

Key implementation factors in telemedicine-delivered medications for opioid use disorder : A scoping review informed by normalisation process theory.

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Summary

Telemedicine may improve access to Medications for Opioid Use Disorder (TMOUD). TMOUD has expanded substantially in response to the restrictions imposed by the COVID-19 pandemic on in-person clinical contact, yet this has not happened consistently across all health systems and countries. This study was designed to understand key factors in TMOUD implementation which may explain variations in uptake. We conducted a scoping review using three English language databases OVID/Medline, CINAHL and PsycINFO for articles reporting on the implementation of TMOUD services. 57 peer-reviewed articles were identified and subjected to open coding and thematic analysis, further interpreted through Normalisation Process Theory (NPT). NPT, originally used to evaluate tele-health innovations, has been applied extensively to describe, assess and develop the implementation potential of a broad range of complex healthcare interventions. By categorising our findings according to the four core NPT constructs of coherence, cognitive participation, collective action and reflexive monitoring, we aim to rationalise the current evidence base to demonstrate the “workability in practice” of TMOUD. Findings include variations in TMOUD models in practice depending on an organisations attitudes to risk, clinician tensions in giving up control over standard practices, organisational level support in overcoming operational and technological challenges and evaluation methods which may neglect a potential widening of the digital divide.

Introduction

The World Health Organisation (WHO) defines telemedicine as, "the delivery of health care services, where distance is a critical factor, by all health care professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interests of advancing the health of individuals and their communities" ¹. Opioid use remains the largest contributor to mortality and morbidity among people with Substance Use Disorders (SUD) ², and extensive availability of Medications for Opioid Use Disorder (MOUD) such as buprenorphine and methadone can reduce overdose deaths by at least 50 percent ³. Here we focus on the use of telemedicine in a triad of activities required to deliver MOUD. This triad incorporates the diagnosis of OUD, an assessment of suitability for MOUD and then an offer of a prescription of the relevant medication (termed TMOUD in this paper). The TMOUD provider is typically a specially trained and licensed clinician, and will require repeat visits after treatment initiation for dose titration and review. TMOUD has the potential to overcome known barriers to accessing MOUD such as prescriber shortages, stigma, affordability, restricted clinic or pharmacy opening times and locations, and distance and travel costs ⁴. Unfortunately, despite the growth of digital technology and increasing acceptability of telemedicine in other areas of healthcare, regulatory and legal barriers have hampered TMOUD expansion ⁵.

The Coronavirus disease-19 (COVID-19) pandemic has altered the risk environment for drug harms globally, causing disruptions to treatment services ⁶, increasing drug overdose deaths and exacerbating inequalities in the impact of drug harms ⁷⁻⁹. Through the pandemic, overdose deaths increased by 60 percent in some jurisdictions in the US and by 58 percent across Canada ¹⁰. Further, these deaths have and has disproportionately affected Black and Latinx communities in the US who are systematically excluded from MOUD ¹¹. COVID-19 related restrictions on human movement together with diversion of healthcare resources to manage the pandemic has led to policy, regulatory and service changes in addiction care ¹². Examples included a less restrictive regulatory environment, increased delivery of low threshold MOUD, and the expansion of TMOUD ¹³⁻¹⁶.

Low threshold MOUD is a person centred approach into treatment based on harm reduction principles ¹⁷. It incorporates the removal of treatment conditions such as the need to be abstinent from illicit drugs or to engage in obligatory psychosocial therapy ¹⁷, and minimising barriers such as stigmatising regulatory policies ⁵. The expansion of TMOUD and low threshold MOUD are inextricably linked due to legislative changes which have facilitated both interventions, leading to the possibility of increased access to treatment. . If the regulatory easing allowed by the Drug Enforcement Agency and the Substance Abuse and Mental Health Services Administration in the US over the pandemic were reversed, this would sound the death knell for TMOUD in this jurisdiction ⁵. The successful implementation of an innovation such as TMOUD within complex healthcare settings requires understanding implementation processes and the contextual factors within which they are embedded ¹⁸.

This review applies an implementation science lens to facilitate an understandings of

the processes and strategies used to progress TMOUD in various settings¹⁹. This is important because TMOUD implementation during the pandemic tended to be a bottom-up endeavour, where service providers have engaged in creative problem solving to meet the demands of rapidly changing guidance, policy and regulations as well as the reversal of governance decisions¹⁹. Our approach allows us to capitalise on the pandemic by exploring the contingencies that organisations put in place and learning from their implementation successes and challenges. We aimed to answer the following questions:

1. What are the important mechanisms underpinning TMOUD implementation?
2. How do these mechanisms work to influence TMOUD implementation?
3. What are the important gaps in the TMOUD implementation literature?

Methods

This review is part of an exploration of the implementation of TMOUD. We focus here on implementation processes, defined as the social and cognitive work or effort conducted at individual or group levels to adopt and embed innovations into organisations' routine activities¹⁸. Equally important are contextual determinants that impact upon implementation processes and contribute to innovation success or failure¹⁸, which we explore elsewhere. We used the Normalisation Process Theory (NPT) which focusses on actions and processes at individual and social levels to implement an intervention such as TMOUD. NPT was developed through empirical work telemedicine adoption and has continued to be used extensively in this and other healthcare innovations²⁰. NPT is based on the premise that implementation of an intervention such as TMOUD involves human actors in four processes:

- (i) Adaptations in how actors interact with physical and virtual things (for example, hardware, software and infrastructure);
- (ii) Changes in the way individuals interact with each other
- (iii) Changes in policies, regulations and resource distribution that make action possible); and
- (iv) Shifts in how whole systems are re-defined and understood

Each of these processes are linked to specific kinds of work referred to as the NPT constructs of Coherence, Cognitive Participation, Collective Action, and Reflexive Monitoring¹⁸. Each construct is further subdivided into four sub-constructs as described in panel 1.

We opted for a scoping review, allowing us to identify a broad range of evidence types, draw knowledge around TMOUD processes and contexts, and identify research gaps in relation to implementation²¹. We conducted this research following the JBI scoping review methodology²² and reported the research findings in accordance with the PRISMA Extension for Scoping Reviews²³. A checklist for the latter is included in the supplementary material.

Search strategy and selection criteria

We searched OVID Medline (from 1946), CINAHL (from 1981) and PsycINFO (from

1949) on 16/07/2021 and again on 20/08/2022. Search terms for problematic opioid use and medications for opioid use disorder such as methadone and buprenorphine were combined with terms for telemedicine such as videoconferencing, telepsychiatry, remote consultation or telehealth. Search strategies used are in pages 5-7 of the appendix. Publications were selected if they were in the English language, peer-reviewed and described the piloting, implementation or evaluation of TMOUD and included clinical trials, qualitative research, surveys, reviews, and service innovation reports. We did not include papers which were about digital health interventions not also delivering MOUD.

All the retrieved literature was imported to Rayyan, a review management tool, and titles were inspected to remove duplicates and obviously irrelevant papers ²⁴.

Abstracts were then screened for a detailed evaluation, with a second team member (AB) screening a random selection of 20% to check consistency in screening. The final selection of included papers were downloaded into Atlas.ti for Mac Version 22.1.0 (3475) a qualitative analysis platform ²⁵.

Data extraction and synthesis

A data collection form was developed to include title, author(s), source, date of publication; study design, and whether the data related to the period before the COVID-19 pandemic, the use of implementation frameworks; and the papers key contribution to our research questions. Data extraction was carried out by JT and GZ. We undertook a thematic synthesis developed by Thomas and Harden ²⁶ to review literature addressing questions around intervention acceptability and implementation barriers and facilitators.

Thematic synthesis requires that free codes are generated which are then organised into 'descriptive' themes, which are then further interpreted to yield 'analytical' themes. This was carried out by JT. It is at the analytical phase where we applied NPT constructs and subconstructs to structure the synthesis, and to guide the critical assessment of implementation factors identified in the included studies. An open with inductive coding process such as we have conducted is recommended when applying NPT due to its difficult technical vocabulary and overlapping definitions. NPT-based interpretations of review findings were assessed by JT and AG, and discussed as necessary within the wider review team.

Results

Our initial search (11/06/2021) identified 93 records and a repeat search (20/08/2022) identified a further 118 records. After de-duplication, this resulted in 141 abstracts for screening of which 66 were excluded due to a lack of relevance to the topic of interest. In total, 75 full-text articles were screened, of which 57 studies met our inclusion criteria (figure 1). 43 of 57 papers (75%) were from the US. We identified eight review papers in our search. One focused on patient satisfaction with TMOUD¹³, and three included studies on TMOUD as part of a wider discussion on other topics ²⁷⁻²⁹. Four were scoping reviews focussed on the changes occurring during the COVID-19 pandemic, with three specifically examining TMOUD ³⁰⁻³², and one looking also at other service and policy level innovation ³³. Dates of intervention implementation (as opposed to date of publication) were not consistently reported in each article, particularly those reporting on multisite projects^{27,29,34,35}. Nevertheless, TMOUD projects which were implemented as a response to the

pandemic tended to be clearly stated as such.

Eleven papers described TMOUD implementation in response to the COVID-19 pandemic^{15,36-45}. Six papers used qualitative interviews and/or participant observation to explore clinician, patient and public perceptions of TMOUD, particular in relation to regulatory easing, acceptability and risk perceptions^{16,35,46-49}. Four papers used surveys to look at the degree of adoption, penetrance or successful implementation of TMOUD during the pandemic across different service delivery models for example national healthcare provider, primary care service and nationwide syringe service programs⁵⁰⁻⁵³.

With regards to the evaluation of TMOUD efficacy, the majority of studies, thirteen, used data obtained from retrospective chart reviews^{27,34,44,54-61,61,62} in contrast to only six collecting prospective data from randomised or non-randomised interventional studies^{14,63-67}. Finally, only one study used a formal implementation science framework⁶⁸. Table 1 provides an overview of the papers included in this review. We have structured the rest of our findings according to NPT constructs (summarised in the appendix, pages 1-4).

Normalisation Process Theory constructs

Making sense of TMOUD technology, processes and practices (Coherence).

Coherence here describes the work stakeholders undertake to make sense of TMOUD. This included defining and differentiating TMOUD from standard practice (differentiation), developing a shared understanding of its aims and objectives (communal specification), specifying individual roles and responsibilities (individual specification) and finally internalising its potential value, benefits and importance (internalisation)¹⁸.

We identified three ways to differentiate different models of TMOUD from this review. The first was descriptive, based on the location of the patient relative to the prescriber. We identified a hub-home model where the clinician connected from a clinic to the patient who remained at home without the support of ancillary staff^{16,27,29}. All other identified examples were of hybrid TMOUD. Hybrid approaches enabled the prescriber to work remotely in a hub often supported by the substantial presence of in-person non-prescribing colleagues in peripheral locations or in patient's homes⁴⁶. Examples included a dyadic hub-spoke model where the clinician connected to the patient located in a community site for example in a syringe service program⁴⁵ or a triadic hub-spoke model where the clinician connected to the patient in a remote 'spoke' healthcare site (for example, a hospital ward or primary care centre) with another healthcare worker present (for example, nurse, pharmacist, healthcare support worker)^{38,61,64}.

The second was centered around organisational or clinicians perception of risk. The assumption here was that TMOUD carried greater risk of medication diversion, concurrent illicit use or overdose when compared with in person care. Consequently, a tiered model evolved incorporating varying levels of in-person contact, often by non-prescribers who were expected to provide a form of "surveillance by proxy"⁴⁶. Examples included models which began with telephone screening and triage⁷³, followed by an in-person attendance for identity confirmation and to complete

paperwork⁷³, or to conduct urine drug testing^{16,64,73}. At the two extremes of risk tolerance were two services with no in-person component at all^{80,81} to another where every clinical (but not counselling) session was in-person except for the most vulnerable three percent of their treatment cohort⁵⁰. Interestingly, the reported outcomes for these three services were equivalent with no evidence of increased harms and comparable retention rates^{50,80,81}.

The third perspective on TMOUD was focused on meeting patient need where and when it arose. Examples included TMOUD offered in prisons using the computer, supported by on-site nurses³⁷, through street outreach⁴⁰, syringe service programs^{14,38,45,60}, homeless hostels^{15,45}, rural^{13,59,68,82} and urban environments³⁴, hospital wards or accident and emergency departments^{27,38,61} and obstetric or perinatal care settings⁶⁴.

Many services described their respective TMOUD projects clearly including roles, responsibilities, and lines of accountability^{38,39,44,64,68,73,83}. The Veterans Health Administration (VHA) in the US, a large integrated healthcare system with an already established telemedicine program, was able to use robust, tried and tested protocols and infrastructure to scale up TMOUD implementation over the pandemic^{68,81,84,85}.

While much of the TMOUD literature has focussed on the role of prescribers, healthcare interventions typically involves multi-disciplinary teams with different skill sets and contributions to the patient journey. Panel 2 lists the stakeholders involved in TMOUD implementation identified in this review with more detail in the appendix (pages 16-24). The examples of communal specification provided so far are of multi-centre organisations with an established telemedicine infrastructure or small one-site services with a fully integrated team. Arguably, the necessary stakeholders to launch TMOUD in these settings are more implicit and embedded in everyday practice.

This is not always the case when TMOUD provision is reliant on stakeholders typically outside of the standard clinical team, providing a proxy in-person role on behalf of prescribers^{14,45,60}. Indeed, there was evidence that the expansion of TMOUD over the pandemic may have affected less integrated stakeholder relationships, generating new tensions and exacerbating existing power imbalances^{46,52}. For example, in hybrid TMOUD models, in-person contact tended to be allocated to more junior, lower paid, non-prescribing team members⁴⁶. This group had little if no autonomy in deciding who needed in-person contact yet had to respond to requirements imposed by prescribers who were not on site. The impact of these power imbalances may be reflected in the results of a staff survey of within substance use disorder services in the US during the pandemic, where junior colleagues reported anxiety, job insecurity, burn out and a lack of organisational support compared with senior colleagues⁵².

Referring back to Panel 2 in relation to the subconstruct of internalisation, stakeholders had different perspectives and priorities which impacted on how they valued (or not) TMOUD. Clinicians for example demonstrated a range of perspectives on TMOUD, including anxieties around legal liability and stigmatising attitudes towards patients in some cases⁴⁶. While evidence of efficacy, safety and quality were important to these clinicians, this was unlikely to be the sole or even primary consideration in deciding whether to continue to provide TMOUD post-

pandemic. Other non-prescribing stakeholders, many with a sustained and direct connection with their patients, expressed concerns that only clinician views would be considered on whether TMOUD would continue in the future.

Establishing working relationships and defining roles and responsibilities in TMOUD implementation (Cognitive participation).

Implementation of TMOUD was often delegated to or taken on by a restricted group of leaders, managers or professionals¹⁸ and the ways in which stakeholders are identified and recruited into the program is covered by the initiation subconstruct. Referencing table three, the range of necessary participants for successful TMOUD implementation is broad, and the exclusion of key players could have significant implications. A key stakeholder group identified throughout the international literature, yet often at a remove from those leading on TMOUD projects are pharmacies^{39,73}.

The international literature indicates an established resistance among pharmacists dispensing MOUD to patients³⁵ due to stigma, distrust of prescribers and/or patients, the absence of robust ways of monitoring inappropriate prescribing patterns or medication compliance and shared electronic medical records³⁶. In the US specifically, pharmacists faced triggering a DEA investigation should they dispense on an out of area TMOUD prescription³⁵. Pharmacists are therefore more likely to align their practice with law enforcement and legal gatekeeping than with healthcare provision and patient outcomes^{35,79}. In this context, finding ways to work with pharmacies is a crucial step in avoiding TMOUD inadvertently creating new barriers to treatment access.

From here, we must then consider how we enrol stakeholders such as pharmacies into the delivery of TMOUD. There are examples in this review of how pharmacies have been positively engaged to deliver critical aspects of care. In the US for example, one service developed a coordinated pharmacy model where patients were able to access buprenorphine locally with no delay⁴⁵, following their virtual assessment and supported by facilitators who helped with identity checks and waiver forms. Other services arranged electronic prescriptions to be sent to designated pharmacies for MOUD but also naloxone⁴⁰. Similar examples were also observed in the UK⁶⁷, Canada⁸⁰ and Ireland^{73,78}.

A good example of enrolment came from Ireland where stakeholders such as psychiatrists, general practitioners, pharmacists, the Health Service Executive, and the National Social Inclusion office worked collaboratively to produce emergency guidance enabling the delivery of TMOUD⁷³. As pandemic restriction started to subside, these same stakeholders, supported by an advocacy group for people who use drugs, a frontline third sector substance use service, the College of Psychiatrists of Ireland, the Irish College of General Practitioners and the Pharmaceutical Society of Ireland participated in a Delphi process to decide if emergency guidance should become standard practice^{73,78}. The outcome of this has been an agreement that TMOUD and electronic-prescriptions for MOUD using the national electronic prescription transfer system are now legitimate standard procedures^{73,78}. Activation, the processes needed to enable stakeholders to remain engaged in TMOUD implementation and delivery may then take the form of ongoing training, financial incentives, and consistent legal and regulatory support¹⁸.

The operational work of implementation (Collective action)

The collective action construct explains how the work of TMOUD implementation happens and consists of identifying the skillset required, integrating high level support with frontline needs, facilitating localisation of new processes and building confidence among stakeholders in the robustness of the new system¹⁸.

Within the subconstruct of skill-set workability, a lack of training and unfamiliarity with the technology and skills involved in providing TMOUD consultations was a common theme among clinicians¹⁶. Compulsory training in the US to license MOUD prescribers was described as insufficient to support TMOUD practice^{16,74}. For example, clinicians voiced a need for training on processes, model development and service implementation methods^{86,87}. Training which did not incorporate the non-clinical team was also thought to be a barrier to scaling up TMOUD⁸¹.

TeleECHO, an evidence-based learning framework providing a virtual community of practice to clinicians^{86,87} was an example of the contextual integration subconstruct. Here, ringfenced resources provided skills but also maintained interest in TMOUD over time.

Several TMOUD services developed bespoke workflow adaptations which were in keeping with local restrictions, regulations and resources. For example, one service trained medical students to conduct patient assessments and to act as TMOUD facilitators. This latter role involved the familiarising patients with the technology and processes of TMOUD, and identifying pharmacies which provided discounted medications to patients³⁶. Other models involved outreach workers as TMOUD facilitators alongside their primary role of providing harm reduction interventions^{15,45}. There were also examples of the use of mobile applications to allow virtual direct observation of treatment with MOUD, access to real time psychosocial and relapse prevention support and patient information to guide informed decision making on medicines choice⁶⁶.

Stakeholders found the reliability of the technology used to deliver TMOUD as most challenging to relational integration. Issues such as dropped calls, poor quality image or sound, time lags disrupting communication flow, and fluctuating access to bandwidth created friction and impacted on both clinician and patient confidence^{16,31,32,39,88}. Some providers were concerned that patients would be excluded from accessing TMOUD due to being unable to afford smartphones or bandwidth, having insufficient digital literacy^{6,15,31,32,38,44,46,52} or having inflexible health assistance programs refusing to fund the service³⁸. This was most likely to affect marginalized or socio-economically deprived groups^{6,15,38,44}, widening rather than narrowing the digital divide. Technical fixes to narrowing the “digital divide” such as the provision of mobile handsets^{44,87} or tablets⁸⁴, using telemedicine terminals within a syringe exchange facility⁴⁵ and actively advocating for health insurance providers to begin funding TMOUD³⁸ were a common theme in the literature.

Evaluating TMOUD implementation to promote embedding (Reflexive monitoring).

Evaluation and feedback loops are implicit or explicit mechanisms which allow

stakeholders at multiple levels to assess the effectiveness of TMOUD (or other innovations) and iteratively improve upon processes as the intervention unfolds⁸⁹. A key value of presenting results of an evaluation within an implementation science focussed publication is that the wider treatment community may use this evidence to modify their own practices. Indeed, several authors highlighted that the rapidity of changes occurring from the enforced natural experiment around TMOUD needed to be capitalised upon through conducting robust data collection, evaluation and dissemination of outcomes^{5,13}.

We identified a diverse range of evaluation methods in this review. Some frontrunner providers used mixed-methods research and implementation science methodology to demonstrate the feasibility of providing low threshold services through TMOUD⁵. Qualitative interviews with patients and providers has provided granular perspectives on the positive impacts of regulatory changes, particularly in the US, substantiating calls to make these permanent^{5,16,32,88,90}. Quantitative measures using electronic medical records may become a powerful means of demonstrating effectiveness, particularly as pre and post pandemic comparisons will soon be possible¹⁶. The importance of evaluating and disseminating prescriber experiences as a means to securing professional validation of TMOUD models and platforms was also identified^{15,16}.

There was evidence in some papers of the sharing of evaluation data with other treatment teams triggering wider adoptions of service innovations^{32,44,45,81,91}. Some projects have managed to produce systems wide changes, for example, Ireland completed a full feedback loop from the production and implementation of emergency protocols making TMOUD possible to a Delphi process to ratify these changes throughout the country^{73,78}. Work from Cole et al., who piloted a patient satisfaction survey for TMOUD, may standardise future surveys such that comparative longitudinal studies are possible¹³.

Discussion

This study synthesised diverse forms of evidence relating to the implementation of TMOUD, dominated by work done in the US and by the onset of the COVID-19 pandemic. To the best of our knowledge, this is the first review on this topic to utilise NPT to provide generalisable explanations for observed patterns in the literature. NPT constructs represent empirically demonstrated mechanisms that underpin implementation processes, yet its use is not unproblematic. For example, NPT tends to focus on the immediate site of implementation with limited sensitivity to overarching contextual issues. An example of this is evidence of a large pool of US prescribers ready and able to provide TMOUD, but choosing not to due to barriers such as payment and reimbursement issues and stigmatising attitudes towards people who use drugs^{46,52}. Introducing TMOUD may work to temporarily fill treatment gaps, but will not actively address the issues behind qualified clinicians refusing to work in the addictions field.

A further limitation of NPT is that it does not explicitly acknowledge or address inequalities and power imbalances between stakeholders. A concerning observation in this review was the consistent refusal of clinicians to take on new patients via TMOUD^{30,40,42,46,51,52}. A survey of U.S. clinicians prescribing MOUD during the

COVID-19 pandemic showed that 67% were unwilling to induct new patients without an in person visit despite regulatory easing⁵². This was echoed by Mansour (2021) on a monthly audit of office based physicians where TMOUD was delivered far more often, but primarily for established patients and not new ones⁴². Consequently, at pandemic onset, black, indigenous and people of colour, individuals experiencing poverty, mental health comorbidities, criminal justice involvement and unstable housing were systematically excluded from TMOUD as they were less likely to be already known to services³⁰. Implementation scientists have recommended that NPT is paired with participatory or collaborative approaches to enable inclusivity of under-represented views and opportunities for meaningful action to prevent worsening health inequalities⁹². We have consolidated our critical appraisal of the literature through the NPT lens into seven recommendations in panel 3, which we think should be applicable in diverse settings because of the broad scope of our review.

Our findings coincide with the four scoping reviews examining TMOUD over the pandemic^{30,32,33,93}, while also providing a deeper understanding through the critical lens of the NPT constructs. For example, while the COVID-19 pandemic has increased TMOUD adoption and provided further evidence to support wider implementation,^{30,32,33,93} there has been inconsistent adoption across jurisdictions⁹⁴. Under the construct of coherence, we can see how failing to understand competing stakeholder interests and power imbalances between those still expected to be at the frontline to facilitate TMOUD delivery may hamper its adoption by services^{46,52}. Under the construct of cognitive participation, we observe that TMOUD delivery may fail due to non-engagement of key stakeholders external to the service such as pharmacies^{35,87}.

We also concur that TMOUD has helped to narrow the treatment gap for some, while also reducing access to treatment for racial and ethnic minorities and other marginalised groups^{30,31}. Our study has provided some insights here, raising the possibility through the construct of coherence, that indiscriminate and uncritical prescriber risk aversion and stigmatising attitudes towards people who use drugs are at least partly contributing to this finding^{40,51,52}. Specifically, marginalised groups tended not to be in treatment at the pandemic onset, and so the reluctance of clinicians to initiate new patients onto MOUD via telemedicine tended to exclude them more than others. Critically, there were no identifiable ways in which these marginalised groups were able to contest their exclusion nor become involved in sharing in these risk decisions or designing alternate ways into treatment, a key gap in the current TMOUD literature.

We did not include grey literature in our study and so may have excluded some relevant contextual information. As a response to the COVID-19 pandemic, substantial material on TMOUD published in peer reviewed journals allowed us to reach saturation in terms of coding into NPT constructs, potentially compensating for this omission. 80% of the literature was based in the US, with minor representation from Canada, Ireland, India and Denmark. The lack of representation from low- and middle-income countries may limit the relevance and transferability of our findings and recommendations to these settings. Many studies did not provide sufficient detail on their TMOUD model making cross comparisons problematic. While individual papers did not go into much depth regarding contextual factors, taken

together, we found examples of relevance to all NPT constructs and subconstructs.

Several research gaps have been identified in this scoping review. First, additional TMOUD implementation projects informed by formal theoretical frameworks such as NPT or the CFIR and based in lower-and middle-income countries are required to diversify the currently US centric literature base. Second, more work is required to address the tensions clinicians experience when reducing regulatory and surveillance based activities such as urine drug testing and direct observation of MOUD consumption. In the absence of a robust evidence base to support these practices, a revision of current guidance based on multi-stakeholder consensus and a person centred risk assessment⁹⁵ may be valuable. Third, there is a lack of studies comprehensively evaluating the impact of the COVID-19 pandemic on TMOUD development, implementation and outcomes. International cross-case comparison studies may extend the value and usefulness of rapid implementation activities of TMOUD implementation through the pandemic. Finally, Aronowitz et al.⁴⁶, highlight that non-engagement with TMOUD among marginalised populations is not solely due to access, affordability, or digital skills but also acceptability of telemedicine as a substitute for in-person contact, an issue requiring further exploration.

Authorship contribution statement

Conceived of the project (JT,AB) drafted manuscript (JT), critically reviewed the manuscript (all), interpreted findings (all), secured funding (JT, AB), supervised research activities (AB), extracted data (JT, AB), managed and cleaned data (JT), conducted data analyses (JT, AB, AG).

Declaration of Competing Interest

The authors declare no conflicts of interest. MP has consulted for Opiant Therapeutics, Game Day Data, Baria-Tek, the Addiction Policy Forum, AXA and Idorsia Pharmaceuticals; has been involved in a patent application with Yale University and Novartis; has received research support from Mohegan Sun Casino and the Connecticut Council on Problem Gambling; has participated in surveys, mailings or telephone consultations related to drug addiction, impulse-control disorders or other health topics; has consulted for and/or advised gambling and legal entities on issues related to impulse-control/addictive disorders; has performed grant reviews for research-funding agencies; has edited journals and journal sections; has given academic lectures in grand rounds, CME events and other clinical or scientific venues; and has generated books or book chapters for publishers of mental health texts. SA has received speaker honoraria from Camurus, Indivior, Janssen and Gilead.

Data sharing statement

The authors confirm that the data supporting the findings of this study are available within the article [and/or] its supplementary materials.

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Panel 1: Normalisation process theory constructs and subconstructs as applied in this review

1. Coherence (Sense-making work)

Coherence explains the important actions that lead to individual and organisational understanding of TMOUD and includes actions to define and differentiate it from standard practice, develop a shared understanding of its aims and objectives, specify clear roles and responsibilities for implementation and finally internalise its potential value, benefits and importance.

Sub-constructs:

- Differentiation: A shared understanding of TMOUD definitions, models, and processes.
- Communal specification: A shared understanding of the aims, objectives and expected benefits of TMOUD
- Individual specification: Clear roles and responsibilities in TMOUD implementation.
- Internalisation: Understand the potential value, benefits, and importance of TMOUD.

2. Cognitive participation (Relationship work)

Cognitive-participation describes the actions of the people who would need to carry out the work of TMOUD and includes individual buy-in, sustainment and ways of legitimising their involvement in its implementation.

Sub-constructs:

- Enrolment: Individual buy-in regarding the delivery of TMOUD
- Activation: The ability for individuals to sustain involvement in TMOUD
- Initiation: Key members of the team must believe that TMOUD brings genuine benefits to their patients in order to drive its implementation forward
- Legitimation: Key individuals believe they are the right people to deliver TMOUD and that it fits in with their roles

3. Collective action (Enacting work)

Collective action explains how the work of TMOUD implementation happens and consists of identifying necessary workforce skills and training, operational support and building confidence among frontline workers in the robustness of the new system.

Sub-constructs:

- Skill set workability: Identifying training needs to deliver TMOUD and being prepared to ask for these to be met.
- Contextual Integration: Organisational receptiveness to frontline requests for support in delivering TMOUD.
- Interactional workability: TMOUD is adapted to contribute to improving individual workflow and efficiency.
- Relational integration: Confidence builds in the new TMOUD system among the various stakeholders

4. Reflexive monitoring (Appraisal work)

Reflexive monitoring describes the psychological underpinnings of feedback

loops or appraisal work necessary for iterative improvements to occur to TMOUD and eventually its systematisation and embedding within an organisation.

Sub-constructs:

- Reconfiguration: Individual efforts to adapt TMOUD to work for them.
- Communal appraisal: Ways that stakeholders judge the value of the TMOUD service
- Individual appraisal: The ways that individuals appraise the effects on them and their work environment
- Systematisation: The ways that benefits or problems are identified or measured and addressed

Panel 2: Stakeholders involved in TMOUD implementation and their diverse perspectives.

1. Leadership and management

Examples: clinical, organisational, operational or nursing managers

Perspectives:

- TMOUD may address gaps in coverage due to scarcities in suitably qualified professionals in specific geographic areas
- Reductions in patients non-attendance
- Maintaining the safety of patients and providers from the transmission of COVID-19 during the pandemic
- Removal of complicated clinic logistics and staffing limitations
- Greater flexibility and capacity within treatment services at reduced cost
- Development of innovative addiction services re-design, for example, e-consultations with hospitals and virtual group and individual therapy sessions
- Opportunities to develop models of integrated care.
- Stigmatising attitudes towards people who use drugs

2. Prescribers

Examples: medical director, physician, physician assistant, nurse practitioner.

Perspectives:

- A moral and ethical imperative to maintain access to OUD treatment during the pandemic and a opioid epidemic
- Retaining people in treatment
- Removing barriers to MOUD via telemedicine during the pandemic in a variety of settings and addressing rural access pre-pandemic
- Bureaucratic approach to risk- anxieties around liability, medicines diversion and overdose blocking the local implementation of regulatory easing
- Stigmatising attitudes towards people who use drugs
- Preferring TMOUD as it facilitates a better personal work life balance
- Refusal to enrol and induct new patients unto MOUD

3. Behavioural health personnel

Examples: social worker, clinical psychologist, mental health therapist, substance use counsellor, case manager.

Perspectives:

- Having to adapt to new ways of working.
- Adjusting to altered therapeutic relationships
- Having to act beyond the scope of professional competencies
- There is a role for hybrid models of TMOUD such as a tailored service can be provided to patients based on their preference

4. Community/ other frontline worker

Examples: housing support worker, homeless hostel staff, outreach or harm reduction worker, peer support worker, volunteer.

Perspectives:

- Role and attitudes heavily Influenced by the nature of the organisation (community based or grassroots organisations being more flexible and

responsive)

- Having to act beyond the scope of professional competencies
- Exclusion from the organisations strategic decisions

5. Administrative

Examples: clinical administrator, program coordinator, IT administrator

Perspectives:

No information available. One study reported surveying this group but did not report their findings.

6. Pharmacists

Examples: pharmacists working in pharmacies local to the service and patient or in jurisdictions close to the patient but far from the TMOUD service, pharmacists with an established working partnership with TMOUD service(s)

Perspectives

- Distrust of patients or clinicians
 - Stigmatising attitudes towards people accessing MOUD
 - TMOUD-based prescriptions exposing pharmacists to risk
 - Accountability to the Drug Enforcement Administration
 - Seeking security through bureaucratic practices
 - Developing partnerships with TMOUD services to meet patient need
- Nominated pharmacy program

7. Patients

Examples: current patients on established MOUD, new or prospective patients, multiply disadvantaged patients, people experiencing homelessness

Perspectives

- High levels of satisfaction and acceptance of TMOUD, many seeing it as an effective alternative to in-person visits
- A reduction in treatment delays
- Increased convenience, or removal of barriers for example, with flexible appointment times, reduced costs and geographic distances
- On-demand availability of support
- Preference for home induction of buprenorphine.
- The ability to socially isolate during the COVID-19 pandemic.
- Decreased stigma and anxieties regarding unfamiliar surroundings.
- Continuity of care regardless of the setting, for example when transitioning in and out of prison.
- Lack of access to technology, and other social challenges impacting on their ability to obtain care.
- A feeling of disconnect and distrust between patient and provider.
- Acceptability of virtual contact versus in person.
- Reductions in in-person clinic visits made housing and food security more precarious.

Panel 3: Recommendations from this review

1. Begin with a clear understanding of the necessary processes (process mapping) involved in delivering TMOUD and where the potential points of failure or risk are.
2. Changes in prescriber attitudes to TMOUD will require an understanding that perceptions of clinical risk depend on social relationships, attitudes, trust, values, power relations, hierarchies, experience and knowledge. Providing evidence of good outcomes alone without also addressing the risk culture is unlikely to be sufficient to enable change.
3. Bureaucratic risk responses by prescribers in the absence of regular critical reflection and improvement loops may widen the digital divide and structural inequalities.
4. Monitor and actively address the digital divide, paying attention to non-technical fixes such as human connection and peer support. Providing technology and bandwidth alone is unlikely to address patient's acceptability of telemedicine.
5. Engage frontline practitioners and patients as partners in the design, implementation and evaluation process of TMOUD. Participatory and collaborative approaches are a good fit with implementation science theoretical frameworks.
6. Add to your process map a collaborative needs assessment to identify what will be "missing" from virtual contact and its impact on existing structural inequalities for example access to food, benefits advice, shelter, heating and safety and housing support.
7. Develop strong partnerships with pharmacies early in TMOUD intervention design to minimise the risk of added barriers to treatment which may derive from virtual prescribing.

Figure 1. PRISMA diagram²³

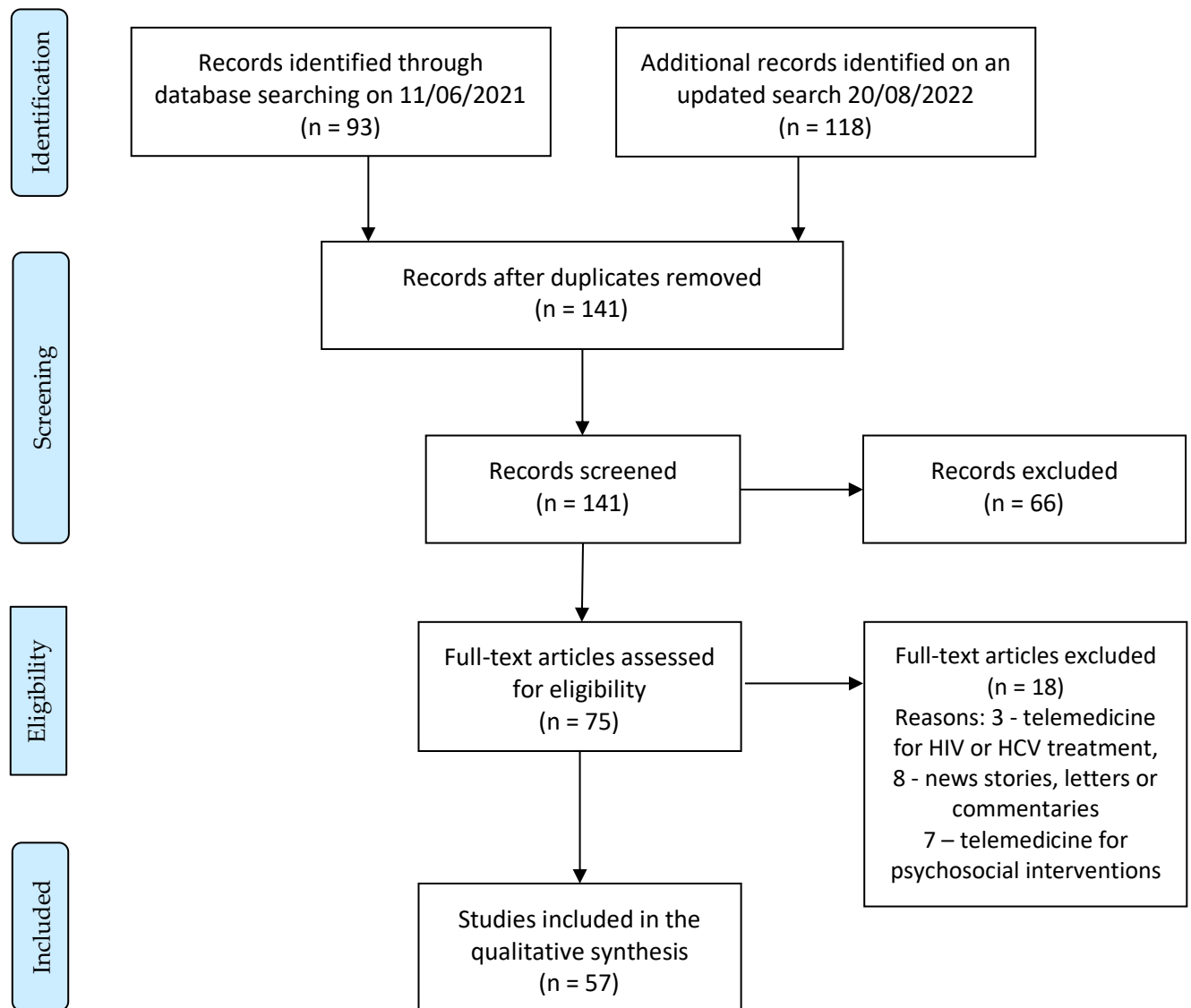


Table 1. An overview of the studies included in this review

Publication	Publication type/ study design	Country	Key contribution to review
Young, 2012 ²⁹	Review	2/50 included papers were TMOUD-relevant, both from the US	Telephone support as an adjunct to MOUD provision and outreach case management.
Tofighi, 2015 ⁶⁹	Survey	US	While acceptable, mobile devices in TMOUD delivery are limited by difficulty in retaining mobile phones and/or the same phone number. The use of peer distribution of TMOUD information via mobile phones should be explored.
Gustafson, 2016 ⁶⁵	Randomized clinical trial	US	Mobile-application-based relapse-prevention program with blood-borne-virus-screening service offered alongside MOUD
Eibl, 2017 ³⁴	Retrospective data analysis	Canada	TMOUD expanded access to treatment to rural and underserved areas with higher retention rates (50% versus 39% for in-person visits) and equal levels of quality and safety.
Eibl, 2017 ²⁸	Review	Canada	Describes variation in treatment access and TMOUD expansion by province according to regulatory decentralisation and easing.
Zheng, 2017 ⁶²	Retrospective data analysis	US	No statistically significant difference between in-person MOUD and TMOUD in outcome measures such as average time to 30 and 90 days of abstinence, treatment retention rates and additional illicit drug use.
Huskamp, 2018	Retrospective data analysis	US	TMOUD pre-COVID-19 regulatory and reimbursement barriers versus

57			improving access to treatment where patients face a scarcity of treatment providers or transport, physical or privacy barriers.
LaBelle, 2018 59	Retrospective data analysis	Canada	Telemedicine can be effective in providing TMOUD to patients with both OUD and co-occurring mental health disorders.
McIntyre, 2018 43	Case report	Canada	TMOUD can address barriers to and improve quality of OUD treatment in correctional settings.
Weintraub, 2018 70	Retrospective data analysis	US	TMOUD with buprenorphine can be effectively delivered to patients with OUD in rural, underserved areas.
Lin, 2019 ²⁷	Review	3 out of 13 studies were TMOUD-relevant, 1 from Canada and 2 from the US	The 3 relevant manuscripts are incorporated into this review.
Lingam, 2019 71	Regulatory policy document analysis	US	Regulatory compliance flowcharts for TMOUD may support practitioners in telemedicine risk management, competency-based training and policy development.
Brunet, 2020 68	Service innovation	US	The only study we identified with detailed description of the use of a recognised quality improvement approach, the Consolidated Framework for Implementation Research (CFIR)
Castillo, 2020 36	COVID-19-related innovation	US	Description of a novel model of TMOUD where it is incorporated into the services offered in a syringe service program.
Cavazos-Rehg, 2020 63	Pilot study	US	Describes an app-based shared decision-making and informed-consent tool for TMOUD.

Coulter, 2020 ⁷²	Service innovation	US	Description of generating a TMOUD maintenance service with 3-monthly virtual visits.
Crowley, 2020 ⁷³	COVID-19-related innovation	Ireland	This paper describes a national TMOUD program in Ireland characterised by it being led by clinical and funding regulatory bodies and incorporating a secure electronic health link system allowing for prescriptions to arrive securely to the local dispensing pharmacy.
Eaves, 2020 ⁴⁷	Ethnographic research	US	Ethnographic research with stakeholders and opioid treatment providers in Arizona from 2017 into 2020 including analysis of media reports reflecting attitudinal responses to policy changes allowing increased take home doses of methadone or buprenorphine and relaxed restrictions on telehealth delivery
Guille, 2020 ⁶⁴	Non-randomised control trial	US	Comprehensive service description including protocols for managing the clinic and models of collaborative care between perinatal, emergency and addictions services.
Harris, 2020 ¹⁵	Case report	US	A model of TMOUD using street outreach services.
Moore, 2021 ⁷⁴	Service innovation	US	Description of a TMOUD hub developed pre-pandemic to address gaps in service of the New England Veterans Healthcare Administration (VHA). This service was primed to support TMOUD expansion in other VHA sites come the pandemic. Lessons have included the value in a centralised hub to support more distributed TMOUD services and to provide ongoing expertise development. The basic training provided for clinicians to be able to

			prescribe buprenorphine may not be sufficient for tele-prescribing of to occur.
Uscher-Pines,2021 ¹⁶	Qualitative interviews	US	Descriptions of clinician perspectives on changing from in-person to TMOUD and their concerns on potential impact on care quality.
Schramm, 2020 ⁶⁶	Pilot randomised controlled trial	US	One of the key risk areas in delivering MOUD during the pandemic onset was in difficulties maintaining directly observed therapy (DOT), particularly at treatment induction and titration of methadone or buprenorphine. Risks in not providing DOT included treatment non-adherence, treatment failure, medications diversion and lower treatment retention. Whether medications diversion of buprenorphine in particular is a significant public and individual risk is debatable, but practitioner concerns around the issue is broadly endemic. This paper describes a the research protocol for a DOT service using a mHealth application.
Alexander, 2021 ³⁰	Scoping review	Predominantly US	Racial inequalities in access to MOUD and rates of overdose deaths were exacerbated by COVID19. TMOUD uptake was highest for whites and most easily accessed for those already receiving MOUD. This meant that those new to treatment were often excluded from accessing this treatment via telemedicine. TMOUD therefore may have widened the divide between races in accessing MOUD. There were gaps in the literature in how to reverse the digital divide faced by marginalised populations, especially those living in

			transitional housing or homeless populations.
Aronowitz, 2021 ⁴⁶	Qualitative interviews	US	TMOUD improved access for some with evidence of overt digital inequality for others due to difficulties accessing devices, bandwidth or technical skills, there was a layered digital divide to do with non-acceptance by service-users of virtual contact with a clinician. Hybrid arrangements facilitated service-users who preferred or required in person contact. Theories of technology acceptance such as the Socio- technical System model may facilitate an understanding of ways to improve marginalised patients' engagement with telehealth.
Caton, 2021 ⁵¹	Survey	US	TMOUD for stable and existing patients became normative but not for new patients due to a perception of high risk and too much liability. Other adjustments included longer prescriptions, more assertive outreach work, better attendance at appointments via telemedicine, increased home working for staff.
Chan, 2021 ³¹	Scoping review	US	Nine studies evaluating TMOUD were identified: three controlled trials (two randomised), and six observational studies. All studies showed similar outcomes between TMOUD and treatment as usual. Small sample sizes limit the evidence which suggests telemedicine may enhance access to MOUD with similar outcomes as in-person care. The potential impact

			TMOUD on the digital divide impacting racial/ethnic minorities has yet to be understood.
Cole, 2021 ³⁷	Review	US	A review and description of a new tool to evaluate patient satisfaction with TMOUD.
Duncan, 2021 ³⁷	COVID-19-related innovation	US	TMOUD alongside a reduced prison census enabled the sustained delivery of treatment through the pandemic.
Fiacco, 2021 ³⁸	COVID-19-related innovation	US	This service transitioned over to TMOUD over 3 weeks in response to the COVID-19 pandemic resulting in a number of benefits including increased flexibility in clinician time, improved capacity within the system and improved client-clinician relationships.
Ghosh, 2021 ³⁹	COVID-19-related innovation	India	Synchronous stepwise mixed model incorporating telephone, video and face-to-face elements. The only paper not of North American or European origin. Despite this, very similar barriers including the digital divide, privacy and issues around electronic prescribing.
Hser, 2021 ⁷⁵	COVID-19-related innovation	US	Multiple implementation barriers noted including low detection of OUD at screening, low rates of TMOUD referral, technology, workflow and capacity and insurance-coverage issues. A lack of empirical guidance for best TMOUD practice was identified.
Jones, 2021 ⁵²	Survey	US	33 % service providers reported remote buprenorphine prescribing to new patients without an in-person examination, with clinicians who prescribed routinely for large numbers and who were used to

			TMOUD prior to pandemic were more likely to do so. 5.5 % reported difficulties with buprenorphine induction, most commonly withdrawal symptoms. Making this practice permanent beyond the pandemic is likely to expand access to buprenorphine treatment.
Krawczyk, 2021 ³³	Scoping review	Spanning five continents	The COVID-19 pandemic has accelerated innovations in models of care, and associated policies and increased uptake of technologies including TMOUD, virtual therapy sessions, provision of smartphones, relaxed dispensing and take home arrangements of medications, increased use of long-acting opioid medications, home delivery of services, outreach and provision of a safe supply of opioids and other medications
Levander, 2021 ⁴¹	Case report	US	A demonstration of how trusted community partners in association with low-threshold TMOUD facilitated by COVID-19 regulatory easing enabled previously marginalised patients to enter treatment. These patients were previously disengaged for reasons including geography, lack of housing, transportation difficulties, and mistrust of traditional health-care systems.
Lin, 2021 ⁷⁶	Retrospective data analysis	US	Despite being retrospective, the authors had 7 years of data from the largest national health care system the United States. They confirmed other findings of good retention rates of TMOUD but also identified less uptake by Black Americans.

Mansour, 2021 ⁴²	COVID-19-related innovation	US	The authors used a US dataset based on a monthly audit of 4800 office-based physicians. They identified a significant rise in TMOUD as the pandemic unfolded, but primarily for established patients rather than new patients.
Treolar, 2021 ⁶⁷	Randomized Controlled Trial	UK	TMOUD offered using a modified Hub-and-Spoke (outreach) model. Patients attended outreach clinic, where an outreach worker undertook drug testing and telemedicine conducted via the outreach workers laptop. Specialist addiction prescribers located remotely, at the Hub. High level of patient satisfaction including convenience (reduced travel, reduced travel time and reduced travel costs) and ongoing supportive staff providing ongoing human connection. Patient satisfaction was high for timings, information provision, privacy, enough time to talk, opportunities for shared decision making.
O’Gurek, 2021 ⁷⁷	Collaborative guidance development and evaluation	US	Pre-arranged organized workflows in response to emergencies such as pandemics supports critical service continuation. Incorporating telemedicine, in the context of relaxed federal regulations, has improved addiction care. The protocol implementation was evaluated using retrospective chart review.
Tofighi, 2021 ⁴⁴	Retrospective data analysis	US	Three models of care to deliver TMOUD and unobserved buprenorphine home induction were described: an urban and rural setting program and a prison departure outreach service.

Tringale, 2021 ⁴⁵	COVID-19-related innovation	US	Two further innovations described including a telephone-booth model which is a private, regularly sterilised space equipped for telemedicine consults) based in a syringe program and a co-ordinated pharmacy model as opposed to on-site dispensing.
Watson, 2021 ¹⁴	Randomized clinical trial	US	This study is intended to shorten to the period of time between someone deciding in a syringe program to access treatment and MAT induction via telemedicine. As it is a randomized clinical trial, it also provided evidence regarding the impact (positive and negative) of pandemic-level regulatory easing.
Weintraub, 2021 ⁶¹	Retrospective data analysis	US	TMOUD is viable and sustainable in delivering buprenorphine to rural patients and has retention rates and toxicology results similar to in-person delivery, and continuous cycles of service improvement may increase this. Other models and settings for TMOUD should be defined, evaluated and disseminated including home-based treatment, treatment for patients who are actively using drugs at treatment entry, treatment of incarcerated persons, and integrated treatment for people with co-occurring conditions.
Avalone, 2022 ⁵⁴	Retrospective data analysis	US	A review of 11,389 completed TMOUD consultations in four New York boroughs showed high level of attendance compared with in-person visits regardless of age, sex, race or insurance status. Most of these consultations were audio only. Continuing to make TMOUD available beyond the pandemic is likely to improve access and ongoing engagement.

Cales, 2022 ⁵⁰	Survey	US	<p>Provided a hybrid system during the pandemic where patient contact was in-person by default with appropriate infection control precautions. telehealth during COVID-19 by clinicians and counsellors. Only 3% of the highest risk patients had exclusive TMOUD. Otherwise, it was mainly the counselling aspect of treatment which was offered virtually.</p>
Cunningham, 2022 ⁵⁵	Retrospective cohort study	US	<p>This retrospective study examined treatment outcomes following TMOUD introduced as part of COVID19 related service changes across the full treatment journey from initial visit to treatment induction and treatment retention at 90 days. A key finding was a drop by 50% in new referrals during the pandemic, with a larger proportion of those entering treatment having private care insurance. This may reflect a widening digital divide due to the introduction of TMOUD.</p>
Day, 2022 ⁵⁶	Service innovation and evaluation	Canada	<p>Alberta's Virtual Opioid Dependency Program (VODP) began in 2017 to address barriers to MOUD such as geographic distance, transportation, in-person induction requirements, childcare or employment demands and limited treatment choice. This completely virtual model of care. allowed low barrier immediate access to treatment with 90% remaining in treatment over 6 months, and 58% over 12 months. 90% reported a high level of satisfaction with the service. Reductions in drug use, overdose and improved social functioning was also identified.</p>

			Entirely virtual delivery of opioid agonist therapy is feasible and effective and particularly for rural or underserved areas.
Durand, 2022 ⁷⁸	National Delphi study	Ireland	In response to the COVID-19 pandemic, Ireland produced contingency guidelines which deviated substantially from the pre-pandemic clinical guidelines of 2016. Among other innovations, the adapted guidance made it possible to deliver TMOUD. This paper describes the development of consensus recommendations for opioid agonist treatment post-pandemic, specifically addressing whether the emergency guidance should be retained. Consensus was achieved around preserving the option of telemedicine for patients to have an initial health assessment and follow up reviews, as well as ongoing use of providing electronic-prescriptions directly to the person's pharmacy using the national electronic prescription transfer system.
Guillen, 2022 ³²	Scoping review		The review was to examine the evidence base of TMOUD using buprenorphine. The authors examined 69 publications, and found that TMOUD was associated with treatment retention rates equivalent with standard care and higher levels of patient satisfaction but at lower costs. Relaxed federal guidelines in response to the COVID-19 pandemic has fuelled a rapid growth of TMOUD increasing access to treatment to

			many. Benefits were not experienced equally across groups due to organisational obstacles, reliability of technology and user- based concerns including privacy.
Harris, 2022 40	COVID-19- related innovation	US	This study describes the transition of a street based MOUD service to telemedicine during the COVID-19 pandemic and one year treatment retention. TMOUD allowed improved flexibility and contributed to high retention rates and served as a model for low threshold treatment access. All visits were voice-only due to limited patient access to technology. Visit frequency ranged from one to eight weeks, with most patients on a four- week cycle. Prescriptions were called in or electronically prescribed to the patient's pharmacy of choice, along with a prescription for naloxone if needed.
Kaur, 2022 58	Retrospective data analysis	US	The impact of TMOUD with buprenorphine during COVID-19 on treatment retention was examined. Data suggests that telemedicine is efficacious in retaining patients in MOUD. Telemedicine is an alternative to face-to-face treatment delivery for MOUD with buprenorphine treatment and should be available post pandemic as an option.

Lambdin, 2022 ⁵³	Survey	US	Syringe service programs (SSPs), particularly grassroots or non-statutory programs can act as trusted locations or culturally competent links to MOUD providers. SSPs tend to welcome those who have experienced discrimination, stigma and mistreatment in traditional healthcare settings. The Ryan Haight Act waiver in the pandemic resulted in increased TMOUD with buprenorphine implementation within SSPs, more so among non-statutory services. Organisations with larger annual budgets also tended to have more success in implementing TMOUD. Unfortunately, organisations with greater need (exemplified by raised drug related death rates) were not more likely to implement TMOUD. SSPs partnering with TMOUD providers, has the potential to improve equitable access to buprenorphine beyond those with private insurance and hence help to reduce the digital divide.
Lambdin, 2022 ⁶⁰	Retrospective data analysis	US	This study evaluated TMOUD offered to attendees at a Californian SSP between May 2020-March 2021. Of 115 new participants, 87% were inducted on buprenorphine on the day of their referral. 92% of participants were covered by Medicare/Medicaid indicating that this approach may have improved equity and access to buprenorphine treatment.
Mattocks, 2022 ⁴⁸	Semi-structured interviews	US	Semi-structured Zoom interviews with VA clinicians at nine VA Medical Centers (VAMCs) in eight states. Adaptations to COVID-19 resulted in a shift towards low

			<p>threshold and harm reduction approaches to MOUD and rapid implementation of TMOUD. Video calls provided direct insight into veterans' home lives but more guidance is needed in how to incorporate these insights into care plans; Providers found telemedicine challenging and struggled with trusting patients</p>
<p>Textor, 2022 35</p>	<p>Participant observation and semi-structured interviews</p>	<p>US</p>	<p>Despite regulatory easing and the expansion of TMOUD improving treatment access, significant barriers remain at the pharmacy level. Pharmacy level red-tape and gatekeeping resulted in issues such as geographic restrictions, telephone prescription “confirmations,” prescription cancellations and refusals. TMOUD in itself is insufficient to remove treatment barriers, and may in some cases cause them. Underpinning this is inconsistencies in policy implementation where some agencies continue to work from a regulatory rather than a treatment framework. Pharmacies perceived themselves to be vulnerable to Drug Enforcement Administration (DEA) sanctions and so prioritised bureaucratic hurdles including the medico-legal legitimacy of prescriptions self-defensive institutional practices and reinforcement of ideologies of drug law enforcement.</p>

<p>Tofighi, 2022 79</p>	<p>COVID-19-related innovation and evaluation</p>	<p>US</p>	<p>TMOUD processes described clinical histories, instructions on buprenorphine induction, opioid overdose education, naloxone administration, identifying other needs such as primary and specialty care (e.g., psychiatry, HIV, pain management). The study confirmed the feasibility of low threshold TMOUD as a bridge into community services for underserved people (e.g. unstably housed, justice-involved, Latinx, and African-American). Ongoing structural and class based barriers to accessing buprenorphine after it was prescribed remained, including an inability to overcome bureaucratic hurdles , waiting on the phone, finding transportation, or obtaining a private prescriber potentially widening the digital divide.</p>
<p>Walters, 2022 49</p>	<p>Semi-structured qualitative interviews</p>	<p>US</p>	<p>Participants included patients on buprenorphine or methadone, providers, government regulators, and persons who use drugs not in treatment. Increased take-home medication, home deliveries, and telehealth were very positively viewed allowing more balanced lives. The consensus was that keeping these changes beyond the pandemic was likely to increase MOUD retention. The digital divide is likely to reduce the benefits of TMOUD if challenges faced by some groups such as people experiencing homelessness or specific racial or minority groups are not addressed.</p>