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## Qualitative research and implementation science: Informing the acceptability and implementation of a trial of a conditional cash transfer intervention designed to reduce drug use and HIV risk

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### Abstract

HIV risk remains high among Cambodian female entertainment and sex workers, driven by amphetamine-type substance use and sexual risk. Conditional cash transfer is an evidence-based approach to reduce stimulant use and optimize HIV/AIDS prevention, but questions remain regarding implementation in resource-limited settings. We conducted formative qualitative research to enhance acceptability of a conditional cash transfer intervention aimed at reducing amphetamine-type substance use and HIV risk among female entertainment/sex workers and inform implementation as part of a large cluster randomized trial. We conducted in-depth interviews with 30 female entertainment/sex workers. Interviews were digitally recorded and conducted and transcribed in Khmer. English transcripts were read for emerging themes and an initial coding scheme was developed. Data were coded using open and axial coding to clarify and consolidate initial themes. While most participants expressed enthusiasm for the intervention, financial and transportation issues emerged as key barriers to participation. The proposed incentive of USD\$1 per screen was regarded as unacceptable and participants identified a need for transportation assistance. Participants also expressed concerns about directly observed urine

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#### Author contribution

L.M., K.P., and E.S. conceived and designed the study. Data collection was conducted by C.S. and P.M. and supervised by L.M. Coding and analyses were conducted by T.C.D. T.C.D. and L.M. drafted the manuscript, and all authors contributed to and have read and approved the final manuscript.

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specimen collection. Finally, while most participants found the 4-week aftercare program acceptable, the need for enjoyable as well as educational content was emphasized. Revisions to the protocol taking these data into account were made to optimize the acceptability of the intervention and the implementation of the trial. Findings identified key concerns and preferences that were taken into account in the final trial protocol. In particular, financial and transportation issues were identified as critical barriers to participation, with the potential to impact both intervention uptake and trial feasibility. Results demonstrate the value of formative qualitative research for clinical trial planning and implementation, particularly in settings where little is known about acceptability of interventions or willingness to participate.

## Keywords

formative research; clinical trial; sex work; drug use; conditional cash transfer

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## Introduction

An estimated 0.8% of the adult population in Cambodia is living with HIV. A key driver of the epidemic is transactional sex work. In epidemiological studies, prevalence among female sex workers, referred to in Cambodia as female entertainment and sex workers (FESW), has ranged from 15.5% to 23%, with HIV incidence between 1.2% and 3.5% (Page et al., 2013). A significant proportion (26%) of FESW also use illicit drugs, principally amphetamine-type stimulants (ATS) which are associated with increased risk of HIV and other sexually transmitted infections (STI) in this setting (Couture et al., 2011, 2012). No HIV prevention interventions in Cambodia currently target ATS use among FESW, and there is a need for novel approaches which target ATS use as a driver of the epidemic in FESW in Cambodia and other resource-limited settings.

Conditional cash transfer (CCT) programs provide tangible rewards as positive reinforcement for the achievement of specific behavioral goals and have been used to impact a range of health outcomes including infant mortality, child health and nutrition, tuberculosis, immunization, and HIV risk (Baird et al., 2012; Boccia et al., 2011; Fernald et al., 2008; Rasella et al., 2013; Topp et al., 2013; Todd and Winters, 2011; Victora et al., 2011). CCT approaches have been shown to mitigate the negative effects of structural factors, such as food insecurity and poverty, on health outcomes (Forde et al., 2011). In the drug treatment field, an extensive literature has examined the efficacy of contingency management, an evidence-based form of CCT where individuals receive escalating financial reinforcement for abstinence. Founded on behavioral economics, contingency management yields clinically meaningful, short-term reductions in stimulant use and has been utilized to promote HIV-related health behavior change among drug users (Crawford and Vlahov, 2010; Haug and Sorensen, 2006; Higgins et al., 2012; Prendergast et al., 2006; Sorensen et al., 2007). CCT programs for stimulant users have shown that these short-term reductions in stimulant use promote enhanced retention in other drug treatments and better overall treatment outcomes (Lee and Rawson, 2008; Prendergast et al., 2006; Rawson et al., 2002, 2006; Shoptaw et al., 2006).

The Cambodia *Integrated HIV and Drug Prevention Implementation* (CIPI) program includes the following intervention components: (1) a 12-week, CCT intervention where women complete thrice-weekly urine screening visits and receive small financial incentives for ATS abstinence followed by (2) a four-session cognitive-behavioral aftercare group for those who attend at least half (>18) of the CCT urine screening visits. The CIPI program also includes a microfinance opportunity consisting of financial literacy training and the possibility to apply for small business loans for women who do not use ATS or those who complete the CCT plus aftercare intervention with confirmed abstinence. CIPI is utilizing an implementation science approach to evaluate this evidence-based intervention to reduce ATS and HIV risk among FESW using a cluster randomized stepped-wedge trial design. The trial involves the sequential rollout in 10 Cambodian provinces of a 16-week program that combines the 12-week CCT program with a 4-week group-based aftercare program ([www.clinicaltrials.gov](http://www.clinicaltrials.gov); NCT01835574).

Previous research shows that formative research can support intervention development and clinical trial design and implementation through improved understanding of the mechanisms and effects of interventions by exploring the attitudes of target groups, identifying barriers to trial participation and intervention uptake, improving ethical informed consent, and informing intervention design and evaluation (Institute of Medicine, 2008; Oakley et al., 2006; Riley et al., 2005; Tolley and Severy, 2006). Qualitative research methods, with their capacity to identify and describe beliefs and practices, are especially useful in providing specific, concrete understandings of particular groups or settings and in exploring complex beliefs and attitudes about the acceptability and feasibility of particular programs or interventions. These attributes mean that qualitative methods are well suited to formative research designed to inform more effective interventions and enhance evaluations of their efficacy. However, studies reporting the impact of qualitative data in informing interventions and shaping implementation in the context of clinical trials remain rare. The goal of this qualitative study was to inform the content, implementation, and evaluation of the proposed intervention by assessing acceptability and feasibility among ATS-using FESW, focusing on barriers and facilitators to engagement in CCT and perceptions of potential aftercare components.

## Methods

Adaptation of the CCT and cognitive-behavioral aftercare intervention was informed by the Assessment, Decision, Administration, Production, Topical experts, Integration, Training, and Testing (ADAPT-ITT) model for modifying or tailoring evidence-based HIV interventions for new target populations while remaining consistent to the core elements and internal logic of the prototype work (Wingood and DiClemente, 2008). Consistent with the ADAPT-ITT model, the process of adaptation was iterative and the development phase for the trial was informed by qualitative research with the target population, FESW who use ATS. This article describes the processes and results of the formative phase of the adaptation of the intervention, including consultation on key elements, activities, attributes, and delivery methods.

During 2013, we conducted in-depth interviews with FESW ( $n = 30$ ) in five provinces. Eligibility criteria were that participants were aged at least 18 years, biologically female, understood spoken Khmer, used SMARTgirl (SG) services operated by our Cambodian partner FHI360, and reported both ATS use and at least two sexual partners in the last month. SG is the most widely disseminated HIV prevention program in Cambodia aimed at FESW. It was implemented nationally in 2009 as a social marketing health promotion program aimed at women working in the high-risk entertainment sector. SG uses a “club” recruitment system and targeted communication tools to promote use of health information and referrals for HIV testing, STI, and reproductive health services. In each locale where SG is implemented, local non-governmental organizations (NGO) are the facilitators (FHI 360, 2015). In order to minimize potential issues of access and trust, participants for the study were recruited through neighbourhood- and venue-based outreach by SG program staff. Following verbal informed consent, women were interviewed at SG program offices in each province. Interviews were conducted in Khmer by trained interviewers and took between 30 minutes and 2 hours to complete. Participants were remunerated with a USD\$3 phone card and provided with transportation assistance.

Interviews were digitally recorded and transcribed verbatim in Khmer. Transcripts were checked for accuracy against the original recordings before being translated into English by a certified translator. Following the general tenets and principles of grounded theory (Strauss and Corbin, 1990), we analyzed the data using an inductive approach. Interview narratives were scrutinized and emerging themes discussed and refined to develop an initial coding scheme. Data were formally coded using both open and axial coding to clarify and consolidate initial themes (Ezzy, 2002). The Cambodian National Ethics Committee and the University of California San Francisco Institutional Review Board provided ethical approval for the study.

## Results

Participants’ accounts identified three key barriers and facilitators to CCT: the amount of financial remuneration for the multiple visits, the need for transportation assistance to attend the visits, and issues regarding urine toxicology screening. Women also provided feedback on potential components of the aftercare program.

### CCT intervention

CCT interventions provide opportunities for behavioral change by incentivizing, enabling, and empowering participants and have been shown to be effective in increasing healthy behaviors among vulnerable populations in low- and middle-income countries (Baird et al., 2012). As well as providing a source of short-term income, CCT programs can facilitate the first and often most difficult steps toward lasting health and lifestyle changes. CCT or the use of financial incentives may also help to reduce barriers to healthcare among marginalized populations by addressing indirect and opportunity costs (Ranganathan and Lagarde, 2012).

Our previous research identified occupational functionality as an important determinant of ATS use among sex workers in Cambodia (Maher et al., 2011). ATS was described as a

“power drug” (thnam kam-lang) which allowed women to work long hours and increase their income by seeing more clients but increased their risk of STI (Couture et al., 2012). By providing women with income support to compensate for reduced working hours, CCT interventions have the potential to mitigate occupational ATS use.

While the idea of an intervention that paid women to reduce or refrain from using drugs was initially met with surprise, participants understood the concept and the potential for cash incentives to reduce the occupational use of ATS. However, there were concerns that not all FESW would participate in such a program, particularly those who were “addicted,” raising the potential for selection bias:

[Do you think this amount [USD\$84] can have an impact on their decision to reduce their drug abuse within 12 weeks?] It can. Yes, but only those who are not so addicted can get it. But if they are so addicted it is difficult. (Chorvy, 22-year-old woman)

I think that for some it is possible. For others, I dare not say. [Why?] For those who are so addicted, I dare not say. In my area, even their child was sold at 700 or 800 dollars and they did not use the money to run any business but to buy drugs. (Haratey, 24-year-old woman)

Our original proposal for the intervention was a 12-week program in which participants, who were required to attend three urine screens weekly, would receive USD\$1 cash if they tested negative for recent ATS use. Women who provided three negative screens in 1 week would receive weekly bonuses of USD\$4, USD\$6, and USD\$8 for weeks 1–4, 5–8, and 9–12, respectively. The total maximum amount over the 12-week program was USD\$84. Almost all women felt strongly that USD\$1 per visit was too small to be attractive to FESW. Because many women could earn substantially more from sex work, participants felt that the proposed incentive was likely to attract only very poor FESW:

[T]his amount of money [\$USD 1] could not be enough for them to eat, just like how much is one box of rice? One box of rice costs six thousand [riel] already, three thousand riel each and how about paying for motorbike-taxi and water fee? So it could not be enough for them. (Chorphum, 30-year-old woman)

Most participants felt that the minimum acceptable amount per visit would be USD\$2–USD\$3 per day. This would mean that women could potentially earn US\$14–US\$18 per week with the bonuses:

About two or three dollars they could buy something to eat. Don’t give them too much as they may buy drugs. (Leahkhena, 29-year-old woman)

However, some women felt that women should receive US\$5 or more per visit:

Maybe five dollars or they would think that this would waste their time ... They think it wastes their time for sleep and wastes their time for travel. But for me, I don’t think so. I think that [it’s not] a waste of time because we travel for our health. (Sophary, 36-year-old woman)

Some participants felt that for women who were motivated to stop using ATS, the escalating schedule of weekly bonuses made the program more acceptable:

I believe they want it because not only this one dollar. If in this one week the results for the three tests are negative, they can get five dollars. (Viriya, 23-year-old woman)

One dollar is not much but it's just that we think we will get much more in the future. As you said one dollar is little but when we stop it for a long time, we get 84 dollars then we feel happy. It's nearly 100 too. (Rumdoul, 23-year-old woman)

In short, this one dollar could not [make them] reduce it, but what's most important is the bonus ... Yes, I think the bonus could. (Sohpa, 32-year-old woman)

The data indicated that the proposed incentive of US\$1 per negative urine toxicology result would be unlikely to attract a representative sample of FESW. Along with heavy ATS users, participants suggested that younger women and women working in entertainment venues would also require higher incentives to participate. FESW felt strongly that if the incentive was set too low, the cost of participation would be higher for women who continue to use ATS as this group would earn less (because they will test positive for ATS) but still need to pay for their transport costs and commit the same amount of time attending urine screening. From a trial perspective, this could potentially lead to differential attrition with FESW who continue to use ATS being more likely to be lost to follow-up. In response to these data, we raised the base incentive to USD\$2 for each negative urine screen and the weekly bonuses to USD\$8, USD\$10, and USD\$12 for weeks 1–4, 5–8, and 9–12, respectively.

However, most women also indicated that they would not be prepared to attend the CCT program if their transportation costs were not covered:

[What do you think about this one dollar?] Think that it is little. Yes, this amount will be all spent for motorbike-taxi to come to meet you. This is for a near place but how about the place so far away? If you come to pick me up back and forth it will be okay. (Phavy, 20-year-old woman)

[If I am far away, I refuse it. I'd say that one dollar is impossible. [So how much would be possible?] Two dollars. [Two dollars including the travel expense?] Yes. It's also good for two dollars. I'm afraid that if we give just one dollar, they would criticize it. (Phany, 19-year-old woman)

These data suggested that the proposed incentive payment of USD\$1 would not be sufficient to incentivize women to reduce their ATS use and cover the costs of their transportation to the program:

We just get one dollar after the test. If it [ATS] is found, the money is not given and if it is not found, we get only one dollar which is even not enough for motorbike-taxi. (Ratana, 20-year-old woman)

In response, we revised the trial protocol to include either USD\$2 travel reimbursement for those who arranged their own transportation or the option of being transported to visits by outreach staff who then received the USD\$2.

## Urine toxicology screening

The majority of participants expressed concerns about specimen provision. Almost all women indicated they would be unwilling to provide a specimen under direct observation as required by the original draft protocol. Women suggested several alternatives, including using a curtain or a modesty screen below the waist:

We need some concealment as well and women shall not be so nude shamelessly ... If they ask to take our urine they have a can to store urine. In short, for the test if they don't get in we go to the bathroom alone. [And if the female staff stands in front of the room, is it okay?] If she stands in front of the room that's okay. (Srey Neang, 27-year-old woman)

Let's say, [I] feel shy when someone enters the bathroom with me, feel shy. [For instance, if you get in, I turn my face, don't look at you, how do you feel?] No problem for that. [But if you get in, for example, the whole curtain is placed to hide you in the bathroom, but I just stand outside of the curtain in the same bathroom, how does it feel?] No problem if nothing can be seen as it is hidden with the curtain. (Chorvy, 22-year-old woman)

While a solution to this privacy issue would have been to use tamper-resistant (heat-coded) specimen collection containers, the project budget did not allow for this. However, in response to the data, we obviated the need for direct observation during specimen collection using a Specimen Validity Test on each sample to check for adulteration prior to testing.

Women were also asked about preferences for the location and timing of urine toxicology screening. In relation to the location, because the interviewees were recruited by, and familiar with, their local SG club, almost all participants nominated this as the most acceptable location for urine screening:

I think it is good at the [SMARTgirl] club. Coming to the club may help us release stress, feeling refreshed. [Why?] I once came here and had fun and had blood test something like this. (Phany, 19-year-old woman)

[Where should we come for a test?] It's okay to come to our club, let's go. [SMARTgirl Club?] Yes, we have a meeting room as normal like before. (Leakhena, 29-year-old woman)

Views about the most suitable times for specimen collection were mixed. Approximately half the women felt that the most acceptable time to present for urine screening was in the morning:

Coming in the morning is better perhaps around eight or nine o'clock as we are afraid that in the daytime women would be busy. (Chakriya, 25-year-old woman)

The other half of the sample felt that the afternoon and, in particular, the early afternoon was the most acceptable time:

We work at night, we feel sleepy ... If we make the appointment before 2pm, we feel rather exhausted. (Rumdoul, 23-year-old woman)

In response, we amended the trial protocol to provide for urine testing on a drop-in basis between 8 a.m. and 5 p.m. daily. Participants can choose between two schedules: Monday, Wednesday, and Friday; or Tuesday, Thursday, and Saturday. Given the clear preference for SG clubs, we proceeded with our original plan to conduct urine screening at these locations. In some provinces, once the trial was underway, it became apparent that women who anticipated positive results often failed to present for testing (~10%–15%). In these cases, SG outreach workers conducted home visits to collect the specimen.

### Aftercare program

Participants were asked what they would like to see featured in the weekly aftercare sessions. Women expressed a desire to receive information or education about drug use and sexual/reproductive health:

The topic on education about reduction of addictive substances. [What else? What other activities?] And education about women's health, birth spacing and blood testing for HIV [and] sexually transmitted diseases. (Haratey, 24-year-old woman)

However, there were some concerns that not all FESW would be interested in this type of educational content:

[Do you think if they raise a topic about the reasons why women start to use drugs for discussion in our after-care group?] Some don't like to listen. [Why?] Because of feeling bored ... [So what do you think it is good or not if we include it?] Maybe it is not possible because they don't listen to it. (Chamnan, 27-year-old woman)

Participants also identified a need for practical skills and strategies to avoid using ATS with friends, partners, and clients (Maher et al., 2013):

I think that if we can stop it we have to say no, [we have to be able to] answer that we don't want. (Phavy, 20-year-old woman)

Refusal skills were identified as particularly important in the context of relationships with partners and clients who use ATS:

Because I think that first they want to say it too but don't dare to. So when they get that help and motivation, they dare to say it, dare to say no with guests. Dare to say no to drug use. "If you want to do that [have sex] with me, I can, but if you want to use [drugs], do so alone." [Do you think this skill is useful for them?] I think it's useful for them. It helps them to be brave ... They dare to say [no], dare to object to it without being afraid. (Haratey, 24-year-old woman)

Some women emphasized the need for strategies for dealing with stress and/or anger in the aftercare component:

As for my feeling, sometimes I also feel bad-tempered ... when we don't use it, we feel like this. [So if I teach them how to manage anger, do you think it is important for our program in the fourth month or not?] It's important because most of them get more and more angry. (Chorphum, 30-year-old woman)



While there was some receptivity to the idea of including meditation exercises in the aftercare component, many participants felt this would be unsuitable for most women, particularly those still using ATS:

Some may get bored. [Why?] Because they can't stay still. They smoke drugs, let's say, today you come to examine their urine, they smoked drugs last night, but the drugs' effects are not gone immediately. Its effect may somewhat remain. When it is quiet, they get bored. (Ratana, 20-year-old woman)

There were also some concerns that meditation was too traditional, especially for younger women:

It's [meditation] too traditional. [So what should we do to avoid being too traditional?] As I said, we do it like having fun in the program such as lucky draw for prizes or buffet and then we talk to them ... I think that it's me who has to concentrate my feeling. If you tell me to concentrate my feeling I can't do it because it's my feeling. It may explode and I will die. I bang my head against the wall [laughter]. (Morokoth, 18-year-old woman)

While this may indicate a lack of understanding of the goals of meditation, several women expressed a fear of "thinking too much" (kit chreon). This is consistent with Khmer cultural beliefs which associate "thinking too much" with poor health outcomes (Frye and D'Avanzo, 1994; Stevens, 2001):

[B]ut for users when using it and being asked to do this [meditation] it's their brain problem, they would think a lot ... Doing meditation is the best way but mostly for non-users, good for non-users, users could not do this. It is the best way for non-users, but it is very difficult for users when staying quiet, they tend to think a lot. Thinking a lot may lead to brain damage. (Sohpa, 32-year-old woman)

While women felt it might be possible to meditate in a group while attending the aftercare program, an overwhelming majority doubted that these skills would be practiced outside the group, often citing practical constraints such as finding time or room to meditate in cramped living conditions:

Because no one does meditation, just watch over the children all the time ... If there is no gathering and after they return to their homes, they will not do it ... They do it or anything only in front of you. And then no one could take exercise [home] as everyone thinks of only making his or her living. (Rumdoul, 23-year-old woman)

While just over half the sample indicated that they personally would be prepared to do meditation, almost all participants voiced concerns that others might find it too boring. However, this apparent bias against meditation may be explained by the fact that most participants understood meditation in a religious sense, as opposed to the meditation exercises envisaged in the original protocol. Many participants also articulated a desire to learn stress relief techniques which informed our decision to incorporate brief meditation exercises into the aftercare program.

Importantly, most women identified entertainment and “having fun” as an indispensable component of the aftercare program and suggested many activities:

I request you to start the meeting once per week such as program for exercises or dances or comedies. Just play what we call Leak Kanseng game, we feel exhausted. This means that we stop this and we don't think about it. We can play any entertainment game. (Chakriya, 25-year-old woman)

Let's say, there are a lot [of games we could play] such as hitting clay pots, Lot Anteak [Cambodian version of jump rope], Boh Angkunh [knocking down large seeds] is also good. (Srey Neang, 27-year-old woman)

A key part of having fun was having lucky draws and prizes. This was seen as particularly important given that women would not be incentivized to attend the aftercare program. Many women had previous exposure to lucky draws as participants in SG programs:

I think it's good. It's like the SMARTgirl too. Because we can get [an] understanding of it when we come and there is also a lucky draw for prizes. (Rumdoul, 23-year-old woman)

There should any lucky draw for small prizes. We should some items like ice bucket ... ice bucket and fan. Before the big prize was bicycle. Like small blankets. We give them prizes. They may feel happy when they win any prize. (Phany, 19-year-old woman)

In relation to content of the aftercare program, what some women dismissed as “boring,” others insisted was essential. The divergence of preferences highlighted the necessity for balance between enjoyable and entertaining activities and more educational and evidence-based components of the program. Based on the input of FESW, the final aftercare program included the following overarching domains: social support for reducing stimulant use and related harms, cognitive-behavioral recovery skills, culturally appropriate experiential group exercises (e.g. role plays), as well as brief meditation and relaxation training (Center for Substance Abuse Treatment, 2006). We also included a “lucky draw” whereby women draw one ticket from a prize bowl following each group session. For each four session aftercare group, prize bowls with 110 total tickets for the “lucky draw” include one \$10 ticket, 11 \$5 tickets, 48 \$2 tickets, and 50 tickets for applause and positive affirmations from the group (Carrico et al., submitted).

## Conclusion

Our results informed the development of the protocol for a cluster randomized stepped-wedge trial with Cambodian FESW who use ATS. Findings also provided key insights into the concerns and preferences of FESW that shaped the adaptation of the CCT intervention and the content of the aftercare program. In particular, our qualitative observations identified the role of poverty and transportation difficulties as key barriers to engagement and participation, with the potential to impact uptake of the intervention and the feasibility of the proposed trial.

While the CCT concept had broad appeal, women had strong views regarding the amount of the incentive and provided explicit feedback on the “value” of their time and living costs. Participants were quick to point out that the maximum incentive of USD\$84 initially proposed compared extremely poorly with most FESW earnings. In response, we modified the protocol to allow for a USD\$2 incentive for each negative urine screen plus weekly bonuses of USD\$8, USD\$10, and USD\$12 for weeks 1–4, 5–8, and 9–12, respectively, making for a total of USD\$120. Our data also identified a need for financial assistance with transport, which was absent in the original trial protocol. In response, we offered women the choice between receiving a USD\$2 payment to cover the costs of arranging their own transport or being transported by SG Outreach Workers who were reimbursed USD\$2.

Findings also informed pragmatic aspects of the trial such as scheduling. We decided to provide women with a choice between attending for urine screening on Monday, Wednesday, and Friday or Tuesday, Thursday, and Saturday at any time between 8 a.m. and 5 p.m. with no appointment necessary. Direct observation during specimen collection was unacceptable to the majority of women interviewed. In response, we removed the need for this using a Specimen Validity Test on each sample to check for adulteration before testing for ATS. Finally, input from our participants informed the adaptation of the aftercare program to make it “fun” and enjoyable for women while including four key components: (1) group exercises; (2) recovery skills training; (3) meditation and relaxation training; and (4) a lucky draw as positive reinforcement for attendance.

Importantly, CIPI is the first trial assessing the impact of a CCT intervention in reducing drug use and HIV risk to be conducted in Asia. In resource-limited settings like Cambodia, CCT interventions represent a time-limited, potentially scalable approach to reducing ATS use and optimizing HIV/AIDS prevention efforts. The data presented here indicate that CCT interventions are highly acceptable in this setting, where women report widespread occupational ATS use in order to cope with the conditions of sex work, including long working hours, multiple clients, and extended sexual transactions (Maher et al., 2011). The choice of a CCT intervention appears particularly apposite in the Cambodian context where there are currently limited options for drug treatment. CCT may help FESW to engender lasting changes by providing them with a minimum or base income while attempting to reduce or abstain from ATS use and, potentially, by incentivizing them to sustain these changes in the longer term.

Indeed, the second component of the CIPI project involves a microfinance intervention for women who are ATS-free. Microfinance programs have been shown to increase women’s empowerment as well as reduce gender inequality, violence, and improve health (Hamad and Fernald, 2012; Kim et al., 2007, 2009; Pitt et al., 2003; Pronyk et al., 2006), in association with economic benefits. Women who are ATS-free will be offered the intervention, combining financial literacy education and referral to a Cambodian microloan program. By integrating the CCT intervention with a supportive aftercare program, CIPI aims to assist women to achieve clinically meaningful reductions in their ATS use that are necessary to benefit from the subsequent microfinance intervention. However, because ATS use assists FESW with seeing more clients, it is possible that our intervention may not adequately offset the lost earnings due to the relatively modest amount of the cash incentives.

Further research is needed to examine whether and how behavioral interventions targeting ATS use can be paired with structural interventions such as microfinance that address poverty as a driver of ATS use and HIV risk in this population (Gupta et al., 2008). However, as highlighted here, in the short-term, FESW will need to be incentivized at a level which outweighs the occupational drive to use ATS. This issue—getting the dose or the amount of the incentive right—is crucial to the uptake of CCT interventions and the success of trials designed to evaluate their impact.

Our results illustrate the value of formative research designed to facilitate consultation with potential participants in order to provide affected community input into the development of both interventions and trial protocols. The relatively inexpensive changes implemented as a result of our findings have the potential to increase the acceptability of the study and the intervention to prospective participants. Preliminary data from the trial indicate the intervention is feasible and acceptable to Cambodian FESW who use ATS. Process indicators from the first six provinces in this ongoing stepped-wedge cluster randomized trial demonstrate strong engagement, with 138 of the 183 eligible FESW (75%) initiating CCT and completing a median of 25 of the 36 possible urine screening visits. Similarly, 79 of the 84 participants eligible for aftercare (94%) attended at least one aftercare group session and 57 (68%) completed three or more group sessions (Carrico et al., in press).

Our results are particularly timely, given the growing interest in strategies to improve the recruitment of participants to clinical trials (Mapstone et al., 2007) and health research more broadly (Robinson et al., 2007). Suboptimal accrual reduces power to detect significant effects, increases costs, and may result in trial failure. Despite Good Clinical Practice (GCP) guidelines which recommend that investigators should be able to demonstrate potential for recruiting the required number of participants within the agreed recruitment period (ICH, 1996), only 31% of recent clinical trials sponsored by the UK Medical Research Council and the Health Technology Assessment Program achieved their original recruitment target and 55% did not reach a revised target (McDonald et al., 2006). Inadequate enrollment thus reduces the power of trials to detect effective interventions and may delay the public health impact of a positive trial (Institute of Medicine, 2008). Interventions to improve recruitment to clinical trials have been systematically reviewed (Caldwell et al., 2010), including two Cochrane reviews (Mapstone et al., 2007; Treweek et al., 2010). While the effects of various strategies remain unclear, with most studies examined based on small samples and/or recruitment to hypothetical trials (Caldwell et al., 2010; Mapstone et al., 2007; Treweek et al., 2010), trial accrual is also impacted by the intervention under study as well as the target population.

While the importance of using qualitative research for community consultation and pre-trial engagement of target populations has been previously demonstrated in preparatory work for candidate vaginal microbicide trials in Africa (Shagi et al., 2008; Vallely et al., 2007, 2010), few studies have assessed the acceptability of proposed interventions and study protocols from the perspective of potential participants. Formative qualitative research with people who inject drugs conducted as part of a hepatitis C virus vaccine preparedness study informed the development of study protocols, resulting in changes to the amount of participant reimbursement (from AUD\$30 to AUD\$50), changes in the type of

reimbursement (from store vouchers to cash), and a decision to reduce the amount of blood collected at screening (from six tubes to one). These changes were relatively minor and of minimal cost, yet had the potential to increase the acceptability of the study to prospective participants and therefore maximize recruitment and retention (Maher et al., 2010; Treloar et al., 2010; White et al., 2014). The results presented here add to this literature by demonstrating the value of formative qualitative research in adapting interventions, as well as trial protocols, to make them more acceptable to potential participants.

Our results confirm the value of integrating formative qualitative research into the process of clinical trial development. Field trials and large-scale cluster randomized trials are particularly resource-intensive, and in this context, formative qualitative research represents a sound investment. In settings like Cambodia, where little is known about the acceptability of proposed interventions or indeed clinical trial participation itself, formative qualitative research has the potential to yield even greater benefits. As the results presented here indicate, had the CIPI trial proceeded to recruit FESW into a trial where they were incentivized USD\$1 for a urine screening visit, this may have resulted in sub-optimal recruitment leading to insufficient power to show an effect of the intervention. Under-incentivizing CIPI participants also had the potential to result in sampling bias with only impoverished FESW enrolling in the trial, leading to non-generalizable findings (Maher and Page, 2015). Formative qualitative research clearly has the capacity to identify, from the perspective of potential intervention recipients and research participants, what is appropriate remuneration and why and to reveal previously unconsidered barriers (e.g. lack of transportation, directly observed urine screening) and facilitators (e.g. “fun” content) of participation, with the potential to impact both the acceptability of interventions and their implementation in the trial context.

These issues are particularly important, given the growing interest in implementation science or the study of methods for improving the uptake, implementation, and translation of research findings into routine practice (Padian et al., 2011). Given the historical preference and priority for discovery-driven research over implementation science, qualitative research is a powerful ally in shifting the focus away from the discovery of “what” to elucidating the “how” (El-Sadr et al., 2014: 1680). The application of qualitative research methods to meaningfully involve affected populations in planning, designing, and developing both interventions and their implementation and evaluation has the potential to increase trust and acceptability, improve recruitment and retention, and provides an effective foundation for engagement in future public health responses.

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Ngak Song is a medical doctor and public health professional by training. He has over five years of clinical experience and 14 years in project management and implementation. Currently, he is a Chief of Party for a USAID-funded TB project and the liaison for CIPI implementation in Cambodia. Dr Song has managed multiple HIV/AIDS research and surveillance projects including clinical trials, bio-behavioural surveys, size estimation of men have sex with men, enumeration of entertainment workers and Geographic Information System mapping.

Srean Chhim is a Senior Technical Officer (Research) at FHI 360 Cambodia. He has been working for more than five years in public health research including protocol development, data collection and management, data analysis and report writing. He has expertise in HIV/AIDS and risk behavior, family planning, tuberculosis and drug use and in the development of computer-assisted data collection tools.

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