

# Factors Influencing Early Antiretroviral Therapy Initiation Amongst HIV Infected Prisoners: A Qualitative Exploration in South Ethiopia

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## Research article

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## Abstract

**Background:** Early initiation of antiretroviral therapy (ART) reduces the development of acquired immunodeficiency syndrome (AIDS), non-AIDS related comorbidities and mortality, and prevents transmission. However, the prevalence of delayed ART initiation amongst prisoners in low-and middle-income countries is high and the contributing factors to this are relatively unknown.

**Methods:** Qualitative interviewing was employed to understand the prisoners' lived world with regard to ART initiation and associated barriers and facilitators in the South Ethiopian prison system. We interviewed eight inmates living with HIV and AIDS (ILWHA) and eleven stakeholders who had a role in human immunodeficiency virus (HIV) care provision for incarcerated people. A phenomenological approach was used to analyse the interview data in which meaning attributed to the lived experiences of the participants was abstracted.

**Findings:** In this study, participants discussed both barriers to, and facilitators of, early ART initiation during incarceration. The barriers included a lack of access to voluntary counselling and testing (VCT) services, poor linkage to care due to insufficient health staff training, uncooperative prison security systems and loss of privacy regarding disclosure of HIV status. Insufficient health staff training and uncooperative prison security systems both contributed to a loss of patient privacy, ultimately resulting in treatment refusal. Although most participants described the importance of peer education and support for enhancing HIV testing and treatment programs amongst prisoners, there had been a decline in such interventions in the correctional facilities. Service providers suggested opportunities that a prison environment offers for identification and treatment of HIV infected individuals and implementation of peer education programs.

**Conclusions:** Our study identified crucial barriers to and facilitators of early ART initiation amongst prisoners, a key HIV priority population group. Interventions that address the barriers while strengthening the facilitators may enhance a greater utilisation of ART.

## Background

Incarceration rates have been increasing rapidly in resource limited countries such as Ethiopia due to poverty, unemployment, under-education and widespread conflict [1–6]. The prevalence of human immunodeficiency virus (HIV) in prison populations in such countries is much higher than in the general population [7–9], with prevalences up to thirteen times higher reported in some countries in sub-Saharan Africa (SSA) [7]. In Ethiopia, the prevalence of HIV in prison populations is more than four times higher than in the general population [10].

Early ART initiation (i.e. initiating ART at higher CD4 count and/or lower World Health Organization (WHO) stages) [11] not only reduces the development of acquired immunodeficiency syndrome (AIDS) and non-AIDS related comorbidities and mortality [12, 13], but also prevents transmission of HIV infection in the community by reducing viral concentration in people living with HIV and AIDS (PLWHA) [14, 15]. Imprisonment provides a unique opportunity to implement comprehensive antiretroviral therapy (ART)

programs, as PLWHA who may otherwise not access health care can be readily reached. High ART initiation rates have been reported in prison settings where there exists an established structure for HIV care [16–18].

In many nations, however, inmates living with HIV and AIDS (ILWHA) often have delayed ART initiation despite bearing the highest burden of infection and the potential for HIV transmission in the community upon release. Various structural, social and individual level factors have been reported to adversely influence ART initiation for prisoners. Identified structural factors include: a lack of standard HIV care in the prison system [19–23], lack of trust in health care providers [24, 25], loss of privacy [26], discriminatory treatment by prison staff and protracted processes involved in clinic visits [20–22, 26–28]. Social factors, such as stigmatisation by prison officers and fellow inmates, are also found to adversely influence ART initiation for prisoners [26, 29]. Moreover, a lower likelihood of ART initiation has been reported in prisoners who believe that ART is unsafe and ineffective in treating HIV [24, 29, 30].

Specific factors contributing to delayed ART initiation amongst prisoners in low- and middle-income countries are unclear. The few available studies that have investigated this issue [19–23] suggested that suboptimal HIV care in the prison system might have caused delay in ART initiation. The purpose of this study was therefore to explore barriers to, and facilitators of, early ART initiation amongst HIV infected prisoners within the context of South Ethiopia.

## Methods

### Study setting

South Ethiopia, which is also administratively called Southern Nations, Nationalities and People's Region (SNNPR), is home to 23 of 126 prisons present in Ethiopia [31]. According to SNNPR Prison Commission data [32], the annual imprisonment rate in the region was 104 per 100,000 population as of March 2020, with a total prison population of 24,628.

Four SNNPR prisons and respective public health care facilities offering ART services for the prisoners were included in the current study. The prisons had a daily average number of approximately 5,500 inmates, with an average daily entry of 15 persons in each prison [32]. The prisons serve both male and female prisoners in separate units. The majority of prisoners were male, accounting for an average of 96% of the total prison population.

All four prisons had health clinics that were equipped with basic health care materials and health care staff, including psychologists. The prison health care staff mostly consisted of nurses, health officers and laboratory technicians who provided basic care, including first level diagnostic and treatment services for emergency cases and acute illnesses commonly encountered in Ethiopia such as malaria and tuberculosis (TB). None of the clinics operated comprehensive ART services. However, they occasionally offered voluntary counselling and testing (VCT) services and referred identified HIV-infected inmates to nearby ART facilities for treatment initiation [33].

### Design

Qualitative in-depth interviewing using a phenomenological approach was undertaken to explore the lived experiences of HIV infected prisoners regarding ART initiation in the prison context. In-depth semi-structured interviews were also employed to explore the service providers' experiential account of the existing HIV care provision strategy.

## **Participants**

Our aim was to purposively target ILWHA and relevant service providers who met study eligibility criteria. ILWHA participants were those who were 18 years or older, had been continuously incarcerated and using ART for at least six months in prison. These prisoners were assumed to have sufficient institutional experiences with which to generate dense and focused information on custodial contexts influencing early ART initiation [34]. In addition, the prisoner participants were required to be fluent in Amharic language (a widely spoken language in Ethiopia) in order to maintain verbal fluency and clarity of ideas to the interviewer. While not excluded, the small relative size of the female ILWHA population in the selected prisons meant that no females were identified that met the inclusion criteria at the time of the study.

The service provider group included adults ( $\geq 18$  years of age) who were members of prison health care staff, ART service providers, prison officers, and prison and health administrators. Participants of this group were selected based on their role in the process of HIV care provision. The prison health care staff were health professionals working within the prison health care system and had experiences of performing HIV test and linking HIV infected prisoners to care, whereas the ART service providers were those who were providing HIV treatment for incarcerated and non-incarcerated people at the selected public health care facilities. The prison officers were members of prison security who were often involved in the facilitation of prisoners' HIV care accessing. The prison administrators were the higher officials of the prisons managing the overall administrative issues of the institutions including HIV care, whereas the health administrators were health agents in the respective Zonal Health Departments who were providing technical as well as material support for the prison health care system. All service provider participants had over six months' working experience in their respective positions.

## **Data collection**

The interaction between the interviewer and participants was essentially free discussion, in order to create sufficient room for reflections [35, 36], however an interview guide was used to preserve the focus of the discussions on issues and processes related to ART initiation in the prison context (see Additional file 1). The interview guide was constructed in relation to the literature review and the research question. The interview guide for prisoners asked questions related to physical and social environments promoting and hindering early ART initiation, and personal contexts regarding inmates' understanding and perception towards ART. Service provider participants were asked to provide accounts of what they had noticed during their engagement with the provision of HIV care for incarcerated people.

Nineteen participants from the four selected prisons and respective supporting health care facilities participated in the in-depth interviews including: eight prisoners, two prison health care staff, three ART service providers, two prison officers, two prison administrators and two health agents. The number of

participants was determined based on theoretical saturation and a diversity of participants with regard to prison settings, role in the provision of care as well as range of experience [34].

Prisoners were interviewed in a privacy secured place by the principal researcher (TGF); either in a prison clinic or a room near to it during their regular clinic visits. Due to security concerns in prison settings, prison health care staff guided the researcher to contact the prisoners in order to obtain consent for voluntary participation. However, they played no role during consent and interviewing processes. Service provider participants were interviewed in their respective offices in private. Prisoner interviews took up to 60 minutes whereas that of the service provider took a maximum of 45 minutes. All interviews were audio recorded and field notes were taken on observations (tacit knowledge), comments, unclear ideas and emerging insights [35, 37]. The principal researcher initially transcribed the audio recorded interview data in Amharic language and then translated into English for analysis.

To ensure reliability and credibility of the interview data, the interview guide was initially piloted with individuals from the target population. This allowed identification of elements that supported the objectives of the study, inclusion of relevant concepts that had not been considered previously and modification of those which were found to be incomprehensible to the participants. The pilot interviews also enabled the interviewer to explore unanticipated circumstances involved in the interviewing process within prison context [36]. In addition, the interviewer had previous research experiences in the same settings [38] and belonged to the same sociocultural background from which most of the prisoner participants originated; this could potentially reduce interviewer bias [36, 39]. Rapport was established with both prisoner and service provider participants through sharing of the interviewer's experience in issues related to HIV care while retaining the distance essential to explore their views. Participants were provided with the summary of the findings and asked to verify the accuracy of the summary (member-checking) [36, 40].

## Analysis

Analysis of data was conducted iteratively throughout the interviewing process. The analysis employed a phenomenological approach so as to contextualise abstract meanings attributed to the lived experiences of the participants regarding ART initiation in the prison system, and examine how their lived reality was constructed [41, 42]. Data were initially understood through repeated readings of transcripts and review of field notes. The analysis considered tacit information to explore concepts in-depth [35].

Themes were first drawn from the data through detection of shifts in meaning and a constant comparison of emerging themes within and between transcripts [35, 42, 43]. There was consensus, after discussion and debate, on most of the themes identified from triangulating perspectives and interpretations between three analysts (a male postgraduate student (TGF), one female academic (ERM) and one male academic (GT)). The themes were coded and juxtaposed in a chronological order of events and conceptual relationships using NVivo12 qualitative data analysis software [44].

Interpretations were made by comparing emerging concepts horizontally within and between the different categories of participants, settings and phenomena, and vertically between the themes and theoretical concepts in terms of recurrence, patterns and relationships [35, 45]. Reflexivity was considered important

for the analysis regarding the influence that the primary researcher (a male Ethiopian) may have had on the data during his interactions with prisoner and service provider participants during interviewing.

## Results

### Participant characteristics

All eight prisoner participants were male and had a median age of 33.5 years, of whom three reported secondary school (9-10th grade) as their highest educational attainment. Four inmates had been incarcerated for more than one year, four were diagnosed with HIV after prison entry and five were initiated to ART through the prison system. Of prisoner participants who reported their likely mode of infection, the majority reported engaging in unprotected heterosexual intercourse prior to their imprisonment. While most (six) reported five or more years' experience of living with HIV and AIDS (with an overall median experience of five years), four participants had used ART for five or more years (Tables 1 & 2).

Table 1  
Sociodemographic, incarceration and HIV care related characteristics of participants

Prisoner participants								
Participant	Site	Sex	Age	Education (N <sup>th</sup> grade)	Length of time in prison(years)	Time since HIV diagnosis (years)	Time on ART (years)	
P#1	Hossana	M	35	5	1	7	6	
P#2	Wolayta	M	38	9	5	4	4	
P#3	Wolayta	M	30	10	9	9	8	
P#4	Wolayta	M	25	8	3	7	7	
P#5	Wolkite	M	45	3	4	5	4	
P#6	Wolkite	M	32	10	5	12	12	
P#7	Wolkite	M	38	7	0.7(8months)	0.7	0.7	
P#8	Worabe	M	32	8	0.5(6 month)	0.5	0.5	
Service provider participants								
Participant	Site	Sex	Age	Education/ Military rank	Role in prison HIV care	Experience on HIV care (years)		
PN#1	Wolayta	F	35	BSc (Nurse)	Testing and linkage to care	10		
PN#2	Wolkite	F	29	BSc (Nurse)	Testing and linkage to care	9		
AP#1	Hossana	F	32	BSc (Health Officer)	ART initiation /Adherence support	4		
AP#2	Wolayta	M	41	BSc (Health Education)	ART initiation /Adherence support	5		
AP#3	Wolkite	F	25	BSc (Health Officer)	ART initiation /Adherence support	0.6 ( 7 months)		
PO#1	Wolayta	M	37	12 + 3 (Sergeant)	Guarding during clinic visit	2		

*Level of education, time since HIV diagnosis and on ART, and role and experience on HIV care are based on the participant's report. Site indicates the name of the prison. Note: P prisoner, PN Prison Nurse, AP ART service provider, PO Prison Officer, PA Prison Administrator, HA Health Agents*

Prisoner participants							
PO#2	Wolkite	M	39	11th grade (Deputy Inspector)	Guarding during clinic visit	10	
PA#1	Wolayta	M	32	BA (Economics/Assistant Inspector)	Prison Head	14	
PA#2	Wolkite	M	45	Commander (12 + 3)	Prison Head	11	
HA#1	Hossana	M	47	BSc (Health Officer)	Zonal HIV Coordinator	4	
HA#2	Wolkite	M	53	BSc (Nurse)	Zonal HIV Coordinator	5	

*Level of education, time since HIV diagnosis and on ART, and role and experience on HIV care are based on the participant's report. Site indicates the name of the prison. Note: P prisoner, PN Prison Nurse, AP ART service provider, PO Prison Officer, PA Prison Administrator, HA Health Agents*

Table 2  
Summary statistics of prisoner participant characteristics

Variable	Range	Mean	
Age (years)	25–45	34.4	
Highest level of education (Grade)	3–10	8	
Length of time in prison (years)	0.5–9	4	
Time since HIV diagnosis (years)	0.5–12	5.7	
Time on ART (years)	25–45	5.3	
		N	%
Time of HIV diagnosis	Before incarceration	4	50
	After incarceration	4	50
Time of ART initiation	Before incarceration	3	37
	After incarceration	5	63

*Level of education, length of incarceration, length of time since HIV diagnosis, duration of ART use, time of HIV diagnosis and ART initiation with respect to imprisonment are based on the prisoners' report*

All prison health care staff and ART service providers had tertiary qualifications in health care. The prison health staff had nine or more years' experience of working within the prison health care system, whereas the ART service providers had over six months' experience of providing ART services. Prison officers, on the other hand, had two or more years' experience of managing inmates' visits to external health care facilities to access HIV care. Prison and health administrators were also experienced officials who had been

managing and providing technical and material support for the prison health care system for many years (Table 1).

While prisoners discussed best practices and challenges they experienced during initiating ART from structural, sociocultural and personal perspectives, service provider participants added diverse points of view to prisoners' perspectives and described the pros and cons of the existing HIV care provision strategy for incarcerated people. Accordingly, we identified four themes as barriers to, and two themes as facilitators of, early ART initiation after analysing the in-depth interview data. Included under each theme are selected quotes that are representative reflections for the majority of participants for which a unique participant identification is provided by acronym and number (Table 1).

## Barriers to early ART initiation

### Lack of access to HIV testing

The prison systems lacked testing facilities which would support early identification of HIV infected prisoners and linkage to care. New cases were detected only passively through ad hoc campaigns undertaken by external agencies, and when inmates requested testing due to severe sickness, suggesting an advancement of the infection. A prisoner who had tested positive after prison entry reported:

*"My weight had been reduced severely but unfortunately I hadn't realised that. I hadn't known but something started to appear on my thigh [Showing his thigh], um—something like weight loss, and it had just started making me dizzy when I had walked for a while, and tingling on the endings, then I was told I had the virus after being tested. They called me to the clinic, there is a clinic if you have seen it, and they called me there and gave me a piece of advice and took me to the Hospital." (P#2)*

He elaborated on the importance of prisoner concern in the face of potential signs of the infection in order to access testing, in the absence of encouragement in the prison system:

*"I haven't seen anything like [offering of voluntary HIV testing and counselling] that unless the person himself discloses or wants to have the test. For instance, they didn't ask me when I entered. I had the test on my own, after being hurt and got an opportunity during the campaign [performed by an external health agency]. I don't think there is any motivational work being done by the prison health staff." (P#2)*

Another prisoner who had also first tested positive in prison reported the health staff's refusal to refer him to an external health care facility for testing, requiring him to wait until an external agency came to the prison and performed testing. He had noticed some possible signs of the infection and so wanted to have the diagnosis:

*"I noticed a gradual reduction in my body weight after I had received my verdict. I had even asked them [prison health staff] to refer me to the Hospital, but they refused to do so saying, 'You have no pain to be*

*referred to the Hospital, just be there! Fortunately, HIV testing team came to the prison and had the test here.” (P#3).*

Service provider participants supported the reports of inmates that there were inconsistencies in VCT services. This meant that inmates often undertook delayed testing at external health care facilities despite exhibiting symptoms suggestive of infection. Alternatively, they could incidentally be diagnosed through ad hoc testing campaigns undertaken by external agencies. A prison officer acting as a treatment facilitator described:

*“—at least when they [prisoners] repeatedly come to our clinic with the same case, we take them straight to the Hospital when their condition remains unimproved. They will give their medical history and get tested at the Hospital, and will be told to start the treatment if they are found to be positive. No one has been dispatched from here to begin treatment there. But once, people from the Region [a health agency from the Regional State] took their blood for HIV testing and sent back the result via the Post Office.” (PO#1).*

Health agencies lacked faith in prison health care staff to undertake HIV testing despite the fact that they had been trained, and so denied test kits. Thus, diagnostic services were external to the prison health care system. This represented a missed opportunity for prison health care staff to offer testing services and utilise the trust they had built with inmates through regular contacts, to perform the task. A prison nurse reported the following:

*“Test kits had been changed; we had a training on the new kits because you have to have training whenever a new kit is launched, but they [health agents] were not happy to provide us the new kits assuming that we hadn’t had the training. They said, ‘We will do it ourselves.’ The Health Centre should provide us test kits on time rather than trying to carry out the test by their own on three or four monthly basis. I don’t mean they shouldn’t perform testing but it would be better if it was performed by the prison itself because it is with us whom the prisoners make contact with, every day; it is us whom they trust more. It’s better when a person gets served by the professional whom he trusts more. This is what I have to say.” (PN#2).*

Another prison nurse regretted that she was not able to undertake entry HIV testing for incoming prisoners due to an insufficiency of test kits, despite the fact that the majority of prisoners were eager to have the test:

*“—It should have been [offering prisoners voluntary HIV testing at entry], but we didn’t do that. By the way, all prisoners are voluntary to have HIV test, I can say. Many of them ask for testing when they come to the OPD (Outpatient Department). They say, ‘Please Sister, I just want to be diagnosed for HIV!’ Many of them come and say, ‘Would you mind if you check my blood!’ Seventy-five percent of them are very willing but I don’t have test kits, I am short of test kits. I just tell them, ‘Remind me when kits are available!” (PN#1).*

Prison officials confirmed a poor level of diagnostic services available in prisons and explained the process of testing prisoners for HIV. According to these participants, HIV testing occurred only rarely and usually in conjunction with international events such as on “World’s AIDS Day” or when external agencies carried out testing campaigns. A prison administrator elaborated on what he observed at his prison regarding HIV testing activities:

*"Mostly—is it on the 22nd of November? [referring to World's AIDS Day]; it occurs on the 22nd of November, and when there is a request by the Regional [Prison] Commission for an overall testing (program) including the staff, and umm—in collaboration with the Zonal Health Department; they support us test kits." (PA#2).*

Another prison administrator described a rare occurrence of HIV diagnosis that was primarily carried out by external agencies:

*"Once, the federal agency came to undertake examinations on HIV, TB and Hepatitis, paying a lot of expenses; they paid per diem for inmates and prepared a tea-coffee ceremony to provide a brief lesson and they directly went to testing activity. They had tested and be aware of themselves [their HIV status]. Examinations are being carried out every year." (PA#1).*

ART service providers and health agents also described that HIV diagnoses were made external to the prison health care system. They reported that the majority were conducted through incidental campaigns organised by outside agencies in the general community which gave no guarantee that inmates who were about to be released could access. Prison health care staff played little or no role on this, apart from referring prisoners to outside health care facilities when their health worsened. One ART service provider stated:

*"It is not actually the health professionals there [at the prison] who undertake testing and link positive cases rather it is often through campaigns carried out by the City Health Unit, the Hospital or partners." (AP#1).*

Another ART service provider observed prisoners having HIV test through referral to public health care facilities once their health was severely affected (possibly due to the HIV infection):

*"—although there has been HIV testing activities carried out at the prison, they [prisoners] often have tested positive when they come here [to the Hospital] for other treatment." (AP#2).*

Health agents felt a responsibility for making sure that every prisoner who volunteered for HIV testing received an opportunity ahead of his/her release. However, they were uncertain how effective they were in relation to the prison health care staff's performance:

*"We do nothing! [regarding pre-release HIV testing]; We don't know when he gets out. We never know; we never know! [Laughs] We have no any plan to test people who get out of prison, to be honest. We can't work being there as a routine work. Umm—they [prison health care staff] don't ask us for help regarding educating people who come out of the prison." (HA#1).*

In prison settings where onsite HIV testing rarely occurred, it was found to be only secondary to other health care activities. This impacted on the identification of HIV infected prisoners especially among new arrivals as the prison health care staff often gave a priority to other medical duties. A prison nurse described the situation and she recommended the presence of a separate office equipped with its own trained professionals to provide an effective diagnostic service:

*"By the way, they [new prison entrants] often come after 5 pm from police stations; there is a high work load even if you want to perform testing. It requires its own separate office and a professional who would undertake only this work. Many people may arrive at a time, more than a dozen of people! On one hand, it is not suitable to host them as there are people being served here [at the clinic]. I think it would be nice if there was a separate room and HIV trained professional who would perform this job; would be effective in identifying people who enter here every day." (PN#1).*

## **Inability of health staff to make timely care linkage**

Prisoners who were able to be detected as HIV infected, either through testing campaigns or an opt-in diagnosis at a prison clinic, were not always provided their test results at the testing sites. They were often kept waiting for long periods of time. Prisoners described the circumstance that they were referred to a nearby public health care facility to learn about their HIV status, despite having the test in the prison:

*"The prison nurse made some part of the examination and told me that they had no kits to undertake a complete diagnosis so that he referred me to the nearby health centre. I had been told there that I was infected with HIV." (P#8).*

Another prisoner who tested positive in a campaign by external agencies said:

*"——Then they [prison health care staff] called me to the clinic as it was a secret, they didn't tell me anything except offering me an enveloped paper. Then they sent me there [to a Hospital] and they [ART service providers at the Hospital] had counselled me a lot and asked some questions." (P#3).*

ART service providers at external health care facilities described similar situations and found prisoners who were referred through such a system were confused about their test results after they realised that they were HIV infected. They tended to relate the issue with non-motivational factors such as insufficiency of skills influencing the prison health care staff's intention to make appropriate counselling and referral services, as a result of health agencies' failure to provide appropriate training and support:

I have experienced something like this: He [a prisoner] was diagnosed there [at prison clinic] and we found him positive here and he said, 'I was diagnosed there but I have not been told this!' We just thought that it might be due to a counselling problem by the health staff and we counselled him and let him start the treatment. I know they [prison health care staff] have such problems.

*"There is a sector at the Zonal Health Department which works on HIV. So, they should direct them [prison health care staff] how to perform testing, make a referral and linkage and how the system should be. The prison is under the Zonal Health Department not under the Hospital!" (AP#2).*

Another ART service provider gave an account of a prison health care staff member's failure to offer proper post-test counselling adding their pejorative description of inmates' being infected with HIV:

*"Umm—there was a prisoner who had newly been identified as HIV infected; I think there is some problem with the prison health staff; I don't know whether it is due to a knowledge gap or being frightened; they don't clearly let them know about their HIV status. Umm—they don't tell them they have HIV virus rather they say*

*like, 'Your blood is turbid!' We found the guy when he came to the Eye Clinic; he's a prisoner; he has no chance to have the test outside." (AP#3).*

A prison nurse acknowledged the problems associated with not letting inmates know their test results, and the fact that she never declared HIV test results to HIV positive prisoners; rather she referred them to nearby public health care facilities:

*"I mean, we don't even let him [a prisoner] know his test result, although not recommended. We advise him, 'I have tested you here but better you go to the Health Centre because they have more advanced testing equipment so that you can be more certain about your result!' Then they test him again and offer him ART." (PN#2).*

ART service providers noticed significant delays even when such referrals were made that were not in accordance with standards of effectiveness and timing adhered to by other non-ART community health care facilities:

*"Among individuals who had been tested there [in prison], there are people who came after a month, two months, and even after four months. It is very difficult and requires a strong referral system. We have inter-ward and inter-facility linkage systems; other district health facilities do it in that way and we would have done the counselling here if they had told us the results even if they wouldn't let the client know his result; if they let us know even using a piece of paper, or just sent it to us through the Post Office. They have this problem." (AP#2).*

Another ART service provider compared care linkage efforts made by the prison health care system and community non-ART sites, identifying a high likelihood of delays among incarcerated people even if the diagnosis was performed by similar health agencies:

*"The issue of care linkage is the usual complaint. Prison campaigns have been undertaken and positive cases were identified but if it was in the community, there would have been a high chance of being immediately linked to care. For instance, if a positive case is found in a community campaign, one can easily bring him here, and health professionals can also easily bring them if found here in the Hospital. However, the situation at the prison is really hard." (AP#1).*

A prison nurse also described the presence of considerable delays in care linkage while attempting to assemble patient inmates to send them to external health care facilities en masse:

*"If they [prisoners] are found to be positive today, I will call them today. However, the number of people matters when we send them to the Hospital. If not urgent, I will suspend patients who have an appointment today for tomorrow to include them. If so, I'll look at the appointment and say, 'I'll send you on this day!' I say, 'Stay ready!' it won't be longer than a maximum of a week." (PN#1).*

## **Uncooperative prison security system**

Prison security's repudiation of inmates' claims for external health care facility visits played a role in causing delays in care linkage. It tended to discourage newly identified HIV-infected prisoners from pursuing ART initiation and even to deny that they were infected. One prisoner described how he noticed his friend dissuading himself from ART initiation because of the emotional trauma he experienced as a result of prison security's procrastination about his health care facility visit:

*"One day, they [prison security] gave him [newly identified HIV infected inmate] an appointment and let him be back. He became very offended since then. 'You didn't take me out at my appointed time so I don't want to go again!' he refused. They had declined to take him to the Health Centre a couple of times due to a cloudy weather. He got frustrated because of this and he was even saying, 'I don't have the virus!' [Laughs]."* (P#5).

A health agent also reported a prison officers' denial of external health care facility visits as a barrier to accessing care among HIV infected prisoners:

*"Sometimes these people [HIV infected prisoners] may not come (to an external health care facility) by themselves because they have low access to outside environment. At times the prison officers refuse to bring them to the health facilities."* (HA#2).

## **Loss of privacy regarding HIV status**

Prisoners sometimes refused to be initiated on ART due to concerns about loss of privacy during procedures at external health care facility visits, as well as negative attitudes displayed by prison officers during the process. One prison nurse shared her experience in relation to this while assisting newly identified HIV infected inmates to start ART, proposing onsite ART services as an ideal approach to avoid such difficulties:

*"——This was the main reason why the guy we talked about earlier refused to start the treatment. He had been tested here and the prison officers tried to take him to the Health Centre saying, 'Get into the car!' Then he replied, 'I don't want to go there!' It is a very bureaucratic procedure. They should be tested and start their treatment here at the OPD (Outpatient Department). It reduces mistreatment for the prisoners by avoiding perceptions like 'He is going out to bring that drug!', 'He has!' It might not be cheerful to him when someone says, 'Just take him to the Health Centre, and he has to bring his HIV medication!'"* (PN#2).

Another prison nurse described the occurrence of privacy loss during call-backs of HIV positive inmates to let the inmates know their test results, because of the involvement of a third party (prison officers and other prisoners):

*"——If so (referring to being tested positive), we'll call (back) and let them know. But when they are called out alone, they (other inmates) become suspicious. If you say to someone [a police officer], 'Get a person with this number!' he himself will be suspicious. There is something like, 'He was called because he has the virus!'"* (PN#1).

On some occasions, HIV positive prisoners were not directly informed about their test results, but prison officers were informed about the results prior to taking them to public health care facilities. On these occasions, prisoners were unaware of why they had been escorted to the external health care facility until informed by the ART service provider. One ART service provider described:

*"It was one of the guarding police who told me, 'He (a prisoner) has tested positive [Whispering]!': 'He came here after being diagnosed there (at prison clinic)! The man didn't know, but the guarding police knew. The prisoner says nothing. It's just the person pulling him in and out. That's how I have come across the two individuals." (AP#2).*

## **Facilitators of early ART initiation**

### **Peer education and support**

Participants discussed the importance of peer education and support for having an early diagnosis and status disclosure to access care in the prison environment. Peer support of ILWHA was identified as an essential source of information and a means through which the more experienced ILWHA convince newly diagnosed inmates to start ART. As a prisoner who had been using ART in prison for about four years said:

*"We are the ones to help them [HIV infected prisoners who refused to be initiated on ART]. If we seniors advise them like, 'It is just like this——,' they will take it easy and start their medication. Otherwise, they fear to ask and may get worst." (P#5).*

Although ILWHA highlighted the significance of sharing their experience of living with HIV and indicated their intention to perform the course of action, it appeared to be challenging for them to participate in peer education activities that were seldom held in the correctional facilities. They encountered an interference by people without HIV experience in the educational programs that was apparently unnoticed by prison officials. A prisoner who tested positive and initiated ART after he entered into a prison discusses:

Yes, it [referring to World's AIDS Day] is celebrated here as well once in a year, but when that occurs, it is mainly city gangsters who engage in the ceremonial activities. They just interfere in every activity, they know how to dance, how to talk, and then they will be paid! They are the ones who dance and teach, no one who lives with HIV has ever come in. There is no one to coordinate us. Even I sometimes get flustered and say to people, "We are the ones affected, we are the ones who use the medication, what do these unaffected people know?" but they [prison officials] still remain unresponsive.

*"I am willing personally [to share his life experience with others]. I don't even teach at a ceremony, why not they print my name out in newspapers! I will teach them "Why and how it occurs!" What else would be said? But it was not given to me, it was given to the gangsters. They don't know the extent that I know about the situation, it is just an intrusion." (P#3).*

Another prisoner who had been on ART for 12 years (five years in prison) recalled ILWHAs' motivation to teach fellow inmates in such events, describing how it was discouraged by a lack of institutional support:

*"We saw it last time (on World's AIDS Day). We even tried to announce the program on media, but there were no arrangements at all. I don't know why they quit it now if there was any (previously). I have never come across such things in this institution. These are the things that should have been present here. I can say that the institution lacks a coordinating committee or there is a dysfunctional committee." (P#6).*

A prison nurse who had previously run an HIV mainstreaming office described the cessation of HIV education programs at her institution despite the commitment of ILWHA to educate fellow inmates. She attributed blame for the interruption to a disregard for the program by prison administration and health agencies:

*"There had been tea-coffee programs. We used to be provided with two-percent of the total institutional budget for a monthly tea-coffee program; an exciting program! Umm—the Zonal Mainstreaming Officer was also attending the program (I don't know who is in charge of the Office currently; might have been changed), and provided us with brochures, music CDs, and teaching leaflets. The prisoners (living with HIV) also used to write a poem, and it was really a vibrant ceremony. It has been interrupted now, otherwise it was an exciting activity." (PN#2).*

Prison health care staff did not always feel it was their responsibility to undertake HIV promotion work:

*"It's just like you sit in the clinic and do the work you are supposed to do, but there is nothing else you can feel as a responsibility [regarding HIV testing]. We didn't have love and unity. There was no thought to each other within the team rather fault finding. Then you would go out having done your work to which you are accountable for. That has created the gap." (PN#1).*

Both prison and health administrators blamed supporting agencies and the government for a reduction in allocation of resources related to HIV promotion work. It was assumed that the infection had meaningfully declined in the community, which eventually evoked restriction of funds by donor agencies. Having announced the decline of the infection in the community, the government did not appear to have the capacity to implement the programs on its own, which had previously been operated by donor agencies in the main. However, the infection continued to spread at an epidemic level, particularly among the most at risk populations. A health agent described the active HIV promotion work that previously existed at the Zonal level, and the anticipated risks that health agencies would likely face in attempting to achieve the goal of ending the AIDS epidemic by 2030 if funds by donor agencies remained restricted:

*"There is no one to be asked (for funds) like before. Everyone is short of funds. HIV has been assumed to decline but it has not actually, it has been disseminating like a wild fire [Laughs]. A lot had been done at schools, districts and neighbourhood level including prisons. Following these all efforts, the Ethiopian government declared that HIV had been reduced by 70%; (consequently) the budget has declined considerably since then. The Global Fund and supports of USAID have been shifted to other issues leaving the country to deal HIV/AIDS issues on its own. While the national government announced HIV had been reduced, be it for political purpose or not, but it still remains at the epidemic stage. According to the international definition, the prevalence of more than 1% in the general population is considered as an epidemic. But there are cities in our country with a prevalence of more than 5%. Hosanna [the City where his*

*office located] itself has documented over 2%, the land where HIV was assumed to be absent. In this sense, the government and the people got distracted. It has set to do that again but it is not going to be effective by the government's only capacity. Although the government is saying, 'HIV will be stopped by 2030' it's getting harder." (HA#1).*

A prison administrator added:

*"Generally, as there has been a decline in HIV related activities, particularly in relation to the recent slogan, 'Our achievements on decline'; there must be awareness creating work to enhance this through umm—drama, umm—conversations and other means to create knowledge amongst high risk groups such as drivers, soldiers, and others groups like prisoners; both men and women need to know that it [HIV infection] occurs due to lack of precautions to protect oneself." (PA#2).*

In addition to the decline in the emphasis on HIV-related issues at national level, prison administrations and health agencies failed to work collaboratively or demonstrate appropriate understanding that prisoners are among the most at risk populations for HIV transmission:

*"Not that much in this regard [participation in the development and implementation of HIV related plans at the Zonal level]; they don't invite us in what [HIV related plans] they have developed" (PA#2).*

The same prison official discussed the apparent gap in HIV promotion activities existing between his institution and health agencies, and his perception that it was partly attributable to the prison administration's lack of mandate to make direct contact with health agencies. He proposed he was forced by the circumstance from involvement in the implementation of HIV-related programs at Zonal level:

As I said it before, we have no a mandate to directly attract non-governmental organisations (NGOs) to our institution or contact Regional Health Bureau because we are responsible to the Regional Prison Commission. It should be decentralized but still they are the ones who contact NGOs to give us holistic trainings wherever they come from. For instance, you came here after having reported to the Regional Prison Commission! So?

## **Imprisonment as an opportunity for early ART initiation**

Service provider participants discussed the prospects that incarceration could offer for early treatment of HIV infection. A health agent viewed incarceration as an opportunity to identify and initiate ART for HIV infected individuals who otherwise might have been difficult to reach:

*"For instance, sometimes you may not find HIV infected people at health facilities but you may find them at prisons. They may refuse to start ART as they might have tested (positive) at private clinics. Thus, prisons provide a good opportunity to capture such cases which would benefit the patient as well as the community at large." (HA#2).*

One prison nurse appreciated the importance of vicarious experiences of the valuable outcomes of ART that a prison environment offered ILWHA. She provided more wait to positive and negative outcomes in fellow

ILWHA in changing their behaviour than education provided by health care providers. In her perception, it helped ILWHA understand the health benefits of ART and decide to initiate:

*"It is not because we have educated them [prisoners] correctly or advised them, 'the medication does this in your body, it reduces viral load, it boosts your immunity', but they learn from the people inside. For example, I've experienced this: many had just been so drained and their body got back to normal after they had started the medication. Many others have learned from this. They believe that 'Mr X' was like this so nothing happens to me!' That's what I noticed of them." (PN#1).*

## Discussion

In this study, we identified and explored various barriers to and facilitators of early ART initiation amongst prisoners in South Ethiopia. Among the barriers identified, there was a lack of enduring strategies and resources that ensure access to HIV testing which led prisoners to commence ART only at advanced stages of their infection. Ensuring access to voluntary and confidential HIV testing for prisoners is an essential component of efforts to reach universal access to HIV prevention, treatment and care [46]. This enables the HIV key population to undergo early diagnosis, which is an important predictor of timely ART initiation [11], improved treatment outcomes [12, 13] and reduced risk of infection for others [14, 15].

Several intervention studies suggest the effectiveness and feasibility of implementing VCT in prison settings in high- and low-income countries. For example, opt-out based provider initiated counselling and testing (PICT) approach has been associated with higher testing rates in many prisons when integrated into routine prison health care systems [17, 18, 47, 48]. This approach is also known to increase rates of linkage to care and ART initiation especially in HIV infected prison entrants [17].

Participants reported that HIV testing was usually only available upon the prisoners' request (also known as opt-in or risk-based approach). Such approaches are ineffective in correctional settings resulting in delayed diagnosis and linkage to care, and provide a little opportunity to reach prisoners before they return to the community [48–50]. In South Ethiopia, the majority (86%) of prisoners return to the community within less than two years of imprisonment [38], which could make an effective implementation of opt-in approach challenging. A number of other institutional and social factors also affect prisoners' ability to request testing. As stated by some prisoner participants, they often faced refusal from health care providers and prison officers when they tried to seek testing. In addition, due to widespread social stigma and discrimination against HIV both in the community and prison settings, individuals who suspect they may be infected with HIV are generally less likely to request testing [46, 51–54].

Insufficient training for prison health staff on pre- and post-test counselling resulted in delay in the feedback of test results and linkage of HIV-infected prisoners to external ART sites. ART service providers confirmed greater delays in care linkage for prisoners relative to people who were tested at non-ART sites in the community. Training of prison health staff is an essential step in scaling up access to HIV testing, care and treatment for prisoners [46]. This is supported by public health recommendations in international guidelines in relation to training and reassigning tasks to lower level health care workers to enhance testing

coverages in HIV key populations [11, 55]. Such approaches are also found to be efficient and effective in increasing testing rates in prisons in low-income countries, particularly when coupled with peer education programs [47].

Given the congregated living conditions in the prisons (up to 150 inmates accommodated together in a cell measuring 100 m<sup>2</sup>) [38], patient privacy was lost on various occasions. This included from an announcement of test results and transportation to external health care facility to access care, which tended to promote prisoner indifference to ART initiation. Prison officers' negative perceptions towards HIV infected prisoners during the process of external health care facility visits also contributed to loss of privacy and delays in care linkage. That they allowed third parties to be privy to prisoners' HIV status through openly feeding back test results, indicates that prison health care staff lacked skills in ensuring patient privacy and confidentiality.

Studies in low-income countries also reported accessing HIV care from external health care facilities and the associated prison officers' "brutality" as major causes for loss of privacy and missing clinic appointments amongst HIV infected prisoners [56]. Conversely, higher rates of linkage to care and ART initiation were achieved through an onsite ART approach in many prisons [16, 17, 57], which was also supported by most service providers in this study. Training in patient privacy and confidentiality for prison staff who are involved in the provision of HIV care could improve ILWHA trust and consequently uptake of ART [46].

The majority of participants described the importance of peer education and support programs for early diagnosis and treatment of HIV infection in prisoners. Such programs not only offered ILWHA an opportunity to share each other's experiences of living with HIV in a prison environment, but also served as a route to influence those who lacked motivation to commence ART. At the time of the interviews, however, there had been a gradual decline in HIV education and social support initiatives in the prisons. This was explained as being due to a lack of resources and administrative support, and poor collaboration between prison authorities and external health agencies.

Social mobilisation and education initiatives involving peers are highly recommended in correctional settings to enhance HIV testing and to access care [58, 59]. Prisons represent important organisational contexts to identify HIV infected individuals and implement peer education programs to enhance early ART initiation [60]. Prison HIV promotion programs should be an integral part of community information, education and communication programs, and prison authorities should establish strong linkages with these community-based health agencies, in addition to developing plans to assure appropriate resource for supporting well organised peer support and education programs [59].

This study explored important factors influencing early ART initiation among prisoners, but does have some notable limitations. Most prisoner participants had been using ART for many years and this might have affected their recall in relation to their experiences when initiating ART. As we were not able to identify female prisoners meeting the study eligibility criteria, any gender based difference were not examined. While a number of crucial concepts emerged through consultation with service providers regarding the

effectiveness of the existing HIV care provision strategy, incorporating higher level health agencies (e.g. representatives from the Regional Health Bureau and Ministry of Health) might have deepened our understanding of the policy perspectives of HIV care in the prison settings. Although most structural factors identified and explored in this study have been interpreted as strongly influencing prisoners infected with HIV, a quantitative survey with a large sample size is now required, based on these qualitative results, to provide a representative sample regarding the determinants of early ART initiation.

## Conclusions

Participants in this study discussed both barriers to, and facilitators of, early ART initiation in prisoners. The barriers include a lack of access to VCT services, poor linkage to care due to insufficient health staff training, uncooperative prison security systems and loss of privacy regarding HIV status. Insufficient health staff training and uncooperative prison security both contributed to loss of patient privacy, which resulted in treatment refusal. Although most participants described the importance of peer education and support for enhancing HIV testing and treatment programs amongst prisoners, at the time of the study, there had been a decline in such interventions in the correctional facilities due to lack of resources and administrative support. Service providers identified opportunities offered by the prison environment for identification and treatment of HIV-infected individuals and implementation of peer education programs. Timely initiation of ART amongst inmates is likely to be enhanced through interventions that ensure access to voluntary and confidential (opt-out based) HIV testing and care, peer education and support programs, and training of health care providers and other prison staff who are involved in HIV care provision.

## Abbreviations

AIDS: Acquired Immunodeficiency Syndrome; ART: Antiretroviral therapy; HIV: Human Immunodeficiency Virus; CD4: cluster of differentiation-4; ILWHA: Inmates living with HIV; PICT: Provider initiated counselling and testing; RHB: Regional Health Bureau; SBREC: Social and Behavioural Research Ethics Committee; SNNPR: Southern Nations, Nationalities and People's Region; SSA: sub-Saharan Africa; TB: Tuberculosis; VCT: Voluntary counselling and testing; WHO: World Health Organisation

## Declarations

### Ethics approval and consent to participate

This study received ethical approvals from Flinders University, Social and Behavioural Research Ethics Committee (SBREC) (Project Number: 8362) and Ethical Review Board of SNNPR Health Bureau. Formal permissions were obtained from the SNNPR State Prison Administration and Regional Health Bureau (RHB), and consent was obtained from each correctional and health care facility authority. All potential participants were informed during recruitment that participation was entirely voluntary and the interviewer was a neutral individual who had no service provision role in any of the study prisons and health care facilities. Participants engaged in the study after details of procedures and any risks including the amount

of time they would spend had been explained to their satisfaction and written consent was confirmed by signature.

## Consent for publication

Not applicable

## Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

## Competing interests

The authors declare that they have no competing interests.

## Funding

Not applicable

## Authors' contributions

TGF conceived the research idea; conducted the interview; analysed and interpreted data; drafted the manuscript. GT and ERM participated in the coding of the interview data and subsequent revisions of the manuscript. All authors read and approved the final paper.

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## References

1. ICPR. World Prison Population List. United Kingdom Institute for Criminal Policy Research (ICPR); 2018.
2. ICPR. World Prison Brief data for Ethiopia. London: Institute for Criminal Policy Research (ICPR); 2018.
3. Parry CDH, Plidemann A, Louw A, Leggett T. The 3-Metros Study of Drugs and Crime in South Africa: Findings and Policy Implications. The American Journal of Drug and Alcohol Abuse. 2004;30(1):167-85.

4. Kinyanjui DWC, Atwoli L. Substance use among inmates at the Eldoret prison in Western Kenya. *BMC psychiatry*. 2013;13:53-.
5. UNODC. CRIME AND DEVELOPMENT IN AFRICA. United Nations Office on Drugs and Crimes 2005.
6. AHRE. Ethiopian political prisoners and their accounts of torture. Geneva, Switzerland: Association for Human Rights in Ethiopia (AHRE); 2018.
7. UNAIDS. Joint United Nations Programme on HIV/AIDS (UNAIDS) data for 2019. Geneva, Switzerland: UNAIDS; 2019.
8. Dolan K, Wirtz AL, Moazen B, Ndeffo-Mbah M, Galvani A, Kinner SA, et al. Global burden of HIV, viral hepatitis, and tuberculosis in prisoners and detainees. *The Lancet*. 2016;388(10049):1089-102.
9. Sayyah M, Rahim F, Kayedani GA, Shirbandi K, Saki-Malehi A. Global View of HIV Prevalence in Prisons: A Systematic Review and Meta-Analysis. *Iranian journal of public health*. 2019;48(2):217-26.
10. UNODC. HIV and AIDS Prevention, Care, Treatment Support in Prison Settings sub-Saharan Africa: Final Project Report (2017) Pretoria: United Nations Office on Drugs and Crime (UNODC); 2017.
11. WHO. Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection : recommendations for a public health approach. Geneva, Switzerland: World Health Organization (WHO); 2016.
12. Temprano Anrs 12136 Study G, Danel C, Moh R, Gabillard D, Badje A, Le Carrou J, et al. A trial of early antiretrovirals and isoniazid preventive therapy in Africa.(Report). 2015;373(9):808.
13. Lundgren JD, Babiker AG, Gordin F, Emery S, Grund B, Sharma S, et al. Initiation of antiretroviral therapy in early asymptomatic HIV infection.(Report). 2015;373(9):795.
14. Cohen MS, Chen YQ, McCauley M, Gamble T, Hosseinipour MC, Kumarasamy N, et al. Antiretroviral Therapy for the Prevention of HIV-1 Transmission. *The New England Journal of Medicine*. 2016;375(9):830-9.
15. Na H, Song D, Yingying D, Keming R, Jennifer MM, Manhong J, et al. Antiretroviral therapy reduces HIV transmission in discordant couples in rural Yunnan, China. *PLoS ONE*. 2013;8(11):e77981.
16. Iroh PA, Mayo H, Nijhawan AE. The HIV care cascade before, during, and after incarceration: A systematic review and data synthesis. *American journal of public health*. 2015;105(7):e5-e16.
17. Lucas KD, Eckert V, Behrends CN, Wheeler C, MacGowan RJ, Mohle-Boetani JC. Evaluation of Routine HIV Opt-Out Screening and Continuum of Care Services Following Entry into Eight Prison Reception Centers—California, 2012. *MMWR: Morbidity & Mortality Weekly Report*. 2016;65(7):178-81.
18. Telisinghe L, Charalambous S, Topp SM, Herce ME, Hoffmann CJ, Barron P, et al. HIV and tuberculosis in prisons in sub-Saharan Africa. *The Lancet*. 2016;388(10050):1215-27.
19. Sgarbi RVE, Carbone AdSS, Paiao DSG, Lemos EF, Simionatto S, Puga MAM, et al. A Cross-Sectional Survey of HIV Testing and Prevalence in Twelve Brazilian Correctional Facilities.(Report). 2015;10(10).
20. Bick J, Culbert G, Al-Darraji HA, Koh C, Pillai V, Kamarulzaman A, et al. Healthcare resources are inadequate to address the burden of illness among HIV-infected male prisoners in Malaysia. *International journal of prisoner health*. 2016;12(4):253-69.

21. Chakrapani V, Kamei R, Kipgen H, Kh JK. Access to harm reduction and HIV-related treatment services inside Indian prisons: Experiences of formerly incarcerated injecting drug users. *International journal of prisoner health*. 2013;9(2):82-91.
22. Todrys KW, Amon JJ, Malembeka G, Clayton M. Imprisoned and imperiled: access to HIV and TB prevention and treatment, and denial of human rights, in Zambian prisons. *Journal of the International AIDS Society*. 2011;14:8.
23. Makombe SD, Jahn A, Tweya H, Thambo L, Yu JK, Hedt B, et al. A national survey of prisoners on antiretroviral therapy in Malawi: access to treatment and outcomes on therapy. *World Hospitals & Health Services*. 2007;44(1):26-9.
24. Mostashari F, Riley E, Selwyn PA, Altice FL. Acceptance and adherence with antiretroviral therapy among HIV-infected women in a correctional facility. *Journal of Acquired Immune Deficiency Syndromes and Human Retrovirology*. 1998;18(4):341-8.
25. Altice FL, Mostashari F, Friedland GH. Trust and the acceptance of and adherence to antiretroviral therapy. *Journal of Acquired Immune Deficiency Syndromes: JAIDS*. 2001;28(1):47-58.
26. Culbert G. Violence and the perceived risks of taking antiretroviral therapy in US jails and prisons. *International journal of prisoner health*. 2014;10(2):94-110.
27. Guin S. A Qualitative Exploration of HIV/AIDS Health Care Services in Indian Prisons. *Journal of Correctional Health Care*. 2009;15(3):179-89.
28. Sprague C, Scanlon ML, Radhakrishnan B, Pantalone DW. The HIV Prison Paradox: Agency and HIV-Positive Women's Experiences in Jail and Prison in Alabama. *Qualitative Health Research*. 2017;27(10):1427-44.
29. Culbert G, Bazazi A, Waluyo A, Murni A, Muchransyah A, Iriyanti M, et al. The Influence of Medication Attitudes on Utilization of Antiretroviral Therapy (ART) in Indonesian Prisons. *AIDS and behavior*. 2016;20(5):1026-38.
30. Monarca R, Madeddu G, Ranieri R, Carbonara S, Leo G, Sardo M, et al. HIV treatment and care among Italian inmates: A one-month point survey. *BMC Infectious Diseases*. 2015;15(1).
31. EFPA. Number of establishments / institutions under Federal Prison Administration Addis Ababa Ethiopian Federal Prison Administration (EFPA) 2005.
32. SNNPR Prison Commission. Unpublished data on number of prisoners in SNNPR. 2020.
33. SNNPR Health Bureau. Personal Communication. 2018.
34. Cleary M, Horsfall J, Hayter M. Data collection and sampling in qualitative research: does size matter? *Journal of Advanced Nursing*. 2014;70(3):473-5.
35. Moen K, Middelthon A-L. Qualitative Research Methods. In: Laake P, Benestad HB, Olsen BR, editors. *Research in Medical and Biological Sciences (Second Edition)*. Amsterdam: Academic Press; 2015. p. 321-78.
36. Seidman I. Interviewing as qualitative research : a guide for researchers in education and the social sciences. 3rd ed. ed. New York: New York : Teachers College Press; 2006.

37. Gill P, Stewart K, Treasure E, Chadwick B. Methods of data collection in qualitative research: interviews and focus groups. *BDJ*. 2008;204(6):291.
38. Fuge TG, Ayanto SY. Prevalence of smear positive pulmonary tuberculosis and associated risk factors among prisoners in Hadiya Zone prison, Southern Ethiopia Infectious Diseases. *BMC Research Notes*. 2016;9(1):<xocs:firstpage xmlns:xocs=""/>.
39. Marja K. Validity in qualitative research: Interview and the appearance of truth through dialogue. *Psiholoka Obzorja*. 2009;18(2):39-50.
40. Jan Armstrong. Naturalistic Inquiry In: Salkind NJ, editor. *Encyclopedia of Research Design*. Thousand Oaks, California: SAGE Publications, Inc; 2012. p. 881-5.
41. Paley J. Phenomenology as qualitative research : a critical analysis of meaning attribution: London, England, New York, New York : Routledge; 2017.
42. Giorgi A. The Descriptive Phenomenological Psychological Method. *Journal of Phenomenological Psychology*. 2012;43(1):3-12.
43. Maxwell J. Qualitative Data Analysis. In: Frey B, editor. *The SAGE Encyclopedia of Educational Research, Measurement, and Evaluation*. 1-4. Thousand Oaks: SAGE Publications, Inc; 2018.
44. QSR International. NVivo qualitative data analysis software. 12 ed. Doncaster, Australia: QSR International Pty Ltd.; 2018.
45. Maxwell J. Designing a qualitative study. In: Bickman L, Rog D. J, editors. *The SAGE handbook of applied social research methods*. 41. 3rd ed. ed. Thousand Oaks: Thousand Oaks : SAGE Publications; 2009. p. 214-53.
46. UNODC/WHO/UNAIDS. Policy brief: HIV testing and counselling in prisons and other closed settings. Austria2009.
47. Maggard K, Hatwiinda S, Harris J, Phiri W, Krner A, Kaunda K, et al. Screening for tuberculosis and testing for human immunodeficiency virus in Zambian prisons. *Bulletin of the World Health Organization*. 2015;93(2):93-101.
48. Strick L, Macgowan R, Margolis A, Belcher L. HIV Screening of Male Inmates During Prison Intake Medical Evaluation-Washington, 2006-2010. *JAMA*. 2011;306(16):1756-7.
49. National Library of M. Routine HIV screening during intake medical evaluation at a County Jail - Fulton County, Georgia, 2011-2012. *MMWR Morbidity and mortality weekly report*. 2013;62(24):495-7.
50. Beckwith CG, Rich JD, Flanigan TP, Poskus M, Aucoin N, Bandieri A, et al. Routine Jail-Based HIV Testing-Rhode Island, 2000-2007. *JAMA*. 2010;304(3):266-8.
51. Kalichman SC, Simbayi LC. HIV testing attitudes, AIDS stigma, and voluntary HIV counselling and testing in a black township in Cape Town, South Africa. *Sexually Transmitted Infections*. 2003;79(6):442-7.
52. Young SD, Bendavid E. The relationship between HIV testing, stigma, and health service usage. *AIDS Care*. 2010;22(3):373-80.
53. Gesesew H, Gebremedhin AT, Demissie TD, Kerie MW, Sudhakar M, Mwanri L. Significant association between perceived HIV related stigma and late presentation for HIV/AIDS care in low and middle-

- income countries: A systematic review and meta-analysis. 2017.
54. Chariyalertsak C, Yottruean K, Charuwat C, Srithanaviboonchai K. VCT Acceptance and High Level of HIV Stigma and Discriminatory Attitudes towards HIV Infected People among Male Prisoners in Northern Thailand. *AIDS Research and Human Retroviruses*. 2014;30(S1):A11-A110.
55. WHO. Task shifting to tackle health worker shortages. HIV/AIDS Programme: Strengthening health services to fight HIV/AIDS: World Health Organization 2007.
56. Shalihu N, Pretorius L, van Dyk A, Vander Stoep A, Hagopian A. Namibian prisoners describe barriers to HIV antiretroviral therapy adherence. *AIDS care*. 2014;26(8):968-75.
57. Telisinghe L, Hippner P, Churchyard GJ, Gresak G, Grant AD, Charalambous S, et al. Outcomes of on-site antiretroviral therapy provision in a South African correctional facility. *International journal of STD & AIDS*. 2016;27(13):1153-61.
58. WHO, UNODC, UNAIDS. Effectiveness of Interventions to Address HIV in Prisons; Evidence for action technical paper. Geneva: World Health Organization (WHO); 2007.
59. UNDOC. HIV prevention, treatment and care in prisons and other closed settings: a comprehensive package of interventions. Austria United Nations Office for Drugs and Crime (UNDOC); 2013.
60. Maggard K, Hatwiinda S, Phiri W, Morse J, Turnbull E, Topp S, et al. Inmate peer educators are essential to prison-based HIV testing and TB screening in Zambia. *J Int AIDS Soc*. 2012;15(s3):261.

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