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# A pilot evaluation of managed alcohol programs operating in the context of the COVID-19 pandemic

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## Abstract

**Background** Managed Alcohol Programs (MAPs) are a harm reduction strategy designed for individuals with severe AUD, unstable housing, and previous unsuccessful treatment attempts. MAPs provide access to individualized doses of beverage alcohol alongside other social supports and are effective for stabilizing alcohol consumption and reducing alcohol-related harms. In Canada, MAP models (scattered site outreach or fixed site) were developed in response to the COVID-19 pandemic to reduce harms associated with severe AUD, high-risk drinking, and unstable housing as means of supporting physical isolation and distancing. This study provides a description of novel program models and practices and an in-depth description of nine MAP participants in British Columbia in the context of the COVID-19 pandemic.

**Methods** This research used a longitudinal mixed methods design. Participants included nine individuals enrolled in MAPs in British Columbia during the COVID-19 pandemic. Quantitative interviews assessing mental and physical health, safety, service usage, substance use, quality of life, well-being, physical distancing and risk behaviours, and alcohol-related harms were collected every 2 weeks for up to 3 months ( $n=9$ ). Qualitative interviews about experiences, goals, and expectations related to the MAP were conducted ( $n=5$ ). MAP records, including alcohol administration, liver function tests, and healthcare records were collected ( $n=8$ ).

**Results** Clinician-scattered site outreach or fixed-site MAP models were the most common during the COVID-19 pandemic. The individual findings suggest that MAPs may enhance housing stability, improve health, safety, and well-being, reduce alcohol-related harms, and help participants improve their ability to follow COVID-19 guidelines.

**Conclusions** The COVID-19 pandemic accelerated the development of novel MAP models and approaches to alcohol distribution. The findings of this pilot evaluation illustrate the potential role for outreach models in the development of future MAPs.

**Keywords** Harm reduction, Alcohol, Alcohol harm reduction, Managed alcohol programs, Homelessness, Severe alcohol use disorder, COVID-19 pandemic

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## Background

An estimated 27.3% of Canadians who drink consume above the 2011 weekly Low-Risk Drinking Guidelines (which have since been updated and replaced with *Canada's Guidance on Alcohol and Health*) [1, 2]. The lifetime risk of death and illness increases as alcohol consumption increases; risks associated with alcohol consumption include injury, cancers, cardiovascular disease, liver disease, neurological conditions, and death [3]. These risks are greater in people with severe alcohol use disorder (AUD) experiencing unstable housing [4].

Alcohol harm reduction strategies aim to reduce the harms of drinking without necessarily eliminating use. Examples of harm reduction strategies include low risk or safer drinking guidelines, brief screening and intervention, not drinking and driving, server training, and alcohol pricing. While these public health and primary care strategies aim to reduce harms of drinking for the whole population, the continuum of options for those with severe alcohol use disorders (AUD) often focus on access to abstinence-based services such as detoxification and treatment [5]. Managed Alcohol Programs (MAPs) are a harm reduction strategy designed for individuals with severe AUD, unstable housing, and previous unsuccessful treatment attempts. MAPs aim to reduce the barriers to accessing shelter or housing and provide access to individualized doses of beverage alcohol, as well as increased access to healthcare, food, and other social supports [6]. Research indicates that MAPs can be effective for stabilizing alcohol consumption patterns, reducing the consumption of non-beverage alcohol (NBA), reducing acute alcohol-related harms (e.g., housing instability, withdrawal seizures), and increasing quality of life [7–11]. Further, early research has reported reductions in mortality and hospitalization during periods when individuals are enrolled in a MAP compared to when they are not [12].

There has been growing international interest in MAPs, including in the USA, Australia, Poland, and in the UK [13]. During the COVID pandemic, there was an increased demand for MAPs, including the development of provincial guidelines in British Columbia, the implementation of a small MAP in Alaska, and an examination of the feasibility of implementing MAPs in Scotland [14–17]. In Canada, many MAPs were developed in response to the COVID-19 pandemic to reduce harms associated with severe AUD, high-risk drinking, and unstable housing. COVID-19 accelerated the development of these programs, which generated innovation around new models of MAP and alcohol administration. While there is considerable evidence in support of residential MAPs, there is little evidence as to the outcomes related to other MAP models. Early evaluations of emergency COVID-19

MAPs in Halifax and San Francisco demonstrate positive outcomes [18, 19].

This study provides a description of novel program practices and an in-depth description of nine MAP participants in British Columbia in the context of the COVID-19 pandemic. The specific objectives of this research are: (1) To describe the specific characteristics of the novel MAPs; (2) To examine changes in patterns of alcohol use, health, safety, and well-being and ability to follow COVID-19-related physical distancing and hygiene guidelines; (3) To describe goals related to MAP participation. The results of this study offer valuable insights into outreach MAP models and contribute to the development of future approaches and research on MAPs.

## Methods

### Sampling and recruitment

This research used a longitudinal mixed methods design. Quantitative interviews were collected by phone every 2 weeks for up to 3 months, between November 2020 and March 2021. One-time individual semi-structured qualitative interviews were conducted with five participants. MAP records were collected from eight participants. The MAPs included in this study were the Individualized Managed Alcohol Program in the Vancouver Island Health Authority, the Surrey Managed Alcohol Program located in the Fraser Health Authority, and the Interior Health COVID-19 MAP for Vulnerable Populations. All eligible participants at each MAP were invited to participate. Eligibility criteria included: (1) currently enrolled in a MAP; (2) ability to provide free and informed consent; and (3) ability to speak comfortably in English. MAP participants were recruited during routine contact with MAP managers, staff, or clinicians (e.g., during alcohol delivery).

Due to limitations imposed by the COVID-19 health and safety guidelines, study recruitment was conducted in the MAP facilities by MAP staff during routine contact (e.g., during alcohol distribution), following Health Authority safety protocols. Each participating MAP agreed to facilitate participant recruitment and data collection; MAP staff participation involved ongoing communication with researchers to schedule interviews, as well as distribution and collection of study cellphones and gift cards. All MAP managers, staff, and clinician interviews were conducted over the phone. Participants were given the option to use a prepaid study-provided cellphone for this research. Because recruitment relied on participants' willingness and ability to engage with staff during routine program contact under pandemic conditions, there is a potential for selection bias. This may have resulted in the inclusion of participants who

were either more engaged in the program or more visible due to acute support needs.

## Measures

### Quantitative surveys

An assessment of mental and physical health, safety, health services and police service usages, patterns of substance use, quality of life, well-being, physical distancing and risk behaviours, and alcohol-related harms was conducted using a series of standardized scales, non-standardized questions, and open-ended questions. Apart from a scale developed to assess COVID-19 risk behaviours (the *Physical Distancing and Risk Behaviours Scale*), these assessments were developed for previous Canadian Managed Alcohol Program study (CMAPS) evaluations [9, 10].

A range of indicators were assessed through quantitative interviews conducted at baseline, every two weeks for up to three months, and at a final interview. The Alcohol Use Disorders Identification Test (AUDIT) was administered at baseline to assess hazardous and harmful patterns of alcohol consumption [20]. The Severity of Alcohol Dependence Questionnaire (SADQ) was used to measure alcohol dependence and risk of withdrawal at both baseline and the final interview [21]. The following measures or domains were assessed at all interview timepoints: the Physical Distancing and Risk Behaviours Scale, housing stability, the Harms Related to Drinking Scale, the EQ-5D [22], health care and police contact, alcohol use (quantity and frequency), non-beverage alcohol (NBA) use (quantity and frequency), other substance use, and physical withdrawal symptoms drawn from the SADQ. Results from the quantitative surveys are presented as average scores across each time period: pre-MAP, during MAP participation, and post-MAP.

### MAP records

Data from MAP records included: (1) alcohol administration and MAP care plans; (2) Liver Function Test (LFTs) including alanine transaminase (ALT), aspartate aminotransferase (AST), gamma-glutamyl transferase (GGT), serum bilirubin, and serum albumin; (3) healthcare records of ER and hospital admissions from up to one year prior to joining the MAP.

### Qualitative interviews

Qualitative interviews, using a semi-structured format, were conducted by two members of the research team trained in qualitative interviewing. The questions focused on experiences prior to and within the MAP, experiences related to COVID-19, perceptions of the program, harms, and goals and expectations related to participation in the MAP. Open ended questions were followed by specific prompts. Interviews were conducted over the phone,

audio recorded and transcribed verbatim and cleaned to ensure accuracy of participant responses. Transcripts were read and reread by members of the team, with initial mapping of key ideas conducted collaboratively. An inductive coding framework was developed to capture key elements of program implementation, individual goals and expectations, and experiences of alcohol use and harms. The coding framework was refined throughout the analysis, and key themes were identified using reflexive thematic analysis [23, 24]. Results of the qualitative analysis are presented alongside corresponding quantitative outcomes.

## Results

### Participant characteristics

#### Quantitative survey participants

The final participant cohort included nine individuals (six men and three women) with a mean age of 54.1 years (range 40–70). Participants identified themselves as White ( $n=6$ ) or Indigenous ( $n=3$ ); seven had completed at least some post-secondary education; four were never married and four divorced or separated. Six participants were unemployed, and all participants were on some form of income assistance or welfare. Participants reported a mean number of 19.85 standard drinks per day pre-MAP (range 3.42 to 36.88 standard drinks per day). No participants reported consumption of non-beverage alcohol at any point pre-MAP or during MAP. Eight participants met the AUDIT criteria for alcohol dependence and all participants met the SADQ criteria for alcohol dependence pre-MAP [20, 21]. Eight participants were living in an emergency shelter or outdoors prior to joining the MAP.

#### MAP records participants

MAP program records were available for eight participants from the full cohort (seven men and one woman; mean age = 51.4 years, range = 40–59). Participants reported a mean number of 26.35 standard drinks per day at baseline, indicating their consumption prior to joining the MAP (range 14.00 to 66.38). All participants met the AUDIT criteria for alcohol dependence and three participants met the SADQ criteria for alcohol dependence pre-MAP [20, 21].

#### Qualitative interviews participants

Five participants (four men and one woman; mean age = 51.6 years, range = 40–59) also participated in a qualitative interview. These participants were drawn from the same overall cohort of nine individuals.

### Characteristics of COVID-19 MAPs in British Columbia

Clinician-scattered site outreach MAP models were the most common during the COVID-19 pandemic (see the

bulletin entitled *Managed Alcohol Programs: Settings and Models of Delivery* for more details on other Canadian MAP models: [25]). The alcohol harm reduction approach differs between the scattered-site and the fixed-site models. In the scattered-site outreach model, alcohol is delivered by clinical staff to scattered sites (including housing and emergency shelters) up to three times daily. In the fixed-site outreach model, on-site health authority staff provide alcohol multiple times per day (up to hourly administrations). Other characteristics of the COVID-19 MAPs in British Columbia are summarized in Table 1.

#### **Qualitative data: program goals and perceptions of MAP**

Participants were asked about their short- and long-term goals related to participation in the MAP. One participant highlighted that they did not have any specific hopes or expectations about the MAP because they knew what the MAP provided and so accepted the program as it was:

*[...] well they [the MAP staff] were very up, they are very straightforward with us and just said OK this is what's happening so there was no miscommunication*

*or confusion or anything like that it was relatively easy. [...] no, I didn't know there was there was no expectation or stuff like that; it was what it was and it helped us, so.*

Another participant had similar views about the MAP, goal, and expectations: "Everything that I'm already getting is like immaculate, is enough, so I don't think there is anything more that I could possibly want to expect." These participants point to the fact that their expectations were being met.

One participant had the additional goal of saving money to get their own place. They explained how the regulated servings of alcohol in the MAP could eventually help them to save enough money:

*Yeah, yeah I'm thinking of just cutting it in half maybe just the morning beer and not the night beer [...] but yeah so if um I get off this program then I can save some money and then we're gonna try to get a place together [with their brother-in-law].*

**Table 1** Key characteristics of the COVID-19 maps in British Columbia

	<b>Program Goals and Eligibility</b>	<b>Food and Accommodation</b>	<b>Model of Alcohol Administration</b>	<b>Funding and Money Management</b>	<b>Primary Care Services</b>	<b>Social and Cultural Connections</b>
Individualized Managed Alcohol Program (11 clients)	To reduce the harms associated with severe AUD and homelessness. <b>Criteria for eligibility:</b> • History of long-term daily heavy drinking • NBA use • Alcohol-related harms • High risk of withdrawal Residence in supported housing or temporary shelter	Occasionally offers coffee or snacks and connections to a program that offers prepared meals at a discounted price. No accommodation provided.	<b>Scattered-site outreach:</b> • Alcohol is delivered twice a day (beer or vodka, max of 16 standard drinks/day). • Clients receive a wellness check with each alcohol delivery.	Provincial funding and cost-sharing between the program and the clients. Money management services are offered to clients.	Clients are connected with primary care services provided by the Cool Aid Community Health Centre. Clients are also receiving ICM care.	Clients receive psychosocial rehabilitation supports. Cultural supports are available for Indigenous people.
Surrey Managed Alcohol Program (6 clients)	To manage alcohol intake, intoxication, and withdrawal. <b>Criteria for eligibility:</b> • History of hospitalizations related to alcohol use	Meals are offered at the shelter where the alcohol is distributed. No accommodation provided.	<b>Fixed-site outreach:</b> • Clients who reside in the shelter where the MAP is located can access alcohol from 8:00AM to 10:00PM; outreach clients are able to access alcohol from 8:00AM until 4:00PM.	N/A	Clients are connected with a physician or community nurse practitioner.	No additional social or cultural supports are offered; any additional programming is provided by the shelter. Cultural supports are in development.
Interior Health COVID-19 MAP for Vulnerable Populations (14 clients)	To advocate for the value of MAPs and highlight the benefits for vulnerable populations. <b>Criteria for eligibility:</b> • AUD or a history of high-risk drinking • High risk of withdrawal • Requiring self-isolation related to COVID-19 infection • Requiring additional monitoring	Meals are only offered to those housed in the vulnerable populations' isolation housing. No accommodation provided outside of the isolation housing.	<b>Scattered-site outreach:</b> • Alcohol is delivered daily (beer or wine, max of 18 standard drinks/day). • Clients receive a wellness check with each alcohol delivery.	N/A	Clients are connected with other resources, including counselling services and day treatment programs.	No additional social or cultural supports are offered.

While participants did reference the changes in their drinking patterns, they mostly highlighted the current advantages of being on the program rather than future goals. For example, one participant continuously referenced the overall, general benefits of being in the program: “oh it just made my life easier man”.

### Alcohol-related outcomes

#### Self-reported total alcohol consumption

Participants reported consuming on average 19.85 standard drinks per drinking day prior to joining the MAP. Participants consumed on average 15.37 standard drinks per drinking day while in the program, including both MAP drinks (on average 13.03 standard drinks per drinking day) and outside drinks (on average 2.34 standard drinks per drinking day). Outside drinks are those procured by participants outside of the MAP. Five participants reported consuming outside drinks. Seven participants reduced their drinking while in the MAP, and two participants increased their drinking.

Seven participants reported drinking every day in the 14 days prior to joining the MAP. While in the MAP participants reported drinking MAP drinks on average 13.47 days and outside drinks on average 1.72 days per 14 days. All participants reported high consumption days (greater than 5 standard drinks per day) every day pre-MAP and while in MAP.

#### Qualitative data: program goals related to alcohol consumption

In qualitative interviews, most participants described goals of decreasing their drinking and maintaining a stable alcohol intake over time. For example, when asked what they were hoping to get out of the MAP, one participant explained:

*Um I guess just controlling it and you know the seven beers a day it helps me get by and I... I don't know what else to say... it I would like to kind of wean myself off the 8% and maybe just go down to a 5% beer. Cause necessarily I don't have to drink every day, but I just know that my body needs it.*

Another participant described how they have been successfully decreasing their drinking in the MAP:

*Well, what I did was I started cutting down they were given that I think they were giving me six beer day maybe even a little bit more and then I just said like cut it down a little bit yeah but I got eight beers a day and then I said OK that's, that's a little bit too much right now so I could I cut back two beer a day.*

Being in the MAP provided an opportunity to reflect on their drinking and specific goals related to consumption.

#### MAP alcohol consumption records

There are few discrepancies between participant self-reported administration and alcohol consumption records. Over the course of data collection, participants were administered an average of 12.19 standard drinks per day (range of 8.32 to 20.04).

#### Alcohol-related harms

All participants indicated a decrease in the number of alcohol-related harms on MAP (mean 0.85/person) compared to pre-MAP (mean 5.44). Figure 1 shows the average number of harms experienced across all domains at each time point. Specifically, participants reported decreased harms for the social, physical health, home life, work, financial, legal, housing, and the physical assault domains. One participant reported an increase in learning-related harms. One participant experienced harm related to passing out and seizures. One participant explained that prior to joining the MAP, they would occasionally steal when they were no longer able to collect cans or panhandle to fund their alcohol supply: “I would say that when I got desperate I would [unclear] I'd go up there just like a block and try to steal a bottle of rum”.

#### Liver function test results

All participants with data available for longer-term MAP participation (>6 months) had an AST: ALT ratio of >1, which indicates liver damage [26]. However, in no case was there evidence of a participant moving from no damage to evidence of liver damage in the longer term. Six participants had abnormal GGT levels at all time points. One participant had elevated bilirubin levels at each available timepoint, which together with the AST: ALT ratio, indicates declining liver function possibly towards liver failure. No participants had abnormally low albumin levels at longer-term follow-up.

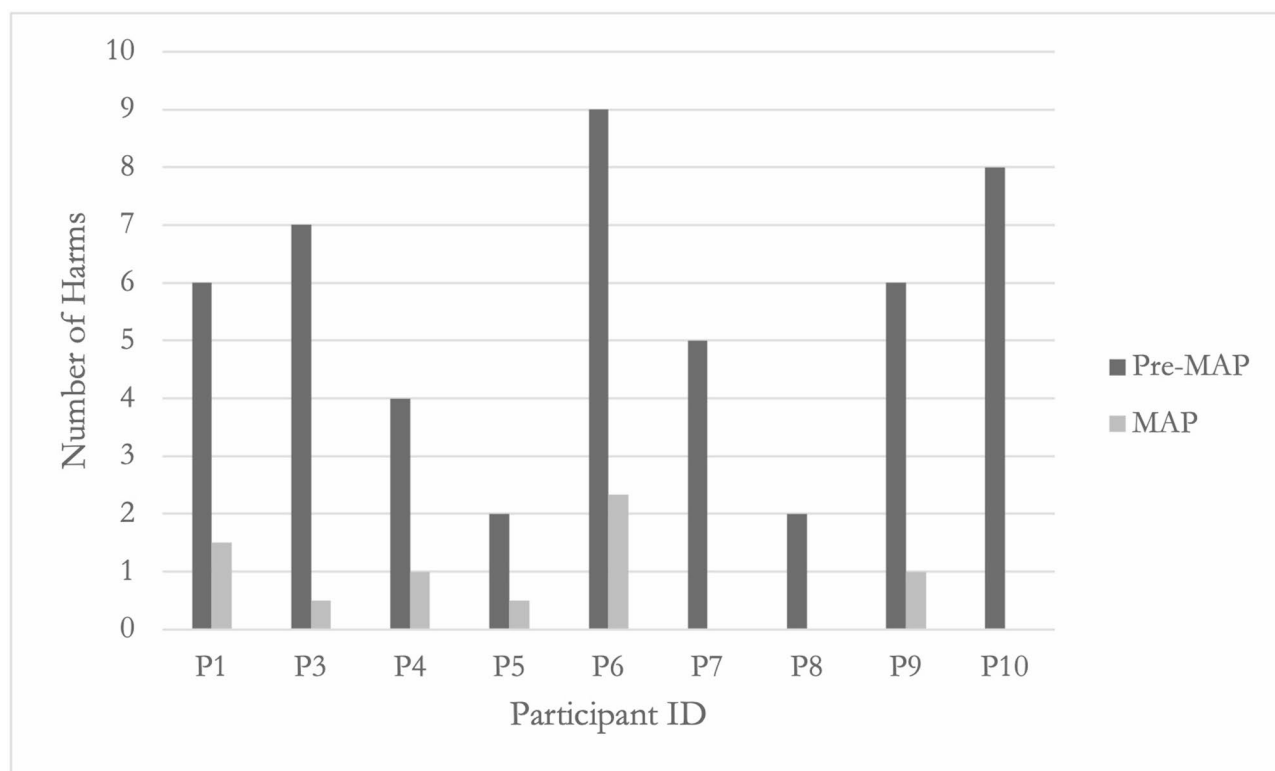
#### SADQ and alcohol withdrawal symptoms

Four participants reported a decrease in the degree of alcohol dependence in the final interviews compared to pre-MAP (final SADQ range: 14–34); one participant's score changed from severe to moderate and another's from moderate to mild. Seven participants also reported a decrease in the physical withdrawal subscale of the SADQ on MAP (mean 3.34) compared to pre-MAP (mean 5.11).

#### Other substance use

Participants reported a high frequency of other substance use throughout the study. Most reported an increase in





**Fig. 1** Average Number of Alcohol-Related Harms Note. The number of harms experienced across all domains (including social, physical, home, work, financial, legal, housing, learning, assault, seizures, and passing out) were averaged across all data points collected during pre-MAP, and MAP. Scores of 0 indicate no harms experienced

the number of other substance use days while on MAP (mean 10.36, range 0–14 days per 14 days) compared to pre-MAP (mean 6.2, range 0–14 per 14 days). Substances used included cannabis, crack, crystal meth, medication to reduce alcohol craving or withdrawal, antidepressants (pre-MAP only), cocaine (MAP only), and benzodiazepines (MAP only).

#### **Qualitative data: relationships to alcohol**

In qualitative interviews, participants all shared their experiences of positive impacts provided by the MAP. Though some were unable to provide specific examples of the program's impact, the program was spoken about in a positive manner. As one participant stated, "Oh, I just think it's a great program and very beneficial to somebody like me." In contrast to life prior to the MAP, the MAP provided a safe space, stable access to alcohol, and opportunities for positive financial change and friendship.

All participants outlined the positive impact of the MAP on their drinking. For example, one participant stated, "Uh it's really cut me [my alcohol use] down a lot [...] Uh yeah that's a positive yeah." Another participant explained, "Well, I mean, I'm drinking a lot less than I used to." Most participants described how they consumed much more alcohol through less regulated means

prior to joining the MAP. This participant explained how drinking was a way to cope with their pain and their problems:

*Well I do it more I guess under control, right, like I know how to spread it out and not get out of control whereas before when I was just homeless I was just drinking to I guess kind of numb my pain and problems or um yeah at least here I know I'm safe and comfortable in my own space and don't have to worry about drinking outside in public or on the streets or yeah I'm definitely happy to be able to have my own space to do that.*

This participant identified the safety and stability provided by the MAP. When describing life before joining the MAP, participants frequently contrasted it with life on the MAP, highlighting the changes in environment, lifestyle, and patterns of unsafe drinking.

#### **Health, safety, and well-being**

Seven participants rated the overall quality of their MAP accommodation highly (mean 4.13 out of 5). Average satisfaction scores for each housing domain were also high overall (range 3.27–4.38 out of 5). Six participants were unhoused prior to joining the MAP and three were living

in shelters. All unhoused participants were provided with accommodation prior to this study and remained housed during the study, including housing and shelters. Participants reported improved health, safety, and well-being, as well as an increase in access to health and other services.

#### **Qualitative data: the impact of housing**

Many participants provided examples of the impacts of housing. Most participants indicated that the MAP provided a stable and safe alternative to life outdoors. As one participant explained, “Yes it’s nice to have a warm bed and a roof like I’m getting to the age where I can’t be outside anymore. Well, I could be outside but I won’t last too long.” This participant, and another, highlighted the impact of the “*roof over my head*” and contrasted it to the life on the street, “[...] I’m pretty chill, happy to have a roof over my head and food every day and getting back to a normal life I guess other than being on the street and begging people for change and shit.”

All participants were homeless or living in emergency shelters prior to joining the MAP. One participant shared their experience of being homeless and how the COVID-19 pandemic changed their situation:

*I was homeless and kind of couch surfing...for about four years I guess and...I wasn't working and I just I got you know slack-off-ish I guess and I don't know I, it was definitely different. But yeah, I was homeless, and I don't know this COVID kind of got me in this hotel that I'm in in right now.*

One participant described some issues with safety in their housing, “So safety, not, well I’m not concerned about my safety it’s just like this, my partner’s scared you know. Yeah, but we can pretty much keep to ourselves and do our own thing.” That same participant described the other substance use and instances of overdose in their housing:

*Well there's the place we're in, I don't know if you're familiar with [it]. It's a drug infested place like there's drugs everywhere around here people wander around, you can't leave anything outside or it's stolen. [...] There's like a couple of ODs every day here. It's just sad. Like these are kids; like they're youngsters, man.*

It is important to recognize that housing available to people with low incomes varies widely in quality; so, satisfaction with the program may be different than satisfaction with housing.

#### **Quality of life and health status (EQ-5D)**

Five participants reported improved overall health on MAP compared to pre-MAP, as indicated by increases on their self-reported health scale scores (EQ-VAS), ranging from 3 to 25% on the 0–100 scale. Three participants reported decreases, ranging from 2 to 20%. Participant ratings also showed changes across each of the five EQ-5D dimensions: mobility, self-care, usual activities, pain and discomfort, and anxiety and depression. In the domains of mobility, self-care, usual activities, and anxiety and depression, more participants reported reduced severity of problems than increases. In the pain and discomfort domain, an equal number of participants reported increases and decreases in severity.

#### **Qualitative data: quality of life**

In qualitative interviews, four participants described their lives prior to starting with the MAP and how they were focused on daily survival or coping, “binning” (collecting bottles and cans) or panhandling to make money for alcohol, food, and cigarettes. As one participant explained, “Like I said we were just coping [...] like day to day to day. [...] it’s got nothing to do with depression or any of that stuff man, but we just coped.” Another participant stated, “I was panhandling to survive day by day.”

One participant described the change from having to travel long distances to being able to remain at home:

*Well, no I don't really know how to say it, but it helped us immensely you know that that way we didn't have to go wander, like we walked like 15 km a day and I'm not very mobile. So, it helped huge.*

Another participant described the difficulties of holding a job while living in a park:

*Well during the summer lived in [a] park but then I, you know bylaw comes and like there was the 7/7 rule and they come, and the cops take all your things. So like where I was working at the time and I'd come back from work and I'd come home to nothing.*

Another participant described the impact of the MAP on their friendships and quality of life:

*And I have a friend that comes over every now and again and has a sleepover and he does a lot to around here to help [...] no like just like tidying and dishes and that kind of stuff. He's a good man.*

Participants highlighted that MAP broke a cycle of cycle with improvements in their quality of life including their living situations and their relationships with friends.

### Health service usage and police contact

There was no change in the average number of self-reported ER and hospital visits from pre-MAP to MAP. The frequency of self-reported other healthcare contacts increased while on MAP (including contacts with nurses, doctors, pharmacists, and a neurologist). MAP records show that in the 12 months pre-MAP, participants presented to the emergency room or hospital an average of 6 times (range 2–8). In the first 8–15 months on MAP (average 10.75 months), MAP records show participants presented to the emergency room or hospital an average of 4 times on MAP (range 0–18).

Only one participant reported contact with police pre-MAP (4 occasions), and two participants reported contact with police while on MAP (1 occasion each). No participants reported being charged with an offence pre-MAP or during MAP.

### Qualitative data: healthcare and MAP staff

Participants shared their positive experiences with increased access to healthcare, the benefits to their personal relationships, and the positive impact of the MAP staff. Two participants described how the program increased their access to healthcare and other services. One participant provided examples of the services they were helped with while on the MAP, “[...] yeah well they help me get my ID, um, doctor’s appointment and I got a dentist appointment coming up.” Another participant made references to the healthcare workers on staff:

*You know the people that come and see us [...] is it there’s a nurse’s station downstairs they pop in every now and again to see how we’re doing; I think they call it a wellness check or something like that. Or where a couple of, couple of the outreach workers coming just knock on the door and go “you guys OK?” They come by every now and again like every day or two or once a week at least.*

Participants highlighted the positive relationships they have with the MAP staff. As one participant described, “Oh I’m at the [hotel name] and I’d have to say 99.9% of the staff I met are good people.” Another participant described their affection and respect for MAP staff:

*I think the staff is absolutely splendid they’re very chill but they are fabulous and yeah I have the utmost respect for them and they are actually, they are really beautiful people and that’s all I have to say about that.*

### COVID-19 related outcomes and MAP impacts

Scores on the Physical Distancing and Risk Behaviours Scale remained low throughout the course of the study.

The highest possible total score on the Physical Distancing and Risk Behaviours scale is 20, with higher scores indicating improved ability to follow COVID-19-related physical distancing and hygiene guidelines. Participants reported a total average score of 10.25 pre-MAP (range 6.5–12.5) and 13.83 in MAP (range 11.75–15.34). All participants showed increases in the Physical Distancing subscale of the Physical Distancing and Risk Behaviours scale; five participants showed increases in the Hygiene subscale; and six participants showed increases in the COVID-19 Risk subscale. No participants contracted COVID-19 during the course of the study.

### Qualitative data: COVID-19 impacts

In qualitative interviews, participants explained how the housing and regular servings of alcohol in the MAP allowed them to better implement some of the COVID-19 safety guidelines. As one participant stated, “Well it helps me stay con-contained and...yeah it’s, they’ve helped me a lot.” Two participants in particular highlighted how the MAP allowed them to isolate rather than be in public collecting bottles. One participant stated:

*[...] like I said it keeps me from having to go out during COVID to do a bottle run ‘cause I can stay here and nurse the beers all day otherwise I’d have to go out and run into people and stuff.*

The other participant explained, “Oh isolating is a good thing ‘cause I don’t have to go out on a bottle run [...] which would put me out there and so um it’s helping me from having to go out in public.”

Overall, participants identified the positive benefits of the program on their ability to implement COVID-19 safety guidelines, particularly isolation.

### Discussion

This study presents the findings of a pilot evaluation of an alternative model of MAPs that emerged in response to the COVID-19 pandemic. The findings suggest that participation in these MAPs may have helped participants improve their ability to follow COVID-19 guidelines, enhance housing stability, and support improvements in health, safety, and well-being, while reducing alcohol-related harms.

Participants reported drinking less alcohol after joining the program, despite continuing to drink almost daily. There were also reported reductions in alcohol dependence and in the degree of physical withdrawal. This pattern of stabilized, lower-risk drinking aligns with findings from other studies, suggesting potential benefits of MAP participation [10]. The results are also consistent with research showing that MAPs can help disrupt cycles of



survival drinking and repeated transitions through unstable or unsafe environments [8, 27].

All participants also reported experiencing fewer alcohol-related harms while on MAP. Similar results were found in a large multi-jurisdictional study where MAP participants reported significantly fewer alcohol-related harms compared to controls [9]. Despite these reported benefits, there are persistent concerns regarding the long-term health risks of continuous high-level alcohol consumption, including cancer, liver disease, and other chronic [3]. However, some research shows that MAP participation is associated with reduced risk of mortality, morbidity, and hospital usage [12]. Some participants also continued to drink outside of the program, and some under-reporting is expected [7]. Outside drinking is an issue that should be considered in the development of drinking policies in future MAPs, as it may facilitate ongoing patterns of risky alcohol consumption and associated harms. This finding also highlights the importance of access to other harm reduction methods and supplies in conjunction with MAP (e.g., cannabis substitution for alcohol, safer supply, safer drinking guidelines). The feasibility of cannabis as a harm reduction tool has been reported elsewhere [28].

Participants reported an increase in other substance use while on MAP. In qualitative interviews, some discussed the impact of the COVID-19 MAP setting on this pattern. It is possible that the inclusion of both individuals who use alcohol and those who use other substances in the same housing inadvertently increased access and exposure to substances other than alcohol. Future research and program development should consider the potential influence of MAP setting on substance use.

Similar to other research, most participants expressed a high degree of satisfaction with the overall quality of their housing, particularly in terms of safety, spaciousness, privacy, and friendliness [8, 29]. Participants described the positive impact of their housing in discussions of limited mobility and their ability to remain home, stable, and safe in the MAP. One participant discussed issues related to safety due to the MAP setting. Although these are encouraging results, they are based on a small cohort and should be interpreted with caution. Nonetheless, these findings highlight the potential importance of housing as an integral component of MAP—particularly notable given that all participants were homeless prior to program entry.

The LFT results demonstrate the importance of monitoring liver function and informing participants when damage is apparent, though there is little evidence that MAP participation is associated with worsening liver function [11]. However, one participant appeared to be nearing liver failure, and all participants tested after >6 months of MAP participation had indications of

alcoholic liver damage. Some participants also reported a deterioration in overall health. Given the complex nature of participants' health status, these declines may have occurred regardless of program participation [30]. Participants also showed increased access to health services, which may be linked to support from nurses and health workers within the MAP teams. As noted in other MAP research, increased access to health care is anticipated to lead to better individualized treatment and improved long-term outcomes [30].

Participants' ability to follow COVID-19-related physical distancing and hygiene guidelines appeared to improve slightly while on MAP. Supporting individuals' ability to isolate and maintain safe practices during the COVID-19 pandemic was a key objective of these novel MAPs. No participants contracted COVID-19 during the study, which may be viewed as a notable outcome of program implementation, though this finding should be interpreted cautiously given the small sample size.

Participants shared their experiences of life before and on the MAP, and described their goals related to participation in the MAP. There are other studies in which participants describe their experiences with the program [8, 29]. In this other research, the MAP is described as a safe place that facilitates the reduction of harms and improves the quality of life through improved housing conditions and nonjudgmental treatment [8, 29]. The present findings expand the understanding of MAPs by highlighting their impact during the unprecedented and complex context of the COVID-19 pandemic. Participants often contrasted life before joining the MAP to life on the MAP, highlighting the safety and stability provided by the program. These narratives help contextualize the quantitative results—such as housing satisfaction scores, which, though not at ceiling levels, may reflect meaningful improvements from extremely precarious baseline conditions. Participant narratives also aligned with quantitative data related to pain, alcohol use, and mobility challenges, and further illustrated the value participants placed on the program and its impacts.

Two of the novel MAPs used a scattered-site outreach model of alcohol administration, where alcohol was delivered by clinical staff to dispersed locations up to three times daily. This model may enhance autonomy, as participants can plan around delivery times. At the same time, the waiting period between deliveries may generate anxiety or contribute to outside alcohol use. While the outcomes reported here align with those found in studies of residential MAP models, this is particularly noteworthy given the alternative, outreach-based provision used in the programs studied. Although generalizability is limited, these findings suggest that MAP outcomes may be achievable across a range of delivery models and settings.

## Limitations

The small quantitative sample size limits the generalizability of the research findings, and a comparison of outcomes between sites is also not possible. Qualitatively, the small sample means we may not have captured the full range of experiences of those in a MAP or may have missed important experiences related to particular program elements. Recruitment during the COVID-19 pandemic introduced potential selection bias, as participation was limited to individuals willing and able to engage in research-related contact during a time of heightened vulnerability and restriction. This may have resulted in a sample skewed toward either more engaged or more severely impacted program participants. Another limitation is the use of some retrospective data, as participants were not recruited as soon as they joined the program. The limitations imposed by the COVID-19 health and safety guidelines on research should also be noted. Typically, data are collected in person from this population; MAP participants often face considerable stigma and marginalization and, as a result, may feel cautious and distrustful. Face-to-face interviews are generally used to help build the crucial trust between interviewers and participants. Due to COVID-19 restrictions, all interviews were conducted over the phone using study-provided cellphones, which limited interviewers' ability to develop rapport. This may have affected participants' willingness to share openly. Additionally, we were unable to conduct participant validation (member checking) to assess the fittingness or confirmability of our findings. This limitation may affect the extent to which interpretations fully reflect participants' intended meanings. Nonetheless, efforts were made to enhance the trustworthiness of the data through strategies aimed at ensuring credibility, dependability, and confirmability, including collaborative coding, peer debriefing, and detailed documentation of analytic decisions.

## Conclusions

The COVID-19 pandemic accelerated the development of these novel MAPs and generated innovation around models of alcohol distribution. The findings of this pilot evaluation are similar to previous MAP research and illustrate the potential role for outreach models in the development of future MAPs. Overall, the results suggest that participation in a MAP can facilitate improvements in health, safety, and well-being while reducing alcohol-related harms. Participation in a MAP also help reduce hazardous patterns of alcohol use. Though participants consumed high volumes of alcohol daily, they reduced overall consumption, maintained steady drinking patterns, and consumed safely within their housing. Importantly, MAPs may increase access to health care services and reducing the use of emergency and hospital

services. The findings indicate that MAPs may consider implementing ongoing clinical assessments to evaluate long-term harms and providing ongoing feedback to participants about their liver health. Considerations should also be given to possible substitutions for alcohol, such as cannabis, to prevent liver failure or other long-term harms.

## Abbreviations

ALT	Alanine Transaminase
AST	Aspartate Aminotransferase
AUD	Alcohol Use Disorder
AUDIT	Alcohol Use Disorders Identification Test
EQ-5D	EuroQol 5 Dimensions
GGT	Gamma-Glutamyl Transferase
LFT	Liver Function Test
MAP	Managed Alcohol Program
NBA	Non-Beverage Alcohol
REB	Research Ethics Board
SADQ	Severity of Alcohol Dependence Questionnaire
UBC	University of British Columbia

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## Author contributions

SGS contributed to the conception and design of the project, data acquisition and analysis, interpretation of the data, and writing of the manuscript, including revisions. TS contributed to the conception and design of the project, interpretation of the data, and manuscript revisions. BP contributed to the conception and design of the project, interpretation of the data, and manuscript revisions. MB contributed to the conception and design of the project, and to data acquisition and analysis. DR contributed to data acquisition. All authors read and approved the final manuscript.

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## Data availability

No datasets were generated or analysed during the current study.

## Declarations

### Ethics approval and consent to participate

The University of Victoria Research Ethics Board, Fraser Health, Interior Health, Island Health, and the University of British Columbia Behavioural Research Ethics Board approved this research (UBC REB number: H20-02073). All participants provided free and informed consent prior to participation in any and all research interviews and surveys.

### Consent for publication

Not applicable.

### Competing interests

The authors declare no competing interests.

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