% longer (37.2 months) than females (29.2 months) at the time of the interview.

Changes in drug use, including opioid use and other areas of functioning were comparable for females and males as were changes in health services utilization, work/school participation, involvement with the criminal justice system, family conflict and mood, and satisfaction with life scores. The stigma questionnaire suggests that females experienced more stigma than males with 47.5% of females versus 25.0% of males endorsing the statement: “Worried others view me unfavorably because I am in treatment” ($p<0.05$). In addition, in 5 of the other 6 questions and in the total stigma score, a higher percentage of females perceived stigma than did males. There were no apparent differences in the responses to the treatment questionnaire and the Treatment Effectiveness Assessment between males and females.

Results: Summary

The data from the quantitative component of the evaluation provide strong support for the positive impact of MAT for OUDs as delivered in the Vermont H & S system. The primary goal for OUD treatment is to reduce illicit opioid use, and, indeed, a majority of hub and spoke

participants reported dramatically reduced opioid use. Participants in both settings, hub participants using methadone and spoke participants using buprenorphine, substantially reduced other drug and alcohol use and made many improvements in their lives during the time they had been in treatment. Participants treated in the spokes perceived their improvement more positively. Because treatment site and medication type were linked, it is impossible to know if this effect is due to the location of treatment, the medication, or pretreatment addiction severity variables. The results will be discussed in more detail in Chapter 7.

References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th Ed.). Arlington, VA: American Psychiatric Publishing.

Luoma, J. B., Twohig, M., Waltz, T., Hayes, S., Roget, N., Padilla, M., & Fisher, G. (2007) An investigation of stigma in individuals receiving treatment for substance abuse. *Addictive Behaviors, 32*, 1331–1346.

Chapter 5: Results of the Qualitative Study of Patient and Family Member Attitudes toward Treatment Provided in the Vermont Hub-and-Spoke System of Care

This results section presents data from the three qualitative data collection components described in Chapter 3, Part 2.

Part 1: Quantitative Component Questions

As described in detail in Chapter 3, 100 participants were asked a set of open-ended questions as part of the quantitative questionnaire component of the evaluation. The out-of-treatment participants were asked different questions from the in-treatment participants.

Out-of-Treatment Participants

The out-of-treatment individuals who had never been in MAT treatment (n=10)**,** were asked: 1. Why have you never entered methadone/buprenorphine treatment? 2. Have you ever unsuccessfully tried to enter methadone/buprenorphine treatment? If yes, what happened? 3. Are there treatment policies or rules that prevent you from entering methadone/buprenorphine treatment? If yes, please describe them; and 4. Are there any changes to any aspect of methadone/buprenorphine treatment which would make you willing to enter treatment? If yes, please describe them.

Results

This group reported that they wanted to get into treatment, had tried to enter treatment on multiple occasions, and had been on waiting lists for considerable periods of time, but had never been able to enter treatment. Seven of the 10 participants had been on waiting lists. Several described being on waiting lists for periods of months, but when they neglected to make the mandatory monthly call to stay on the waiting list, they were dropped from the waiting list and had to start over again from the end of the list. After several of these experiences, they had given up. Four of the participants were on a waiting list (or multiple lists) at the time of the interview. The six participants who had attempted to get into treatment responded that they felt the waiting list was a serious obstruction to their ability to enter treatment. Three participants reported that they had never tried to enter treatment due to all or some of the following: transportation issues (3 reported); scheduling issues (e.g., child care, work schedule, etc.; 3 reported); rules and

restrictions, including urine testing (3 reported); and/or not liking methadone/buprenorphine (2 reported; e.g., taste, fear of withdrawal). In addition, two of these individuals mentioned that they lacked motivation to go through the steps ("hoops") to get into treatment and go to treatment regularly. Two individuals in this group said they believed the staff and doctors were judgmental and looked down on addicts.

The out-of-treatment individuals who had previously been in treatment (n=10), were asked: 1. Why did you discontinue your treatment with methadone/buprenorphine? 2. Did you feel the methadone/buprenorphine treatment was helpful to you? Why or why not? 3. What was most useful and least useful to you in methadone/buprenorphine treatment? and 4. Would you ever consider going back into methadone/buprenorphine treatment? Why or why not?

Results

The reasons reported for discontinuing treatment (and the number of participants citing them) were: violated rules (3); "completed" treatment (1); transportation (2); moved away (2); co-pay (1); went to jail (1); schedule conflicted with work/child care (2); and prescribing doctor retired (2). (Some listed more than one reason).

Nine of the 10 participants reported that they would like to re-enter treatment. One individual said the time required was too great to go back into treatment. Six of these participants were on waiting lists at the time of the interview. Participant comments about the benefits of treatment included:

- "I was able to stay clean the entire time I was in treatment."
- "The [buprenorphine] controlled my craving, and I did very well."
- "All areas of my life improved. I was able to live as a normal person."
- "Held a job, stopped doing dope and coke."
- "I committed no crimes when I was in treatment."

Participants reported that the most useful aspects of treatment were (with the number of participants reporting such in parentheses): routine/schedule (4), counseling (5), learned to be responsible (2), and medication reduced craving (6). The least useful were group counseling (2), absence of mental health treatment (2), take-home rules (2), and restrictive hours (3). (Some listed more than one reason.)

From the combined out-of-treatment participants' responses, we found that of the 20 participants, 15 reported they wanted to enter (or re-enter) treatment and half (n=10) were currently on a waiting list. Only five reported that they did not want to be in treatment under any circumstances. Nine out of 10 of those who had previously been in treatment reported they would like to get back into treatment, and their comments on their treatment experiences were generally very positive. Several patients cited that their lives were so disorganized due to their mental illness that it was difficult to maintain the scheduled requirements of treatment, and they suggested that concurrent mental health treatment would be very useful.

In-Treatment Participants

For all 80 in-treatment participants, we asked: 1. What do you like about this treatment clinic/office? 2. What do you dislike about this treatment clinic/office? 3. What services help you the most? 4. What services would you like to have added to your treatment? and 5. What are the biggest obstacles to your involvement in treatment?

We present these data separately for participants who were treated in the hubs and for those treated in the spokes.

Results

Hub participants

Hub participants responded to Question 1 ("What do you like about this treatment clinic/office?") with a diverse set of answers. About 50% said the thing they liked best was the counselor and the medication. Variations on this theme emphasized that the counselors were non-judgmental, empathetic, easy to talk to, open and honest, and that they cared about patients. In addition, some appreciated the convenience of treatment, the early hours of the clinic, some of the special groups, including women's groups and trauma groups, and an opportunity for positive lifestyle/behavior change.

In response to Question 2 ("What do you dislike about this treatment clinic/office?"), the responses were more unified. About 80% of the hub participants were critical of the hub clinic environment, disruptive and counter-therapeutic "drug talk" by patients, and the clinic procedures. There was a great deal of criticism of the behavior of other patients while in the clinic, in the clinic parking lot, and while standing in the dosing line. Many patients reported that the drug talk (including stories about drug use, plans for drug use, plans for purchasing drugs, plans for crimes

to obtain drugs, offers to buy and/or sell drugs, etc.) was common and upsetting to them in their efforts to do well in treatment. The following are quotes from participants:

- "I wear earphones all the time in the clinic and while waiting in line so I don't have to hear all the offers to buy drugs."
- "Last week I was offered Klonopin for sale twice, on my way to the car after dosing."
- "Some people just come to the clinic to avoid being drug sick and to sell and buy drugs."
- "You can buy drugs at the clinic easier than anywhere in town."

In addition, the long waiting lines for dosing gave many participants the feeling of being herded like cattle, in a dehumanizing process. About 25% felt that treatment was "cookie cutter," with little individualization of care. Specific items noted by some participants were the lack of a meaningful treatment plan and lack of any plan for post-methadone care. One participant said:

- "When you give a dirty test, or report almost any physical symptom, or tell your counselor or the nurse you feel anxious or upset, the response is the same…'Why don't you see the doctor and get your dose increased.'"

  "Even when I was getting too much methadone and was sleepy all the time, nobody ever suggested that I lower my dose, I had to ask lots of time before they lowered my dose."

Fifteen participants (37.5%) reported that high staff turnover was problematic. For example, two participants noted:

- "I have been here in treatment for 8 months and have had six different counselors."
- "I've given up talking to my counselor about anything important because he probably won't be my counselor tomorrow."

In addition to these frequently reported items, there were a variety of other criticisms. Thirty percent of participants reported that the restrictive dosing hours and daily (or very frequent) visit requirements made it difficult to get and maintain employment. Others did not like having to provide urine samples, the very restrictive take-home medication policies, and other logistical issues.

In response to Question 3 ("What services help you the most?"), counseling was reported as most useful by 62% of participants. While about 20% of participants reported valuing the groups (particularly specific topic groups, e.g., women's groups, trauma groups, introductory groups), 40% of the participants reported that individual counseling was of greatest value. About

half of this group (or 20% of the total hub group) felt individual counseling was very valuable but frequently not available. Others felt group therapy sessions were not useful.

In response to Question 4 ("What services would you like to have added to your treatment?"), about 30% of the participants could not name a service they wanted to see added. The most common responses to this question were: mental health treatment (22.5%), help with employment (22.5%), more attention to discharge planning (17.5%), medical services (15%), more counselor availability (15%), and women's groups (10%).

In response to Question 5 ("What are the biggest obstacles to your involvement in treatment?), transportation problems were named by just under 50% of participants. Other issues listed by 10% or less of the participants were: long lines in the clinic, child care, stigma, cocaine availability in the community, and alcohol use.

Spoke participants

The responses to the five questions by the spoke patients were remarkably different from the responses of the hub patients. Unlike participants treated in hubs, who generally reported one or two items they liked, participants treated in the spokes were far more enthusiastic about many aspects of the treatment. In response to Question 1 ("What do you like about this treatment clinic/office?"), 28 of the 40 participants (70%) cited the doctor and/or their relationship with the doctor. This question elicited a great deal of discussion from participants about how important their visits with the doctor were. Common descriptors for the doctors were: nonjudgmental, empathetic, flexible, caring, etc. In addition, the counselor/nurse from the MAT team was mentioned by 40% of the participants. Also, 10 of the participants (25%) reported that they very much appreciated being treated in a doctor's office, not segregated into a specialty addiction facility. Some other aspects of treatment in the spokes that were cited as being viewed positively were good information about addiction; medical care along with treatment for addiction; being treated with respect; and being treated as a person, not an addict. This question generated the most discussion of any item among the spoke participants.

In response to Question 2 ("What do you dislike about this treatment clinic/office?"), 12 participants (30%) had no response. Just under 50% (19 of 40) said they felt the counseling was not useful and they did not like mandatory counseling, especially group counseling; 37.5% of participants reported that the waiting list and/or the difficulty in finding a doctor who would accept them in a spoke was the major problem they had had with treatment. Other issues cited by less

than 10% of participants were: urine testing, medication call backs, limited hours, lax rules (e.g., “Patients are allowed to use and are not kicked out.”), and judgmental staff.

Responses to Question 3 (“What services help you the most?”), reflected the responses to Question 1. Doctor visits (65%) and medication (60%) were most often cited. Counseling was mentioned by 16 of the 40 participants (40%), and a variety of forms of counseling and groups were noted.

In response to Question 4 (“What services would you like to have added to your treatment?”), 50% of the participants did not give a response. For those who did respond, there were two major suggestions: mental health treatment (32.5%) and help gaining employment (27.5%). Other issues that were mentioned included transportation (17.5%) and, by less than 10% of the sample for each, women’s groups, sober living, yoga and exercise programs, information on nutrition, and more exposure to AA/NA groups.

Eighteen of 40 participants (45%) did not have a response to Question 5 (“What are the biggest obstacles to your involvement in treatment?). The most often cited “obstacle” was transportation, which was reported by 12 (30%) participants. Co-pays were cited by six participants (15%), and fewer than four participants listed each of the following: testing for cannabis, family resistance, bad doctor, no child care, and time commitment.

Summary: In-Treatment Group Responses to Questions at the End of the Quantitative Survey

From the information collected in this component of the evaluation, there was a clear message that participants who were treated in either the hubs or the spokes were very grateful for their treatment. Many explained that the treatment has saved their lives and that without the MAT care they would be in jail, homeless, and at very high risk for overdose. Of the 80 individuals interviewed, a large majority of them felt generally positive about the treatment and how much it was helping them.

However, beyond that common perspective, there were some clear differences in how participants viewed their treatment experience. People treated in the hubs reported more negative aspects of their care than did those treated in spokes. (It needs to be reiterated that individuals with more severe addiction and associated problems were guided to hubs by the TNQ. Consequently, the patient group in the hubs was different than the spoke patient group and this difference in patient severity is likely a factor in these participant responses).

Because a large number of individuals with varying commitments to reducing drug use come together at the clinic on a frequent basis (often daily), participants treated in the hubs had substantial (and often daily) exposure to other individuals in treatment. Many of these people found their interactions with other participants to be counterproductive, particularly while standing in line and while entering and exiting the clinic. This negative aspect of the hub treatment experience was mentioned frequently and with considerable consternation. Many aspects of treatment were appreciated and valued in the hubs, especially the counselors. Interestingly, out of the 40 participants treated in the hubs, not a single participant mentioned their relationship with their MD as an important part of their treatment.

The overall impression from talking to participants treated in the spokes is that they viewed the treatment they receive quite positively and they felt fortunate to receive treatment in spokes. Clearly, their relationship with the doctor was the central treatment element for nearly all of these participants. Despite visits with MDs that were often brief and as infrequent as once per month, these visits were viewed as very powerful, positive, and meaningful. Of course, the visits with the MD were essential to obtain a prescription for the very important medication. However, the spoke participants were clear that the visits with the doctor had great impact on their thinking and behavior and were not simply visits to get buprenorphine. Surely, the importance of the doctor and the relationship with the doctor is not unique to buprenorphine treatment, but as contrasted with the report from individuals treated in hubs, this relationship in the spokes was a unique and apparently influential aspect to MAT in spokes.

There were some other common themes. A substantial number of participants in both hubs and spokes reported that they would like to have more access to mental health treatment and employment assistance. In addition, a considerable number in both groups reported that long waits to get into treatment were a substantial negative aspect of treatment and that difficulties with transportation to treatment visits and child care were significant obstacles.

Part 2: In-Depth Qualitative Interviews with Opioid Users in Treatment

These study findings are not meant to be representative of the statewide H & S system because data were not systematically collected from all over the state and from all hubs and spokes. Rather, to make the exercise as efficient as possible, interviews were conducted in a selected set of hubs and spokes, as described in Chapter 3. However, the results from these

interviews can be interpreted as describing some of the most common themes and observations from individuals treated in the H & S system.

Interview Findings

Perspectives of participants collected from the qualitative interviews are provided, where relevant, to illustrate the major themes and perspectives of participants. Findings for hubs are discussed first, then the spokes, and conclude with discussion of some differences between these two groups of interviewees.

Findings from Participants Treated at Hubs (n=12)

The hub "environment" is a powerful influence on participants' treatment benefits: For some, the clinic environment provides a positive influence, and, for many others, a negative influence.

Interview findings. The "environment" refers to how the participants experienced their visits to the hub site and their interaction with other patients inside and outside the clinic. For some of the 12 participants treated at the hub and participating in the in-depth interviews, the clinic represented a place of stability in an otherwise chaotic life. Several of these participants described their daily visits to the clinic as the single organizing event in their days.

- "This place, overall. like I said, it's a good place if you want to use it to your advantage; then it's awesome. Because there is different people that have different resources here."
- "The hub was really good in a lot of ways because of the structure, the discipline. It makes you get back on track if you want to get back on track."
- "Yeah. I like it though. I don't know anybody here, really, so I didn't use with anybody; so for me, I can make new friends here or socialize with somebody, and not have to talk war stories, or anything like that. You can actually just talk about everyday life now, get to know somebody, and not be like, "Oh, remember when we used to…ya know?"

However, 7 of the 12 hub patients interviewed found the attitudes and behaviors of their fellow patients at the hub to be a negative aspect of their treatment process. Many cited instances where others were disruptive, did not seem committed to recovery, and even went so far as to sell drugs (including their own methadone or buprenorphine doses) outside of the clinic providing their medications. Some people said that many of the other patients were not in treatment for the proper reasons or did not take treatment seriously, which negatively influenced other people's success rates. Of all the aspects of participation in the hub environment, this aspect produced the most negative comments.

- “People are swearing, or they’re arguing, or they’re fighting….It’s like, ‘Can’t you just take your dose and go?’”
- “People need to stop talking about their extracurricular drug use in line while waiting for a dose of [buprenorphine] or methadone. If they don’t need the help or don’t want the help that the hub or the spoke is offering, they need to get the hell out of there because there’s a lot of people out here dyin’ that need it.”
- “I just don’t like coming up here ‘cause all the drama. People bring so much fuckin’ drama up here. It’s retarded. I’ve had it—between the old clinic and here, I’ve almost gotten into freakin’ eight fights, nine fights, ‘cause at the old clinic, someone had bit me on my face and gave me a nosebleed while I was waiting to go to counseling.”
- “It's more of a place for people to—for some—to buy drugs in the meetings.”

The clinic staff members are major factors in creating the overall perception of the hub clinic experience, both positive and negative.

Interview findings: The staff at the hub clinics were perceived as important agents in supporting treatment attendance and helping patients maintain a positive attitude toward treatment. Many of the patients talked about how much they liked the staff and, specifically, how the staff would go out of their way to help them feel like a human versus an object of addiction.

Many participants reported generally positive and supportive interactions with the clinic staff. Staff were reported as being helpful and as creating a positive environment.

- “If you have a question, they know, they know where to tell you where to go, even though they don’t have it here. The willingness to get people to stop using and to get their live back to normal. That stuff is a really big help.”
- “I like the counselor. I like the nurse. The people here, the staff, are really laid back. They treat you as a human being, not as another number, not as a junkie, not as an addict. Like an everyday, normal person.”
- “No judgment, no punishment. There’s been times that he’ll sit right there, and we’ll try to figure out where it went wrong, or what can we do to not have it happen again. I mean he’s very—I feel he’s a father figure.”
- “The guards are super friendly in the morning. Everybody says hi to you. They open the door. I love how everybody’s so friendly up there when you check in. They try to give you your privacy. Your counselors check in with you. They leave you notes at the front desk.”
- “I really like the clinic, I do. If I had to give it a scale from 1 to 10, 6.5, maybe 7 just because XXX [the counselor] is here.”
- “You treat them with respect, they treat you with respect. My dosing nurse, the people that we go [to] and give us our medicine, they answer any questions that we really have as far as about our medication. They’re knowledgeable.”

- "I like to see my counselor. When I get down in the dumps, I'm ready to say, 'Fuck it,' and go back to using. She'll tell me, 'Look. You can do this. Now, you're getting stronger than that.' I believe her. I feel like I can trust her because she don't do me wrong."

However, there were some patients who expressed discontent with the staff (including MDs), perceiving them as unhelpful and not doing their jobs or saying that they often treated them unfairly or did not listen to them. Specifically, two participants had negative comments about interactions with MDs; one stated:

- "When I'm talking to Dr. XXXX, most of the time I feel like an equal, but sometimes I feel like I'm talking to her and it's [in] one ear and out the other. Dr. YYYY, as well. He's the doctor here, you know what I mean? I just feel like he's either on his computer or on his phone when you're talking to him. It's like, 'Hello? I'm right here.' He's just not listening to what you need him to listen to, which sucks."

The clinic procedures and routines were generally viewed as creating an impersonal, arbitrary, and somewhat unpleasant experience. Standing in long lines for dosing was viewed as a dehumanizing and degrading experience.

Interview findings: The category of "clinic procedures and routines" included anything that related to how the treatment facility functions and how the process of receiving treatment was perceived. By far, the most frequently mentioned negative aspect of clinic procedures that consistently came up throughout the interviews were the lines at the hub clinics. These long lines were viewed as serious obstacles to a positive treatment experience.

- "After you check in, you go around the corner, which goes to the waiting line for the windows where you get your medicine. A lot of times, that line will be from the top all the way curved all the way around the big hallway all the way back to the women's bathroom. I think that makes it to be more susceptible for people to fail."
- "Standing in the line, you're seeing all these people. You're talking to these people. Drug talk's going on. Interactions are going on. It just gets to be too much after a while."
- "You go stand in line; that's the only thing that really stinks, is you've got to stay in that line….That's the only thing I would change is that line thing, because I feel like a dog waitin' for, it's crazy how they do this."
- "Yeah, 'cause down there, shit, we in line for a freakin' hour sometimes. Fuckin' line would be so long, it'd be outside the fuckin' door. It's retarded…. It was go around some rope and people didn't abide by it and just—I don't like coming up here every day because got mouthy people."
- "There's days when I come in, and I check in, and I'm waiting in line for 30 minutes to use the bathroom. Then, I'm waiting in line for another hour and a half before I get my dose. Then, I'm hearing people swear and curse, and 'Hey, let me sell you my dose

when I leave.' That, to me, is not a fun day. I'm here to be sober, and I don't wanna hear anything that disrupts that when I'm in a sober facility.

In addition to the lines, many also noted that there were time restrictions as to when they could get their medication. This could make it difficult to receive their medication, even if they were only a few minutes late, making treatment in a clinic unavailable to some.

- "There's people like that, man. I saw some guy who got there 5 minutes late. Who knows? Maybe he didn't really hitchhike, but he was like, 'I just hitchhiked all the way in a rainstorm, and you're not gonna give me my medication?'"

The counseling services provided at the hub clinics were generally viewed as helpful and of use in promoting successful recovery. The high rate of counselor turnover was cited quite commonly as problematic.

Interview findings: The treatment services (individual and group counseling) were generally viewed in a very positive light. There were some comments about the groups having limited practical value, but they were still seen as useful for support.

- "I like the meetings. I get a lot out of them. Even if it's just emotional value, I get a lot out of the meetings."
- "Regardless of what the topic is, I always—it's hard to explain. I always just walk out of a meeting and just feel like a bunch of weight was taken off my shoulders."
- "We should be women. We should be united. We should build each other up, you know what I mean? That's how it should be, and that's what the groups do for me."
- "They've helped a lot. He's helped a lot one-on-one. Just me being able to open up and talk to someone, which I've never really been able to do, is a good thing."
- "A lot of the groups that they have here are really good groups. They have a girls' group on Friday that's arts and crafts. They make dream catchers. They do paintings. It was a really fun group."

However, four participants viewed the counseling services as an obstacle to their progress. A particular criticism was the high rate of counselor turnover.

- "I've been in treatment for 8 months—I'm on my fourth counselor now. Yeah, I forgot one, I've had five."
- "At least, my counselor is like—she's way over her head with too many people. All of them here are. It's not as much individual care as it could be, but it works. In the past, when there was more counselors, it definitely worked well here with the counseling. I don't know, I think it will get better once they get a couple more counselors."

There are considerable problems gaining access to treatment, including long waiting lists.

Interview findings: When seeking treatment, the main barriers noted by patients were not knowing where to go for treatment and dealing with wait lists. Patients recognized that they needed and wanted to seek out treatment but knew little about treatment or how to gain access to it. Once they had found out where to go, many encountered daunting wait lists keeping them from the treatment they were seeking.

- "It took about a year to get into treatment. I just continued using my normal amount of heroin—I knew you have to check in once a month for the wait list, so I was randomly calling once a month, doing my normal heroin routine."

- "The first time I ever put my name on the list, it was 2 years, if not longer, 3 maybe? While I was waiting, I just kept using and committing crimes."

- "A lot of people have issues with waiting. I had to call and it's months and months and months. I literally had to call and say, 'I'm so bad, I'm gonna kill myself,' and then they really try to push to get you in."

- "I remember [the] last time I tried to get in, it was a huge waiting list, and it took me almost 3 or 4 months of waiting around. Which was a nightmare, because I'd get in trouble again, go back to jail; then you're put on the back of the waiting list."
- "I called [the] agency, and they kept putting me off because they had tons of people in there at the time. Actually, the director ended up taking me in as a client, because I kept calling and telling him, 'I gotta talk to somebody. I don't know what to do.'"

Despite the prevalence of these wait lists, many of the patients were able to get fast-tracked into the program for a variety of reasons, such as having a partner also seeking treatment or knowing a healthcare professional who was able to expedite the process. Individuals might also get fast tracked if they were getting out of prison, were involved with the Department for Children and Families, or were pregnant. Along with being fast tracked into treatment, another common facilitator for patients seeking treatment was their social lives. Patients reported being supported by their family to get into treatment as well as experiencing negative events within their social life that motivated them to seek treatment.

- "Needle exchange gave me a new way and a new life. I listened to two people there. One was XXXX and one was YYYY. YYYY is the man that runs the place. He's the one I talked to. He's the one that is responsible for getting me into treatment quickly."
- "Basically, she [a partner] got in, and then I started. I actually was going to that clinic for their meetings, and I wasn't even in the clinic. Then they did a fast track thing. If

you have a partner in there, that's the one time (that and pregnancy)—that's the one time you get fast tracked in, I guess, which was not known on the street really. I was fast tracked in, I think, 3 months later."

- "He [an uncle] already knew about this clinic before he even brought me up here. He knew that I was strung out down there, and that my kid was in DCF custody, and that the only way I could get him back was to get involved into some sort of treatment program. Yeah, he came and got me, brought me up here, gave me a place to stay, put me into this treatment program, and basically just isolated me from the lifestyle that I was living."

Participation in treatment creates many benefits in many domains of patients' lives.

Interview findings: A large majority of participants reported that their involvement in treatment was producing many important improvements in their lives. Some reported how those around them, such as children and other family members, motivated them to stay on track with their treatment. Those patients that had a job in place and steady housing expressed how this made it so much easier to maintain their treatment and remain on the path they had initiated.

- "…so yeah, this place actually helped me with my plan to stay on the right path to be able to have a chance to get my kid back."
- "A lot better, my life has gotten a whole lot better. I've been able to hold down a job, I'm a better mother. I'm just aware of everything now. I'm not doped up. I've been able to save money. It's just a whole lot different, and better."
- "I have my own apartment. I can pay my bills. I'm just not chained down. If I wanna go camping in the woods for a couple days, I can do it, without either having to have drugs, or—so I have more fun. I'm happier."
- "Life was a lot better. It's a lot easier. It don't hurt no more and I'm able to think now instead of not thinking. Now I can. Now I want to."
- "Self-esteem is up. Okay, that's one they were looking for is self-esteem, and the ability to think on my own and take responsibilities on my own and not run away from them—there you go—to a drug. Now I'm running towards them, plugging myself into anything I can for knowledge. Instead of running away from the knowledge, now I'm running towards it."

Participants treated at the hubs feel a substantial amount of stigma about addiction, and, in fact, stigma for being in treatment is common.

Interview findings: Stigma plays a very large role in the lives of individuals in treatment. Participants often felt that they were going to be judged by family and friends and so they avoided

treatment. They also felt judged and that they were treated differently in health care facilities and in the world in general.

- "There have been countless times that I will not get the help that I need at the ER, a doctor's office, or somewhere because I am immediately associated with pills and being an addict."
- "I feel like I am treated as less of a person because I am in treatment for my addiction; you'd think they'd be proud you're getting help, but in reality, I feel like I am treated unfairly."
- "I didn't want to tell my friends or family for a very long time when I first started treatment… it was hard to tell them, even though I knew they'd support me."
- "There's such a stigma related to addiction that doctors don't wanna take on drug addicts, even though they're their patients already."
- If you are in treatment at the hub, you are immediately associated with opioid addiction, drug addicts, or "junkies."
- "When you pull up to the clinic, everyone knows what you're going there for, especially if you're riding on the bus every morning, I just feel like they're lookin' at me funny.

Findings from Participants Treated at the Spokes (n=12)

The spoke environment is a powerful positive influence on participants' self-esteem and attitude toward treatment.

Interview findings: Ten of the 12 participants found their treatment experience was greatly enhanced by receiving treatment in a primary care setting. There were numerous comments about how much they enjoyed visiting a medical clinic, rather than a specialty care clinic (i.e., hub). They appreciated being treated like other patients and not singled out as "addicts."

- "I go into the clinic and I get a friendly hello from the receptionist and then I go in to see the nurse and doctor like other patients."
- "None of the other patients in the clinic know that I am there for [buprenorphine]. I feel good and normal in the waiting room."
- "I don't feel like I have a big "A" on my chest. I am just another patient."

Several patients noted that the fact that they received their MAT in a doctor's office was critical to their treatment involvement.

- "If I had to go to the [hub] clinic, for treatment, I would not be in treatment."

- "I was in treatment at the [hub] clinic and I dreaded going in every day. If I had to stay there for my treatment, I would probably have dropped out and gone back to using."

The clinic staff members contribute to the participant perception of the spoke as a positive treatment experience

Interview findings: The comments about spoke staff were almost uniformly positive. Staff at the spoke sites were perceived as compassionate and supportive health care professionals.

- "At [the spoke] office, I have never felt, ever, discriminated against at all. I even wrote a letter. I mean from the secretary, all the way to the doctors, you just feel like you're their first priority."
- "I get treated by the receptionists and the nurses just like all the other patients."

In the interviews with the spoke participants, the most striking finding was how powerful and important the relationship with the doctor was. While there were comments that the counselors and nurses were helpful and supportive, it was clear from almost every interviewee (10 of 12) that the relationship with the MD was the central focus of their treatment experience.

- "Yeah. Just bein' that I'm comfortable with [my MD]. He's been my physician my whole life. Knowing that he doesn't judge me for bein' an addict. I'm just open, honest."
- "The best out of all my doctors. Yeah. He knows me very, very well. He has an excellent way of separating primary care physician duties and [buprenorphine] doctor duties. A lot of doctors can't do that. They'll relate everything to your [buprenorphine], your treatment, and whatnot. I've known him for 10 years now. I've been through a lot with him."
- *Moderator:* "You said your relationship with your doctor is definitely a huge motivational factor."

  Respondent: "It's 50% of the success. What I mean is the [buprenorphine] stops the cravings and allows me to live a stable life. The other 50% comes with a relationship with my doctor, and the trust, and respect, allowing me to be able to do what I need to do and know that he is going to be there for me. It just wouldn't work without both parts working together. People gotta have a good doctor."
- "I get a half hour slot with my doctor every other week at this point. I was every week for a while. If I go over, he's never looking at the clock. I've never had to wait for him. He's amazing."
- "I have had a couple of times where I've slipped up. Instead of threatening, we're gonna kick you off the program, [my doctor] said, 'You know what? We're gonna move you to twice a week for the next couple of weeks.' He's like, 'I just really wanna support you and work through this with you.'"

- "[My doctor], he's amazing. He really is. He's very caring. He's learning as he's doing it. He appreciates what we have to say. He's learned a lot from being our doctor as we learn from him too. Yeah. He's wonderful."
- "He's [my MD] probably been the most helpful and beneficial person to me in my recovery, honestly. Even if it's just calling him up and needing someone to talk to. He's always been there, and he's always had good advice."
- "The main support is always they focus on your health and your wellbeing. They always try to make sure you're safe. That's the number one thing, and then your substance abuse, to not using."
- "In the [buprenorphine] visit and a 10-minute meeting with [my doctor], we discuss medicine for 1 minute. It's the other 9 minutes is everything else in life and the 1 minute is give a urine or a pill count, if necessary. 'How are things goin' with that? Good or not good? Why? Okay.' That's it."

There were several negative comments about MDs.

- "It's almost like this God complex, because they're prescribing something that is scheduled and that I can't go buy at the store myself. It's this God complex, you feel God giveth, God taketh. I can give and I can take from you. It's just an ass backwards way of looking at people that you're saying you're trying to help."
- "He personally don't talk to you anything about future plans. The conversations with him, just more 'How are you feeling with the dose? Do you wanna go up? You wanna go down? You feel stable? How are your cravings?'"

The procedures involved with receiving MAT at the spokes were viewed mostly as very similar to receiving routine medical care.

*Interview findings***:** At the primary care settings, time-consuming issues such as waiting in lines did not seem to be as much of an issue as at the hubs. Spoke participants had appointments and were treated as the clinics' other medical patients were treated. There were no lines and no offers of drug sales or drug talk, which is what many individuals complained about in the hubs. The spokes were more flexible as far as treatment times and plans were concerned, and a typical visit required a 10–20-minute meeting with the MAT nurse, and a brief check-in with their doctor, making the entire visit around 20–30 minutes.

- "It started out twice a week, and then they let me go to once a week, and then, just regular routine checkups. My treatment was like the treatment when you're normally pregnant. It wasn't much different there…the support team was great. They met with me."
- "You gotta do UAs and pill counts and stuff like that. I don't mind. I don't think you should be able to—you have to drop everything that day and bring your pills in. I think

they should work with you, but they're trying to keep me clean, so I could see that point."

The counseling services provided at the spokes were generally viewed as helpful and useful in promoting successful recovery.

*Interview findings***:** Unlike in the hub interviews, there was not a great deal of discussion of the counseling services offered at the spokes. To the extent they were discussed, they were generally viewed as positive, with some negative comments about counseling sessions being mandatory.

- "I liked the group I was in. There was nine guys that every Monday at 5:00 p.m. we had a group that we would—or maybe 4:00 p.m. We'd talk for an hour. Just, I liked that group."
- "NA and AA just don't do it for me….At the [spoke] office, they actually created another group for people like me that weren't interested. She said there's no point in wasting 6 hours of your time. That was kind of, they made up a group of the 6-week period. We just went in and discussed where we were at and what our goals were, and what we hoped to get out of treatment. That was a lot better for me than going to something about NA and AA, which I know that's not for me."
- "We had a women's group that was really helpful. However, for some reason this was discontinued. I hope we can get it restarted."

Several participants found the mandatory counseling services to be unnecessary and a negative aspect of treatment.

- "I hate being required to come for groups. It's a lot of bullshit talk and I have more important things to do."
- "I have trouble getting child care to come to the counseling meetings. But, I think they might kick me out if I don't attend. I don't think it's a good idea to require counseling."

There were several suggestions for how the counseling services could become more useful.

- "Yeah. My mom felt like she wanted to be involved a little more 'cause I really destroyed both of my parents with this. That's still hard. I mean, she wants to be more involved. I think offering a little more one-on-one stuff for people like me 'cause some people do not work well in group settings. I guess my only suggestion is offering more one-on-one and maybe to let me bring in my mom."
- "I need a job. I don't need to talk to a counselor unless they can pull some strings and help me find a job."

The benefits from buprenorphine are viewed as very positive and very important.

Interview findings: Participants receiving buprenorphine in spokes frequently made comments about how important the medication was to the improvements in their lives.

- "It totally—it was 180 degrees. I mean, I went from constant pain and worrying. It was like that I was like normal again."
- "I gotta remember not to go away without having my pills with me. I mean, you lose a bit of freedom, but the other side is like, ugh."
- "[Buprenorphine] was the only thing that really worked for me, I think."
- "Yeah. I feel normal. I mean, I don't feel like an addict anymore—yeah."
- "It was totally—yeah, so much better than methadone."
- "Yeah. Yeah. It didn't make me tired and lazy, and that kinda stuff."

Participation in treatment creates many benefits in many domains of patients' lives.

Interview findings: When participants in spokes were asked to talk about how MAT has impacted their lives, the response was overwhelmingly positive. They made a point to discuss the fact that while MAT helped them not use opioids, it also allowed them to make major improvements in other areas of their lives. This was a consistent and strongly emphasized point in the interviews.

- "Oh, absolutely. I'm a lot healthier. I have money. *[Laughter]* Everything's changed, relationships, work, everything for the positive. There hasn't been one negative thing from the [buprenorphine] on my life since being on the program. As far as lifestyle changes, they've all been positive."
- "The shame goes away. I don't have to lie to my family and whatnot. Then, everything else falls into place after that. There's no deceit, secrets, hiding. You're not spending—I have insurance, thankfully, 'cause otherwise, it just wouldn't be possible."
- "I remember I was homeless, jobless, had no real anything. It started clicking in one thing at a time. I don't know the timeline exactly, but I got a place, got a traditional type job, credit started building up. I went and put money towards an unsecured credit card or a secured credit card so I could re-establish from withdrawing from society. Just stuff like that. I have a leased car now. I had a job for three years selling cars and working at a car dealership. I quit smoking two months ago. Just little pieces that I feel like have made my life a lot better."
- "For me, it's good because I have the ability to get things accomplished in my life for myself. For me, I've been able to do a lot because I've been in treatment because I sit and read all the time and I learn and I'm always challenging myself."

- "We have a beautiful two-bedroom apartment in Park Village right here in town. It's got a dishwasher. Our rent is $623.00 a month with heat included. We just had to hold on and wait, and it happened. Now we're both working, and the kids are doing really well in school. Things have turned around for us. That's what I tell him. You just gotta make it through the crap."
- "Yeah. I have a job. My fiancé's working. We have a new home in Grand Isle. It's a fresh start. Yeah. Everything is pretty good."
- "I've been able to have established a job, I've been able to establish things. I'm not working right now, but I'm signed up for another job. I've established all these things in my life, and the goal is to encourage people to keep going with that."
- "Well, I'm divorced and living—I mean, no, life is great. I mean, it's what I would call normal. It's not drug-seeking or—it's normal. I work, and I have a girlfriend, and I have kids who're now grown up. I mean, it's like normal."
- "My whole entire lifestyle. I have my own house now. I have my own car. I'm engaged in school. Like before, shit. Like I said, I got all F's in high school. Dropped out in ninth grade. To be just involved into college now, taking college courses, is a big step from where I was at. The fact that I am seeking a job, a paying job. I have a house. Financially stable. I'm not running the streets. I'm home every night. I eat a lot better. I'm a lot more healthier. Legally, I don't have any more issues with the law."

Participants treated in the spoke feel minimal stigma in their spoke sites but do report some stigma in the larger healthcare system.

Interview findings: Participants reported that in general, they felt very little stigma at the primary care offices where they received their MAT. However, because they were on buprenorphine, when they had other contact with the healthcare system, they still encountered some degree of stigma.

- "Not even so much by police or authority figures. That doesn't matter. It's more the healthcare, physicians, and doctors because with my disability, there's a lot of times where I need pain meds. They see the [buprenorphine]. They automatically assume that you're a heroin addict."
- "There is little stigma at my doctor's, yes. But at the main hospital through the emergency room and/or when I'm on the floor, its different. That's a whole different thing. That's the stigmatism of the [buprenorphine] program, though."
- "I do get treated differently and grouped into a lump-sum category of trouble, whatever- 'Watch him, don't listen to his needs 'cause he may be trying to get pain killers or whatever.' It's ridiculous. They're in a tough spot, too, so I can sympathize with both."

In-depth Qualitative Interviews: Summary

The qualitative interviews helped to provide a deeper understanding of many of the participants' views about their treatment. One very consistent message from participants was that the treatment they receive (hub or spoke) is life-saving and that by being in treatment, their lives have improved tremendously. Participants treated in both types of sites said that treatment with MAT in the H & S system had substantially reduced their drug use, helped stabilize and improve their housing situation, allowed some to become employed, and helped them improve their emotional health and feel "normal."

Participants receiving treatment in the hub sites were clear that aspects of the clinic environment are not helpful. They frequently mentioned that other patients who were not doing well were often engaging in drug talk and/or selling drugs/medication. Standing in long lines provided, in some cases, extended circumstances for participants to be exposed to this counterproductive talk/behavior. In addition, the long lines for dosing at some clinics helped create an assembly-line, somewhat dehumanizing atmosphere. None of the participants treated in the spoke settings reported that they felt the treatment environment was a negative part of their treatment. In fact, participants treated in the spokes were universally positive about their treatment experience in primary care offices.

In general, reviews of staffing were quite positive. However, participant perceptions of who the key staff were in the two settings differed greatly. In the hubs, the relationship with a counselor was the key connection for the patients. Relationships with doctors in the hubs were described as far less meaningful, and, in some cases, there were negative perceptions about the involvement of the MDs in patient care. In the spokes, there was a virtually uniform perception that the relationship with the buprenorphine prescriber was central to the treatment experience. There were numerous mentions of how valuable it was for the MD to be involved in both their MAT care as well as in their primary care.

The waiting list was viewed as a substantial obstacle to treatment entry. There were multiple suggestions that the treatment (at hubs and spokes) could be greatly enhanced by the addition of mental health services and employment assistance. Although participants in both sites experienced stigma associated with their addiction and treatment for addiction, those treated in the hubs felt a higher level of stigma when they attended the clinic for their medication and treatment sessions than did the spokes patients.

Part 3: Family Members/Significant Others (FM/SOs) Interviews

The family members/significant others (FM/SOs) interviews were conducted to preliminarily ascertain how FM/SOs of patients treated in the H & S system perceived the treatment of their family member, to provide some sense of the degree to which they (the FM/SOs) were involved in the treatment, and to get suggestions/recommendations for service improvement. The interviews were relatively brief (30–45 minutes).

Findings from the Family Members/Significant Others interviews

Within the MAT settings (hubs and spokes), there were no services for FM/SOs and no attempt to engage or educate FM/SOs about addiction.

Interview findings: The most consistent report among all of the FM/SO interviews was that there were no services for FM/SOs in the H & S system. In fact, 50% of the interviewees reported they had attempted to schedule sessions to meet with H & S staff (counselors/MDs) and in all cases, these appointments were discouraged/refused based on confidentiality grounds or absence of a response. FM/SOs reported they were uninformed about the nature of addiction and the purpose and methods of MAT. Several had attended a family session during a previous inpatient rehab episode and had found them very helpful. Half of the FM/SOs had attended sessions at Turning Point (which offers meeting space for recovery support services) and/or Wit's End (which offers support for FM/SOs) and found them helpful. However, none of these services were provided as part of MAT and none of the family members were given referrals or assistance in finding family support. At present, according to the 12 FM/SOs interviewed, there are no services for FM/SOs and in some cases there is a perception of a hostile attitude by treatment staff toward inquiries from FM/SOs to learn about treatment.

- "I called to talk with her counselor and was told: 'I can't speak with you because there is not a release of information." When I said, I just wanted to learn about what treatment was at [the agency], I was told: 'I'm sorry I can't speak to you."
- "I spoke with her (the counselor) once and after that she wouldn't take my calls."
- "I spoke to the receptionist and told her I was worried that [my family member] was sleeping all the time and slurring his words." She said: 'I'll tell [the counselor].' When I didn't hear back in 4–5 days, I called back and she said: '[The counselor] says she can't talk to you." That really pissed me off."

FM/SOs are very appreciative and grateful for the fact that Vermont has developed services for people with OUDs. In general, their perception was that treatment was available and accessible.

Interview findings: Eleven of the 12 participants voiced gratitude and praise for the Vermont MAT system. A number of the participants were familiar with access to OUD treatment in other states (New Hampshire, New York, Florida), and voiced great appreciation that treatment for their family member is quite accessible in Vermont.

- "It was a nightmare when she got arrested, but I was able to help her find treatment in less than 24 hours."
- "He got into treatment at the clinic [hub] after 3 weeks, but he can't find a doctor who will give him [buprenorphine] in their office." There needs to be more doctors who prescribe [buprenorphine]."

FM/SOs who were associated with individuals in treatment in hubs expressed unhappiness about what they perceived as harassment by staff, bad influences from other patients, and a high rate of counselor turnover.

Interview findings: FM/SOs of participants in spoke treatment did not express any concerns about the service delivery sites. They did say that they felt the counseling was of limited value and had suggestions for needed services (see below). FM/SOs of individuals in treatment at hubs voiced concerns about the environment at the hubs being less than therapeutic. They had been told stories of their family member being offered drugs by other patients, being sexually harassed by clinic guards, and being denigrated by clinic staff. The FM/SOs of patients in treatment at hubs expressed a negative opinion of the hub environment in general. An additional concern that was expressed by four of the six FM/SOs whose family member was in hub treatment was that there was a great deal of counselor turnover, which was problematic for the patient in treatment.

- "She said the security guard whistled at her and said she had a cute ass almost every day."
- "[The hub clinic] the easiest place to buy drugs….She says almost every day when she's in line, they are buying drugs from each other."
- "He has gone there for 8 months and has had four different counselors. He thinks the counseling is a joke."
- "Just when she gets comfortable with a counselor, they leave."

FM/SOs expressed a strong opinion about the need for access to mental health treatment for their family members who had an OUD and other concurrent psychiatric disorders.

Interview findings: Seven FM/SOs expressed concern about the absence of mental health treatment. Some comments reflected the opinion that while counseling was a nice service, their family members needed much more intensive treatment with trained mental health professionals. Depression, ADHD, and severe anxiety were all cited as problems that did not receive adequate attention as part of the H & S treatment.

- "Counselors aren't qualified to help people with depression. He has been waiting for 6 months at [the mental health center] to get an appointment to discuss his depression."
- "She's had two suicide attempts and nobody is helping her get help for depression."
- "When he tells them he has lots of anxiety and can't focus on his work, they tell him to increase his methadone dose."

FM/SOs suggested that treatment in the hubs and spokes could be strengthened with more targeted counseling services that included the addition of family services, job placement assistance, and discharge planning.

Interview findings: FM/SOs were generally critical of the counseling services provided to patients in the H & S system. There were numerous mentions that, from what they (the FM/SOs) could determine, it seemed the counseling had little purpose or useful impact. Although they were grateful that patients had someone to talk to, they expressed frustration that the counseling was not useful in addressing important problems. Specifically, many said that they would very much appreciate being able to either: 1. participate in treatment (e.g., via family support groups or education groups), or 2. be given basic information on opioid addiction and treatment. One suggestion was for the Vermont Agency of Human Services to develop a website with information written for family members about addiction and how to find the right kind of treatment for someone with addiction.

In addition, several FM/SOs noted that it would be very useful if the counselors either had counseling skills that would help patients get employment or refer them to agencies that could help their family member gain employment. Finally, there were several suggestions that patients could be helped by the development of plans for tapering medications and discharge. Several family members said that their family member wanted to taper off MAT, but no one would discuss this with them.

- "I really feel helpless to know the right things to do or say. I go to Wit's End, but they don't talk much about [buprenorphine]."
- "I think they talk about Trump and the weather. They need to show them how to get jobs."
- "When does it end? Is she going to be on medicine forever? Nobody seems to ever talk about how to get off this stuff."

Summary

Three themes emerged in these interviews. First FM/SOs were very grateful that the state of Vermont has been so forward thinking in developing the H & S system. Although many of them were unaware of the term "hub and spoke," they were aware that in Vermont, there were clinics that provided methadone and buprenorphine and that some doctors provided medication in their offices. There was a recognition that these services were generally available all over Vermont and at little or no cost, and they were aware that this was not the case in many other states. Although virtually all the FM/SOs recounted long and challenging stories of immersion in the backwash of a family member's addiction, they generally expressed cautious optimism about the benefits of treatment and hopes for the future.

Secondly, there was strong expression of the opinion that more opportunities for the FM/SOs to become better informed about how to help their family member and how to better understand addiction and its treatment would be very useful.

Finally, there was a strong suggestion to provide better access to mental health care for patients with co-occurring psychiatric disorders. Also, employment assistance was perceived as a service that was not as available as it is needed to be, and several FM/SOs suggested a better process of treatment and discharge planning.

Chapter 6: Access to Medication-Assisted Treatment (MAT) for Opioid Disorders in Vermont: Information from the Spoke Settings

Introduction and Background

Before the start and during the course of this project, the PI of this project (Rawson) and senior research associate (McCann) traveled around the state of Vermont, visiting 9 of the 10 hub sites and approximately 15 of the spoke sites. During these visits, they informally interviewed many of the doctors and clinic staff and, in some cases, spoke to individuals in treatment. In addition, Dr. Rawson became an active participant in the addiction action group in his local community, Brandon Cares, where he spoke to individuals in and out of treatment as well as family members of individuals dependent upon opioids. These experiences helped shape this H & S system evaluation.

During the course of these visits, there were differences of opinion among clinicians, support staff, patients in treatment, and family members about how much access opioid users had to MAT in Vermont. Some physicians in spokes thought that there were many opioid addicted individuals who wanted treatment but could not access MAT. Some opioid addicted individuals stated that they could not access treatment in hubs due to distance to the clinic or a waiting list. Others reported that they could not access treatment with buprenorphine because they did not have an established primary care doctor, their primary care doctor was not a buprenorphine prescriber, or their primary care doctor, who was a prescriber, was at the maximum approved capacity of buprenorphine patients.

Every month, each hub reports the number of people they have on their waiting list to the Vermont Department of Health, Alcohol and Drug Abuse Program (ADAP). The ADAP waiting list numbers for hub services peaked at 615 in January 2015 and dropped to 104 in May 2017, with the only substantial waiting list at that time being in Chittenden County. (As of November 2017, there was no waiting list in Chittenden County).

As the proposal for the H & S system evaluation was discussed with ADAP, budget considerations made it infeasible to conduct a systematic, comprehensive study of the issue of access to MAT in Vermont. However, there was an interest in collecting additional information from around Vermont regarding perspectives on the availability of MAT for individuals with OUDs. The following information, which is not a systematic, comprehensive study, represents an

exploratory information collection effort. The findings are speculative and incomplete. No names or titles of informants are included in this section of the report.

Exploratory Information: Collection Activity

We contacted the Medicaid Blueprint managers in 10 of the 14 state regions. (These "Blueprint" [BP] regions represent individual Vermont counties.) On the phone calls to the BP managers, we asked general questions regarding spoke waiting lists and access to MAT in their region, and with their permission, called a number of spokes and talked to their office manager or MAT nurse to gather more detailed information regarding their perceptions about demand for MAT.

Information from Blueprint (BP) Managers

Of the 10 BP managers we spoke with, seven did not know of any regional waiting list or waiting lists at specific spokes. In three of the BP regions, one had an acknowledged waitlist at a hub, one had a waitlist at a specific spoke, and one had waitlists at multiple spokes. In general, the BP managers seemed to have good familiarity with MAT accessibility in their regions. In the three regions with acknowledged waiting lists, the reasons for these waiting lists differed. In one region, the access problem was the result of a combination of inadequate number of licensed treatment "slots" at the hub, causing a wait for methadone services, and MDs with buprenorphine waivers who limited their practice to very few patients. In this region, the BP manager felt that if the MDs were willing to increase their buprenorphine caseloads by even five patients each, there would be adequate MAT capacity. In a BP region without a hub, a single medical clinic was the only MAT provider in the county and had a waiting list of approximately 80 individuals with waits up to 6 months for admission. Although opioid users in this BP region could be admitted for hub services in neighboring regions, distances to the hubs were problematic. Finally, in another region without a hub, the BP manager reported a waiting list of approximately 30 individuals at the super spoke.

BP Managers: Summary

Overall, the BP managers viewed access to MAT in Vermont as quite good throughout most of the state. They viewed the development of the buprenorphine provider network as having expanded rapidly in most BP regions and noted that sites providing buprenorphine were gradually becoming much more comfortable treating individuals for OUDs as a routine part of their practice. A number of BP managers felt that some of the spokes were unnecessarily rigid about not accepting patients directly into treatment, but rather referred new inquiries to hubs or super

spokes for induction and stabilization. In addition, several observed that some of the spokes frequently took a number of weeks (up to a month) to schedule new patients for admission, simply due to "clinic policies." In these spokes, BP managers suggested that more flexibility and urgency in rapid admissions would substantially facilitate treatment entry of new patients. In general, it was the perception of the BP managers that the integration of treatment for OUDs into primary care settings in Vermont is gathering momentum and becoming quite routine in many places.

There were some less positive perceptions, however. A majority of BP managers believed that if there were more spoke locations, thereby reducing the distance for patients, there could be a substantial increase in patients treated with MAT. As noted above, in one BP region, there appeared to be enough prescribers, but many of them limit the number of buprenorphine patients on their roster. In short, the BP managers felt that great progress has been made in expanding access to care. However, with more flexible and timely admission policies/procedures and with more geographically distributed spokes (and larger MD caseloads), the capacity for MAT treatment in Vermont could be significantly improved.

Information from the Spokes

The following information was collected from telephone conversations with staff members of the convenience group of spokes. Information is presented in a site-by-site manner in order to reflect the diversity of policies and practices in spokes. Individual site methodologies may suggest strategies that can facilitate or impede access to MAT treatment. This group of spokes is not intended to be fully representative of all spokes but is intended to provide some perspective on practice diversity.

Spoke A: This practice only accepts patients who are already stabilized on MAT; they do not perform buprenorphine inductions. There are approximately five opioid users per month who call and express an interest in MAT. They are referred to either the closest hub or to a super spoke. Typically, this practice turns away IV users, whom they consider too unstable for their treatment service.

Spoke B**:** This practice also does not induct individuals onto buprenorphine. They refer all inquiries for OUD treatment to the regional hub, located 30 minutes away. Between 5 to 15 opioid users are referred to a hub or the super-spoke facility per month. It is not known how many of these individuals are admitted for treatment.

Spoke C: Approximately 10–20 people per month call looking for treatment at this spoke, but as with Spokes A and B, only patients stabilized on buprenorphine are accepted directly into

the practice. Addicted individuals must enter treatment at a hub or a super spoke and then they may transfer to this spoke. About 3-4 opioid users per month are admitted at this spoke as transfers from the super spoke or from a hub.

Spoke D: MAT nurses receive approximately five self-referred calls per week, which are then referred to the hub prior to entry into this spoke. Once the individual is stabilized on buprenorphine, there is no waiting list to enter into MAT treatment at this practice. The total number of individuals who call who are eventually admitted to MAT is not recorded.

Spoke E: As with Spokes A–D, individuals who are not already stabilized on buprenorphine are referred to the hub or a local buprenorphine induction program. The number of individuals who call to inquire or enter treatment is not recorded.

Spoke F: This facility does not have a waiting list; however, their buprenorphine treatment program is full and they are not accepting any new patients into treatment. Typically, the individuals who are admitted have already been established and stable on MAT and are then transferred to this location for treatment. The number of individuals who call for treatment is unknown.

Spoke G: There are a variety of MAT nurses that take self-referred calls, and callers are referred to the buprenorphine induction program or to the local hub. The staff at this site is small and there are delays in accepting new patients. Patients must already be in hub treatment as a prerequisite to acceptance into treatment at this site.

Spoke H: This spoke is in a BP region without a hub. They operate as a super spoke, as they have MDs with substantial addiction training, and they directly provide buprenorphine induction at their practice. There is a long waiting list for new patients who are not on MAT. Individuals on the waiting list can wait up to 6 months for admission to buprenorphine treatment. This spoke accepts transfer patients from other locations who bypass the waiting list (about one or two transfers per month).

Spoke I: At this practice, there are four prescribers. There are approximately four to eight people per month calling for treatment. Following phone screening, about two to three people are referred to a higher level of care, and the remainder are accepted into treatment. Of the patients referred to a higher level of care, about half follow through with their treatment.

Spoke J: This spoke estimated that about three opioid users per month call to get treatment. Typically, all of the individuals are referred to the hub, and it is unknown how many of

these individuals enter treatment. In those cases where individuals are admitted directly into the spoke practice, it takes about 2 months for them to get an initial appointment to enter treatment.

Spoke K: This facility receives about two or three calls for treatment per month. Approximately half of these people are brought into the practice for treatment, and the other half are referred to the hub or the region's more intensive super-spoke setting.

Spoke L: This intensive spoke program receives about six calls per month from self-referred opioid users. There are also referrals from other local spokes and other addiction programs that do not administer MAT. Of the spoke-to-spoke referrals, about half are subsequently sent to the hub for more intensive care.

Spoke M: This spoke only accepts patients already stabilized on MAT. About 10 people were currently waiting for transfer admissions into the spoke. About one or two people per month are referred to the local hub for MAT treatment.

Spoke N: This facility has discontinued providing opioid treatment and, as result, calls have nearly ceased.

Spoke O: At this location, approximately four people per month call for treatment. However, all of those interested in treatment are referred to the local hub. It is unknown how many individuals are admitted into the hub.

Spoke P: This spoke accepts addicted individuals directly into treatment or as referrals from the hub or other spokes. An estimated three to six new patients per month are admitted at this practice.

Spoke Q: This spoke has three prescribers and about 55 individuals on buprenorphine. They have accepted as many of their own primary care patients into treatment as have applied. They are now accepting new patients who have not previously been receiving primary care services at the practice. They report never having received a referral from a hub. They admit and induct patients onto buprenorphine and manage all individuals with OUD in their practice. They have an informal waiting list of approximately 25 patients. Interestingly, in speaking with the RN on the MAT team and one of the MDs at this practice, we were told that their attempts to refer patients to the hub had been universally unsuccessful. Individuals have reported that they have been unable to access hub services due to a waiting list or distance to the hub, or they were unwilling to go to the hub due to perceptions of drug dealing and other counter-therapeutic activities at and around the hub.

Spoke R: This site is an outpatient behavioral health practice, with less intensive care than a hub but more focused care than a spoke (aka, a super spoke). At this practice, approximately 20 people call each month as self-referrals without a primary care provider. An additional five to six people are referred from other spoke programs when they feel that the patient may need more focused care. About three patients each week are admitted into buprenorphine. Any additional people per month are referred to a higher level of care at the hub.

Summary from the Spokes

As illustrated above, there is a great diversity of policies, procedures, and practices in the spokes, and this group of 18 spokes represents about 20% of the spokes in Vermont. While many spokes operate only as maintenance sites for stabilized patients, others have become more operationally independent and conduct their own initial assessments and will induct new patients onto buprenorphine without referral from a higher level of care. Most likely, there are pluses and minuses to each approach. However, it is clear that each spoke practice has a considered policy and practice and that MAT now has a place in many primary care settings in Vermont.

Conclusions

This exploratory exercise likely raised more questions than it answered. It is clear that in some places in Vermont there is a need for more access to MAT. It appears to be the perception of most of the BP managers and spoke staff interviewed that there is a substantial number of opioid users in Vermont who are not accessing treatment due to distance and other logistical issues. There is a near universal perception that there is a need for more prescribers, additional spokes, and possibly more hubs. For patients who require the frequent visits, monitoring, and intensive structure of a hub, there are parts of Vermont where this service is inaccessible. For individuals who want treatment with buprenorphine from a spoke, the policies of many spokes requiring induction and a period of stabilization in a hub may be an obstacle to treatment for a significant number of individuals.

This exercise did not provide an answer to the question of how extensive the unmet need for MAT is in Vermont. However, a number of things are clear. First, Vermont has considerably increased access to MAT since the initiation of the H & S system in 2013. Second, in many parts of Vermont, there are functioning networks of hubs and spokes (and super spokes) that are working together to bring individuals with OUDs into MAT. Third, in some parts of Vermont, there

is clear unmet need, with some areas still reporting that some treatment-seeking individuals have to wait up to 6 months to be admitted into MAT. Fourth, in many primary care and other health care settings (spokes), MAT for individuals with OUDs has become a well-accepted part of the service array for patients. Fifth, there is a widespread perception that more MAT services in spoke settings (more prescribers and prescribers who accept more patients) would benefit a substantial number of people who currently are unable to access MAT.

This information collection exercise did make one fact very clear. There are many individuals who are contacting the Vermont healthcare system inquiring about treatment for OUDs. At present, there does not appear to be any systematic collection of information on how many people are seeking care, and of those who make treatment inquiries, how many find their way into treatment. As Vermont policy makers attempt to better understand the size of the opioid addiction problem in Vermont, the failure to systematically collect these data seems to be a missed opportunity. Even if it is not possible to set up a practical, economically feasible data collection effort that would guarantee non-duplication of inquiries, it seems that having some better understanding of how many calls come to each of the H & S service delivery sites over time would provide a useful indicator of the trends in treatment-seeking for MAT.

Similarly, at all levels, the hubs, the spokes, and the BP managers, there is a great deal of discussion of "referral" of individuals from one MAT care setting to another (e.g., hub to spoke, spoke to hub, spoke to spoke, etc.). However, with some exceptions, there is little sense of whether these "referrals" lead individuals with OUDs into treatment, or simply are de facto treatment refusals. The successful engagement of individuals with SUDs into treatment was a primary focus of the SAMHSA-funded NIATx initiative. This initiative documented many strategies that enhance and facilitate engagement into SUD treatment. Among the practices that clearly <u>do not</u> promote engagement into treatment are substantial waits for treatment and referrals to other treatment settings. In fact, as a result of NIATx findings, many organizations have attempted to reduce waits for treatment to 24 hours or less in order to promote treatment engagement. To this end, it would seem that an important starting point in Vermont would be to have a better understanding of what happens when people are referred, what percentage of referrals are successful, and what percentage are essentially treatment refusals. As Vermont attempts to better understand access to opioid care in the state as well as the size of its opioid problem, the collection of data of these types could be extremely informative and useful.

Chapter 7: Conclusions and Recommendations

The data collected in this evaluation provide new preliminary information on opioid addiction treatment services offered in the Vermont H & S system of care. While there are limitations to the sample selected (non-random) and to the nature of participant information (self-report), the data collected add to the developing knowledge on the impact of MAT services delivered in hubs and spokes.

This evaluation is primarily from the perspective of individuals receiving services, or not yet receiving services, in the H & S system. This person-centric perspective was chosen to supplement reports based on claims data on the amounts, types, and fiscal impact of services delivered to those in treatment for opioid addiction. Directly querying the consumers of H & S services provides a new perspective on those services and their impact on those receiving them. Querying individuals who qualify for these services but are not currently accessing them provides information about the obstacles that discourage individuals from seeking treatment.

In addition to the data from the point of view of individuals with OUDs, in and out of treatment, this evaluation includes information on the variety of service configurations that make up the H & S system, on access to MAT, and on the usefulness of the H & S services from the perspective of family members of individuals receiving treatment.

Conclusions

Who is receiving treatment in the H & S system?

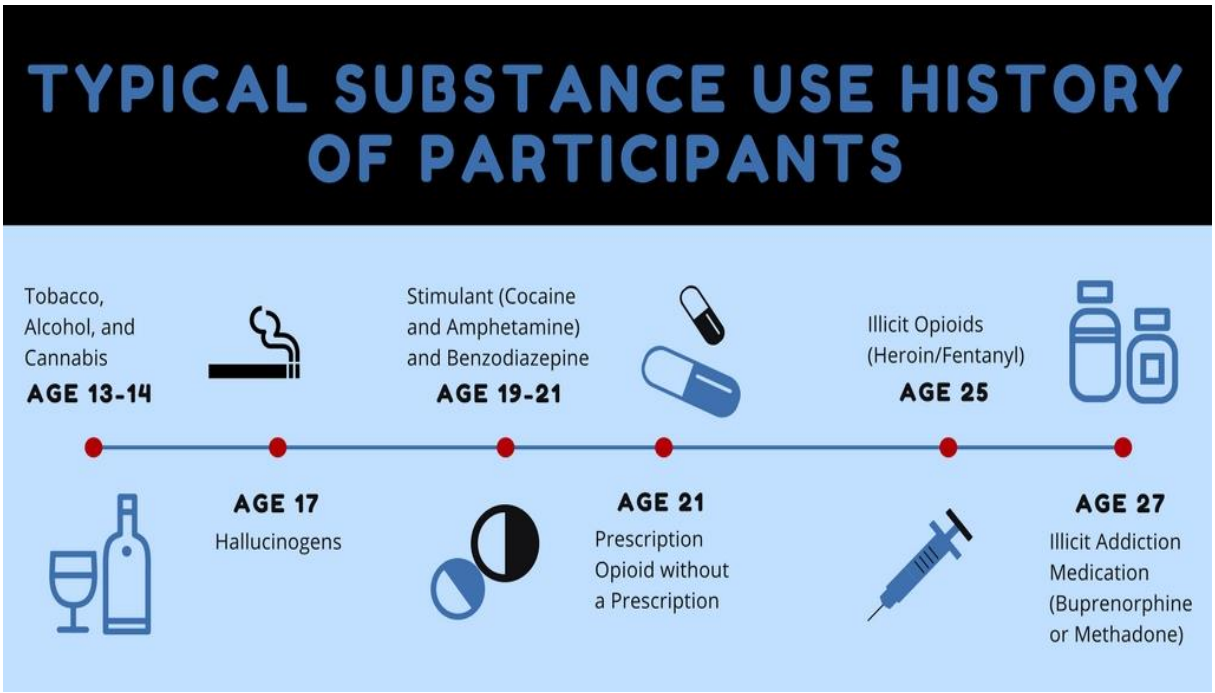
The 80 self-selected individuals in treatment (40 from hubs, 40 from spokes), with each group stratified for a 50:50 male/female ratio, were, on average, in their mid-30s, predominantly Caucasian, non-Hispanic, and with a 12th grade education or more. Over half were in a relationship and 70% had children. Because of the small sample size, it is not meaningful to compare the characteristics of the 80 individuals in treatment to the 20 out-of-treatment participants.

Almost 50% of the participants in treatment reported a prior diagnosis of a mental health disorder other than addiction, most frequently, depression and attention deficit disorder. Over 90% had been tested for HIV and hepatitis C; one individual out of the total sample of 100 participants was HIV positive, and approximately 30% of the sample was positive for hepatitis C.

Participant drug histories show initiation of tobacco, alcohol, and cannabis use between 13 and 14 years of age; progression to hallucinogen use at 17; and then stimulant (cocaine and

amphetamine) and benzodiazepine use between ages 19 and 21. The mean age of opioid initiation was around 21, although nearly 50% took opioids before the age of 18. Over 80% reported that the first opioid they used was a prescription opioid medication. Progression to illicit opioids (heroin/fentanyl) occurred about 4 years later (25 years of age, on average), and over 90% of the sample transitioned to illicit opioids as their primary drug. Approximately 2 years later (age 27), participants reported their initial use of an addiction medication (buprenorphine or methadone), which was purchased illicitly by over 80% of the participants. Mean age of first injection drug use was approximately 27 years old. Figure 25, illustrates the time course of substance use initiation over time.

Figure 25. Time Course of Substance Use Initiation.



Changes in drug and alcohol use by individuals in MAT for at least 6 months.

The sample of 80 individuals in treatment in the H & S system of care reported significant positive changes in their lives during the treatment period (mean duration = 33 months).

Participation in MAT was associated with a reduction in opioid use. Most opioid-dependent individuals entering methadone or buprenorphine treatment used opioids multiple times daily. Those in treatment reported having used an average of 86 of the 90 days immediately

prior to treatment admission (T_1), and 68 of 80 reported having used all of the 90 days immediately preceding admission to treatment.

At the time of the interview (T_2), 85% of H & S participants reported no opioid use in the previous 90 days. The mean of 86 days of opioid use out of 90 at treatment admission (T_1) was reduced to an average of 3 days in the previous 90 days at the time of the interview (T_2). These data provide strong support for the effectiveness of methadone and buprenorphine in reducing illicit opioid use.

Participation in MAT was associated with a substantial reduction in other drug/alcohol use, except cannabis.

Quantitative data showed statistically significant reductions in alcohol and most classes of non-opioid drug use, specifically in the number of days of use of cocaine, benzodiazepines, and alcohol. Tobacco use also decreased, although to a lesser degree. Only cannabis use was not impacted by participation in MAT—the number of days of cannabis use was unchanged between T_1 and T_2.

Participation in MAT was associated with a reduction in drug injection. At admission (T_1), in-treatment participants were injecting drugs on an average of 43.2 days out of 90 days, while at the time of the interviews (T_2), this was reduced to 3.4 days. Clearly, participation in MAT is associated with an important and substantial reduction in injection frequency and associated risk for overdose and transmission of infectious disease.

Change in functioning of individuals in MAT for at least 6 months.

Participation in MAT was associated with a large reduction in ED visits and overdoses. During the 90-day period before treatment (T_1), the 80 participants reported an average of 3.5 days with an ED visit, or 280 visits across the 80 participants. At T_2, an average of 0.4 days of ED visits were reported, or 32 visits in the more recent 90-day window, a reduction of 89%. Many of the participants reported that many/most of the T_1 period ED visits were primarily efforts to obtain opioids.

At T_1, 25% of H & S participants reported at least one overdose episode during the 90-day period, whereas at T_2, no participants reported an overdose episode in the 90-day reference period. Participation in MAT was associated with a substantial reduction in reported overdose risk.

Participation in MAT was associated with a slight increase in education/training activities, but not in days of employment. There was a small, but significant, increase in the days participants were involved in training or educational activity between T_1 and T_2; however, there was no significant change over that time in days of employment.

Participation in MAT was associated with a 90% reduction in both days of illegal activity and contacts with police. At the time of treatment entry (T_1), participants reported involvement in illegal activity on approximately one third of the days during the 90-day period. At T_2, this involvement in illegal activity was reduced by 90%. Similarly, during the 90-day T_1 period, participants reported being stopped or arrested by police an average of 3.1 times, or 248 times across the 80 participants. This number dropped to an average of 0.3 times, or 24 times across the participants, at T_2, also a 90% reduction.

Participation in MAT was associated with a substantial decrease in family conflict and improvement in measures of mood. At T_1, participants reported conflicts with family members on about one third of the days (37 days out of 90). This estimate of days of family conflict was reduced by nearly 70% (11.3 days out of 90) at T_2. Similarly, participants reported significant reductions in the days in which they experienced depression, anxiety, and irritability/anger.

Change in life satisfaction over the course of MAT.

Participation in MAT was associated with a substantial improvement in overall satisfaction with life and with major improvements in the domains of drug use, medical status, legal involvement, family/social functioning, and emotional/mental health. The one area of life where improvement was not reported during the MAT period was in the domain of school or work situation.

Differences in response to treatment between hubs and spokes.

The H & S system uses the Treatment Needs Questionnaire to triage individuals with the most clinically challenging and complex OUDs into the hubs. Hubs use clinical judgment and patient preference to determine if a patient is treated with methadone or buprenorphine. In the evaluation design, we chose to select only patients on methadone from the hubs. All patients in the spokes were treated with buprenorphine. As a result, patients in the hubs and spokes do not constitute clinically identical samples. Because the sample size was only 40 each from the hubs

and spokes, a definitive comparison of outcomes of participants treated in the two settings was not possible.

Despite the triaging of patients into hubs and spokes based on clinical severity, participants were similar in many dimensions. However, there were some differences. Participants treated in the spokes were more likely to have a stable living situation, more likely to have custody of their children, and less likely to have hepatitis C. Spoke participants were less likely to have initiated opioid use with heroin/fentanyl and were more likely to report the current treatment as their first involvement with treatment for an OUD. Individuals treated in spokes were less likely to be using heroin/fentanyl or injecting at the time of the interview. On other drug history and treatment history variables, there were no detectable differences.

Differences in drug and alcohol use, drug injection, and other areas of functioning in hubs and spokes.

Participants treated in the hubs with methadone and those treated in the spokes with buprenorphine showed very similar and positive responses to MAT in virtually all measurement domains, including satisfaction with life. It was encouraging to find that the outcomes of those treated in the primary care / spoke settings with buprenorphine were very similar to those treated in the intensive, specialty OUD treatment environment of the hubs.

Perceptions of treatment for individuals treated in hubs and spokes.

Participants in both settings viewed MAT very positively and as very helpful to them. Spoke patients rated their care slightly higher on several dimensions and viewed treatment as helping them to a greater degree in three of the four assessed domains. The treatment experience was rated highly by participants in both the hub and spoke settings. Participants treated in the spokes indicated that they perceived the treatment as somewhat more in tune with their needs than were reflected by ratings of participants in the hubs. Further, although participants in hubs and spokes rated the helpfulness of the treatment for their drug-use situation similarly, spoke participants rated their treatment more highly than did hub participants for health improvement, personal responsibilities, and community membership.

Reasons individuals are currently out of treatment.

Most out-of-treatment participants intend to enter treatment. The sample of 20 out-of-treatment individuals was small and most (14) were recruited from syringe services programs, which limits the generalizability of the findings. Most expressed a desire to enter treatment but had been previously discouraged by substantial waiting lists; 15 of 20 participants reported they planned to enter treatment, and 10 said they were either on waiting lists or scheduled for admission interviews. Obstacles to treatment participation included transportation problems, dosing hours conflicting with their work schedule, child care problems, a desire to avoid hub treatment, and a lack of available spoke prescribers.

Most and least helpful aspects of treatment by treatment site.

The participants in treatment were very grateful and felt fortunate to have access to the treatment they were receiving. Qualitative interview data indicated that there was a near universal expression of appreciation and gratitude by participants regarding their access to treatment and the actions taken by leaders in Vermont to expand treatment for people with OUDs. Most participants viewed the benefits received from MAT to be effective in helping them reduce/discontinue their drug use and improve their lives. Many of the participants described the impact of MAT on their lives as transformative and that their time in treatment had allowed them to create productive, positive lives for themselves and their families. Almost every participant interviewed described some version of a major life improvement, which they attributed to MAT.

In contrast to the positive aspects of treatment listed above, participants at both the hubs and spokes reported that they had little assistance with employment/vocational issues and little access to mental health treatment. There were numerous suggestions that the time spent in required counseling sessions (group and individual) could be better spent in receiving tangible vocational assistance in finding employment and/or assistance in gaining access to psychiatric care.

Participants in the hubs reported some specific aspects of treatment at the hubs that were negative. A very frequently voiced perspective from participants was that going to the hub for medication and other services was often a negative experience. Although participants reported that staff were compassionate and helpful, the interaction with some of the other patients in the clinics was very disruptive and upsetting. Long dosing lines created the opportunity for offers to sell or buy drugs, instances of sexual harassment, abusive language, and occasional physical

altercations. This specific aspect of the hub treatment experience was commonly reported. The extent of these reports seemed to interviewers to be directly related to the size of the clinic; large numbers of patients (>400) in the clinics appeared to be associated with more negative clinic experiences.

Spoke participants with past hub experience mentioned experiencing similar issues at hubs. Some said that if they were required to return to treatment at a hub, they would discontinue treatment.

Other negative aspects of treatment in the hubs included high rates of staff turnover, insufficient access to hub physicians, and a feeling of "assembly-line" or "cookie cutter" treatment.

Participants in treatment at the spokes were extremely positive about their treatment experience. Spoke participants were outspoken about the care and compassion of the doctors providing their care. The core non-medication-treatment "dynamic" in the spokes was very different than that in the hubs. In the hubs, participants talked about their relationship with the counselors, some good and some not so good. In the spokes, although participants positively acknowledged the contribution of counselors and nurses, they were emphatic that the key to their ongoing participation in treatment and the positive life changes they had made during treatment was the relationship they had with their physician. They frequently mentioned that the physician treated them with respect, and because they also provided their general medical care, they felt the physician treated them as human beings, not simply as addicts. This was a powerful and positive aspect of treatment of OUDs in primary care.

A related positive aspect of treatment in the spokes was the fact that coming to the office for MAT does not identify the individual as an "addict." The medical office treats patients for a broad range of medical conditions and the participant with an OUD sits in the same waiting room with a heterogeneous group of individuals and receives care "just like other patients." This mainstreaming of OUD treatment into general medical care was very much appreciated by spoke participants.

Spoke participants had very few negative comments about their treatment experience. Some viewed the required counseling as unnecessary and non-productive, but there were relatively few negative comments about treatment in the spokes. The most frequent negative comment was that there were not enough doctors who offered treatment for OUDs.

Family members/significant others (FM/SOs) view of treatment.

Family members/significant others (FM/SOs) of individuals receiving treatment in the H & S system (N=12) were uniformly grateful and appreciative of the availability of treatment. The FM/SOs interviewed were aware that access MAT in Vermont is far better than in neighboring states and other parts of the United States.

FM/SOs expressed interest in being involved in the treatment of their family member but felt that such involvement was actively discouraged. They also identified other service deficiencies. Several of the FM/SOs had previously participated in family treatment sessions when their family member was in a residential treatment program. They reported finding this experience to be helpful in explaining addiction and supporting their loved one's recovery experience. Within the H & S system, none of the FM/SOs interviewed had ever participated in any family programming. Several had attempted to become involved but were actively rebuffed by counselors who stated that due to confidentiality regulations they could not speak to the FM/SO. This absence of opportunities for FM/SOs to be meaningfully involved was seen as a limitation of the H & S treatment model.

FM/SOs also reported that the absence of vocational assistance, mental health care, and any discussion of discharge planning or post-medication care were weaknesses in the H & S service system.

Recommendations

1. Increase access to MAT in spokes.

Participants receiving treatment in the spokes described a very positive treatment experience, and their measures of functioning were excellent. However, in some parts of Vermont (e.g., Northeast, Chittenden/Addison counties) spoke access is limited. Efforts to promote having primary care doctors, nurse practitioners, and physicians' assistants obtain buprenorphine waivers is a priority. Vermont should also continue to encourage waivered prescribers to increase the number of people they serve. Finally, in many regions, when individuals contact primary care settings seeking treatment for OUDs, they are routinely referred to the hubs for evaluation. Instead, whenever possible, active opioid users should be assessed in a spoke and admitted to treatment directly, if appropriate. If they are assessed as needing more intensive services, they

can be referred to a hub. Requiring assessment and initiation of MAT in a hub is a significant obstacle to care for many out-of-treatment individuals with OUDs.

2. Add additional hub locations/or medication units to improve access and reduce high clinic censuses.

The most frequently heard criticism of the Vermont H & S services was that in larger hubs, it was common to encounter detrimental/negative interpersonal interactions with other patients. The greatest number and proportion of reports of serious negative interactions were in the clinics with a census in excess of 400 patients. Consideration should be given to reducing the size of these large clinics by adding additional OTP clinics and/or medication units not requiring full OTP licensing. More, smaller sites, could increase access to hub care and could improve the treatment environment to promote recovery.

Adding hub capacity in Addison County and the Southwest region of Vermont would both increase access to hub services, which is currently very low in those areas, and help decrease the size of the existing OTPs.

3. Develop an addiction workforce plan for Vermont.

A common report from in-treatment participants, especially in hubs, was that they were not benefitting from counseling due to high turnover among counselors. Since the primary therapeutic relationship in the hubs is with the counselor, rapid turnover in this position is problematic to patient engagement and outcomes. Some prescribers are not taking new MAT patients because there are no MAT team staff available to provide support. The workforce problem will continue to limit the impact of the H & S system. A workforce plan should be developed that addresses at minimum: recruitment strategies; education and skills requirements; salary guidelines; and an adequate number of higher education degree programs.

4. Conduct a prospective evaluation of the H & S system, with randomly selected participants and an intent-to-treat design.

The present evaluation of the H & S system is a step toward understanding the benefits and weaknesses of this service system, but it is not a rigorous assessment of how well the system engages and retains patients, of the types of patients who do well or poorly, nor the extent that

the H & S service configuration is responsible for clinical outcomes. All data in the present evaluation are based on self-report, without verification from biological samples, and participants were not randomly selected. Those in treatment had successfully stayed in treatment for at least 6 months. The evaluation does not include information about individuals who dropped out of MAT following short lengths of stay. The sample sizes are small. As Vermont continues to develop and refine services for individuals with OUDs, a more complete and rigorous prospective evaluation of the H & S service system would be very useful to guide future investment.

5. Establish a workgroup to improve clinical treatment within the H & S system.

The H & S system was developed to rapidly increase access to MAT for the treatment of OUDs. System growth has slowed and there may be opportunities to improve care through the establishment of a workgroup focused on better meeting the needs of patients, their families, and the community. Membership of the workgroup should be clinicians currently providing care within the H & S system, university experts in addiction services, representatives from the Department of Health, the Department of Vermont Health Access, the Vermont Blueprint for Health, and outside experts from ASAM/NIDA/AAAP (possibly provided via a SAMHSA technical assistance request). The workgroup should consider doing the following:

5a. Increase access to mental health services.

More than 40% of study participants reported possible concurrent psychiatric disorders that could benefit from assessment and treatment. Patients report difficulty in accessing care for serious, persistent symptoms of anxiety, depression, severe mood swings, and thought disorders, which if left untreated, substantially limit the positive outcomes of treatment within the H & S system. Development of an effective and efficient methodology to assess patients for psychiatric disorders and to provide a pathway to timely mental health treatment would address this need.

5b. Provide vocational services to individuals who need employment assistance.

Develop an improved vocational support service to address employment and satisfaction with employment. Participants frequently identified this as an ongoing problem that was not addressed in the H & S system.

5c. Develop a family members/significant others component for the H & S system.

Develop services for family members/significant others (FM/SOs) to help them understand the nature of opioid addiction, the role of MAT, and how the FM/SO can help their family member in treatment.

5d. Expand and diversify residential treatment capacity.

In interviews with participants who were out of treatment and those who were on MAT, but not doing well in treatment, there were requests for more residential treatment options. As with many health conditions, not all individuals respond to one form of treatment, and in the case of OUDs, not all individuals with OUDs, respond positively to MAT. Those who were not successful expressed a need for longer-term residential treatment options to allow them to remove themselves from the chaos of addiction and engage in some behavioral treatments, including family treatment. Similarly, 3 of the 12 FM/SOs we spoke with had family members who had previously been in MAT but had continued to use opioids and, therefore, had discontinued MAT. Subsequently one of these individuals died of an opioid overdose and two left Vermont to enroll in longer term, therapeutic community programs. It would be a valuable addition to the service array in Vermont to have additional residential treatment capacity for those who do not respond well or are unwilling to engage in MAT.

5e. Develop clinical materials/protocols to assist patients using stimulants or benzodiazepines, or misusing alcohol while on MAT.

Identify and train clinicians with evidence-based approaches and strategies for addressing polysubstance use in MAT. Participants who reported stimulant/benzodiazepine use and/or misuse of alcohol reported that the only interventions that were discussed were the loss of take-home doses of methadone, an increase in the visit schedule, transfer to the hub for spoke patients, and/or treatment termination. There is a literature of evidence-based strategies that could be used to address these problems.

5f. Develop materials to assist clinicians in explaining the typical course of MAT and positive and negative considerations of medication termination and post-MAT continuing care.

A substantial number of participants in treatment and FM/SOs reported that they did not understand how long the participants should stay in MAT. Participants in treatment voiced confusion about if/when they should consider discontinuing MAT; how to determine if they were ready to discontinue MAT; how to discontinue MAT; and the services available to support them with this phase of recovery. There did not appear to be awareness of the network of recovery centers that provide services that might be useful in the event of a decision to discontinue MAT. Development of some clinical protocols and/or treatment materials could be of great value.

5g. Review and revise the patient placement instruments (Treatment Needs Questionnaire and Office Based Opioid Treatment Stability Index) to improve placement of individuals in the H & S system.

The Treatment Needs Questionnaire (TNQ) and Office Based Opioid Treatment Stability Index (OSI) are currently used to place and maintain individuals into the most appropriate opioid treatment setting. There has been no systematic effort to assess the effectiveness of these placement tools in the H & S system specifically, and with 4 years of experience with these tools, it seems appropriate to review them with input from a group of prescribers for modification and consensus approval.

5h. Review and develop an H & S system protocol on cannabis screening and response to positive screens.

There is tremendous variation across the H & S system regarding the inclusion of cannabis testing as part of the required urinalysis (UA) screen panel. Some locations do not include cannabis screening in the UA panel, so the use of cannabis does not influence methadone take-home policies nor buprenorphine visit schedules. Other locations include cannabis in the UA panel, and cannabis-positive UAs can cause revocation of take-home doses or an increased buprenorphine clinic visit schedule. In one region where the hub screens for cannabis, individuals in treatment with buprenorphine who test positive for cannabis are

considered ineligible for transfer to spokes. Developing consistent cannabis screening protocols would prevent undesired, unintended consequences.

5i. Develop and add tobacco cessation services for patients on MAT.

Well over 50% of the individuals in MAT are daily tobacco users. While these individuals are receiving MAT there is an opportunity to address this major health risk behavior. As it becomes evident that many of these patients require long-term chronic care for their OUD, this engagement in treatment provides an opportunity to integrate tobacco cessation programs to reduce tobacco-related morbidity and mortality.

5j. Review and consider the addition of newer forms of MAT for OUDs

The Vermont strategy of expanding access to MAT by focusing on the expanded availability of methadone and buprenorphine was a very astute and well-founded strategy. As a result, Vermont has accomplished a great deal in providing evidence-based treatment to individuals with OUDs. However, one issue acknowledged by evaluation participants, clinicians, and law enforcement officials is that there is considerable diversion and illicit sales of buprenorphine (and to a much lesser extent, methadone) in Vermont. There are new dosage forms of buprenorphine currently available and soon to be available that would greatly reduce the diversion of buprenorphine. Although the currently available buprenorphine implant with a duration of 6 months is seen to have a variety of practical limitations (e.g., potency of the buprenorphine dose and need for surgical procedure), there is a new injectable form of buprenorphine recently approved by the FDA that could provide individuals with a 30-day steady blood level of buprenorphine. This 1-month, extended-release form of buprenorphine could have significant clinical benefits for some patients and reduce/eliminate diversion potential for individuals using this form of buprenorphine.

Summary

The Vermont Hub-and-Spoke System of Care for Opioid Use Disorders is one of the most innovative and constructive public health responses to the opioid epidemic of the 21st century in the United States. The H & S system was designed to make medication-assisted treatment (MAT) for opioid use disorders (OUDs) readily available throughout the state. This strategy is supported

by established science, which recommends MAT as the most effective treatment strategy for OUDs (U.S. Department of Health and Human Services, Office of the Surgeon General, 2016). Vermont has also increased naloxone distribution through syringe-services programs, standing orders at pharmacies, requirements for co-prescribing naloxone with high dose opioid prescriptions, and distributing naloxone to first responders. Syringe-services programs statewide provide harm reduction services, including clean syringes, education, testing for infectious diseases, and referrals to treatment. This comprehensive statewide response is the result of leadership from the governor's office, state agencies, federal-funding opportunities, university health leadership, physician groups, physician MAT champions, residential-treatment programs, organizations that operate opioid treatment programs (aka, methadone clinics) and a diverse collection of community health/mental health professionals throughout the state.

The H & S system has dramatically expanded access to MAT in Vermont. As of 2017, waiting lists for OUD treatment in Vermont have been nearly eliminated. Most individuals seeking treatment for OUDs can access MAT within a 30–45-minute drive. The service configurations within each of the H & S regions vary substantially, but the intended purpose of the H & S system, to make MAT available to treatment-seeking individuals throughout the state, has been accomplished.

The data collected in this evaluation have documented that individuals receiving MAT in hubs and spokes improve their lives dramatically due to their involvement in treatment. They report very dramatic reductions in opioid use, as well as reductions in other illicit drug use (except cannabis), problematic alcohol use, and drug injection. They use hospital EDs less frequently, spend fewer nights in the hospital, have less contact with the police, and report profound reductions in illegal activities. Family life, housing stability, and emotional health also improve substantially. In short, there has been a huge positive impact on thousands of people receiving treatment in the H & S system.

Still, there are opportunities for improvement. There are regions with limited spoke access that have a need for new prescribers and increased patient caseloads for existing prescribers. Some of the regions have such large hub clinics that some aspects of the clinic environment are counter-therapeutic. In these regions, more, smaller hub sites could reduce this effect. The workforce in the H & S system is overstretched and, thus, a plan for workforce development is needed. Finally, provision of mental-health and vocational-support services would improve treatment outcomes.

The H & S system has made a major contribution to the citizens and communities of Vermont. This model is a pioneering response to the opioid crisis in the United States and is a great credit to the political and public heath leadership in Vermont. Although there is still work to be done to produce optimal benefits from the H & S system, there is no question that the services developed within this model have saved many lives and have allowed many Vermonters to discontinue opioid use and improve their lives.

References

U.S. Department of Health and Human Services (HHS), Office of the Surgeon General. (2016, November). *Facing addiction in America: The Surgeon General's report on alcohol, drugs, and health*. Washington, DC: HHS.

Appendices

A. List of Tables

B. List of Figures

C. Quantitative Interview Questionnaire

a. In-Treatment Questionnaire

Participant Code: _____

Interviewer: _____

Date: _____

Site: Hub_____ Spoke_____ (select one)

Gender: Male_____ Female_____

Location: _____

Date Consent Signed: _____

In general, how many years have you been addicted to opioids? _____

How many years have you been in treatment (during this current episode)? _____

Are you in treatment with methadone _____ or Suboxone/Subutex_____?

What town do you live in? _____

How far do you drive to your treatment center? _____

Does the patient have a significant mental health condition? Yes _____ No _____

If yes, diagnosis? _____

Hub and Spoke Questionnaire: In Treatment Group

You have been invited to participate in this study because you are a patient in treatment for opioid dependence. The purpose of this study is to learn more about how people with opioid use disorders are functioning in their lives when they are in treatment with methadone or Suboxone/Subutex. Study participation will take a total of 60-90 minutes. Your information will not be stored with your name or identifying information.

You will be asked to answer a series of questions about your drug use, health, employment, involvement in criminal behavior, your moods (anxiety and depression) and your general quality of life.

Do you have any questions?

Demographics:

1. Gender: 1-Male 2-Female	Score:	Comments:
2. What race/ethnicity/nationality do you consider yourself? 1-White/Non-Hispanic 2-White Hispanic 3- Black 4-Asian 5- Native American 6- Other	Score:	Comments:
3. Marital Status: 1-Single 2- Married/Living Together as Married 3- Divorced 4- Widow/er	Score:	Comments:
4. Age:	# of years _____	Comments:
5. Years of Education:	# of years_____	Comments:
6. Have you ever been tested for HIV? 1-Yes 2- No	Score:	Comments/Results:
7. Have you ever been tested for Hep C? 1-Yes 2-No	Score:	Comments/Results:
8. Are you on probation or parole, in drug court, or have a case pending> 1-Yes 2-No	Score:	Comments:

Housing:

9. Are you currently living in: 1-Your own home or apartment 2-With family or friends 3-In a shelter or homeless	Score:	Comments:
10. Has your housing situation changed since you entered treatment? 1-Yes 2-No If yes, describe.	Score:	Comments:
11. Are you currently in a relationship with a significant other/spouse? 1-Yes 2- No	Score:	Comments:
12. If you answered yes to the above question, is this person a current or former drug user? 1-Yes 2-No	Score:	Comments:
13. If you answered yes to the above question, is this person in treatment for their drug use? 1-Yes 2-No	Score:	Comments:
14. Do you have children? 1-Yes 2- No	Score:	Comments:
15. How many children do you have?	# of Children _____	Comments:
16. Do your children live with you? 1-Yes 2-No	Score:	

Instructions: We are trying to get an estimate of the number of opioid users in Vermont. We are looking for some very rough estimates from your knowledge about opioid use in Vermont.

17. How many people do you know who are opioid users? (Both in treatment and not in treatment.)	# of People _____	Comments:
18. Of this number, how many are in treatment?	# of People _____	Comments:
19. How many of those in treatment are "doing well"	# of People _____	Comments:
20. How many in treatment are currently not "doing well"?	# of People _____	Comments:

Tobacco, Alcohol, Drugs History:

Age of first use of the following substances? If none, put 0

21. Age of first tobacco use?	Age:	Comments:
22. Age of first alcohol use?	Age:	Comments:
23. Age of first cannabis use?	Age:	Comments:
24. Age of first cocaine use?	Age:	Comments:
25. Age of first amphetamine use?	Age:	Comments:
26. Age of first sedative (Xanax, Valium, Klonopin, etc.) use?	Age:	Comments:
27. Age of first hallucinogen use (LSD, PCP, mushrooms, etc.):	Age	Comments:

28. Age of first illegal opioid (heroin, fentanyl) use?	Age:	Comments:
29. Age of first prescription opioid (i.e., prescription medication without a doctor's prescription: morphine, codeine, Vicodin, Oxycontin, Norco, Percodan, etc.) use?	Age:	Comments:
30. Age of first opioid addiction treatment medications i.e, Methadone/Suboxone/Subutex (obtained outside of a treatment program)?	Age:	Comments:
31. If Suboxone/Subutex was used, did you use 1- Tablets 2-Film 3- Both	Score:	Comments:
32. Age of first opioid injection?	Age:	Comments:
33. Did you "switch" from one type of opioid to another? 1- Yes 2- No If yes, describe in comments.	Score:	Comments:
34. Before the current treatment episode, how many times have you been in treatment before? List in comments.	#_____	Comments:

CURRENT VS PRE-TREATMENT ITEMS: Drug and Alcohol Use

Instructions: The following items alternate between During the past 90 days*, how many days have you used each following substances? And During the* ***90 days before you entered this treatment episode*** *how many days did you use each of the following*

Tobacco Products (Cigarettes, chewing tobacco, etc.) 35. **Past 90 days**:	# Days _____	Comments:
Tobacco Products (Cigarettes, chewing tobacco, etc.) 36. **90 days before treatment**:	# Days _____	Comments:

Alcoholic Beverages (Beer, wine, spirits, etc.) 37. **Past 90 days**:	# Days _____	Comments:
Alcoholic Beverages (Beer, wine, spirits, etc.) 38. **90 days before treatmen**t:	# Days _____	Comments:
Cannabis (Marijuana, pot, grass, hash, etc.) 39. **Past 90 days**:	# Days _____	Comments:
Cannabis (Marijuana, pot, grass, hash, etc.) 40. **90 days before treatmen**t:	# Days _____	Comments:
Cocaine (i.e. coke, crack, etc.) 41. **Past 90 days**:	# Days _____	Comments:
Cocaine (i.e. coke, crack, etc.) 42. **90 days before treatmen**t:	# Days _____	Comments:
Amphetamines (i.e. Meth, diet pills, ecstacy, etc.) 43. **Past 90 days**:	# Days _____	Comments:
Amphetamines (i.e. Meth, diet pills, ecstacy, etc.) 44. **90 days before treatmen**t:	# Days _____	Comments:
Sedatives (i.e. Valium, Klonopin, Xanax, etc.) 45. **Past 90 days**:	# Days _____	Comments:
Sedatives (i.e. Valium, Klonopin, Xanax, etc.) 46. **90 days before treatmen**t:	# Days _____	Comments:
Hallucinogens (i.e. LSD, mushrooms, PCP, Special K, etc.) 47. **Past 90 days**:	# Days _____	Comments:

Hallucinogens (i.e. LSD, mushrooms, PCP, Special K, etc.) 48. **90 days before treatmen**t:	# Days _____	Comments:
Illegal Opioids (i.e. Heroin, Fentanyl) 49. **Past 90 days**:	# Days _____	Comments:
Illegal Opioids (i.e. Heroin, Fentanyl) 50. **90 days before treatmen**t:	# Days _____	Comments:
Prescription Opioids (i.e. prescription medication without a doctor's prescription: morphine, codeine, Vicodin, Oxycontin, Norco, Percodan, etc.) 51. **Past 90 days**:	# Days _____	Comments:
Prescription Opioids (i.e. prescription medication without a doctor's prescription: morphine, codeine, Vicodin, Oxycontin, Norco, Percodan, etc.) 52. **90 days before treatmen**t:	# Days _____	Comments:
Opioid Addiction Treatment Medications (obtained outside of a treatment program) (i.e. Methadone, Subutex, Suboxone/Subutex) 53. **Past 90 days**:	# Days _____	Comments:
Opioid Addiction Treatment Medications (obtained outside of a treatment program) (i.e. Methadone, Subutex, Suboxone/Subutex) 54. **90 days before treatment**:	# Days _____	Comments:
Drug Injection (injection of any drug) 55. **Past 90 days**:	# Days_____	Comments:
Drug Injection (injection of any drug) 56. **90 days before treatment**:	# Days_____	Comments:

57. On a day when you injected approximately how many times would you inject?	# Times_____	Comments:
How satisfied are you with your current drug use situation? 58. **In the past 90 days**: -5 -4 -3 -2 -1 0 1 2 3 4 5 Very Dissatisfied Neutral Very Satisfied	Score: _____	Comments:
How satisfied were you with your drug use situation? 59. **In the 90 days before treatment**: -5 -4 -3 -2 -1 0 1 2 3 4 5 Very Dissatisfied Neutral Very Satisfied	Score: _____	Comments:

CURRENT VS PRE-TREATMENT ITEMS: Other Domains

Instructions: Same as above

How many days were you in school or training? 60. **Past 90 days**:	# Days_____	Comments:
How many days were you in school or training? 61. **90 days before treatment**:	# Days_____	Comments:
How many days did you work? 62. **Past 90 days**:	# Days_____	Comments:
How many days did you work? 63. **90 days before treatment**:	# Days_____	Comments:

How satisfied are you with your school/work situation? 63. **Past 90 days**: -5 -4 -3 -2 -1 0 1 2 3 4 5 Very Dissatisfied Neutral Very Satisfied	Score: _____	Comments:
How satisfied were you with your school/work situation? 64. **In the 90 days before treatment**: -5 -4 -3 -2 -1 0 1 2 3 4 5 Very Dissatisfied Neutral Very Satisfied	Score: _____	Comments:
How many times have you been in the ER? 65. **Past 90 days**:	# Times_____	Comments:
How many times were you in the ER? 66. **In the 90 days before treatment**:	# Times_____	Comments:
How many days have you been in the hospital overnight? 67. **Past 90 days**:	# Days_____	Comments:
How many days were you in the hospital overnight? 68. **In the 90 days before treatment**:	# Days_____	Comments:
How many times have you gone to an outpatient clinic or doctor's office? 69. **Past 90 days**:	# Times_____	Comments:
How many times did you go to an outpatient clinic or doctor's office? 70. **In the 90 days before treatment**:	# Times_____	Comments:
How satisfied are you with your current medical situation? 71. **Past 90 days**: -5 -4 -3 -2 -1 0 1 2 3 4 5	Score: _____	Comments:

Very Dissatisfied Neutral Very Satisfied		
How satisfied were you with your <u>medical situation</u>? 72. **In the 90 days before treatment**: -5 -4 -3 -2 -1 0 1 2 3 4 5 Very Dissatisfied Neutral Very Satisfied	Score: _____	Comments:
How many days have you been in a serious family/relationship conflict? 73. **Past 90 days**:	# Days _____	Comments:
How many days were you in a serious family/relationship conflict? 74. **In the 90 days before treatment:**	# Days _____	Comments:
How satisfied are you with your current family/relationship situation? 75. **Past 90 days**: -5 -4 -3 -2 -1 0 1 2 3 4 5 Very Dissatisfied Neutral Very Satisfied	Score: _____	Comments:
How satisfied were you with your family/relationship situation? 76. **In the 90 days before treatment**: -5 -4 -3 -2 -1 0 1 2 3 4 5 Very Dissatisfied Neutral Very Satisfied	Score: _____	Comments:
How many days have you been stopped by the police or arrested by the police? 77. **Past 90 days**:	# Days _____	Comments:
How many days were you stopped by the police or arrested by the police? 78. **In the 90 days before treatment**:	# Days _____	Comments:

How many days have you been incarcerated? 79. **In the Past 90 days**:	# Days _____	Comments:
How many days were you incarcerated? 80. **In the 90 days before treatment**:	# Days _____	Comments:
How many days have you been involved in illegal activities (eg. shoplifting, drug SALES bad checks, etc. NOT DRUG USE)? 81. **Past 90 days**:	# Days _____	Comments:
How many days were you involved in illegal activities (eg. shoplifting, drug SALES bad checks, etc. NOT DRUG USE)? 82. **In the 90 days before treatment**:	# Days _____	Comments:
How satisfied are you with your current legal situation? 83. **Past 90 days**: -5 -4 -3 -2 -1 0 1 2 3 4 5 Very Dissatisfied Neutral Very Satisfied	Score: _____	Comments:
How satisfied were you with your legal situation? 84. **In the 90 days before treatment**: -5 -4 -3 -2 -1 0 1 2 3 4 5 Very Dissatisfied Neutral Very Satisfied	Score: _____	Comments:
How many days have you felt depressed? 85. **Past 90 days**:	# Days _____	Comments:
How many days did you feel depressed? 86. **In the 90 days before treatment**:	# Days _____	Comments:
How many days have you felt anxious? 87. **Past 90 days**:	# Days _____	Comments:
How many days did you feel anxious? 88. **In the 90 days before treatment**:	# Days _____	Comments:

How many days have you felt paranoid? 89. **Past 90 days**:	# Days _____	Comments:
How many days did you feel paranoid? 90. **In the 90 days before treatment**:	# Days _____	Comments:
How many days have you felt irritable or angry? 91. **Past 90 days**:	# Days _____	Comments:
How many days did you feel irritable or angry? 92. **In the 90 days before treatment**:	# Days _____	Comments:
How satisfied are you with your <u>current emotional/mental health</u>? 93. **Past 90 days**: -5 -4 -3 -2 -1 0 1 2 3 4 5 Very Dissatisfied Neutral Very Satisfied	Score: _____	Comments:
How satisfied were you with your <u>emotional/mental health</u>? 94. **In the 90 days before treatment**: -5 -4 -3 -2 -1 0 1 2 3 4 5 Very Dissatisfied Neutral Very Satisfied	Score: _____	Comments:

Overdose Questionnaire:

95. How many times have you overdosed?	# Times _____	Comments:
How many times have you overdosed? 96. **Past 90 days:**	# Times _____	Comments:
How many times did you overdose? 97. **In the 90 days before treatmen**t:		Comments:

	# Times _____	
98. Do you know anyone who has OD'd (fatal and nonfatal)? 1-Yes 2-No #Fatal: _____ #Non-fatal: _____	Score:	Comments:
99. How concerned are you about overdosing? 0 3 5 Not at all Somewhat Very	Score: 0 1 2 3 4 5	Comments:
100. Do you know what naloxone (Narcan) is? 1-Yes 2-No	Score:	Comments:
101. Do you have access to naloxone? 1-Yes 2-No	Score:	Comments:
102. How many times has naloxone been used to revive you?	# Times _____	Comments:
How many times did you pick up syringes from the needle exchange? 103. **Past 90 days:**	# Times_____	Comments:
How many times did you pick up syringes from the needle exchange? 104. **In the 90 days before treatment**:	# Times _____	Comments:

Instructions: For the following items, we are only interested in the past 90 days, NOT, the 90 days before treatment admission.

Mental Health/ Mood State: PHQ-9

Over <u>the last 90 days</u>, how often have you been bothered by any of the following problems? Please answer using the following scale:

0. Not at all 1. A few days 2. About half the days 3. Most of the days 4. Every day

94. Little interest or pleasure in doing things	Score: 0 1 2 3 4	Comments:
95. Feeling down, depressed, or hopeless	Score: 0 1 2 3 4	Comments:

96. Trouble falling or staying asleep, or sleeping too much	Score: 0 1 2 3 4	Comments:
97. Feeling tired or having little energy	Score: 0 1 2 3 4	Comments:
98. Poor appetite or overeating	Score: 0 1 2 3 4	Comments:
99. Feeling bad about yourself- or that you are a failure or have let yourself or your family down	Score: 0 1 2 3 4	Comments:
100. Trouble concentrating on things, such as reading the newspaper or watching TV	Score: 0 1 2 3 4	Comments:
101. Moving or speaking so slowly that people could have noticed? Or the opposite- Being so fidgety or restless that you have been moving around a lot more than usual	Score: 0 1 2 3 4	Comments:
102. Thoughts that you would be better off dead or of hurting yourself in some way	Score: 0 1 2 3 4	Comments:

Stigma Questionnaire:

Please use the following scale when answering questions below:

Never Very rarely Sometimes Frequently Always
0 1 2 3 4

103. I have worried that others will view me unfavorably because I am in treatment for my addiction	Score: 0 1 2 3 4	Comments:
104. I have been in situations where I have heard others say unfavorable or offensive things about people are in treatment for their addiction.	Score: 0 1 2 3 4	Comments:

105. I have avoided telling my family that I am in treatment for my addiction	Score: 0 1 2 3 4	Comments:
106. I have avoided telling others outside my immediate family that I am in treatment for my addiction.	Score: 0 1 2 3 4	Comments:
107. I have been treated as less competent by others when they learned I am in treatment for my addiction.	Score: 0 1 2 3 4	Comments:
108. I have been shunned or avoided when it was revealed that I am in treatment for my addiction	Score: 0 1 2 3 4	Comments:
109. I have been treated unfairly by others who learn I have been in treatment for my addiction.	Score: 0 1 2 3 4	Comments:
110. I am embarrassed to go to the clinic/Drs office to receive treatment for my addiction, because people will know I am an addict and think less of me.	Score: 0 1 2 3 4	Comments:

Treatment Assessment:

For each statement below, indicate the extent to which you agree about your treatment experience:

1-Strongly Disagree 2- Somewhat Disagree 3-Neither agree or disagree 4- Somewhat agree 5- Strongly Agree

111. The amount of time I had to wait to get services was acceptable to me.	Score: 1 2 3 4 5	Comments:
112. The location of this treatment center is convenient for me.	Score: 1 2 3 4 5	Comments:
113. The staff at this treatment center treat me with respect.	Score: 1 2 3 4 5	Comments:
114. The people at this treatment center spend enough time with me.	Score: 1 2 3 4 5	Comments:

115. I have a say in deciding about my substance abuse treatment that I am receiving here.	Score: 1 2 3 4 5	Comments:
116. I am less likely to use alcohol or other drugs because of this treatment.	Score: 1 2 3 4 5	Comments:
117. People at the treatment center care about whether I am doing better.	Score: 1 2 3 4 5	Comments:
118. The treatment center is helping me to recover from using drugs and alcohol.	Score: 1 2 3 4 5	Comments:
119. I would recommend this/ treatment center to a friend.	Score: 1 2 3 4 5	Comments:

Treatment Effectiveness Assessment (TEA)

Please answer the following questions regarding the extent of changes for the better that have occurred since you have been in treatment using the scale below. Answer each question thinking about how you have improved (higher number).

None or not much **Better** **Much better**

1 2 3 4 5 6 7 8 9 10

120. **Substance use**: How much better are you with drug and alcohol use? Consider the frequency and amount of use, money spent on drugs, amount of drug craving, time spent being loaded, being sick, in trouble and in other drug-using activities, etc.	Score: 1 2 3 4 5 6 7 8 9 10	Comments:
121. **Health**: Has your health improved? In what way and how much? Think about your physical and mental health: Are you eating and sleeping properly, exercising, taking care of health problems or dental problems, feeling better about yourself, etc?	Score: 1 2 3 4 5 6 7 8 9 10	Comments:
122. **Lifestyle**: How much better are you in taking care of personal responsibilities? Think about your living conditions, family situation, employment, relationships: Are you paying your bills? Following through with your personal or professional commitments?	Score: 1 2 3 4 5 6 7 8 9 10	Comments:

123. **Community**: Are you a better member of the community? Think about things like obeying laws and meeting your responsibilities to society: Do your actions have positive or negative impacts on other people?	Score: 1 2 3 4 5 6 7 8 9 10	Comments:

Interview Questions

124. What are the things that you most like and value about this treatment clinic/Drs. Office?

_____
_____
_____
_____

125. What are the things that you don't like about this treatment clinic/Drs office?

_____
_____
_____
_____

126. What services do you receive in this clinic/Drs office that help you the most (for example, medication, medical care, help for your family, individual counseling, group counseling, referrals, AA/NA, etc.)?

_____
_____
_____
_____
_____

127. What additional services could be added to this clinic/Drs office that would be helpful to you?

_____
_____
_____
_____
_____

_____

128. What are the biggest obstacles or challenges to your involvement in addiction treatment?

_____
_____
_____
_____
_____
_____
_____

129. Other notable information or comments;

_____
_____
_____
_____
_____
_____
_____-
_____

130. GOOD STORY CANDIDATE: Yes _____ No_____

Explain_____
_____
_____
_____
_____

b. Out-of-Treatment Questionnaire

Participant Code: _____

Interviewer: _____

Date: _____

Previously in treatment _____ Never in Treatment _____

Site: Referral Source _____

Location of interview _____

Date Consent Signed: _____

In general, how many years have you been addicted to opioids? _____

What town do you live in? _____

Does the patient have a significant mental health condition? Yes _____ No _____

If yes, diagnosis? _____

Hub and Spoke Questionnaire: Out of Treatment Group

You have been invited to participate in this study because you have a history of opioid dependence and you are not currently in treatment. The purpose of this study is to learn more about how people with opioid use disorders are functioning in their lives. Study participation will take a total of 90-120 minutes. Your information will not be stored with your name or identifying information.

You will be asked to answer a series of questions about your drug use, health, employment, involvement in criminal behavior, your moods (anxiety and depression) and your general quality of life. There are 2 sections to this questionnaire.

First, you will be asked these questions for how you are feeling today. I will ask some questions about your background and then I will ask about what you have been doing over the last 90 days.

Next, I will ask you many of the same questions about how you felt 12 months ago. (*Interviewer, refer to the date, 12 months previously so the participant can understand the time frame)*

Do you have any questions?

Participants previously in treatment

How many times have you been in treatment _____

When was your last treatment period? _____

What type of treatment: _____

How long ago did you discontinue treatment? _____ *(Interviewer, this has to be more than 90 days ago)*

Did you: 1. complete treatment _____, 2. Drop out of treatment _____, 3. Were you involuntarily discharged (kicked out) from treatment _____. Describe circumstances.

_____
_____
_____
_____

Participants not in treatment

Why have you never entered treatment?

_____
_____
_____

Have you attempted to enter treatment? ____ Yes ____ No

Are you currently waiting to enter treatment? ____ Yes _____ No

If yes, how long have you been waiting? _____

Are you using syringe exchange services? Yes_____ No _____

Do you have naloxone available to you? Yes_____ No_____

SECTION 1 RESPONSES AS OF TODAY

Demographics:

105. Gender: 1-Male 2-Female	Score:	Comments:
106. What race/ethnicity/nationality do you consider yourself? 1-White/Non-Hispanic 2-White Hispanic 3- Black 4-Asian 5- Native American 6- Other	Score:	Comments:

107. Marital Status: 1-Single 2- Married/Living Together as Married 3- Divorced 4- Widow/er	Score:	Comments:
108. Age:	# of years _____	Comments:
109. Years of Education:	# of years_____	Comments:
110. Have you ever been tested for HIV? 1-Yes 2- No	Score:	Comments/Results:
111. Have you ever been tested for Hep C? 1-Yes 2-No	Score:	Comments/Results:
112. Are you on probation or parole, in drug court, or have a case pending> 1-Yes 2-No	Score:	Comments:

Housing:

113. Are you currently living in: 1-Your own home or apartment 2-With family or friends 3-In a shelter or homeless	Score:	Comments:
114. Has your housing situation changed since 12 months ago? 1-Yes 2-No If yes, describe.	Score:	Comments:
115. Are you currently in a relationship with a significant other/spouse? 1-Yes 2- No	Score:	Comments:

116. If you answered yes to the above question, is this person a current or former drug user? 1-Yes 2-No	Score:	Comments:
117. If you answered yes to the above question, is this person in treatment for their drug use? 1-Yes 2-No	Score:	Comments:
118. Do you have children? 1-Yes 2- No	Score:	Comments:
119. How many children do you have?	# of Children _____	Comments:
120. Do your children live with you? 1-Yes 2-No	Score:	Comments:

Instructions: We are trying to get an estimate of the number of opioid users in Vermont. We are looking for some very rough estimates from your knowledge about opioid use in Vermont.

121. How many people do you know who are opioid users? (Both in treatment and not in treatment.)	# of People _____	Comments:
122. Of this number, how many are in treatment?	# of People _____	Comments:
123. How many of those in treatment are "doing well"	# of People _____	Comments:
124. How many in treatment are currently not "doing well"?	# of People _____	Comments:

Tobacco, Alcohol, Drugs History:

Age of first use of the following substances? If none, put 0

125. Age of first tobacco use?	Age:	Comments:
126. Age of first alcohol use?	Age:	Comments:
127. Age of first cannabis use?	Age:	Comments:
128. Age of first cocaine use?	Age:	Comments:
129. Age of first amphetamine use?	Age:	Comments:
130. Age of first sedative (Xanax, Valium, Klonopin, etc.) use?	Age:	Comments:
131. Age of first hallucinogen use (LSD, PCP, mushrooms, etc.):	Age	Comments:

132. Age of first illegal opioid (heroin, fentanyl) use?	Age:	Comments:
133. Age of first prescription opioid (i.e., prescription medication without a doctor's prescription: morphine, codeine, Vicodin, Oxycontin, Norco, Percodan, etc.) use?	Age:	Comments:
134. Age of first opioid addiction treatment medications i.e, Methadone/Suboxone/Subutex (obtained outside of a treatment program)?	Age:	Comments:
135. If Suboxone/Subutex was used, did you use 1- Tablets 2-Film 3- Both	Score:	Comments:
136. Age of first opioid injection?	Age:	Comments:
137. Did you "switch" from one type of opioid to another? 1- Yes 2- No If yes, describe in comments.	Score:	Comments:
138. Have you ever been in treatment before? 1- Yes 2-No	Score:	Comments:

CURRENT VS 12 MONTHS AGO: Drug and Alcohol Use

Instructions: The following items alternate between during the past 90 days and during the 90 day period before 12 months ago. (Interviewer: *For example if today is May 1, 2017, we are interested in the period from Feb 1-April 30, 2017. Next we are interested in the period from Feb 1-April 30 2016.)* For each 90 day period, on how many days did you use each of the following:

Tobacco Products (Cigarettes, chewing tobacco, etc.) 139. **Past 90 days**:	# Days _____	Comments:
Tobacco Products (Cigarettes, chewing tobacco, etc.) 140. **12 Months Before Today**:	# Days _____	Comments:

Alcoholic Beverages (Beer, wine, spirits, etc.) 141. **Past 90 days**:	# Days _____	Comments:
Alcoholic Beverages (Beer, wine, spirits, etc.) 142. **12 Months Before Today**:	# Days _____	Comments:
Cannabis (Marijuana, pot, grass, hash, etc.) 143. **Past 90 days**:	# Days _____	Comments:
Cannabis (Marijuana, pot, grass, hash, etc.) 144. **12 Months Before Today**:	# Days _____	Comments:
Cocaine (i.e. coke, crack, etc.) 145. **Past 90 days**:	# Days _____	Comments:
Cocaine (i.e. coke, crack, etc.) 146. **12 Months Before Today**:	# Days _____	Comments:
Amphetamines (i.e. Meth, diet pills, ecstacy, etc.) 147. **Past 90 days**:	# Days _____	Comments:
Amphetamines (i.e. Meth, diet pills, ecstacy, etc.) 148. **12 Months Before Today**:	# Days _____	Comments:
Sedatives (i.e. Valium, Klonopin, Xanax, etc.) 149. **Past 90 days**:	# Days _____	Comments:
Sedatives (i.e. Valium, Klonopin, Xanax, etc.) 150. **12 Months Before Today**:	# Days _____	Comments:

Hallucinogens (i.e. LSD, mushrooms, PCP, Special K, etc.) 151. **Past 90 days**:	# Days _____	Comments:
Hallucinogens (i.e. LSD, mushrooms, PCP, Special K, etc.) 152. **12 Months Before Today**:	# Days _____	Comments:
Illegal Opioids (i.e. Heroin, Fentanyl) 153. **Past 90 days**:	# Days _____	Comments:
Illegal Opioids (i.e. Heroin, Fentanyl) 154. **12 Months Before Today**:	# Days _____	Comments:
Prescription Opioids (i.e. prescription medication without a doctor's prescription: morphine, codeine, Vicodin, Oxycontin, Norco, Percodan, etc.) 155. **Past 90 days**:	# Days _____	Comments:
Prescription Opioids (i.e. prescription medication without a doctor's prescription: morphine, codeine, Vicodin, Oxycontin, Norco, Percodan, etc.) 156. **12 Months Before Today**:	# Days _____	Comments:
Opioid Addiction Treatment Medications (obtained outside of a treatment program) (i.e. Methadone, Subutex, Suboxone/Subutex) 157. **Past 90 days**:	# Days _____	Comments:
Opioid Addiction Treatment Medications (obtained outside of a treatment program) (i.e. Methadone, Subutex, Suboxone/Subutex) 158. **12 Months Before Today**:	# Days _____	Comments:
Drug Injection (injection of any drug) 159. **Past 90 days**:	# Days_____	Comments:
Drug Injection (injection of any drug) 160. **12 Months Before Today**:	# Days_____	Comments:

161. On a day when you injected, approximately how many times would you inject?	# Times_____	Comments:
How satisfied are you with your current drug use situation? 162. **In the past 90 days**: -5 -4 -3 -2 -1 0 1 2 3 4 5 Very Dissatisfied Neutral Very Satisfied	Score: _____	Comments:
How satisfied were you with your drug use situation? 163. **In the 12 Months Before Today**: -5 -4 -3 -2 -1 0 1 2 3 4 5 Very Dissatisfied Neutral Very Satisfied	Score: _____	Comments:

CURRENT VS 12 MONTHS AGO ITEMS: Other Domains

Instructions: Same as above

How many days were you in school or training? 164. **Past 90 days**:	# Days_____	Comments:
How many days were you in school or training? 165. **12 Months Before Today**:	# Days_____	Comments:
How many days did you work? 166. **Past 90 days**:	# Days_____	Comments:
How many days did you work? 167. **12 Months Before Today**:		Comments:

	# Days_____	
How satisfied are you with your school/work situation? 63. **Past 90 days**: -5 -4 -3 -2 -1 0 1 2 3 4 5 Very Dissatisfied Neutral Very Satisfied	Score: _____	Comments:
How satisfied were you with your school/work situation? 168. **In the 12 Months Before Today**: -5 -4 -3 -2 -1 0 1 2 3 4 5 Very Dissatisfied Neutral Very Satisfied	Score: _____	Comments:
How many times have you been in the ER? 169. **Past 90 days**:	# Times_____	Comments:
How many times were you in the ER? 170. **In the 12 Months Before Today**:	# Times_____	Comments:
How many days have you been in the hospital overnight? 171. **Past 90 days**:	# Days_____	Comments:
How many days were you in the hospital overnight? 172. **In the 12 Months Before Today**:	# Days_____	Comments:
How many times have you gone to an outpatient clinic or doctor's office? 173. **Past 90 days**:	# Times_____	Comments:
How many times did you go to an outpatient clinic or doctor's office? 174. **In the 12 Months Before Today**:	# Times_____	Comments:

How satisfied are you with your <u>current medical situation</u>? 175. **Past 90 days**: -5 -4 -3 -2 -1 0 1 2 3 4 5 Very Dissatisfied Neutral Very Satisfied	Score: _____	Comments:
How satisfied were you with your <u>medical situation</u>? 176. **In the 12 Months Before Today**: -5 -4 -3 -2 -1 0 1 2 3 4 5 Very Dissatisfied Neutral Very Satisfied	Score: _____	Comments:
How many days have you been in a serious family/relationship conflict? 177. **Past 90 days**:	# Days _____	Comments:
How many days were you in a serious family/relationship conflict? 178. **In the 12 Months Before Today:**	# Days _____	Comments:
How satisfied are you with your current family/relationship situation? 179. **Past 90 days**: -5 -4 -3 -2 -1 0 1 2 3 4 5 Very Dissatisfied Neutral Very Satisfied	Score: _____	Comments:
How satisfied were you with your family/relationship situation? 180. **In the 12 Months Before Today**: -5 -4 -3 -2 -1 0 1 2 3 4 5 Very Dissatisfied Neutral Very Satisfied	Score: _____	Comments:
How many days have you been stopped by the police or arrested by the police? 181. **Past 90 days**:	# Days _____	Comments:
How many days were you stopped by the police or arrested by the police?		Comments:

182. **In the 12 Months Before Today**:	# Days _____	
How many days have you been incarcerated? 183. **In the Past 90 days**:	# Days _____	Comments:
How many days were you incarcerated? 184. **In the 12 Months Before Today**:	# Days _____	Comments:
How many days have you been involved in illegal activities (eg. shoplifting, drug SALES bad checks, etc. NOT DRUG USE)? 185. **Past 90 days**:	# Days _____	Comments:
How many days were you involved in illegal activities (eg. shoplifting, drug SALES bad checks, etc. NOT DRUG USE)? 186. **In the 12 Months Before Today**:	# Days _____	Comments:
How satisfied are you with your current legal situation? 187. **Past 90 days**: -5 -4 -3 -2 -1 0 1 2 3 4 5 Very Dissatisfied Neutral Very Satisfied	Score: _____	Comments:
How satisfied were you with your legal situation? 188. **In the 12 Months Before Today**: -5 -4 -3 -2 -1 0 1 2 3 4 5 Very Dissatisfied Neutral Very Satisfied	Score: _____	Comments:
How many days have you felt depressed? 189. **Past 90 days**:	# Days _____	Comments:
How many days did you feel depressed? 190. **In the 12 Months Before Today**:	# Days _____	Comments:
How many days have you felt anxious? 191. **Past 90 days**:	# Days _____	Comments:

How many days did you feel anxious? 192. **In the 12 Months Before Today**:	# Days _____	Comments:
How many days have you felt paranoid? 193. **Past 90 days**:	# Days _____	Comments:
How many days did you feel paranoid? 194. **In the 12 Months Before Today**:	# Days _____	Comments:
How many days have you felt irritable or angry? 195. **Past 90 days**:	# Days _____	Comments:
How many days did you feel irritable or angry? 196. **In the 12 Months Before Today**:	# Days _____	Comments:
How satisfied are you with your <u>current emotional/mental health</u>? 197. **Past 90 days**: -5 -4 -3 -2 -1 0 1 2 3 4 5 Very Dissatisfied Neutral Very Satisfied	Score: _____	Comments:
How satisfied were you with your <u>emotional/mental health</u>? 198. **In the 12 Months Before Today**: -5 -4 -3 -2 -1 0 1 2 3 4 5 Very Dissatisfied Neutral Very Satisfied	Score: _____	Comments:

Overdose Questionnaire:

199. How many times have you overdosed?	# Times _____	Comments:
How many times have you overdosed? 200. **Past 90 days:**		Comments:

	# Times _____	
How many times did you overdose? 201. **In the 12 Months Before Today**:	# Times _____	Comments:
202. Do you know anyone who has OD'd (fatal and nonfatal)? 1-Yes 2-No #Fatal: _____ #Non-fatal: _____	Score:	Comments:
203. How concerned are you about overdosing? 0 3 5 Not at all Somewhat Very	Score: 0 1 2 3 4 5	Comments:
204. Do you know what naloxone (Narcan) is? 1-Yes 2-No	Score:	Comments:
205. Do you have access to naloxone? 1-Yes 2-No	Score:	Comments:
206. How many times has naloxone been used to revive you?	# Times _____	Comments:
How many times did you pick up syringes from the needle exchange? 207. **Past 90 days:**	# Times_____	Comments:
How many times did you pick up syringes from the needle exchange? 208. **In the 12 Months Before Today**:	# Times _____	Comments:

Instructions: For the following items, we are only interested in the past 90 days.

Mental Health/ Mood State: PHQ-9

Over <u>the last 90 days</u>, how often have you been bothered by any of the following problems? Please answer using the following scale:

0. Not at all 1. A few days 2. About half the days 3. Most of the days 4. Every day

120. Little interest or pleasure in doing things	Score: 0 1 2 3 4	Comments:
121. Feeling down, depressed, or hopeless	Score:	Comments:

	0 1 2 3 4	
122. Trouble falling or staying asleep, or sleeping too much	Score: 0 1 2 3 4	Comments:
123. Feeling tired or having little energy	Score: 0 1 2 3 4	Comments:
124. Poor appetite or overeating	Score: 0 1 2 3 4	Comments:
125. Feeling bad about yourself- or that you are a failure or have let yourself or your family down	Score: 0 1 2 3 4	Comments:
126. Trouble concentrating on things, such as reading the newspaper or watching TV	Score: 0 1 2 3 4	Comments:
127. Moving or speaking so slowly that people could have noticed? Or the opposite- Being so fidgety or restless that you have been moving around a lot more than usual	Score: 0 1 2 3 4	Comments:
128. Thoughts that you would be better off dead or of hurting yourself in some way	Score: 0 1 2 3 4	Comments:

QUESTIONS FOR THE PREVIOUSLY IN TREATMENT GROUP

129. Why did you discontinue your treatment with methadone/Suboxone?

_____
_____
_____
_____
_____

130. Did you feel the methadone/Suboxone treatment was helpful to you? Why or why not?

131. What was most useful and least useful to you in methadone/Suboxone treatment?

132. Would you ever consider going back into methadone/Suboxone treatment? Why or why not?

QUESTIONS FOR THE NEVER IN TREATMENT GROUP

133. Please provide the reasons why you have never entered methadone/Suboxone treatment.

134. Have you ever unsuccessfully tried to enter methadone/Suboxone treatment? If yes, what happened?

135. Are there treatment policies or rules that prevent you from entering methadone/Suboxone treatment? If yes, please describe them.

_____
_____
_____
_____
_____

136. Are there any changes to any aspect of methadone/Suboxone treatment which would make you willing to enter treatment? If yes, please describe them.

_____
_____
_____
_____
_____

137. GOOD STORY CANDIDATE: Yes _____ No_____

Explain_____
_____
_____
_____

D. Qualitative Interview Script with Patients and Family Members/Significant Others

Good morning/afternoon/evening and welcome to our session. We want to thank you for taking the time to join us to talk about the Hub and Spoke Model of providing opioid treatment services. You were invited because you are a family member or significant other, over 18 years of age, of someone who is receiving treatment for opioid abuse. The purpose of this study is to learn about your experiences and perspectives as a family member of someone who is currently in recovery, and receiving treatment through the Hub and Spoke treatment model, and finally your opinions and knowledge about methadone and/or Suboxone.

As you know from your review of the consent form and materials, we won't use any names in our reports and we will keep all of your information confidential.

To protect confidentiality, everything you say will be kept confidential by the researchers unless required by law.

Demographics:

Location/clinic: _____
Date: _____
Age: _____
Gender: ○ Mal ○ Female
Race/Ethnicity: *(circle all that apply)*

White
Hispanic
Black/African American
American Indian Alaskan Native
Asian/Pacific Islander
Other

1. **Please tell me a little bit about yourself and your family member/friend.**
    a. What is your relation to the patient?

    b. What is/was their primary substance of choice?

    c. What have they tried to help them stop using?

    d. Please describe any negative events that happened while they were using substances over their time when they weren't using substances.

2. **Impact their use has had on their life.**
    a. Can you please describe the impact that Opioids have had on your family member/significant other's life?

        i. Health impacts have they experienced related to their OUD?

        ii. Work or school impacts?

        iii. Family and social impacts?

3. **Treatment experience of the patient or significant other (Please answer only items that you feel you are comfortable with and knowledgeable about)**
    a. Please describe the experience of your family member at the opioid treatment center.
    b. Do you know if they are receiving treatment in a "hub" (specialized clinic with methadone and Suboxone) or a "spoke")a doctor's office or community clinic). Describe:

i. *What are your opinions and thoughts about your family member /significant other's experience with treatment?*
ii. *Did they feel they are receiving good treatment?*
iii. *Do they feel they are making progress in treatment?*
iv. *What is their biggest criticism/or concern about their treatmen*

4. Experiences with your family member/friend's current treatment.

a. Please describe your thoughts and opinions about your family member's/friend's current treatment. In your opinion,
   i. *Which services provided by the hub/spoke have been most helpful in his/her recovery?*
      1. *Medication? Counseling? Other services? Case management? Ua testing? Their relationship with their medical provider (doctor).*

   ii. *Do you feel like he/she is getting support for more than just the substance use disorder? (eg. help with other psychological issues, help with children, help with employment?)*

   iii. *Are there any aspects of the* treatment *that might be improved?*

b. Please describe the relationship between your family member/friend and their provider?

   i. *Does is seem like your family member/significant other is part of the decision-making process with their providers?*

c. How does the clinic (hub or spoke) involve you in your family member/friend's treatment plan?
   i. *Are family support programs available at the treatment sites?*
   ii. *Have you been referred to resources outside of the treatment sites?*
   iii. *How could the clinic better support your family?*

5. Impact of Treatment

a. Please describe what types of other medical services your family member receives in addition to substance abuse treatment.

i. Has treatment for their addiction allowed them to address other health concerns?

b. Have they been using non-medical services as well? (Skills/job training, education, counseling)

i. Why or Why not?

ii. Have these services been effective in improving his/her recovery? Please explain.

c. Have you noticed any other impacts treatment has had on his/her work or school life?

i. Family or social life?

Is there anything else you would like to add about your family member/significant other's experience in the Hub and Spoke treatment model?

Thank you for taking the time today to share your experience and opinions. We want to ensure the treatment is as helpful and supportive to clients as possible.

Version 5 July 24, 2017

E. Treatment Needs Questionnaire (TNQ)

Patient Name/ID: _____
Date: _____
Staff Name/ID: _____

Ask patient each question, circle answer for each: Yes No

Are you employed?	0	1
Do you have 2 or more close friends or family members who do not use alcohol/drugs?	0	1
Do you have a partner that uses alcohol/drugs?	1	0
Is your housing stable?	0	1
Do you have any legal issues (e.g., charges pending, probation/parole, etc.)?	1	0
Have you ever been charged (not necessarily convicted) with drug dealing?	1	0
Are you currently on probation?	1	0
Do you have any psychiatric problems (e.g., major depression, bipolar, severe anxiety, PTSD, schizophrenia, personality subtype of antisocial, borderline or sociopathy)?	1	0
Do you have a chronic pain issue that needs treatment?	2	0
Do you have access to reliable telephone number?	0	1
If you have ever been on medication assisted treatment (e.g., methadone, buprenorphine) before, were successful?	0	1

Do you have a problem with alcohol, have you ever been told that you have a problem with alcohol, or have you ever gotten a DWI/DUI?	2	0
Do you ever use cocaine, even occasionally?	2	0
Do you ever use benzodiazepines, even occasionally?	2	0
Are you motivated for treatment?	0	1
Are you currently going to any counseling, AA or NA?	0	1
Do you have any significant medical problems (e.g., hepatitis, HIV, diabetes)?	1	0
Have you ever used a drug intravenously (IV)?	2	0
Did you receive a high school diploma (e.g., did you complete at least 12 years of education)?	0	1

Calculate total: _____

Total possible points is 26

Score: 0 - 13Consider as candidate for lower-intensity/office based treatment, with movement toward more intensive treatment is patient destabilizes.
Score: 14 - 26Consider as candidate for higher-intensity/clinic-based treatment, followed by a potential reduction in intensity contingent upon documented treatment success.

F. OBOT Stability Index (OSI) OBOT Stability Index

1. Was the patient's previous urine drug screen positive for illicit substances?
   - Yes
   - No

2. If **YES** to #1 or if the patient was recently started on buprenorphine, does the patient have fewer than four consecutive weekly drug-free urine drug screens?
   - Yes
   - No

3. Is the patient using sedative-hypnotic drugs (e.g. benzodiazepines) or admitting to alcohol use?
   - Yes
   - No

4. Does the patient report drug craving that is difficult to control?
   - Yes
   - No

5. Does the patient endorse having used illicit substances in the past month?
   - Yes
   - No

6. Does the query of the Vermont Prescription Monitoring System (VPMS) show evidence of the unexplained, unadmitted, or otherwise concerning provision of controlled substances?
   - Yes
   - No

7. Did the patient report their last prescription as being lost or stolen?
    - Yes
    - No

8. Did the patient run out of medication early from his/her last prescription?
    - Yes
    - No

Scoring:

If **No to all**, the patient is “stable” can be seen monthly for prescriptions and urine drug screens.

If **Yes to any of the above**, the patient is “unstable” and needs to be seen weekly for prescriptions and urine drug screens.

Additionally, if **yes to 1-6**, the patient should be referred for addiction services.