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Research Paper

"You'll come in and dose even in a global pandemic": A qualitative study of adaptive opioid agonist treatment provision during the COVID-19 pandemic

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ABSTRACT

Background: Opioid agonist treatment (OAT) improves multiple health and social outcomes, yet requirements to attend for supervised dosing can be burdensome and stigmatising. The COVID-19 pandemic and associated restrictions threatened continuity of care and the wellbeing of people receiving OAT, risking a parallel health crisis. This study sought to understand how adaptations in the complex system of OAT provision impacted and responded to risk environments of people receiving OAT during the COVID-19 pandemic.

Methods: The analysis draws on semi-structured interviews with 40 people receiving and 29 people providing OAT located across Australia. The study considered the risk environments that produce COVID-19 transmission, treatment (non-)adherence, and adverse events for people receiving OAT. Drawing on theories of risk environments and complex adaptive systems, data were coded and analysed to understand how adaptations to the typically rigid system of OAT provision impacted and responded to risk environments during the COVID-19 pandemic.

Results: During COVID-19, the complex system of OAT provision demonstrated possibilities for responsive adaptation to the entangled features of risk environments of people receiving OAT. Structural stigma was evident in the services which stayed rigid during the pandemic, requiring people to attend for daily supervised dosing and risking fracturing therapeutic relationships. In parallel, there were several examples of services developing enabling environments by offering flexible care through increased takeaways, treatment subsidies, and home delivery.

Conclusions: Rigidity in the delivery of OAT has been an impediment to achieving health and wellbeing over past decades. To sustain health-promoting environments for people receiving OAT, the wider impacts of the complex system should be acknowledged beyond narrowly defined outcomes relating solely to the medication. Centring people receiving OAT in their own care plans will ensure adaptations in the complex system of OAT provision are responsive to the individual's risk environment.

Introduction

Opioid agonist treatment (OAT) improves multiple health and social outcomes among people dependent on opioids. OAT lowers risk of suicide, as well as drug-related, alcohol-related and cardiovascular-related mortality (Santo et al., 2021). OAT has also been shown to improve quality of life (Nosyk et al., 2016; Torrens et al., 1997) and reduce the likelihood of HIV and hepatitis C virus transmission (Degenhardt et al., 2019). The COVID-19 pandemic and associated restrictions threatened staffing levels and access to OAT, particularly for people required to quarantine because of COVID-19 diagnosis (Dunlop et al., 2020). These potential disruptions to treatment risked causing a health crisis in parallel to COVID-19, increasing harms for people receiving OAT (Grebely et al., 2020).

Models of OAT provision vary widely around the world (Jin et al., 2020) and can mediate the benefits of OAT. Engagement with OAT pro-

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grams can be burdensome and restrictive, particularly when services require daily, in-person, supervised dosing. A Cochrane systematic review of six randomised controlled trials and prospective controlled cohort studies found evidence lacking on the difference between supervised and unsupervised OAT with respect to: keeping people in treatment, reducing opioid use, reducing mortality, reducing adverse drug events (Saulle et al., 2017). Shorter time to first unsupervised dose (takeaway) has been associated with retention in treatment and reduced mortality among people receiving OAT (Peles et al., 2011). Low-threshold OAT (defined as no referral required to initiate and no urine screening required to initiate) has been found to be at least as effective and safe as standard OAT in terms of treatment retention, the use of illicit opioids, non-fatal overdose, and death (Chalabianloo et al., 2022). Historically, OAT provision has been considered complex given its strict regulatory oversight and varied interpretation of guidelines among OAT prescribers (Fraser, 2008). OAT provision is also considered to be rigid in that many aspects of treatment which are prejudicial to people receiving OAT (limited access to unsupervised dosing, limited dosing hours, drug screening, inconvenient locations of dosing points, which cumulatively increase risk of treatment cessation) have remained the same over decades (Bourgois, 2000; Chang, 2023; Fraser, 2008). Despite providers differing in their interpretation of guidelines (Fraser, 2008), OAT provision in Australia has been criticised for its rigidity in not adapting to the needs of people engaged in treatment (Crawford, 2013; Holt, 2007).

OAT is available in Australia as methadone, buprenorphine, buprenorphine-naloxone or buprenorphine long-acting injections (Australian Institute of Health and Welfare, 2022). The majority of dosing points (89%) are located in pharmacies (Australian Institute of Health and Welfare, 2022). There are significant variations in OAT provision between Australian jurisdictions, due to decentralised funding of health services and the varied historical contexts across the country (Nicholas, 2022). Jurisdiction-level regulations on OAT prescribing perpetuate the notion that OAT is risky and the implied medico-legal consequences dissuade potential prescribers (Prathivadi & Sturgiss, 2021). New South Wales has a higher rate of people receiving treatment than any other state, and accounts for the majority of public and private clinics that offer OAT (36/56 clinics in the country are in New South Wales) (Australian Institute of Health and Welfare, 2022). Public clinics offer no-cost programs but require daily, supervised attendance. People attending pharmacy for OAT may be asked to attend for daily supervised dosing or can access a number of take-home doses, depending on their prescription. In early 2020, national interim guidelines were launched for clinicians delivering OAT during the COVID-19 pandemic. The main recommendations were to reduce supervised dosing, increase the availability of take-home doses based on a categorisation of risk, consider the use of long-acting injectable buprenorphine, and increase the use of telehealth (Lintzeris et al., 2020). The rapid implementation of the interim guidelines offered the possibility of disrupting the system of OAT provision long criticised for its lack of flexibility and choice.

Adaptations can be understood in the context of interactions between the complex system of OAT provision and the "social worlds in which affected people live" (Fraser, 2008). Rhodes' risk environment framework (Rhodes, 2002) facilitates the exploration of these interactions, by elucidating the environmental factors which produce health in people who use drugs. In doing so, the framework helps to illuminate the role of social and political institutions in the production of harm and moves beyond "individualistic modes of behaviour change" (Rhodes, 2002). Investigation of risk environments inform policies to produce enabling environments – environments which alleviate the structural drivers of risk to produce improved health and wellbeing (Rhodes, 2002). Complex adaptive systems theory is suitable to make sense of unpredictable and non-linear changes to services that arose during COVID-19 (Grebely et al., 2020; Greenhalgh, 2020; Lancaster et al., 2020). Investigating how system adaptations influenced risk environments can inform the planning and delivery of OAT services to generate enabling environments for people receiving OAT (Duff, 2007).

In light of the numerous possibilities for change in the traditionally rigid system of OAT provision, this study aims to explore how any adaptations in this complex system impacted and responded to risk environments of people receiving OAT during the COVID-19 pandemic. Informed by the experiences of people receiving and providing OAT, the analysis considers the environments that produced risk of: COVID-19 infection, unintended effects of increased access to unsupervised OAT, and OAT (non-)adherence.

Methods

Semi-structured interviews were completed between August and December 2020 via telephone and videocall with people receiving and providing OAT. Prior to data collection, the study proposal and interview guide for people receiving OAT were reviewed by a reference panel of peer workers who use drugs to verify content and appropriate terminology. As a result of the panel's feedback, the interview guide was modified and the process of requesting consent was adjusted to include a clearer explanation of the interview schedule and to offer a variety of compensation methods (bank transfer, e-transfer, voucher).

Recruitment of people receiving OAT was facilitated by members of the community reference panel in their capacity as staff in eight peer-led organisations in seven Australian jurisdictions. A flyer with study information was shared on social media and interested parties could contact the study team to arrange an interview. People who did not have a phone were able to use the phone of the organisations where the community reference panel worked. OAT providers (doctors, nurses, or service managers) known to the research team were sent an email with the study flyer. Additional providers were recruited via snowball sampling and dissemination of the study flyer to staff at two sites. The sample was recruited to reflect a range of jurisdictions and gender. All participants were reimbursed AUD$50 cash transfer or gift voucher (according to their preference) for their time and expertise. Participants provided verbal consent prior to the interview. AC conducted the interviews and audio recordings of the interviews were transcribed verbatim by a transcriber working under a confidentiality agreement. Transcripts were deidentified and checked for accuracy by AC. NVivo 12 was used to manage and code the deidentified data. Participants were assigned pseudonyms.

A review of the broader literature identified three primary risks related to receiving OAT during COVID-19: (Santo et al., 2021) COVID-19 transmission; (Torrens et al., 1997) unintended effects of unsupervised OAT; and (Nosyk et al., 2016) OAT (non-)adherence (Dunlop et al., 2020; Grebely et al., 2020). For each of these primary risks, the Rhodes risk environment framework (Rhodes, 2002) was used to create a coding guide, based on the four overall domains (physical, economic, social and policy) at the micro and macro level (Rhodes, 2002). The domains of the risk environment are useful when applying the theory but are also "to a large extent phoney divides, serving a heuristic or analytical purpose and necessarily clouding the depiction of situated social realities of risk" (Rhodes, 2002). To understand the situated risks, the analysis also considers interactions across the divides (Rhodes, 2002). The initial coding guide was developed by AC and then discussed among study authors (consisting of researchers, a person with lived experience of receiving OAT and an OAT prescriber) and refined as analysis was ongoing. AC coded all interview data.

We used the theory of complex adaptive systems to examine the interplay between OAT provision during COVID and risk environments with respect to three primary risks. The interview data was sorted with the coding guide and then descriptive categories were analysed deductively using the theoretical concepts of complex adaptive systems and risk environments (Neale, 2021). From this process, four key themes were identified to explore how the complex adaptive system of OAT

provision during COVID-19 influenced the risk environments of people receiving OAT:

1) The physical OAT setting. The dosing point and the obligation to attend for supervised dosing impacts wellbeing and risk of COVID-19 transmission (Crawford, 2013; Dunlop et al., 2020).
2) Stigma. OAT-related stigma exists within health institutions at the structural level (McCradden et al., 2019) and at the interpersonal level in interactions with healthcare professionals (Farrugia et al., 2020; Fraser et al., 2007; Harris & McElrath, 2012; Treloar & Holt, 2006). Stigma impacts health outcomes (Couto e Cruz et al., 2019) and tensions around COVID-19 and enforcement of restrictions may have compounded the stigma experienced by people receiving OAT.
3) Financing. Out-of-pocket costs for people receiving OAT can impact access and adherence to treatment (Mcnally et al., 2018; Tran et al., 2022). The impact of changes to individual-level finances during COVID-19 has not been investigated in the context of drug treatment.
4) Client-provider relationships. Due to COVID-19 and associated restrictions, providers were called upon to reassess client risk and change OAT delivery (Dunlop et al., 2020). Ensuring the person's "voice" is heard in planning for changes in their own treatment can help redress the power imbalance in patient-provider relationship and improve quality of care (Rance & Treloar, 2015).

These themes collectively demonstrated the rapid and, at times, radical departures from previous OAT practice that were unimaginable prior to COVID-19. The analysis furthers the evidence that the pandemic often shifted people's risk environments, upsetting the axes upon which providers made clinical decisions.

The study protocol was approved by the Human Research Ethics Committee at the University of New South Wales, Sydney (HREC Ref: HC200459) and for recruitment of staff at two sites by the Human Research Ethics Committees at St Vincent's Hospital, Sydney (HREC Ref: 2020/ETH02342).

Results

Interviews were conducted with 40 people receiving OAT in New South Wales, Victoria, Queensland, Western Australia, South Australia, Australian Capital Territory and Northern Territory (mean number of years receiving OAT=10) and 29 OAT providers in New South Wales, Victoria, Queensland, Western Australia and Australian Capital Territory (59% doctors, 31% nurses, 10% managers, mean number of years as OAT provider=11).

The four themes of the physical OAT setting, stigma, financing and client-provider relationships interact to produce or mitigate risks. The interaction between these themes demonstrates that the complex adaptive system of OAT provision impacts risk environments across multiple levels. These interactions make it impossible for an evaluation of changes to OAT provision to isolate the effect of a singular outcome. In the results, we explore the relationship between adaptations in OAT provision and the themes across the three primary risks of (Santo et al., 2021) COVID-19 infection; (Torrens et al., 1997) unintended consequences of unsupervised dosing and (Nosyk et al., 2016) OAT (non-)adherence.

Risk of COVID-19 infection - "having to travel [to dose]… anything can happen, you can get mugged or catch a disease or miss a train"

The frequent contact required in OAT dosing in Australia, and the concentration of people accessing services, made providers consider the dosing point as a possible "hotspot" (Addiction medicine specialist 1) for transmission of COVID-19. The usual pathways to develop evidence-informed guidelines were constrained by the need for rapid adaptation, and services were forced to rely upon "evidence-enough" (Lancaster et al., 2020). Using the available information on risk factors associated with COVID-19 symptoms, providers' clinical decision-making was informed by people's risk environments including their commute to the dosing point.

> *One of my [patients] is 75 [years old]. We had a massive discussion with the team, and I said, "Look, this guy's still potentially at risk [of COVID-19]. He doesn't have transport. Can we increase the takeaways to a monthly pick-up so it only gives him one day of the month to have exposure to people?" – Clinical nurse 1*

People receiving OAT felt their needs and own risk of COVID-19 infection were sidelined when the rapid adaptations seemed to serve only a "general public" i.e., people not engaged in treatment. Prior to COVID-19, Alyssa (OAT ~17 years) valued the relative privacy that was afforded in her pharmacy by a cubicle for dosing. When the cubicle was removed to redesign the pharmacy to allow for physical distancing, Alyssa felt "other customers won out and the methadone customers lost out." This was reflected in Anabel's experience, that the clinic prioritised the perceptions of the "general public" to the detriment of the health of people receiving OAT.

> *[The clinic worker] would get upset about [people receiving OAT] hovering outside before they opened, but once we were inside, we were all standing pretty close together, so yeah, there wasn't really any instructions about separating or social distancing once in the clinic […] You know rather than it coming from a place of "you guys need to keep separate because COVID is going around and I care about you guys", it was more of a place of, "don't make me look bad". - Anabel, OAT ~15 years*

The sense of "losing out" (Alyssa) to other customers was reinforced when some pharmacies raised the out-of-pocket costs of OAT to pay for costs associated with their COVID-19 prevention strategies. Several pharmacies refused to recycle methadone takeaway bottles citing concerns about COVID-19 transmission and began to charge for new bottles with each dispensation. Some interviewees recognised how the adaptations made structural stigma visible, by treating people receiving OAT differently to other pharmacy customers. Anabel felt that pharmacists "don't want much to do" with people receiving OAT.

> *Since COVID, a lot of pharmacies that used to allow [recycling of takeaway bottles], no longer do […] [It's probably due to] a bit of stigma and judgment, when a bottle is being reused, most patients sip the methadone directly out of the bottle, they don't pour it into a glass and a lot of pharmacists you know [think], "their house is probably filthy, they probably don't wash their hands enough…" it's all that judgement. – Sophie, OAT ~18 years*

Initiation onto long-acting injectable buprenorphine was also recommended as a strategy to decrease the number of visits at OAT dosing points (Dunlop et al., 2020; Grebely et al., 2020), given the formulation only requires weekly or monthly attendance for an injection. Long-acting injectable formulations first became available in Australia in September 2019 (Arunogiri & Lintzeris, 2020). Providers acknowledged the increased uptake of long-acting injectable buprenorphine over the course of 2020, but largely attributed it to the formulation's "entry onto the market coinciding with COVID-19" (Nurse practitioner 1). The complex system of OAT adapted in unforeseen ways to this relatively new technology, with one provider saying the service had a "pause on recruiting people" (Service manager 1) to long-acting injectable buprenorphine because the service was concerned about the logistics of providing it to people who were self-isolating. The few participants interviewed who were receiving long-acting injectable buprenorphine (n=4) said they would likely have initiated this formulation regardless of COVID-19. Amy (OAT ~25 years) reflected that transitioning to long-acting injectable buprenorphine was primarily cheaper and more convenient but also prevented her from having to make a "choice between going out and getting sick and possibly dying [from COVID-19] or going without [her]

methadone". Dylan concurred, acknowledging that the formulation addresses a range of risks, just one of which was "catching a disease".

> *The sublingual buprenorphine was $70 a fortnight and the injectable is once a month and it's free, so it's good…. plus it's better that way you know, like having to travel … like who knows, anything can happen, you can get mugged or catch a disease or something like that or miss a train … this way is much easier, I go there and 20 minutes later I'm gone. – Dylan, OAT ~2 years*

Unintended consequences of unsupervised OAT – "if it ain't broke, don't fix it"

The OAT system has long been complex in its strict governance accompanied by arbitrary interpretation of guidelines by the provider (Fraser, 2008). The strict scheduling and provision of OAT has been justified based on potential unintended consequences of unsupervised dosing, namely diversion and overdose (Gowing et al., 2014). The COVID-19 pandemic saw the introduction of new clinical guidelines to scale up access to takeaways in Australia (Lintzeris et al., 2020). The guidelines included a risk categorisation, similar to pre-COVID-19, based on factors including time from treatment initiation, recent drug use, recent missed doses, and ability to store takeaways, to indicate who was suitable for takeaways. Despite the familiarity of the risk categorisation, the OAT system was confirmed to be complex but rigid with providers struggling to apply the new guidelines. When providers were asked which factors they considered when offering increased takeaways, they suggested they were "balancing on a safety threshold" (Nurse practitioner 2) and pointed to risk of overdose after "getting 14 takeaways [at once]" (Nurse practitioner 2) and "concern about diversion of OAT" (Addiction medicine specialist 2). While some participants requested and were denied takeaways to reduce COVID-19 risks, Tom was provided with more takeaways without consultation. This experience demonstrates the "internal rules" (Greenhalgh & Papoutsi, 2011) which govern complex systems but are not always interpretable to those outside of healthcare staff and policy makers. The lack of in-person care further distanced Tom from decision-making process, demonstrating rigidity in not permitting the input of the person receiving OAT. The inconsistent availability of takeaways for clients suggested power imbalances in the patient-provider relationship were leading to inequalities in provision of care.

> *(Interviewer) Did you ask for the extra takeaway or did your providers suggest it? No, the doctor just stuffed it on my script. I didn't actually know that the doctor had put it on my script, he didn't mention it during the appointment and then when the script turned up at the pharmacy, it had an extra takeaway. – Tom, OAT ~6 years*

Despite concerns about increased access to unsupervised dosing, providers largely reported that, to their knowledge, since the beginning of COVID-19, services "[didn't have a] significant increase in adverse events" (Nurse practitioner 3). Local and national surveillance of adverse events lagged behind these changes to OAT provision and so could not be used to generate evidence to guide clinical decision-making. When providers were asked about sustaining the increased availability of takeaways, responses varied with some taking the view that if the increased takeaways had not generated any adverse events they should be sustained: "if it ain't broke, don't fix it" (Addiction medicine specialist 3). Other providers pointed to the need for a state-level evaluation to assess impact on OAT-related overdose during the COVID-19 pandemic before maintaining the increased access to takeaways over the long term.

> *If we see increased [takeaway] doses for 12 months [it would be interesting to look at the] number of methadone overdoses in that 12 months, for example. And if we didn't see an increase in methadone overdoses, there would be an argument for not tightening [takeaway restrictions]. – Addiction medicine specialist 4.*

OAT (non-)adherence – "[the takeaways were] way more convenient for me, way less stress… you felt more like a normal person"

COVID-19 disrupted movement and services, causing concern that people receiving OAT may miss doses or stop attending treatment. Supervised dosing requires frequent engagement in environments which may be hostile and not conducive to regular, uninterrupted attendance (Crawford, 2013). OAT accessibility impacted adherence prior to COVID-19 (Amiri et al., 2018). This pre-existing rigidity in dispensing meant the complex system struggled to adapt when COVID-19 provoked fluctuations in the risk environments that produce treatment non-adherence. People who do not attend for dosing risk being marked as non-adherent, a categorisation that reduces the possibility of being given access to takeaways. Contrary to dropping off treatment, people receiving OAT reported that the "generous constraints" (Harris & Rhodes, 2013) enacted during COVID-19, particularly more takeaways, supported flexible dosing and thus treatment adherence.

> *I'm someone that needs a lot of sleep. I need at least 9 hours sleep. Mornings aren't an option, so [getting six takeaways a week was] just way more convenient for me, way less stress and I was much more physically stable because I wasn't missing doses and also felt … it was sort of empowering as well, because it means they are trusting you to have the six takeaways, you felt more like a normal person, more like an adult, being trusted with some responsibility and that was quite empowering. – Sam, OAT ~6 years*

While flexibilities were offered primarily to reduce possibilities of COVID-19 transmission, providers considered the relationship between these adaptations and the risks, such as stigma generation, which are not central to the planning of OAT provision. Some services pre-empted disruptions due to the pandemic by offering home delivery of OAT. Such adaptive responses set a precedent which may not have been achieved outside of COVID-19, demonstrating the capacity of services to meet people where they are. Nurse practitioner 4 showed understanding of the risk environments which could provoke treatment non-adherence while being aware of the stigma that could be reproduced with the home deliveries. To maintain social distancing, providers reported that they would not enter people's houses and instead supervised dosing outside.

> *(Interviewer) And was it ever an issue trying to find space to do the supervised dosing if you couldn't go into peoples' houses? No. Obviously, we wanted to be considerate for the client if they wanted to keep it confidential because, being in public and going to their homes, we don't want them to feel like they're being stigmatised against. They're [receiving the dose] outside with a neighbour potentially looking […] a lot of our clients don't like their neighbours knowing their business. So most of them were fine doing it at the front door but some we actually did it around the corner. – Nurse practitioner 4*

Addiction medicine specialist 5 stated that the out-of-pocket costs for dosing in community pharmacy presented a "barrier that has long existed for people". The cost of OAT in community pharmacy may also cause people to "miss doses" when they cannot afford the payments (Zahra et al., 2022). People receiving OAT in Australia spend an estimated one-eighth of their income on out-of-pocket costs associated with OAT (including travel costs, dispensing costs, and OAT-related appointment costs), disproportionately affecting people who are new in treatment or receiving fewer unsupervised doses (Tran et al., 2022). Providers from two services reported they subsidised the cost of OAT in pharmacy temporarily during the pandemic, again revealing the extent of the adaptations that are possible if OAT provision centres people receiving OAT. Addiction medicine specialist 6 considered the subsidy of clients' costs a necessary strategy to support treatment adherence during the pandemic.

> *If a whole lot of people jump off treatment because they've been told, "Well, you just have to pay for it," and they say, "Well, fuck you. I*

can't afford it", and then we had a series of overdoses or other, you know, serious consequences can happen whenever people abruptly leave opioid pharmacotherapy […] I guess that would be the main, potential outcomes. – Addiction medicine specialist 6

Providers who did not offer flexible care to people during the pandemic risked OAT provision becoming more punitive, by expecting people to comply with a treatment regimen that became unfeasible in light of guidance to reduce COVID-19 transmission. Such a test of compliance risked reproducing the stigmatising rhetoric of "deficit", whereby the person seeking treatment is problematised as being in crisis or incapable of making treatment decisions (Treloar & Holt, 2006), and lowered people's expectations of entitlement to basic care (Farrugia et al., 2020). Anabel's experience demonstrates how COVID-19 entrenched existing tensions between providers and people receiving OAT when attempts to socially distance were thwarted by demands to attend for supervised dosing.

I think generally speaking, the vibe is that the pharmacists don't want much to do with us, he just wants to give us our dose and get rid of us, you know there's not much engagement and I think a lot of that is because I feel like we are seen as "less than" in general, like, "you'll get what you are given". You know, "you'll come in and dose even in a global pandemic", that sort of lack of care, which I do believe stems from stigma underneath it all. – Anabel, OAT ~15 years

Discussion

The complex system of OAT provision has long been characterised by its rigidity which prevents it from adapting to meet the needs of people who receive treatment. The COVID-19 pandemic disrupted entrenched power relations in OAT provision which typically privilege the stability and health of the system over that of the individual (Bourgois, 2000). Service responses which were best characterised by "generous constraints" (Harris & Rhodes, 2013) promoted patient-centred care and generated enabling environments (Duff, 2007) that produced health in people receiving OAT. The analysis is strengthened by drawing on the voices of both people receiving and providing OAT to explore how the complex adaptive system of OAT provision influenced the risk environments of people receiving OAT during the COVID-19 pandemic. Theories of complex adaptive systems which approach service changes as emergent responses, complement the risk environment framework which considers the environments that impact health as being dynamic and fluid (Grebely et al., 2020). The complex systems paradigm, which exposes multiple perspectives (Greenhalgh, 2020), is suitable for investigating the health of people receiving OAT who are often side-lined in their own care.

Structural stigma attached to OAT and people who use drugs persisted through the pandemic and the adaptations suggested in the guidelines did little to address the barriers to care which were exacerbated by COVID-19. The examples of temporary respite from dispensing payments suggests health districts were aware of this aspect of the risk environments, yet financing had been an ongoing issue prior to COVID-19 (Tran et al., 2022). Additionally, the usual out-of-pocket costs associated with OAT increased in some cases, despite being routinely cited as a barrier to treatment access and adherence prior to the pandemic (Shepherd et al., 2014; Zahra et al., 2022). Regulatory and financial reform of OAT provision is required to sustain the positive changes that were implemented during the pandemic period. Out-of-pocket costs impact how and where people receive OAT and ensuring it is free at the point of access would reduce some of the national disparities in Australia.

Structural stigma was expressed in changes to the physical space of the dosing points which prioritised protection of the "general public" against COVID-19, and consequently reduced privacy offered to people receiving supervised dosing. Treating the needs of people receiving OAT as secondary to those of people not in drug treatment, affirms the narrative of "deficit" (Treloar & Holt, 2006) and reinforces the idea that quality care is a reward for "good behaviour", as defined by the provider. It has long been reported that people receiving OAT in pharmacy may face stigma which is not experienced by other customers (Crawford, 2013; Radley et al., 2017), but the analysis demonstrates how changes to dosing due to COVID-19 could intensify those interactions. Requesting that people attend for supervised dosing in contradiction of public health guidelines that people should not congregate, generated a sense of double standards. Even generously positing that the experiences were only a consequence of these unprecedented times, they still serve to entrench the "them and us" treatment divide between providers and people receiving OAT (Rance & Treloar, 2015), and the divide between people receiving OAT and people who use health services for other purposes. In the USA, people reported unintended benefits to mental health when attending a dosing point that was not overcrowded (Levander et al., 2021), demonstrating the potential for dignified services that generate enabling environments in the post-pandemic era. Our analysis indicates there was high variability in how systems of OAT provision adapted during the pandemic. Mandating more flexible provision of OAT could improve existing services and reduce disparities in provision of care.

The COVID-19 pandemic challenged paradigms of evidence-based medicine, demonstrating that rapid adaptation in the system of OAT provision could be produced from incomplete or contested data (Greenhalgh & Papoutsi, 2011). The ability of some providers to overcome the gap between incomplete evidence and implementation, to find workarounds to ensure care was uninterrupted, are characteristic of complex adaptive systems (Greenhalgh & Papoutsi, 2011) and show promise for a more adaptive OAT system becoming the norm. Throughout the pandemic, OAT providers were able to make decisions based on "evidence enough" (Lancaster et al., 2020), in the absence of population level data. This led to more agile and tailored treatment, adaptable to the risk environments of the patient rather than being bound in pre-COVID-19 norms. People that had increased access to takeaways in this study reported benefits that improved their quality of life including more rest, less commuting, and importantly, improved therapeutic relationships. Studies which attempt to investigate the linear impact of intervention on outcome (Brothers et al., 2021; Lintzeris et al., 2022) should be contextualised with rich, nuanced work which uses theory to highlight the breadth of factors involved in producing good health. The study of single events (such as overdose) in the context of OAT provision, reinforce such evidence as "useful" and "rational" (Lancaster et al., 2017) to the detriment of other knowledges which may be more integral to understanding adaptations and their impacts within complex systems.

The stigma experienced by some participants in patient-provider interactions during the pandemic is derived from a long-standing power imbalance (Harris & McElrath, 2012), and the COVID-19 response risked further fracturing any therapeutic relationship. Providers have historically made decisions on access to unsupervised dosing based on a categorisation of clients as "low risk" or "high risk", which disguised moral values as clinical (Fraser, 2008). While the arbitrary application of this categorisation persisted during the pandemic, several providers broadened their considerations of patients' risk environments. Some service adaptations, such as home delivery of OAT, sought to reduce stigma and redress the power imbalance in the patient-provider relationship. The reduced monitoring during the pandemic period implied more trust in the ability of people receiving OAT to make autonomous decisions and improved their experience of care, as seen in studies in the USA (Hoffman et al., 2022; Mattocks et al., 2022). The pandemic presented an opportunity to open a dialogue on the needs of the person receiving OAT, to ensure people were receiving appropriate care and were informed about the existence of pathways for meaningful participation in their own treatment (Bryant et al., 2008; Marchand et al., 2020). More research is needed to understand the disparity among providers in terms of willingness to tailor treatment to people's needs,

and to investigate the mechanisms by which providers engage with adaptations.

The findings from this study can inform policies that generate enabling environments for people receiving OAT going forward. In response to the pandemic, a more flexible model of OAT provision that had long been demanded (Crawford, 2013; Harris & Rhodes, 2013) was offered through increased takeaways, home delivery, and subsidies for out-of-pocket costs. The experiences of participants in this study indicates that high variability in standards of care persist despite regulations and guidelines. An overhaul of the regulatory environment for OAT in Australia could support person-centred care, but there is also a need for a cultural shift that centres the treatment goals of the person receiving OAT. Reform of OAT provision could draw on the experiences of sites in other countries which report GP-based treatment for OAT (Benyamina, 2014), provide a large number of takeaways (Trujols et al., 2020), or offer other medication options such as hydromorphone (Klaire et al., 2022). Despite being listed on Australia's Pharmaceutical Benefits Scheme (which includes medicines that are available to be dispensed to patients at a Government-subsidised price), OAT in community pharmacies in Australia is different to other medicines in that it is subject to uncapped dispensing fees which exacerbated financial stress for many study participants. Any appraisal of the changes to OAT services during COVID-19 should involve the voice of the person receiving OAT, to ensure people's multiple and diverse treatment goals are reflected (Treloar et al., 2011). People who receive OAT and peer-led organisations have the experience and knowledge which make them best placed to partner in the design, implementation, and analysis of evaluations. OAT reform requires recognition of expertise from a plurality of voices and, at the clinic level, needs clear pathways for feedback to be actionable in an environment that is constantly evolving.

There are several limitations to the study. Providers who agreed to participate in the study may have been those who were more satisfied with their service's response to COVID-19, or who were more responsive to clients' needs during this time. The recruitment of people receiving OAT via community organisations resulted in one third of participants being peer workers who may have stronger networks to support advocacy efforts for their own care thus influencing their experiences of OAT treatment during COVID-19. The recruitment of healthcare workers was done via clinics which limited the opportunities of reaching people working in the private sector. There were two locations (Northern Territory and Australian Capital Territory) where people receiving OAT were recruited but not providers. Although there was no analysis by jurisdiction, recruiting a more geographically representative range of providers may have impacted the analysis. The interviews took place over a period of four months at the end of 2020 and given the rapidly changing COVID-19 case numbers, restrictions and differences in state response, the time of enrolment and location of participant may have influenced participants' responses. Conducting interviews exclusively via telephone and videocall risked excluding people who did not have access to telephones but likely improved participation for people in rural locations. Community organisations offered their phone to people wishing to participate in the study in order to address this issue.

This study draws together the experiences of people receiving and providing OAT during COVID-19 to understand the impact of the complex system adaptations. Using the theories of both complex adaptive systems and risk environments allows the impact of OAT adaptations during COVID-19 to be investigated beyond narrow, pre-defined outcomes. The experiences of the COVID-19 pandemic demonstrate that rigidity in the delivery of OAT is an impediment to achieving health and wellbeing. Sustaining enabling environments for people receiving OAT requires OAT providers and policy makers reduce focus on single outcomes and look to the health and wellbeing of people receiving treatment more broadly. Centring people receiving OAT in their own care plans will help address the individual's risk environment and reduce the structural stigma that produces poor quality care.

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Ethics approval

The authors declare that they have obtained ethics approval from an appropriately constituted ethics committee/institutional review board where the research entailed animal or human participation.

The study protocol was approved by the Human Research Ethics Committee at the University of New South Wales, Sydney (HREC Ref: HC200459) and for recruitment of staff at two sites by the Human Research Ethics Committees at St Vincent's Hospital, Sydney (HREC Ref: 2020/ETH02342).

Declarations of Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

CT has received speaker fees from Abbvie and Gilead and has received a research grant from Merck outside the submitted work. SC has received speaker fees from Abbvie outside the submitted work. JG is a consultant/advisor and has received research grants from AbbVie, Camurus, Cepheid, Gilead, Hologic, Indivior, and Merck outside the submitted work. GJD has received research grant funding from Gilead and Abbvie. In the past three years, MF and LD have received funding from Indivior, and Seqirus for studies of new opioid medications in Australia. AC and ADM have nothing to disclose.

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References

Amiri, S., Lutz, R., Socías, E., McDonell, M. G., Roll, J. M., & Amram, O. (2018). Increased distance was associated with lower daily attendance to an opioid treatment program in Spokane County Washington. *Journal of Substance Abuse Treatment, 93*(June), 26–30.

Arunogiri, S., & Lintzeris, N. (2020). Depot buprenorphine during COVID-19 in Australia: Opportunities and challenges. *Journal of Substance Abuse Treatment, 124*(108221). 10.1016/j.jsat.2020.108221.

Australian Institute of Health and Welfare. National opioid pharmacotherapy statistics annual data collection [Internet]. (2022). [cited 2022 Jul 6]. Available from: https://www.aihw.gov.au/reports/alcohol-other-drug-treatment-services/national-opioid-pharmacotherapy-statistics-2019/contents/clients.

Benyamina, A. (2014). The current status of opioid maintenance treatment in France: A survey of physicians, patients, and out-of-treatment opioid users. *International Journal of General Medicine, 7*, 449–457. 10.2147/IJGM.S61014.

Bourgois, P. (2000). Disciplining addictions: The bio-politics of methadone and heroin in the U.S. culture. *Medicine and Psychiatry, 24*, 165–195.

Brothers, S., Viera, A., & Heimer, R. (2021). Changes in methadone program practices and fatal methadone overdose rates in Connecticut during COVID-19. *Journal of Substance Abuse Treatment, 131*(April), Article 108449.

Bryant, J., Saxton, M., Madden, A., Bath, N., & Robinson, S. (2008). Consumer participation in the planning and delivery of drug treatment services: The current arrangements. *Drug and Alcohol Review, 27*(2), 130–137.

Chalabianloo, F., Ohldieck, C., Haaland, Ø. A., Fadnes, L. T., & Johansson, K. A. (2022). Effectiveness and safety of low-threshold opioid-agonist treatment in hard-to-reach populations with opioid dependence. *European Addiction Research, 28*(3), 199–209 May 1.

Chang, J. (2023). Rigid opiate agonist treatment programmes risk denying people their agency. *British Medical Journal, 380*, 400.

Couto e Cruz, C., Salom, C. L., Dietze, P., Burns, L., & Alati, R. (2019). The association between experiencing discrimination and physical and mental health among PWID. *International Journal of Drug Policy, 65*, 24–30.

Crawford, S. (2013). Shouting through bullet-proof glass: Some reflections on pharmacotherapy provision in one Australian clinic. *International Journal of Drug Policy, 24*(6), e14–e17.

Degenhardt, L., Grebely, J., Stone, J., Hickman, M., Vickerman, P., Marshall, B. D. L., et al., (2019). Global patterns of opioid use and dependence: Harms to populations, interventions, and future action. *The Lancet, 394*(10208), 1560–1579.

Duff, C. (2007). Towards a theory of drug use contexts: Space, embodiment and practice. *Addiction Research and Theory, 15*(5), 503–519.

Dunlop, A., Lokuge, B., Masters, D., Sequeira, M., Saul, P., Dunlop, G., et al., (2020). Challenges in maintaining treatment services for people who use drugs during the COVID-19 pandemic. *Harm Reduction Journal, 17*(1), 1–7.

Farrugia, A., Pienaar, K., Fraser, S., Edwards, M., & Madden, A. (2020). Basic care as exceptional care: Addiction stigma and consumer accounts of quality healthcare in Australia. *Health Sociology Review, 0*(0), 1–16.

Fraser, S., & Valentine, K. (2008). *Substance and substitution: Methadone subjects in liberal societies*. Palgrave Macmillan.

Fraser, S., valentine kylie, Treloar, C., & Macmillan, K. (2007).Methadone maintenance treatment in New South Wales and Victoria: Takeaways, diversion and other key issues.

Gowing, L., Ali, R., Dunlop, A., Farrell, M., & Lintzeris, N. (2014).National guidelines for medication-assisted treatment of opioid dependence.; Available from: https://www.health.gov.au/sites/default/files/national-guidelines-for-medication-assisted-treatment-of-opioid-dependence.pdf.

Grebely, J., Cerdá, M., & Rhodes, T. (2020). COVID-19 and the health of people who use drugs: What is and what could be? *International Journal of Drug Policy, 83*(January), 102958. 10.1016/j.drugpo.2020.102958.

Greenhalgh, T. (2020). Will COVID-19 be evidence-based medicine's nemesis? *PLoS Medicine, 17*(6), 4–7.

Greenhalgh, T., & Papoutsi, C. (2011). Studying complexity in health services research: Desperately seeking an overdue paradigm shift. *BMC Medicine, 16*(1), 4–9.

Harris, J., & McElrath, K. (2012). Methadone as social control: Institutionalized stigma and the prospect of recovery. *Qualitative Health Research, 22*(6), 810–824.

Harris, M., & Rhodes, T. (2013). Methadone diversion as a protective strategy: The harm reduction potential of 'generous constraints. *International Journal of Drug Policy, 24*(6), e43–e50.

Hoffman, K. A., Foot, C., Levander, X. A., Cook, R., Terashima, J. P., McIlveen, J. W., et al., (2022). Treatment retention, return to use, and recovery support following COVID-19 relaxation of methadone take-home dosing in two rural opioid treatment programs: A mixed methods analysis. *Journal of Substance Abuse Treatment, 141*, Article 108801 Oct.

Holt, M. (2007). Agency and dependency within treatment: Drug treatment clients negotiating methadone and antidepressants. *Social Science & Medicine, 64*(9), 1937–1947 May.

Jin, H., Marshall, B. D. L., Degenhardt, L., Strang, J., Hickman, M., Fiellin, D. A., et al., (2020). Global opioid agonist treatment: A review of clinical practices by country. *Addiction, 115*(12), 2243–2254.

Klaire, S., Sutherland, C., Kerr, T., & Kennedy, M. C. (2022). A low-barrier, flexible safe supply program to prevent deaths from overdose. *Canadian Medical Association Journal, 194*(19), E674–E676 May 16.

Lancaster, K., Rhodes, T., & Rosengarten, M. (2020). Making evidence and policy in public health emergencies: Lessons from COVID-19 for adaptive evidence-making and intervention. *Evidence and Policy, 16*(3), 477–490.

Lancaster, K., Treloar, C., & Ritter, A. (2017). 'Naloxone works': The politics of knowledge in 'evidence-based' drug policy. *Health, 21*(3), 278–294.

Levander, X. A., Hoffman, K. A., McIlveen, J. W., McCarty, D., Terashima, J. P., & Korthuis, P. T. (2021). Rural opioid treatment program patient perspectives on take-home methadone policy changes during COVID-19: A qualitative thematic analysis. *Addiction Science and Clinical Practice, 16*(1), 1–10.

Lintzeris, N., Deacon, R. M., Hayes, V., Cowan, T., Mills, L., Parvaresh, L., et al., (2022). Opioid agonist treatment and patient outcomes during the COVID-19 pandemic in south east Sydney, Australia. *Drug and Alcohol Review*, (41), 1009–1019.

Lintzeris, N., Hayes, V., & Arunogiri, S. (2020). *Interim guidance for the delivery of medication assisted treatment of opioid dependence in response to COVID-19 : A national response* (pp. 1–18) (April).

Marchand, K., Foreman, J., MacDonald, S., Harrison, S., Schechter, M. T., & Oviedo-Joekes, E. (2020). Building healthcare provider relationships for patient-centered care: A qualitative study of the experiences of people receiving injectable opioid agonist treatment. *Substance Abuse: Treatment, Prevention, and Policy, 15*(1), 1–9.

Mattocks, K. M., Moore, D. T., Wischik, D. L., Lazar, C. M., & Rosen, M. I. (2022). Understanding opportunities and challenges with telemedicine-delivered buprenorphine during the COVID-19 pandemic. *Journal of Substance Abuse Treatment, 139*, Article 108777 Aug.

McCradden, M. D., Vasileva, D., Orchanian-Cheff, A., & Buchman, D. Z. (2019). Ambiguous identities of drugs and people: A scoping review of opioid-related stigma. *International Journal of Drug Policy, 74*, 205–215.

Mcnally, A., Milner, S., Turnbull, R., Ryan, T., & Crooks, L. (2018).Poor access to pharmacotherapy will jeopardise eliminating hepatitis C in Australia.

Neale, J. (2021). Iterative categorisation (IC) (part 2): Interpreting qualitative data. *Addiction, 116*(3), 668–676 Mar 1.

Nicholas, R. (2022). Opioid agonist therapy in Australia: A history. *Adelaide: National Centre for Education and Training on Addiction (NCETA)*. Flinders University.

Nosyk, B., Bray, J., Wittenberg, E., Aden, B., Eggman, A., Weiss, R., et al., (2016). Short term health-related quality of life improvement during opioid agonist treatment. *Drug Alcohol Dependence, 157*, 121–128.

Peles, E., Schreibe, S., Sason, A., & Adelson, M. (2011). Earning 'Take-Home' privileges and long-term outcome in a methadone maintenance treatment program. *Journal of Addiction Medicine, 5*(2), 92–98.

Prathivadi, P., & Sturgiss, E. A. (2021). When will opioid agonist therapy become a normal part of comprehensive health care? *Medical Journal of Australia, 214*(11), 504 Jun.

Radley, A., Melville, K., Easton, P., Williams, B., & Dillon, J. F. (2017). Standing outside the junkie door'—Service users' experiences of using community pharmacies to access treatment for opioid dependency. *Journal of Public Health, 39*(4), 846–855 Dec 1.

Rance, J., & Treloar, C. (2015). We are people too': Consumer participation and the potential transformation of therapeutic relations within drug treatment. *International Journal of Drug Policy, 26*(1), 30–36.

Rhodes, T. (2002). The 'risk environment': A framework for understanding and reducing drug-related harm. *International Journal of Drug Policy, 13*(2), 85–94.

Santo, T. J., Clark, B., Hickman, M., Grebely, J., Campbell, G., Sordo, L., et al., (2021). Association of opioid agonist treatment with all-cause mortality and specific causes of death among people with opioid dependence a systematic review and meta-analysis. *JAMA Psychiatry, 78*(9), 979–993. 10.1001/jamapsychiatry.2021.0976.

Saulle, R., Vecchi, S., & Gowing, L. (2017). Supervised dosing with a long-acting opioid medication in the management of opioid dependence. *Cochrane Database of Systematic Reviews, 2017*(4) Art. No.: CD011983.

Shepherd, A., Perrella, B., & Hattingh, H. L. (2014). The impact of dispensing fees on compliance with opioid substitution therapy: A mixed methods study. *Substance Abuse: Treatment, Prevention, and Policy, 9*(1), 1–9.

Torrens, M., San, L., Martinez, A., Castillo, C., Domingo-Salvany, A., & Alonso, J. (1997). Use of the Nottingham Health Profile for measuring health status of patients in methadone maintenance treatment. *Addiction, 92*(6), 707–716.

Tran, A. D., Chen, R., Nielsen, S., Zahra, E., Degenhardt, L., Santo, T., et al., (2022). Economic analysis of out-of-pocket costs among people in opioid agonist treatment : A cross-sectional survey in three Australian jurisdictions. *International Journal of Drug Policy, 99*, Article 103472.

Treloar, C., & Holt, M. (2006). Deficit models and divergent philosophies: Service providers' perspectives on barriers and incentives to drug treatment. *Drugs: Education, Prevention and Policy., 13*(4), 367–382.

Treloar, C., Rance, J., Madden, A., & Liebelt, L. (2011). Evaluation of consumer participation demonstration projects in five Australian drug user treatment facilities: The impact of individual versus organizational stability in determining project progress. *Substance Use and Misuse, 46*(8), 969–979.

Trujols, J., Larrabeiti, A., Sànchez, O., Madrid, M., De Andrés, S., & Duran-Sindreu, S. (2020). Increased flexibility in methadone take-home scheduling during the COVID-19 pandemic: Should this practice be incorporated into routine clinical care? *Journal of Substance Abuse Treatment, 119*, Article 108154 Dec.

Zahra, E., Chen, R., Nielsen, S., Tran, D. A., & Degenhardt, L. (2022). Examining the cost and impact of dosing fees among clients in opioid agonist treatment: Results from a cross-sectional survey of Australian treatment clients. *Drug and Alcohol Review, 41*(4), 841–850. 10.1111/dar.13437.