

ORIGINAL RESEARCH

Substance Use and Mental Health Effects of Disrupting Treatment and Shelter Services on Boston Harbor's Long Island

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Objective: To understand the impact of Boston's October 2014 Long Island Bridge Closure.

Methods: We conducted a qualitative analysis of semi-structured interviews with nine individuals displaced from programs on the Island. Participants were recruited and interviewed during March and April of 2015. Interviewers administered a 22-item questionnaire and a semi-structured interview at the temporary shelters and programs at South End Fitness Center, BHCHP, Woods-Mullen Shelter, and Shattuck Hospital.

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Received: February 25, 2019.

Accepted: August 12, 2019.

Conflict of interest: none.

Thematic analysis of the transcribed interview data was conducted using an inductive framework approach.

Results: Thematic analysis of the interviews revealed that the most prominent ramifications of the bridge closure were worsening of mental health, substance use behavior, and housing insecurity. Further analysis revealed the importance of stable housing in maintaining sobriety and mental health.

Conclusions: When medical and social services for vulnerable populations are at risk of closure, careful planning, quick mobilization of resources, and investment in affordable housing, are crucial in preventing adverse mental health outcomes. Maintaining shelter and substance use treatment programs should be a high priority, even when government funding is at risk.

Manuscript Word Count: ^{3,484}Disclaimer: The views expressed in this article are our own and not an official position of the institutions listed below.²⁵⁴

Introduction

In 2014, Boston's largest emergency shelter, Long Island Shelter, provided 450 beds and, during winter months, nightly shelter for 600 people without stable housing. Long Island was home to over 18 programs for 1000 people, including a 60-bed detoxification center, a 42-bed residential treatment center for women with substance use disorder (SUD), and a substance use treatment center for men involved in the court system.¹ Daily buses transported individuals from Long Island to medical and social services in Boston via a single bridge built in 1951.²

On October 8th, 2014, the Long Island Bridge was deemed unsafe and shut down indefinitely. All of Long Island's program operations were suspended immediately, and hundreds of residents were evacuated from the Island. According to the Boston Public Health Commission, 450 homeless shelter beds and 265 substance use treatment beds were eliminated by the closure, a loss of 26% of Boston's publicly-funded substance use treatment beds.^{1,3} As of April 2015, Long Island's 450 shelter beds had been replaced with temporary cots in overflow shelters and 250 long-term beds at a newly constructed Boston shelter,⁴⁻⁶ but only 75 (28%) of the eliminated substance use treatment beds had been replaced.¹ The number of unhoused individuals receiving substance use treatment decreased by 17.9% from 2014 to 2015, primarily due to the loss of Long Island treatment services.⁷

Health providers noted several adverse effects of the Long Island Bridge closure, including greater loss to follow-up among patients engaged in the Island's treatment programs, more individuals sleeping on the street, and increased street violence.^{1,4-6} Although data on the effect of planned service disruptions are limited, studies show that loss of services after a natural disaster is associated with increased frequency of psychiatric disorders, substance use, and high-risk substance behaviors.⁸⁻¹² Analyses of mental health and substance use patterns following Hurricane Katrina demonstrated that these detrimental effects disproportionately affect vulnerable populations, including those characterized by poverty, chronic illness, mental health issues, and substance use.¹²⁻¹⁶ This disparity is attributable to forced displacement, loss of resources, and loss of social support, rather than the trauma from the disaster itself.¹⁷⁻¹⁹ We sought to elucidate the short-term health effects of the bridge closure by conducting a qualitative analysis of in-depth interviews with individuals who were utilizing the Island's services when the bridge was condemned.

Ethical considerations

This study was reviewed by the Boston University Medical Center Institutional Review Board and exempted under Category 2 (research involving the use of survey and interview procedures in which no identifying information is

recorded). Study participants received verbal and written information about the study and their rights and protections as participants. Each participant provided verbal consent. Interviews were recorded using voice-changing software (Sound Recorder and Voxal Voice Changer) to protect participants' identities, and surveys were matched to interviews by randomly assigned anonymous link codes. Participants received \$30 in gift cards as compensation.

Methods

The study took place at temporary shelters and programs, including the South End Fitness Center, Boston Health Care for the Homeless Program (BHCHP), Woods-Mullen Shelter, and Shattuck Hospital, in March and April of 2015. Participants were recruited by clinic and shelter staff, as well as Consumer Advisory Board members at the study sites, and screened by trained study interviewers. Eligibility criteria included: use of at least one service on Long Island at the time of bridge closure, age ≥ 18 , ability to understand and speak English, and ability to participate in a lengthy interview. Interviewers administered a 22-item questionnaire, followed by a semi-structured interview.

Interview topics included how participants initially came to need social services, their daily routines before and after bridge closure, what happened to them the day of the bridge closure, their access to and satisfaction with their social service programs before and after the bridge closure, and the effects of the bridge closure on their lives. Questionnaire data included socio-demographics, service utilization and satisfaction, as well as answers to the "Healthy Days Core Module" and the "Healthy Days Symptoms Module," from the Centers for Disease Control and Prevention (CDC) Health-Related Quality of Life (HRQOL)-14 "Healthy Days Measure".²⁰ Questionnaire data from the Healthy Days Core Module were compared to state and national norms published by the CDC.²⁰⁻²¹ Thematic analysis of the transcribed interview data was conducted using an inductive framework approach.²² Four investigators independently reviewed each transcript and annotated the data according to key concepts identified in the text.

Table 1.
Demographic information of study participants

| Participant | Age | Gender | Sexual orientation | Race | Education | Employment status | Source(s) of income | Monthly Income |
|----------------|----------------------------|---|--------------------|-----------|--|-------------------------------|----------------------------|----------------------------------|
| A | 42 | Female | Heterosexual | Black | GED | Unemployed (seeking work) | Food stamps | \$0 (0% FPL) |
| B | 41 | Female | Bisexual | White | Grade 6-8 | Employed (full-time) | Earnings | \$982-\$1,128 (101-115% FPL) |
| C | 52 | Female | Homosexual | White | Some college (no degree) | Unemployed (not seeking work) | SSI, Friends/family | \$982-\$1,128 (101-115% FPL) |
| D | 58 | Male | Heterosexual | Black | Some college (no degree) | Employed (full-time) | Earnings, Friends/family | \$1,227-\$1,839 (116-187.5% FPL) |
| E | 53 | Male | Heterosexual | Black | High school diploma | Unemployed (seeking work) | Friends/family | \$1-\$981 (1-100% FPL) |
| F | 21 | Transitioning (male to female) | Bisexual | White | High school diploma | Employed (full-time) | Earnings | \$1-\$981 (1-100% FPL) |
| G | 45 | Female | Heterosexual | White | Associate's degree | Unemployed (not seeking work) | SSI | \$1-\$981 (1-100% FPL) |
| H | 53 | Male | Heterosexual | Black | High school diploma | Employed (part-time) | Earnings, Disability | \$1-\$981 (1-100% FPL) |
| I | 47 | Male | Heterosexual | White | Some college (no degree) | Unemployed (not seeking work) | Disability, Friends/family | \$1-\$981 (1-100% FPL) |
| Summary | 47 (21-58)* Median (range) | 56% Female LGBTQ; Lesbian, Gay Bisexual, Transgender, Queer | 67% Heterosexual | 56% White | 89% ≥ High school education. General Educational Development (HS equivalency) | 44% Employed | 67% Regular income | 67% Income ≤100% FPL |
| | | | 33% LGBTQ | 44% Black | 11% < High school education | 56% Unemployed | 33% No regular income | 33% Income >100% FPL |

LGBTQ: Lesbian, Gay, Bisexual, Transgender, Queer; GED: General Education Development (High School Equivalency); SSI: Supplemental Security Income; FPL: Federal Poverty Level (2014)

Subsequently, two teams of two investigators each compared themes through an iterative review process, until no new themes emerged and consensus on the most prominent themes was reached. The two teams then met to discuss common themes until consensus on the major themes was reached.

Results

Twelve participants were identified and interviewed; due to poor sound quality, only nine of the twelve interviews were effectively transcribed and used for further analysis. Interviews lasted 30 -100 minutes, with the exception of one interview, which was terminated by the participant after 11 minutes because she found it too emotionally difficult to continue.

Study population

Demographic profiles are displayed in Table 1. The majority of participants were middle-aged (89% between ages 41-58), and most had lived without stable housing for more than one year (67%). 89% had completed high school, 33% identified as LGBTQ, and 44% were employed, though many remained under the Federal Poverty Level (67%) despite employment and/or receiving some regular income.

The duration of homelessness and the time spent on Long Island varied widely among participants (Table 2). Prior to the bridge closure, most participants were staying at the Long Island Shelter (67%). After its closure, most were displaced to other emergency shelters (67%), with some relying on other types of shelter, such as staying with friends or family (33%), or sleeping on the street (22%). Several had to move between different emergency shelters and other types of shelter (33%). Of three participants who had been in residential treatment programs on Long Island, only one remained in their residential program. These changes represented a worsening in sleeping conditions and housing instability for those who previously relied upon stable beds in programs or shelters.

Data on service utilization before and after the bridge closure is recorded in Appendix A. Our participants were high-utilizers of social services, both before and after the Long Island Bridge was condemned. Services used by participants included emergency shelter, health clinics, detoxification

and substance use treatment programs, social work, case management, counseling, housing application assistance, job training, and legal assistance. Prior to the bridge closure, six (67%) participants were in substance use treatment and/or recovery, one (11%) was in a detoxification program, and six (67%) were in counseling or therapy. While five out of six (83%) individuals who used counseling or therapy services on the Island maintained that service throughout the bridge closure, three out of six (50%) participants in substance use programs, as well as the individual in detox, lost their substance use services when the bridge closed. Only two participants had regained those services by the time of interview, five to six months later. Two others who had maintained their substance use services when the bridge closed reported no longer utilizing that service at the time of interview

Quality of life

Participants' responses to the CDC HRQOL-14 Healthy Days Core and Symptoms Modules are summarized in Appendix B. When asked about their general health on a scale ranging from 1 (excellent) to 5 (poor) the mean score was 2.6, which corresponds to good/very good health.²⁰ However, in the past 30 days, participants reported that their physical health was not good for a mean 10.6 days, and that their mental health was not good for a mean 14.6 days. These means are much higher than the nationwide (3.7 and 3.5) and Massachusetts (3.0 and 3.1) means for physically and mentally unhealthy days, respectively (Figure 1).²¹ Further, participants indicated that poor physical or mental health kept them from doing their usual activities for a mean 6.4 days out of the last 30 days, which is much higher than the nationwide (2.3) and Massachusetts (2.0) means.²¹

In the Healthy Days Symptoms Module (for the preceding 30 days) participants reported a mean of 7.1 days that pain had caused them difficulty performing their usual activities, and a mean of 14.2 days that feeling sad or depressed, anxious, or worried made it hard to do their usual activities. Notably, participants reported that they had not gotten enough sleep or rest for a mean 21.6 days. Although the mean number of days feeling healthy and full of energy among all our participants was 17.2, two participants reported feeling healthy and full of energy for zero days.

Table 2.
Shelter and housing history of study participants

| Participant | Months spent on Long Island prior to bridge closure | Months since last stable housing | Type of shelter on Long Island | Types of shelter in the last 30 days |
|----------------|---|----------------------------------|--------------------------------|---|
| A | 108 (9 years) | 264 (22 years) | Treatment/recovery program | Emergency shelters, Friends/family, On the street, Hotel |
| B | 5 | 0 | Treatment/recovery program | Sober house |
| C | 5 | 13 | Treatment/recovery program | Treatment/recovery program |
| D | 2 | 7 | Emergency shelter | Emergency shelter |
| E | 9.5 | 168 (14 years) | Emergency shelter | Emergency shelters, Friends/family, On the street, Hotel |
| F | 8 | 17 | Emergency shelter | Emergency shelter |
| G | 18 | 23 | Emergency shelter | Emergency shelter |
| H | 30 | 0 | Emergency shelter | Apartment |
| I | 11 | 16 | Emergency shelter | Emergency shelter, Friends/family, Treatment/recovery program |
| Summary | 9.5 (2 - 108)* | 16 (0 - 264)* | 33% Treatment/recovery program | 33% Multiple types of shelter |
| | | 22% With stable housing | 67% Emergency shelter | 67% Single type of shelter |
| | | 78% Without stable housing | | |

*Median (Range)

National and state means were not available for the Symptoms Module. These findings reflect relatively few symptom-free days and generally poor health among our study participants. Finally, participants were also asked to rate their overall well-being, on a scale from zero (worst) to ten (best), prior to the bridge closure and at the time of interview, five to six months later. Results are summarized in Appendix C. On average, participants reported slightly higher well-being scores prior to the closure of the Long Island Bridge with an average of 7.1, compared to an average of 6.8 after the bridge closure, but the difference is not statistically significant by t-test.

Themes

Our qualitative analysis elicited three major themes: substance use, mental health, and housing. Housing was the only theme mentioned by every participant.

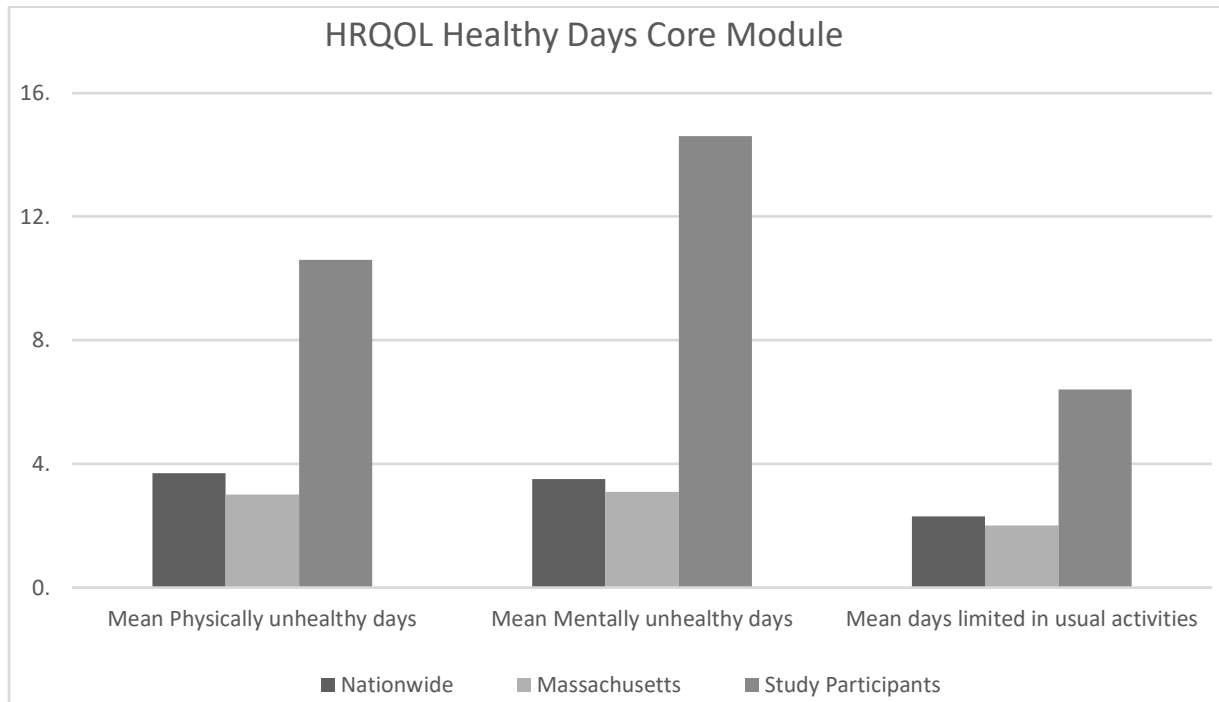
Substance Use. A common theme was how the bridge closure disrupted recovery for

individuals who were receiving substance use treatment on the Island. The majority (78%) of study participants reported a history of substance use disorder (SUD); substances used by our participants included cocaine, alcohol, and/or heroin. When the bridge closed, six of the nine participants were engaged with substance use treatment or recovery services, three of which were within residential programs, and one participant was in a detox program.

Participants noted that many individuals with SUD relapsed after the bridge closure, and that drug use and overdoses had become more common in emergency shelters. Interviewees commented on a direct relationship between the housing insecurity from the Long Island Bridge closure and the incidence of relapse. One woman, when asked how many nights she had spent on the street since the bridge closed, told us, “A lot, like really a lot. I’ve been using drugs more. I know it’s no excuse but it’s crazy.” Another woman affirmed that the loss of support from program members and the chaotic environment of the

Figure 1.

Nationwide, state, and study participant (n=9) means for physically and mentally unhealthy days, and days with limited activity, due to poor health during the past 30 days.



emergency shelters made it difficult to stay abstinent. The day after the bridge closure, she told her caseworker,

“I’ve got to stay in the program...I can’t be out here on the street...I won’t stay sober, you know?” She eventually relapsed because, in her words, “I wanted to drink. I was all by myself, HIV positive. I had no support.”

While all participants had regained their sobriety by the time of interview, they referenced the high rate of relapse and overdose among other displaced SUD patients, particularly opioid users.

“Now more people are dying from opiates and using...Everybody is dying. Everybody is using more because of the Island.”

“A lot of people relapsed...a lot of people left everywhere, a detox shutting down. They didn’t have homes. That’s what happens...now they have an excuse to use. *That’s what anyone needs, just an excuse. Easiest thing to do.*”

According to participants, access to temporary detox beds remained difficult even six months after the Island shut down. One woman noted that because of the bridge closure, “People lost...a lot of treatment. Now it’s hard to get into a detox. I know they opened Phoenix House or something, in Quincy, but...I don’t know what it is to get in there. Nobody can have detox around [Boston].” Others reiterated that without readily accessible treatment programs, self-motivation became even more important:

“I have to make a decision when I walk through the door who I’m gonna be friends with. Which road I’m gonna travel. And if I choose to travel the road where people are getting high, doing drugs, I know I’m not gonna stand a chance.”

“I wake up every day, and I go to a meeting before I come to work...so that I know that I have that day clean. I know it’s the right thing.”

However, two participants felt differently, noting that the closure of programs on Long Island had been beneficial to their recovery, primarily because they were now closer to substance use, health care, and homeless services, many of which are clustered within one Boston neighborhood. For one of these participants, the bridge closure allowed him to find more structure and stay sober. While using Long Island's services, he said, "I had more free time than I cared to have, and I knew if I didn't fill it with something, I was going to find trouble." Since the bridge closure, he reported being closer to needed services:

"My day's...completely different...I'm a lot more active right now than I was on the Island, because everything's right here...[It's] definitely an improvement."

Mental Health. Most of our participants reported suffering from chronic mental health conditions such as depression, bipolar disorder, and post-traumatic stress disorder. They described how the stress and anxiety induced by the bridge closure made it more difficult for them to manage their mental health. The sudden change brought on by the bridge closure, as well as the loss of control and having to leave belongings behind on the Island, triggered feelings of distress. One participant explained,

"Your panic sets in because you are at your lowest point. Because now the things that mean the most to you, you can't get."

Several participants reported that they had trouble managing their medications due to separation from their belongings, loss of access to Long Island medical services, and long waiting periods for Boston-based providers. The disruption in their mental health care made maintaining their medication regimen difficult. One participant stated, "I'm basically maintained with my meds...but, you know, when you get caught up in different circumstances...and everything's different all around you...I can't focus, and I lose things, and I forget things...I'm losing my mind." Another participant described how a disruption in medication spiraled into an episode of depression for him: "I was off my meds, my mental health meds. I was off them from November to February because of this

whole system. I was back in it, and it's terrible." Once he was off his medications, he explained, his depression made it difficult to keep appointments, and missing one doctor's appointment meant a six-week wait for a new one—six weeks without medication. He concluded, "

It's sometimes so hard, and you know what? I gave up. I gave up and said heck with it. At that point with my stress, everything was horrible."

Additionally, participants expressed feelings of frustration and despair with the provisional shelter space created after the bridge closure. One participant described the negative effects of the makeshift environment on his mental health, saying, "It's really depressing being up in here." For the majority of participants, the sudden loss of services represented not just a setback in their health; it represented a lack of respect for their dignity and human rights, adding more fuel to their despair. As one participant stated,

"I lost even more than the services, because right at first I lost faith toward people...I gave up for a little while. For probably the first three weeks...I gave up. Shit, I already asked for help from them and now they threw everything out."

Housing. Every participant identified housing as a primary concern, and many identified it as their most pressing need. The sudden loss of Boston's largest emergency shelter, and other residential treatment programs on Long Island, created an additional strain on already limited housing resources. For participants in residential programs, this meant moving from a reliable bed to first come, first served cots in crowded, makeshift spaces. Several talked about how difficult it was to address any other goals or concerns before securing stable housing. They expressed frustration and anger when talking about limited bed availability and the lengthy process of obtaining affordable housing; many discussed the difficulties they faced navigating the system while tending to other health and basic needs.

One participant, for example, explained: "Housing...that's my number one problem...I need to succeed, so...housing is the most important thing. Because if I go

to school, I'm going to school to further my life...That's going to give me my best chance...So how on Earth are you going to study...?...It's a huge problem...I am trying...people are sending me in the right direction, but housing is the thing I'm worried about."

Housing also evoked a sense of dignity in many participants. "I wanted to sleep in a bed. I wanted to cook my own food. I wanted to feel normal again...I just wanted to be, like, home..." Other participants also described the need for more housing opportunities:

"Most important: being able to say I got my own place."

"More housing opportunities...We don't need any more multi-million dollar condos. Why can't we...make SROs [single room occupancy]? We need affordable housing...Just one room... I don't want an apartment. I just want a place with a door. Something that says 'welcome home' on it."

One participant's story reaffirmed the importance of housing to mental health. He had received a housing placement the morning that the Island was evacuated. His interview stood out as uniquely positive in comparison to the descriptions of disruption common in the other interviews. He said, "I got my life back in order the way I wanted it...So I'm happy."

Discussion

The public health community continually grapples with the difficulty of maintaining care for marginalized populations during unforeseen disasters. With each successive event, we identify new organizational vulnerabilities that should be better planned for in the future.⁸ In the case of unexpected service disruptions, our findings underscore the importance of quickly mobilizing resources to relocate or create shelter and treatment programs to prevent adverse mental health outcomes. Despite the quick creation of interim shelter space by relief workers (including converting a fitness center into temporary shelter with about 250 cots),²³ many of the programs housed on the Island were unable to relocate their clients to environments specific to their needs. By

April 2015, six months after the closure, the Southampton shelter was open, with 250 emergency shelter beds.⁶ Unfortunately, only 75 of the 265 addiction treatment beds (28%) were reopened at that time.¹ Consequently, many of our interviewees experienced a disruption in their services. For some, services were never restored, or they had to join new programs. For many participants, this short-term disruption in services spiraled into relapse or a mental state incompatible with the effort required to maintain sobriety, manage chronic health conditions, and navigate the process of obtaining affordable housing. In sum, the closure of the Island's programs intensified the pre-existing vulnerabilities of this marginalized population. These findings reveal the impact of an abrupt loss of a shelter and addiction treatment programs: a worsening of mental health and substance use behavior. Especially in light of the current opioid crisis, with 78 people in the US dying from opioid-related overdose every day,²⁴ it is clear that keeping these treatment and residential services open should become a priority even when government funding is at risk.

Importantly, our cohort tended to be relatively proactive individuals engaging in shelter and treatment programs. Our sample does not incorporate the experiences of those who returned to the streets, relapsed and were actively using, and/or were permanently lost to programs. Nor does it include those suffering from severe mental and/or physical health conditions that would prohibit sitting through an interview. Given these limitations and our small sample size, our findings may not be generalizable to all displaced individuals, or to individuals outside the context of this Boston event. However, we believe we captured a diverse set of experiences that describe common themes following the abrupt loss of shelter and other social services.

One thing is clear: Long Island was home to a vulnerable population with complex, interdependent challenges. Despite the varied challenges our participants faced, they all identified housing as their most pressing need. With the loss of shelter and residential beds, this need for stable housing became even more critical. Many studies cite housing insecurity as a significant barrier to maintaining sobriety as well as mental and physical health, and our

participants' experiences are consistent with this principle.²⁵⁻³⁰ The loss of reliable shelter worsened mental health and substance use problems, making it harder to find housing, creating an endless cycle of mental illness, addiction, and housing insecurity.

Increasing access to affordable housing would be an important way to support the displaced individuals and to help mitigate the adverse effects of such events in the future. Moreover, doing so would establish a foundation for sustainably addressing other health challenges that go hand in hand with housing insecurity, including SUD and mental illness.

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