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Impacts of COVID-19 on residential treatment programs for substance use disorder

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ABSTRACT

Introduction: The COVID-19 pandemic may present special challenges for residential substance use disorder (SUD) treatment facilities, which may lack infrastructure and support to implement infection control protocols while maintaining on-site treatment services. However, little is known about how residential SUD treatment programs are impacted by the COVID-19 pandemic.

Methods: The research team conducted semi-structured interviews with 17 directors of 20 residential SUD treatment programs across California during the state's shelter-in-place order. The researchers then analyzed qualitative interview data thematically and coded them using ATLAS.ti software.

Findings: Thematic analyses identified six major themes: *program-level impacts*, *staff impacts*, *client impacts*, *use of telehealth*, *program needs*, and *positive effects*. "Program-level impacts" were decreased revenue from diminished client censuses and insufficient resources to implement infection control measures. "Staff impacts" included layoffs, furloughs, and increased physical and emotional fatigue. "Client impacts" were delayed treatment initiation; receipt of fewer services while in treatment; lower retention; and economic and psychosocial barriers to community re-entry. "Use of telehealth" included technical and interpersonal challenges associated with telehealth visits. "Program needs" were personal protective equipment (PPE), stimulus funding, hazard pay, and consistent public health guidance. "Positive effects" of the pandemic response included increased attention to hygiene and health, telehealth expansion, operational improvements, and official recognition of SUD treatment as an essential health care service.

Conclusion: Study findings highlight COVID-related threats to the survival of residential SUD treatment programs; retention of the SUD treatment workforce; and clients' SUD treatment outcomes. These findings also identify opportunities to improve SUD service delivery and suggest avenues of support for residential SUD treatment facilities during and after the COVID-19 pandemic.

1. Introduction

Interviewer: What has made it difficult to deal with COVID-19 in your treatment program?

Program Director: I don't even know where to begin answering that question. We have profound difficulty with respect to everything. Staff are scared to come to work. Clients are scared to come to treatment. Providing counseling over telehealth … is very, very limited in its benefit, especially with clients with no experience with it. Our ability to provide services is diminished. … Even if we are getting paid, it is not enough to support the ongoing work. … I keep using this word, but it has had and will continue to have a profound adverse impact on every segment of substance use treatment.

(P4, 4/16/20)

The declaration of COVID-19 as a pandemic in March 2020 represents a watershed moment for substance use disorder (SUD) treatment providers in the United States (U.S.), as well as in other countries. Faced with mounting uncertainty, providers have made radical changes to service delivery (Rogers et al., 2020; Rosca et al., 2020; Samuels et al., 2020; Wood et al., 2020). Innovation is necessary as existing health care protocols for disaster preparedness, developed for human-made and weather-related disasters such as terrorist attacks and hurricanes, are

inadequate for a global pandemic (Mareiniss, 2020; Pecchia et al., 2020). Following guidance from the Centers for Disease Control and Prevention, SUD treatment providers in the U.S. have struggled to curb contagion in their facilities while continuing to provide essential services.

While health care facilities across the country face overcrowding and under-supply of personal protective equipment (PPE) (Jacobs, 2020), SUD treatment providers may experience these challenges more acutely due to insufficient infrastructure to address medical emergencies. Further, different types of SUD treatment services may be affected differently. While many outpatient programs have closed temporarily and are attempting to provide services off-site via telehealth, residential programs may face unique challenges in preventing contagion among patients living in their facilities.

Due to the recency of the pandemic, most scientific papers to date have speculated about potential COVID-related impacts on SUD treatment services rather than reporting actual impacts. Much of the current literature concerns outpatient service delivery, especially potential disruptions in patient access to medications for opioid use disorder (Green et al., 2020; Harris et al., 2020; Leppla & Gross, 2020). An exception is one COVID-19 prevalence study of residential SUD treatment clients in Boston (Barocas et al., 2020). However, there is little research on how residential SUD programs are addressing complications of service delivery caused by COVID-19. The study presented here is among the first to investigate reported impacts of COVID-19 on residential SUD programs in the U.S.

2. Methods

2.1. Program selection and recruitment

We drew the sample for this COVID-19 study from 20 residential SUD treatment programs in California participating in two intervention studies (CTCP, 2018; Guydish, Wahleithner, et al., 2020). All programs were state-licensed, publicly funded and served mostly low-income clients covered by Medi-Cal, California's Medicaid program. For the first study, which included 12 programs subsequently recruited to the COVID study, California residential behavioral health programs with a minimum 20-bed capacity that applied to participate in a policy development intervention were eligible (CTCP, 2018). For the second study, which included eight programs subsequently recruited to the COVID study, California-licensed, residential SUD treatment centers participating in a webinar-based intervention to address tobacco use among their patients were eligible (Guydish, Wahleithner, et al., 2020). Program recruitment procedures and baseline tobacco services data for both projects are described in Guydish, Kapiteni, et al. (2020).

For each of the parent studies, we interviewed program directors periodically (every six to 12 months, depending on the study protocol) to assess changes in tobacco policy and services at their programs. For interviews conducted between April and June 2020, the study team modified the director interview protocols to include questions concerning the impact of COVID on their programs (see Data collection).

The final sample for this study included 17 directors from 20 residential treatment programs across California. Three directors represented treatment organizations with more than one program site participating in one of the parent studies, and one interview included two directors from the same program. Although the parent studies and the COVID studies were focused on residential services, 14 of the 20 programs were part of treatment organizations that also offered outpatient services. We show interviewee characteristics in Table 1.

2.2. Data collection

California instituted a statewide shelter-in-place order on March 19, 2020, and we conducted all interviews within 14 weeks after the order. Four qualitatively trained research assistants (SH, KK, ES, and JW)

Table 1
Interviewee demographic characteristics ($N = 17$).

Characteristic	N (%)
Age (M, SD)	48.5 (10.3)
Gender	
Female	14 (82.3%)
Race/Ethnicity	
White	10 (58.8%)
African American	3 (17.6%)
Latino/Hispanic	3 (17.6%)
Other/Multiple	1 (0.05%)
Education	
Some college	6 (35.2%)
Bachelor's degree	2 (11.7%)
Master's degree	8 (47.1%)
Doctoral degree	1 (0.05%)
In recovery from substance use	
Yes	5 (29.4%)

conducted semi-structured interviews via telephone, and each interview lasted about 60 min. Toward the end of each interview, following questions about tobacco policy and cessation services at the program, we asked study participants how COVID-19 had impacted their programs. Questions included: "How has COVID-19 impacted your program, if at all? How do you think the COVID-19 pandemic will affect your program going forward, if at all? What, if anything, would make it easier for your program to deal with COVID-19? What effects do you think COVID-19 might have on SUD treatment in general?" Interviewers also followed up with "probes," or secondary questions to clarify responses, where needed.

Each participant received a $50 gift card incentive as compensation for their participation in the interview, and following IRB approved procedures for the parent studies. We digitally recorded and transcribed all interviews. The Institutional Review Board of the University of California, San Francisco approved research procedures (protocols 18-24526 and 18-26126).

2.3. Data analysis

We analyzed qualitative interview data using thematic analysis techniques (Boyatzis, 1998) and coded them using ATLAS.ti (Muhr, 2013). Data analysis began with the general assumption that COVID-19 had impacted residential SUD treatment programs; the goal of analysis was to determine the nature and scope of those impacts, as well as the relationships between different categories of impacts. Aside from the *a priori* theme of "program impacts," the coding framework emerged organically from the data.

Through repeated review and open coding of the data, a qualitative analyst (AP) identified salient themes and devised a taxonomy to represent thematic hierarchies. We assessed theme salience using two criteria: (1) frequency with which the theme recurred *across the interview sample*, and (2) the degree of emphasis placed on that theme by an interviewee *within a given interview* (Buetow, 2010). We determined degree of emphasis by the relative proportion of text devoted to a given theme within an interview, as well as the relative importance of the theme to the study's research questions. For instance, two interviewees mentioned client job loss as a major impact to clients' recovery progress. Since residential clients could only work off-site in a few programs, client job loss was not a frequently recurring subtheme across the interview sample. However, in the interviews where directors mentioned client job loss, they described it as highly impactful and devoted substantial commentary to explaining its impacts on client recovery. Client job loss thus emerged as a salient, if not recurrent, subtheme of "Client impacts."

Major themes were *program-level impacts*; *staff impacts*; *client impacts*; *use of telehealth*; *program needs*; and *positive effects* (referring to "silver linings" of SUD treatment responses to the pandemic). Each theme

included subthemes. For example, *program-level impacts* comprised *financial impacts*; *service reduction*; *loss of staff*; *client census reduction*; and *infection control*. This taxonomy formed the basis of a coding scheme, which we then programmed into ATLAS.ti and applied electronically to relevant interview text. Finally, we selected interview passages to exemplify the major themes, which we present here.

3. Findings

3.1. Interviewee characteristics

Program directors interviewed for this study reported a mean age of 48.5 years (Table 1). The sample was 82.3% female, 64.7% had a bachelor's degree or higher education, and 29.4% identified as being in SUD recovery. More than half (58.8%) identified as white, with African Americans and Hispanics each representing an additional 17.6% of the sample.

3.2. Program-level impacts

California issued a statewide shelter-in-place order on March 19 (State of California, 2020a). This order required residents to remain at home except for essential work or activities. We conducted interviews between April 16 and June 26, 2020, a period in which the ten California counties where study participants were located enforced the statewide order to varying degrees. Of the 20 programs in the study sample, nine were located in populous urban counties that adopted shelter-in-place measures earlier and retained them longer compared to elsewhere in the State (Sheeler, 2020). The remaining eight programs were located in less populous counties, most of which were in California's Central Valley. Although many counties (except Los Angeles and San Francisco Bay Area counties) loosened shelter-in-place restrictions in May to permit limited retail opening, several tightened them again toward the end of June as COVID-19 cases rebounded (The Associated Press, 2020). When data collection ended in the last week of June 2020, all California residents were still "ordered to stay home or at their place of residence, except for permitted work, local shopping or other permitted errands, or as otherwise authorized" (State of California, 2020b).

While we conducted interviews with treatment programs at different time points during the shelter-in-place order, all had restrictions in place at the time of interview such that clients were not permitted to leave the premises except for necessary medical appointments. Only one program (P15), whose director we interviewed after May 4, when most California counties had commenced a gradual "re-opening" process, allowed in-person visits from family members. At the time of that interview, the program had just begun to allow each patient one 1-hour outdoor visit per week with a family member, who was first screened for COVID-19. The program required patients and visiting family members to maintain a 6-foot distance and wear masks at all times. No other participating programs allowed clients to receive visitors due to temporary COVID prevention measures, which the programs implemented and did not necessarily reflect shelter-in-place measures in their counties at the time of interview.

Interviewees reported receiving infection control guidance from multiple sources, including governmental agencies (e.g., Substance Abuse and Mental Health Services Administration; Centers for Disease Control and Prevention), professional associations (e.g., California Association of Alcohol and Drug Program Executives), state public health agencies (e.g., California Department of Health Care Services), and county public health departments. Their receipt of guidance from multiple sources was reflected in widely variant COVID prevention strategies across programs. Besides restricting clients' movement, all programs had implemented other infection control measures such as verbal symptom screening, temperature-taking, mask-wearing, social distancing of clients and staff, isolation and quarantine rooms, and use of disposable plates and utensils for clients with suspected exposure to

COVID-19. Some interviewees also described using physical barriers in their facilities, such as hanging sheets from the ceiling to partition off beds and minimize COVID-19 spread via coughing. Programs either required incoming clients to wait until they tested negative for COVID (four programs), or they were admitted but quarantined for seven to 14 days within the program facility before joining the current clients (16 programs). Several interviewees described challenges in implementing infection control measures, such as isolation of symptomatic clients, with insufficient funding, space, and staff capacity:

> Yeah, but you know, [the Department of] Public Health wants us to take sick clients. You know, you're supposed to go into an isolation room. Then if they're in the isolation room, it's like they need to be checked on every few hours, you know? And we're bringing them their food, you know …We've had two clients that've had a lot of diarrhea. …We're trying to not bring people to the hospital 'cause the hospitals are so overwhelmed at this time.

(P1, 4/21/20)

Nearly all directors reported 20–60% decreases in their client censuses due to COVID-related shifts in policy and services. Most attributed decreases to new public health guidance limiting the number of beds that could be filled, requiring new clients to be tested for COVID-19, and "limiting access to residential facilities for new clients to those who can provide a letter signed by a medical provider that states clearly that the individual has been 'screened and cleared to enter and reside in congregate living'" (P4, 4/16/20). Three directors (P4, P6, P16) described these new directives as barriers to SUD treatment for potential clients without access to primary health care.

> So we have a decrease in our census … we can't have as many people and people have to be tested before they come into the facility now. So, you know, some people don't have access just to go and get tested. And so I don't think as many people are being able to come in as before COVID.

(P16, 6/24/20)

The access barrier arose from the fact that most programs served low-income clients who relied on Medi-Cal (California's Medicaid program) coverage for primary care. Despite the State's efforts to facilitate Medi-Cal enrollment during COVID-19 (Rosellini, 2020), directors described the steps of applying for coverage, providing proof of eligibility, undergoing a waiting period, and then navigating provider selection as daunting for people with untreated SUD.

One director commented that client retention was also down because clients entered the program, then became frustrated and left due to on-campus COVID restrictions and fewer group counseling opportunities during the pandemic. Two directors remarked that a few clients had left treatment after their programs stopped allowing off-site work and family visitation due to COVID, and another director reported discharging a patient for not observing social distancing rules. Directors whose programs provided services to criminal justice–involved clients reported a lag in new client referrals due to courts being closed.

Most programs also had reduced services, especially in-person group counseling, due to the pandemic. Several held in-person group counseling sessions in "shifts" by which the same regularly scheduled group (e.g., Relapse Prevention) was repeated twice or more per day, each time with only three to four clients present and maintaining social distance. Support groups for parenting, wellness (e.g., meditation, nutrition), and smoking cessation had been suspended to minimize risk of COVID-19 infection, and in some cases due to loss of counselors through layoffs. One program had ceased urine drug testing since it required close contact between clients providing samples and staff verifying sample collection. Several interviewees expressed concern that their programs' inability to deliver group counseling services was compromising care:

Our residential programs are no longer able to do full scale services. Because of social distancing requirements … we are no longer doing groups. We are doing a lot of individual work and a lot of self-directed work, instead of community groups which is very, very unfortunate. We all know that in substance use treatment, it's the group where the power is, and we have lost that.

(P4, 4/16/2020)

3.3. Staff impacts

Reduced services and client census led to reduced reimbursement and mounting financial concerns for all directors who we interviewed. Four programs had laid off or furloughed staff due to financial shortfalls, and other directors stated that they might lay off staff if the pandemic lingered. One director expressed concern that staff reductions might cause permanent losses to the treatment workforce, since furloughed or laid-off staff might leave the field altogether given burnout and job insecurity.

Directors stated that staff who remained on the job frequently reported physical and emotional fatigue. Staff in several programs were working overtime to compensate for colleagues who had been laid off for financial reasons, or who were absent for health reasons—either cold/flu symptoms that resembled COVID-19, or pre-existing conditions that would increase their risk for complications if they were to contract COVID-19. One director reported that staff members were working 10- to 12-hour days, and another mentioned that 90-hour work weeks had become routine.

A few directors remarked that staff members' physical fatigue was compounded by emotional strain, both from helping clients through the recovery process with fewer resources than normal, and from worrying about contracting COVID-19 at work, or inadvertently spreading it to others. One director described how the pandemic required staff to focus constantly on infection control and risk mitigation:

… We are essential workers. So, we have to still go home and still come to work. And being mindful to keep ourselves safe for our own health and wellbeing, our families. And then not to, you know, create issues to where we could bring things inside the facility and cause a resident or another peer or colleague to get sick.

(P13, 5/6/2020)

Another director described the emotional toll of maintaining patient care in a state of emergency:

And then like emotional fatigue, this is hard, when you are involved in emotional labor as an employee, it can be really exhausting. So, when you go home, there's really no outlet because you are sheltering-in-place at home too, so you might be limited in your outlets for self-care, possibly. … So now you are coming to work, and you don't have the same energy or enthusiasm for life, and you are dealing with a lot of confusion and uncertainty.

(P8, 4/29/2020)

3.4. Client impacts

Directors described major impacts of COVID-19 on the health and well-being of clients. Several expressed concern about threats to clients' recovery resulting from admission delays, early discharge, reduced services, isolation, and job loss. Admission or treatment delays occurred either because clients had to test negative for COVID-19 before entering the program, or because new admits had to quarantine and were unable to receive in-person counseling (if offered during the pandemic) for one to two weeks. Two directors also reported discharging clients early to reduce crowding and potential spread of COVID-19; these clients

reportedly were in stable recovery, were near program completion or in "step-down" care (e.g., residing in program-sponsored sober living environments), and had a safe place to stay.

Several directors predicted that isolation would lead to poorer treatment outcomes. Directors described physical isolation and loss of social connection as causing or exacerbating depression and anxiety, as clients could no longer participate in Twelve Step meetings or see their family, including their children. Nine directors predicted there would be an increase in relapse rates due to COVID-19; two mentioned they had read articles stating that relapse rates had increased during the pandemic; and one affirmed that relapse rates were increasing:

Oh, you may have a lot of relapse … we had already been made aware that the relapse rate has increased since COVID-19. And you will still have a high percentage of relapse because people are not able to go to NA meetings or AA meetings, or have that physical and social connection. And if the residents cannot see their families or their children and they're coming into recovery so they can get their kids back, but this is being now shut down … they could actually leave and say, "Well, why am I in treatment if I can't see my kids?"

(P13, 5/6/2020)

At the time of the interviews, no published data indicated that relapse rates had in fact increased due to COVID-19, so it is not clear where interviewees would have found the articles they mentioned. Further, no directors reported collecting or analyzing data at the clinic level that could indicate an increase in relapse rates since the pandemic began to affect their programs. Nevertheless, several predicted that the pandemic would curtail clients' ability to successfully re-enter the community:

…[W]e have a phased program in which people are integrated into the community. And the reason that helps with sustainable and successful recovery is because they go out into the community, they're faced with triggers or situations, but they're able to return to the program and talk to a counselor about what happened. And they're able to process it, work through it, develop additional coping skills. And, you know, the other thing is that they establish a network of support from other women that are in recovery as well. And that hasn't been possible either.

(P11, 6/2/2020)

A few directors also reported that clients who previously worked off-site while residing in the program either had been laid off or were required to quit their jobs to reduce risk of infecting other clients. These directors described clients' job loss as complicating recovery by hindering financial self-reliance:

When a lot of people are leaving treatment trying to get back on their feet, they need an economy to return to, and those things kind of change. And so, their access to ways for self-care or to obtain resources, to obtain housing, like all of these things are changing. A lot of places aren't meeting you face-to-face, maybe to rent an apartment they might give you a virtual tour, and you might have some limitations for that if you are in treatment or if you are on the streets…

(P8, 4/29/2020)

3.5. Use of telehealth

Most directors reported that their programs had either initiated (eight programs) or increased (six programs) their use of telehealth. These programs used telehealth for counseling or medical services that off-site clinicians provided to both residential and outpatient clients. Many described challenges of using telehealth, including technical

difficulties. Several programs lacked sufficient Internet bandwidth to sustain video counseling appointments on multiple devices simultaneously. Clients relied on programs' wireless connections because, as several interviewees remarked, most clients had "Obama phones," or government-issued free cellphones without data plans:

> So it takes up a lot of bandwidth, the amount of Internet servers that we have to have at these homes now is really big because they—it has to support being able to use multiple Obama phones on Wi-Fi at the same time and you know, I would say more half of them can't get on, because their phone is not capable of teleconferencing. So that's why the group sessions have not started, because that's a really big obstacle for us.

> (P7, 4/24/2020)

Other interviewees stated that older and economically disadvantaged clients often struggled to use laptops and tablets that the program provided for telehealth visits. One director said many clients either did not "show up" for telehealth appointments, or only participated for a few minutes due to discomfort with the technology or Internet interruptions. "No-shows" and abbreviated appointments reduced reimbursement for services, compounding financial worries for programs that offered both residential and outpatient services. Directors also indicated that there was insufficient private space for one-on-one telehealth appointments with therapists or physicians. This was the case, for instance, when clients had to use the program's office telephones for appointments due to insufficient cellphones, laptops, or tablets. Beyond technical difficulties, several directors also cited the lack of in-person rapport between client and clinician as a major drawback to telehealth.

Two directors described positive experiences with telehealth, including convenience and clients' expanded access to medical and counseling services during the pandemic. One director said telehealth could confer benefits or challenges, depending on the client:

> I think it's going to change the way we do work, but you've got some people that really like it. Like we had guys who are sitting on the freeway, able to attend a virtual group, right. Some of them maximizing time. But you have other guys that have to be able to sit across from you to feel comfortable. So, I don't think there's a "one size fits all."

> (P12, 5/13/2020)

3.6. Program needs

When asked what would help their programs to deal with COVID-19, directors mentioned both financial and public health resources. Financial resources included hazard pay for on-site staff and stimulus funding to cover payroll and expand telehealth infrastructure. Some public health resources that directors cited included better access to health care during the pandemic (so potential clients could obtain medical clearance to enter their SUD treatment programs), PPE, antibody testing, and consistent guidance on how to prevent contagion in their programs. Most directors, like the one quoted below, expressed the need for both types of resources:

> We need financial assistance to continue to pay staff as our revenues are diminished. The State government and County have supported by providing PPEs, but we can't get our hands on them, we are not a medical facility. We need support and advance payments to keep us going. Government is responsive but we have to wait in line.

> (P4, 4/16/2020)

Some directors reported applying for grant funding or soliciting donations to cover their programs' needs when public health resources were insufficient or inaccessible:

> We need to get barriers set up in the rooms. I'd like to hire a nurse who could look at the clients and help us out, you know, with medical issues that are coming up. And so yeah, there's a couple of things we're looking to do by getting additional grant funding. We want to have more TVs in place so we can do more telehealth with [clients].

> (P1, 4/21/2020)

> So we have donations that have come in for masks, we have limitations on what we can buy as far as gloves, we have reusable masks so people can wash them and reuse them, from homemade ones that were donated to us. I personally even went and made several - a dozen of them for my staff just to assist in making sure that they felt protected.

> (P10, 4/29/2020)

Another recurring theme in our data was constantly changing information about COVID-19 transmission and a lack of clarity regarding the infection control measures residential health care facilities needed to implement. Directors' comments on guidelines reflected the time point in which we conducted the interview. For instance, a director interviewed one month after the shelter-in-place order began expressed confusion over which physical symptoms were indicative of COVID-19 and should be included in screening:

> So…when [the pandemic] originally started, it was, "have you travelled, do you have a cough, a shortness of breath, or fever" and now it's, you know, "do you have a headache, do you have diarrhea, are you social distancing." There's just … more and more every day, and then what do we do and what does that look like. So, the constant change is difficult. And then the things that are working not being available. So, wipes, sanitation stuff, masks, things like that, they're not all consistently available, so that's scary and challenging as well.

> (P9, 4/23/2020)

This director also mentioned difficulty acquiring PPE, which was in especially short supply near the beginning of the shelter-in-place order due to hoarding and price-gouging (Baumgaertner & Karlamangla, 2020; World Health Organization, 2020). A director who we interviewed toward the end of the study period, by contrast, focused less on screening and PPE but expressed frustration over a lack of clarity regarding which restrictions were in place and for how long. By that point, State and county governments had moved from a strict shelter-in-place order, to a modified "re-opening," and then to a "re-closing" phase as COVID-19 cases rebounded:

> For me as the program manager, I feel like clearer direction and an understanding how we're supposed to – like at what point in time can we have less restrictions, what point in time do we need to tighten them down and just kind of clearer directions for residential care. I feel like that would be real – because I feel sometimes like – when I'm making decisions, I'm like, "Am I supposed to be making these decisions, you know, is this safe? Am I going to get in trouble for making these decisions?"

> (P14, 6/23/2020)

This director's comments also reference a continuing lack of clear infection control guidelines for behavioral health settings where patients both live and receive care.

3.7. Positive effects

Although most impacts of COVID-19 that directors reported were negative, directors also mentioned some positive effects of measures their programs and clients had taken in response to the pandemic. These

effects included increased emphasis on hygiene and sanitation and more attention to physical health, which resulted in more hand-washing, more social distancing, and for some clients, in being more motivated to quit smoking to reduce chances of COVID-related respiratory distress. Several directors hoped that these positive health-related changes would help to mitigate not only COVID-19 but also other infections and health complications among clients and staff during the upcoming flu season.

About half of the interviewees also cited increased use of telehealth as a benefit of the pandemic response, both in terms of increased access to services for clients after leaving care and increased operational efficiency. One director reported that the pandemic had caused program operations to slow down enough for them to prioritize operational improvements that would expand access to care:

> While it's a challenge, there are also benefits that come out of it right? While referrals are down, we are looking at ways to improve access, so we are implementing open intake hours so folks don't have to schedule an appointment to come in and they can show up during those open intake times to hopefully make it easier for folks to get into treatment…. And then we've been following up with service providers and talking with them about other ways we might be able to partner better with them.

(P6, 4/24/2020)

Another director commented that the pandemic had finally required government officials to classify substance use disorder treatment programs as essential health care facilities:

> I ran a woman's recovery center about 10 years ago … And back then, people still didn't believe that addiction was a disease. They thought it was a choice. And so, 10 years ago, I don't think we would have been essential. So, it can't go back now. "Substance use disorder is on the same danger as getting this COVID disease," is what we keep hearing from the county as to why we have to keep taking guys in. We… they can't go back on that anymore. … We can't not be essential anymore.

(P12, 5/13/2020)

4. Discussion

In our thematic analysis of semi-structured interviews with 17 program directors, we identified the following major themes: *program-level impacts*, *staff impacts*, *client impacts*, *use of telehealth*, *program needs*, and *positive effects*. Each major theme comprised a number of salient subthemes. "Program-level impacts" included threats to program survival, stemming from insufficient resources to implement infection control measures and from reductions in client censuses and services, both of which resulted in decreased revenue. The challenges that program directors described regarding adequate infection control are similar to those reported in studies of other congregate settings during COVID-19, such as psychiatric inpatient centers (Benson et al., 2020), nursing homes (McMichael, 2020), and correctional facilities (Rubin, 2020): limited resources for PPE and space modifications, limited staff to implement preventive protocols, and high risk for infection given residents with frequent turnover living in close proximity to one another. Financial shortfalls caused by decreased client census were also reported in studies of post-disaster impacts on SUD treatment programs (Frank et al., 2006). A recent survey of California SUD treatment providers, although informal, provides additional support for these findings: 65% of respondents endorsed decreased client census, and 86% endorsed significant financial loss due to the COVID-19 pandemic (California Consortium of Addiction Programs and Professionals, 2020).

"Staff impacts" included increased physical and emotional fatigue among staff members who continued to provide services during COVID-19. While there is sparse research on COVID-19-related stress among SUD treatment staff, a recent study of front-line COVID-19 health care workers identified substantial levels of depression, anxiety, and stress, which were exacerbated by increased working hours and staff-to-patient ratios (Elbay et al., 2020). A recent meta-analysis of psychological impacts that health care workers experienced during viral outbreaks (including COVID-19) found increased odds of acute and post-traumatic stress (Kisely et al., 2020). The risk increased with longer quarantine duration (if applicable) but decreased with adequate PPE access. Most programs in our study reported insufficient PPE access, which may have played a role in staff impacts.

Better provision of PPE from public health authorities could mitigate fear of contagion among staff. However, PPE distribution to SUD treatment programs has been a challenge throughout the COVID-19 pandemic (Gliadkovskaya, 2020). Due in part to the traditional separation of SUD treatment from mainstream health care (U.S. Dept. of Health and Human Services, 2016), public procurement and distribution systems for PPE are either insufficient or nonexistent for SUD treatment and other congregate living facilities, leaving private entities to fill the gap in PPE provision (National Association of Addiction Treatment Providers, 2020; Taaffe, 2020).

Interviewees also described layoffs and furloughs due to funding shortfalls as significant staff impacts. Compared to temporary COVID-related stress and fatigue, layoffs and furloughs represent longer lasting threats to the SUD treatment workforce. Analyses of temporary unemployment during COVID-19 suggest that the probability of workforce attrition rises with each month of furlough (Gallant et al., 2020; Schwab, 2020). This effect is amplified for late-career staff, who are more likely than earlier-career employees to retire after furloughs or layoffs (Merkurieva, 2019). Further research should determine whether COVID-related employment interruptions and attrition cause sustained decreases in the supply of SUD treatment professionals.

"Client impacts" included threats to SUD recovery, including delayed treatment initiation and shorter stays; receipt of fewer services while in treatment; and barriers to transitioning out of treatment, such as lack or loss of employment and limited ability to forge connections with local recovery communities. Delays in treatment admission may reduce the likelihood that persons in need of SUD treatment will enter treatment at all, let alone complete it (Hoffman et al., 2011). Research has linked early discharge, especially when coupled with lower service intensity, to poorer treatment outcomes (Hser et al., 2004; Zhang et al., 2003).

Some directors interviewed for our study also commented that the shelter-in-place order itself may present special risks for residential treatment clients, since they did not have the opportunity to gradually re-enter the community and test strategies for relapse prevention before leaving the program altogether. While there is limited research on how isolation from the outside community during residential SUD treatment may affect outcomes, studies indicate that the missed opportunity to forge peer recovery support networks could negatively impact clients' recovery once they transition out of the treatment program (Reif et al., 2014). Continuing social isolation due to the shelter-in-place order could also increase the risk of poor mental health outcomes after leaving residential treatment (McGaffin et al., 2018). Finally, economic and housing instability have been linked to increases in substance use disorder prevalence (Carpenter et al., 2017; Frasquilho et al., 2016) and to relapse among persons leaving residential SUD treatment (Manuel et al., 2017). COVID-19 has the potential to worsen SUD treatment outcomes globally through a cascade of direct threats (increased treatment access barriers, decreased receipt of services, and lower retention and completion rates) and indirect threats (increased economic instability and social isolation). Longitudinal research on treatment and recovery outcomes, pre- and post-discharge, should determine the long-term effects of COVID-19 on SUD treatment clients, as well as on persons with SUD who are unable to access treatment.

Telehealth has been lauded as an efficacious and cost-effective way to deliver SUD treatment services—especially outpatient services including induction and maintenance of medications for opioid use

disorder—during COVID-19 (Faur et al., 2020; Harris et al., 2020; Knopf, 2020). However, most residential program directors interviewed for our study described challenges rather than benefits of telehealth, including compromised clinician-patient rapport, more patient "no-shows," difficulties with full reimbursement, and technological barriers for patients. Similar limitations of telehealth for SUD treatment have been identified in other studies (Lin et al., 2019), prompting calls for optimization of telehealth services for SUD during COVID-19 (Lin et al., 2020). Reports of limited utility in our study may be influenced by the type of telehealth services provided by this sample of residential programs (e.g., for psychotherapy rather than medication induction or maintenance). As with other consequences of COVID-19, it remains to be seen how telehealth will affect treatment delivery and outcomes. Future research should investigate not only associations between increased telehealth service delivery and treatment outcomes before, during, and after COVID-19; but also the effects of telehealth delivery on perceived quality of SUD services from both client and staff perspectives.

"Program needs" included stimulus funding and hazard pay, COVID-19 antibody tests, PPE, and consistent public health guidance regarding COVID-19 mitigation in residential treatment facilities. While there is little research on SUD treatment responses to infectious disease outbreaks, the need for supportive funding and consistent communication has been documented in studies of postdisaster response among SUD treatment providers (Carlisle Maxwell et al., 2009; Frank et al., 2006). The U.S. federal government Coronavirus Aid, Relief, and Economic Security (CARES) Act of 2020 has offered stimulus funding, including Provider Relief Fund dollars, that could help SUD treatment programs to stay afloat during the COVID-19 recession. However, these funding opportunities require providers to apply directly to the U.S. Department of Health and Human Services, which can present an administrative barrier for short-staffed or smaller programs. States can help to support publicly funded SUD treatment providers with technical assistance in identifying and applying for funding opportunities, and can help providers navigate Medicaid flexibility to procure emergency funds (National Governors Association, 2020).

Finally, programs also mentioned "positive effects" of their responses to the pandemic, including increased emphasis on hygiene and health, increased use of telehealth, the opportunity to improve operations during a slow-down in services, and government recognition that SUD treatment facilities are essential health care services. These comments arose spontaneously during interviews, as there were no questions in the interview guide regarding positive aspects of the programs' COVID-19 experiences. Interviewees' surprise at being acknowledged as an essential service highlights the traditional separation of SUD treatment from both mental health and general health services in the U.S. health care system. This separation has had a deleterious effect on supply of SUD treatment services, leading to the emergence of peer support to help address treatment gaps (U.S. Dept. of Health and Human Services, 2016). Greater visibility of SUD treatment as an essential service has come at the cost of catastrophes such as the U.S. opioid epidemic and now, COVID-19. These "big events" are double-edged swords that confer untold human suffering, but may also prompt greater support for the means to address SUD as a global public health threat (Mackey & Strathdee, 2015).

While research findings are sparse on positive outcomes of disaster response for SUD treatment providers, one study found that post-–Hurricane Katrina rebuilding presented an opportunity for providers to restructure operations and implement a client-centered model that enhanced client access and engagement over time (Toriello et al., 2007). Recently, a number of commentaries and editorials have proclaimed the COVID-19 pandemic an opportunity to increase the reach of telehealth (Knopf, 2020) and sustain relaxed regulations for opioid treatment delivery even in noncrisis times (Green et al., 2020).

Potential limitations of the study include a nonrandomized sample drawn from one U.S. state and reliance on self-report data drawn from program directors only (not clients or other staff). These factors may

influence reliability and generalizability of the data to other residential treatment programs as well as to other U.S. regions and internationally, given differences in COVID-19 prevalence and public health responses to the pandemic. Further, because we collected these data in rapidly changing circumstances, longitudinal research would help to contextualize them.

5. Conclusion

COVID-19 may have lasting effects on the delivery of SUD treatment (del Pozo et al., 2020; Green et al., 2020). As the pandemic evolves, more research will yield a fuller picture of how SUD treatment providers respond to regulatory and practice changes that accompany the pandemic and resulting impacts on client care and treatment outcomes. In the meantime, our findings suggest that federal, state, and local governments can support SUD treatment programs and clients by continuing to provide programs with emergency funding; further expanding Medicaid access through relaxed eligibility requirements and simpler enrollment procedures; and disseminating consistent, evidence-based public health guidance in a timely manner to SUD and other essential health care providers during and after the COVID-19 pandemic. COVID-19 presents a rare opportunity to evaluate how an infectious "big event" (Mackey & Strathdee, 2015) affects SUD treatment delivery and outcomes around the globe, and how we can anticipate and mitigate the fallout of such catastrophes on SUD treatment provision in the future.

CRediT authorship contribution statement

Anna Pagano: Conceptualization, Methodology, Formal analysis, Writing – Original Draft, Writing - Review and Editing.
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Jessie Wong: Investigation, Writing - Review and Editing.
Joseph Guydish: Funding acquisition, Project administration, Conceptualization, Methodology, Supervision, Writing - Review and Editing.

Declaration of competing interest

None.

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