HIV-related stigma and uptake of antiretroviral treatment among incarcerated individuals living with HIV/AIDS in South African correctional settings: A mixed methods analysis

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Abstract

Background
Stigma affects engagement with HIV healthcare services. We investigated the prevalence and experience of stigma among incarcerated people living with HIV (PLHIV) in selected South African correctional settings during roll-out of universal test and treat.

Methods
A cross-sectional mixed-methods study design included 219 incarcerated PLHIV and 30 in-depth interviews were conducted with four different types of PLHIV. HIV-related stigma was assessed through survey self-reporting and during the interviews. A descriptive analysis of HIV-related stigma was presented, supplemented with a thematic analysis of the interview transcripts.

Results
ART uptake was high (n = 198, 90.4%) and most reported HIV-related stigma (n = 192, 87.7%). The intersectional stigma occurring due to individual and structural stigma around provision of healthcare in these settings mostly contributed to perceived stigma through involuntary disclosure of HIV status. Interpersonal and intrapersonal factors led to negative coping behaviours. However, positive self-coping strategies and relationships with staff encouraged sustained engagement in care.
**Conclusion**

We encourage continuous peer support to reduce stigmatization of those infected with HIV and whose status may be disclosed inadvertently in the universal test and treat era.

**Introduction**

HIV prevalence in South African correctional facilities is significantly higher than that of the general population and estimated to range between 9% and 41% [1,2]. The HIV risk in this population increases through needle sharing, violence, unprotected, sometimes non-consensual and unplanned sexual encounters, and limited condom negotiation [3–5]. The HIV treatment policy by the South African Department of Correctional Services (DCS) to improve treatment access was introduced to enable HIV control in this high-risk population [6]. The United Nations Office on Drugs and Crime (UNODC) and the World Health Organisation (WHO) also recommend delivery of pre-exposure prophylaxis (PrEP) for correctional facilities [7]. This recommendation is not yet adopted in these settings that focus more on upholding security [3].

The rollout of universal test and treat (UTT) in South Africa from 2016 appears to be the best strategy for facilitating antiretroviral treatment (ART) delivery and uptake, particularly in correctional settings where alternative prevention approaches such as pre-exposure prophylaxis have specific challenges to implementation [6,8]. Correctional facilities provide an opportunity for successfully engaging individuals in treatment and sustained retention in care after release into the community [9,10]. For expansion of delivery and uptake of HIV services, addressing known barriers, such as stigma, is necessary [11–14]. Individuals experience incarceration stigma which is further compounded by living with HIV [15–17]. As a result, they may experience enacted (overt acts of hostility and discrimination due to HIV status), perceived (anticipated discriminatory acts as a result of HIV status) or internalised (acceptance of negative beliefs and feelings about HIV) stigma [11]. The intersection of these types of stigma create barriers to engagement in HIV care services [17].

Existing evidence has highlighted the negative influence of HIV-related stigma on engagement along the HIV care continuum [18,19]. The different levels of HIV-related stigma are associated with undesirable health and social consequences [20]. Internalized stigma is linked to depressive symptoms [21] whereas perceived and enacted stigma heightens difficulties with disclosure, delays with treatment initiation and leads to poor treatment adherence [22]. Evidence on the effect of HIV-related stigma among incarcerated populations is available in developed countries [13,23]. Findings have identified structural and individual factors that negatively affect engagement in care including stigma and lack of social support from professional healthcare providers [13,15,16,24,25]. In South Africa, HIV-related stigma has been extensively examined in the general population [20,26,27], but not in incarcerated populations. Our study aimed to understand 1) the uptake of ART; 2) the prevalence of HIV-related stigma among ART users; and 3) the experience of HIV-related stigma among incarcerated people living with HIV within the implementation of UTT in these settings.

**Methods**

**Study design**

This analysis was nested within a parent study [Treatment as prevention (TasP)], that investigated the feasibility of implementing UTT in correctional facilities. We conducted a
mixed-methods study [28] among incarcerated people with HIV in selected South African correctional facilities. First, we analysed quantitative data to describe ART uptake and prevalence of HIV-related stigma among ART users. Then, we qualitatively explored the experiences of HIV-related stigma among incarcerated people living with HIV. Lastly, we integrated our quantitative and qualitative findings.

Study setting

The TasP study was conducted between September 2016 and March 2018 in three correctional facilities: Johannesburg (Gauteng Province), Brandvlei and Worcester (Western Cape Province). The Johannesburg correctional centre (JCC) is a large facility situated in Gauteng, a high HIV burden province; with an estimated HIV prevalence of 25.3% [2]. Brandvlei (BCF) and Worcester (WCF) correctional facilities are located within the Breede Valley region in the Western Cape. HIV prevalence is estimated at 10.9% and 9.2% at each facility, respectively [2].

Data collection for the quantitative component

The TasP study enrolled incarcerated participants living with HIV aged $\geq 18$ years, in facility $\geq 3$ months, not on ART and not anticipated to leave the facility within 6 months and followed-up for twelve months. At enrolment, trained research assistants collected baseline information from participants. Follow-up data were collected from clinic files at three time-points: one, six and twelve months after enrolment. At the six-month time-point, research assistants administered a psychosocial survey that assessed stigma, disclosure and social support (S1 File). Our study utilized data collected six months post-enrolment.

Data collection for the qualitative component

From March 2017, trained research assistants approached and recruited study participants from the correctional facilities for qualitative in-depth interviews (IDIs). For inclusion, participants had to be $\geq 18$ years, stayed in the facility for $\geq 6$ months, and agreed to audio recording of interview sessions. Recruitment was through purposive sampling using pre-specified criteria to include: HIV participants not engaged in care; consistently engaged in care with documented viral load suppression ($<50$ copies/ml); and those in care but with unsuppressed viral load ($>1,000$ copies/ml) who were enrolled in the cohort study (Fig 1).

Trained male and female study staff with varying qualifications (Diploma, Bachelors, Masters and PhD Level) conducted IDIs in private rooms located within the facilities using a semi-structured interview guide (S2 File). At each interview, two study staff, one as the main interviewer and a second as the note taker, were present. The main interviewer administered the written informed consent, collected demographic information and conducted the interview. All personal identifiers were removed and participants were assigned a unique study number. The interviews, lasted between 45 and 90 minutes and were conducted in a language of the participants’ preference that included English, isiZulu, isiXhosa, Afrikaans, Setswana and Sesotho. No remuneration was offered and transcripts were not returned to participants for comment. The probing technique was initially reviewed for the first five interviews by investigators and feedback provided to teams to adjust the exploration of themes in more detail. We reached saturation of themes during data collection by reviewing the transcripts, providing frequent feedback to research assistants on probes to use during the interviews and including participants whose experiences of HIV care services varied.
Quantitative measurements

ART uptake was derived from the recorded date of ART initiation. Stigma was assessed using nine questions adapted from The People Living with HIV Stigma (PLHIV) Index and a score ≥1 was used to indicate overall stigma [20]. HIV-related stigma was assessed by combining the six HIV-related stigma questions. Four of these questions assessed HIV-related stigma, two focussed on reluctance to seek treatment and the last two on stigma associated with incarceration. Participants choose “Yes (1)”, “No (0)”, or “No answer (3)” and responses with “No answer” set to missing before combining. A scoring ≥1 indicated stigma as previously used and a numerical dichotomized variable with “Yes” and “No” categories was created.

Voluntary disclosure was assessed quantitatively and qualitatively by asking participants whether they disclosed their HIV-positive status to family, spouse/partner, friend, fellow inmate, work colleague or corrections services staff member.

Qualitative measurements

From qualitative interviews, any mention of negative attitude or action towards a participant based on HIV positive status by peers or corrections staff was coded as HIV-related stigma. Experiences with HIV related stigma were described to reflect social (experienced) and outcome expectations (perceived). Disclosure was explored by asking participants whether they had willingly revealed their HIV-positive status to family, spouse/partner, friend, incarcerated individual (inmate), work colleague or corrections services staff member.

Data analysis and management of the quantitative component

Categorical data were summarized as frequencies and percentages (proportions) while continuous data were summarized as medians, and interquartile ranges (IQR). We did not assess for differences in socio-demographic, stigma measures and psychosocial factors by ART status. Data analysis was conducted using Stata version 14 [29].
Data analysis and management of the qualitative component

Research assistants transcribed all interviews verbatim and back translated to English audio recordings with renderings of local languages. Co-authors (IR and PN), fluent in either study language, checked the accuracy of the transcripts against digital recordings. LC reviewed the process notes during the analysis and authors resolved all queries prior to analysis. Once verified, transcripts were imported into NVivo version 10 for coding and analysis [30].

To analyse the qualitative data, we used thematic analysis. Two members of the research team (LC and CMC-M) independently reviewed and coded the transcripts. Transcripts were read multiple times for familiarity with the data, patterns identified, and initial codes generated. We adapted a previously developed framework for HIV-Related Stigma, Engagement in Care, and Health Outcomes to explore the intersection between individual and structural stigma [31] in an incarcerated population. Codes were organized into four themes that affected engagement in care, namely structural factors, HIV-related stigma, individual factors (interpersonal and intrapersonal), structural factors (correctional environment, staff attitude and involuntary disclosure) and self-coping mechanisms (Fig 2). Collaboratively, researchers discussed and revised emerging themes and sub-themes in an iterative and inductive manner. During analysis, further refining and development of codes and categories was done until we reached a saturation point where no new themes were evident. For instance, a theme on structural factors was created from perceived stigma to include the structural challenges that inadvertently disclose HIV status such as public pill lines, special diet delivery, or ART clinic days. Ambiguities and disagreements on assigning the themes and coding for instance internalized stigma were resolved by discussion. Final themes were summarized, and described using direct quotes.

Ethics statement

This study protocol was jointly approved by the University of the Witwatersrand human research ethics committee (Wits HREC; Number 150510) and Department of Correctional Services (DCS) research ethics committee. Ethics approval was granted to use direct quotes and written informed consent was obtained from participants. No special privilege was offered for participation and their participation would not influence decisions from the parole boards. All participant records and information were anonymized and de-identified prior to analysis.

Results

Quantitative findings

Two hundred and nineteen participants, mostly male (156, 71.2%), median age 34 years (IQR: 29–39) completed a psychosocial survey at 6 months post-enrolment (Table 1). Most participants were single (n = 153, 69.9%), had never been incarcerated before (n = 142, 64.8%), spent less than one year in the facility (n = 129, 58.9%), and were incarcerated at the Gauteng province facility (n = 166, 75.8%). At six months 95.9% (n = 210) reported stigma and 87.7% (n = 192) HIV-related stigma. Most participants voluntarily disclosed their HIV status (n = 207, 94.5%) and many reported receiving social support from friends and family (n = 171, 78.1%). Out of 219 participants, 198 (90.4%) had initiated ART by 6 months. Of those who reported no HIV-related stigma (n = 27), 22 (81.5%) started ART and of the 192 who reported HIV-related stigma, 176 (91.7%) started ART. Of those comfortable with HIV status, 128/137 (93.4%) had started ART whereas of those not comfortable with HIV status, 56/67 (83.6%) had started ART (Table 2). Of those reluctant to access ART 33/40 (82.5%) had started ART and of those not reluctant to access ART, 157/170 (92.4%) had started ART. Of those who thought it
was important to keep HIV status a secret 83/87 (95.4%) had started ART and from those who do not think it is important to keep HIV status a secret, 105/120 (87.5%) had started ART.

Qualitative findings

Fig 1 describes the recruitment sources of 30 IDI participants, of median age 35 (IQR: 29–38) years. Of these, 27 (69%) were single, and had spent a median number of 4 years incarcerated (IQR: 1–8). During inductive reasoning when describing attributes of gender and sites, there were no distinctive differences across and within themes. Table 3 outlines the main themes and sub-themes were developed around the existing structural factors (involuntary disclosure, lack of stigma free spaces and negative staff attitudes), HIV-related stigma (perceived and experienced) and individual interpersonal and intrapersonal factors. Another developing theme was self-coping mechanisms (negative and positive).
Fear of inadvertent HIV positive status disclosure while accessing care in correctional facilities

Due to the lack of privacy in a congregate setting fear of HIV status disclosure was reported by majority of the participants. Specific procedures such as use of public pill lines (lining or queuing for medication), special diets, distribution of medication by peers and being escorted to the clinic on specific ART days further increased disclosure of HIV status. Some patients

Table 1. Socio-demographic characteristics of TasP study participants who completed the psychosocial survey 6-months post-enrolment (N = 219) at selected correctional facilities in, South Africa (2016–2018) by ART uptake.

| Characteristics                  | Total (N = 219) | Not on ART (n = 21) | On ART (n = 198) | p-value |
|----------------------------------|----------------|--------------------|------------------|---------|
|                                  | n (%)          | n (%)              | n (%)           |         |
| Demographic characteristics      |                |                    |                  |         |
| Age group (years)                |                |                    |                  |         |
| <25 years                        | 20 (9.1)       | 2 (10.0)           | 18 (90.0)        | 0.60    |
| ≥25 years                        | 199 (90.9)     | 19 (9.5)           | 180 (90.5)       |         |
| Gender                           |                |                    |                  |         |
| Male                             | 156 (71.2)     | 13 (8.3)           | 143 (91.7)       | 0.32    |
| Female                           | 63 (28.8)      | 8 (12.7)           | 55 (87.3)        |         |
| Marital status                   |                |                    |                  |         |
| Currently Married                | 55 (25.1)      | 4 (7.3)            | 51 (92.8)        |         |
| Previously Married               | 11 (5.0)       | 3 (27.3)           | 8 (72.7)         |         |
| Never married                    | 153 (69.9)     | 14 (9.2)           | 139 (90.8)       | 0.15    |
| Previously incarcerated          |                |                    |                  |         |
| No                               | 142 (64.8)     | 16 (11.3)          | 126 (88.7)       |         |
| Yes                              | 77 (35.2)      | 5 (6.5)            | 72 (93.5)        | 0.34    |
| Time incarceration (months)       |                |                    |                  |         |
| <12 months                       | 129 (58.9)     | 12 (9.3)           | 117 (90.7)       |         |
| ≥12 months                       | 90 (41.1)      | 9 (10.0)           | 81 (90.0)        | 0.86    |
| Site (province)                  |                |                    |                  |         |
| Gauteng                          | 166 (75.8)     | 20 (12.0)          | 146 (88.0)       |         |
| Western Cape                     | 53 (24.0)      | 1 (1.9)            | 52 (98.1)        | 0.03    |
| Psychosocial characteristics     |                |                    |                  |         |
| Reported any stigma              |                |                    |                  |         |
| No                               | 9 (4.1)        | 1 (11.1)           | 8 (88.9)         |         |
| Yes                              | 210 (95.9)     | 20 (9.5)           | 190 (90.5)       | 0.64    |
| Reported any HIV-related stigma  |                |                    |                  |         |
| No                               | 27 (12.3)      | 5 (18.5)           | 22 (81.5)        |         |
| Yes                              | 192 (87.7)     | 16 (8.3)           | 176 (91.7)       | 0.09    |
| HIV disclosure                    |                |                    |                  |         |
| No                               | 12 (5.5)       | 2 (16.7)           | 10 (83.3)        |         |
| Yes                              | 207 (94.5)     | 19 (9.2)           | 188 (90.8)       | 0.32    |
| Received social support          |                |                    |                  |         |
| No                               | 48 (21.9)      | 3 (6.3)            | 45 (93.8)        |         |
| Yes                              | 171 (78.1)     | 18 (10.5)          | 153 (89.5)       | 0.58    |

TasP: Treatment as Prevention; IQR: Interquartile range; TB: Tuberculosis; ART: Antiretroviral treatment;

†Percentages reported as row%;

* derived from six questions PLHIV stigma index.

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Fear of inadvertent HIV positive status disclosure while accessing care in correctional facilities

Due to the lack of privacy in a congregate setting fear of HIV status disclosure was reported by majority of the participants. Specific procedures such as use of public pill lines (lining or queuing for medication), special diets, distribution of medication by peers and being escorted to the clinic on specific ART days further increased disclosure of HIV status. Some patients
Table 2. Reported experiences of stigma from TasP study participants by ART status at selected correctional facilities in Gauteng and Western Cape Provinces, South Africa (2016–2018).

| Individual stigma measures | Not on ART (n = 21) | On ART (n = 198) | p-value |
|----------------------------|--------------------|-----------------|---------|
| Ashamed of their HIV status* (n = 210) | No (n = 160) 13 (8.1) | 147 (91.9) | 0.22 |
| Yes (n = 50) 7 (14.0) | 43 (86.0) |
| Comfortable with HIV status while incarcerated compared to in community* (n = 204) | No (n = 67) 11 (16.4) | 56 (83.6) | 0.03 |
| Yes (n = 137) 9 (6.6) | 128 (93.4) |
| Important to keep HIV status a secret while incarcerated* (n = 207) | No (n = 120) 15 (12.5) | 105 (87.5) | 0.05 |
| Yes (n = 87) 4 (4.6) | 83 (95.4) |
| Lost respect or standing in corrections because of HIV status* (n = 208) | No (n = 178) 18 (10.1) | 160 (89.9) | 0.32 |
| Yes (n = 30) 1 (3.3) | 29 (96.7) |
| Possible to keep HIV status a secret while incarcerated* (n = 210) | No (n = 111) 12 (10.8) | 99 (89.2) | 0.50 |
| Yes (n = 99) 8 (8.1) | 91 (91.6) |
| Ashamed to access health care in correctional facilities (n = 210) | No (n = 185) 19 (9.7) | 166 (85.1) | 0.48 |
| Yes (n = 25) 1 (4.0) | 24 (96.0) |
| Reluctance to access ARVs in correctional facilities* (n = 210) | No (n = 170) 13 (7.6) | 157 (92.4) | 0.06 |
| Yes (n = 40) 7 (17.5) | 33 (82.5) |
| Ashamed of being in the correctional facilities (n = 210) | No (n = 69) 4 (5.8) | 65 (94.2) | 0.22 |
| Yes (n = 141) 16 (11.3) | 125 (88.7) |
| Lost respect or standing in community because of incarceration (n = 209) | No (n = 80) 8 (10.0) | 72 (90.0) | 0.87 |
| Yes (n = 129) 12 (9.3) | 117 (90.7) |

*The six HIV-stigma related questions.

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Table 3. Number of participants reporting specific themes related to HIV-related stigma in selected correctional facilities in Gauteng and Western Cape Provinces, South Africa (2016–2018).

| Main Theme | Sub-themes | Number of participants |
|------------|------------|-----------------------|
| Fear of inadvertent HIV positive status disclosure while accessing care in correctional facilities | Involuntary disclosure | 25 |
| | Lack of stigma free spaces | 18 |
| | Negative staff attitudes | 15 |
| Perceived (anticipated) stigma and engagement in care | Anticipated prejudice | 12 |
| | Anticipated rejection of services | 8 |
| Experienced (enacted) stigma and lack of privacy and confidentiality | Verbal abuse | 12 |
| | Physical abuse | 1 |
| | Social exclusion | 7 |
| | Gossiping | 19 |
| Negative self-coping mechanisms and disengagement from care | Denial of HIV positive status | 3 |
| | Isolation from peers | 6 |
| Positive self-coping mechanisms and engagement in care | Personal resilience | 9 |
| | Religious beliefs | 18 |
| | Social (Peer) support systems | 10 |
| | Altruism | 10 |

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received an extra portion of food and collected their meals on trays mostly referred to as “lap-tops” outside the dining hall instead of queueing in order to receive a special diet.

“The people that are on ARVs their laptops come already dished out and they don’t go and queue in the kitchen. So, the trolley comes in with the food it stands outside and then the people go and actually fetch their food”.

Male, 33 years, PLHIV.

To alleviate the disclosure concerns from incarcerated PLHIV, some staff from the correctional facility took steps to minimize disclosure. For example, some healthcare workers sought to provide care in private.

“You then wait but when we are given our pills we go in one by one, and then you are given. When they give you the pills, they make sure that the door is closed and if there is someone who does not take the same medication as yours, he is made to wait outside so that you are not given pills in front of him. If the pills are the same, they are able to give them to you at the same time.”

Male, 32 years, PLHIV.

**Perceived (anticipated) stigma and engagement in care.** Some participants reported awareness of stigma leading to non-engagement for other inmates. Participants specifically reported that stigma deterred their HIV care engagement.

“Well, there is obviously stigma here (within correctional facilities) as much as it is outside (the correctional facility). You will hear it from comments and will discourage one from actually starting treatment, to be honest”.

Male, unknown age, PLHIV.

Due to the anticipated stigma, participants rejected services from the peer supporters who assisted healthcare workers in providing care by distributing pre-packaged medication. Most incarcerated PLHIV reported this mode of delivery as one that breached confidentiality of HIV status.

“At the beginning, i said there is no confidentiality. The nurses’ assistants (referring to peer educators) shout out loud during clinic visits that those queuing for the tablets (ART) must step forward to collect. Now they are saying that when I am sick that I should report to the assistant! Where is the confidentiality? Isn’t the assistant a monitor?”

Female, 40 years, PLHIV.

**Experienced (enacted) stigma and lack of privacy and confidentiality.** Participants from all facilities reported experiencing stigma through discrimination, gossip, or physical and verbal abuse. Discrimination was a feeling of social exclusion by peers due to HIV status such as rejection and isolation.
“I was rejected to the extent that I could not stay with other inmates. And couldn’t share a bath with other inmates of which we were staying with a single cell.”

Female, 23 years, PLHIV.

The theme on violence emerged from all facilities and across genders. Most described physical abuse which was not related to HIV status. In our study, there was a single report of violence associated with HIV status.

“When I came to the sentenced yard, a few months later, another girl also shouted me about my status and then the two of us also fought.”

Female, 23 years, PLHIV.

Verbal abuse was mentioned and was at times related to the HIV status of an individual. This manifested as insults and mockery with derogatory words meted out on incarcerated PLHIV as this participant reported:

“There is a guy who lived in our room; he is one guy who really abused me because each time he talked about this illness of mine. So he was evicted from the room”.

Male, 36 years, PLHIV.

Verbal abuse through negative comments from correctional staff occurred in all facilities. This potentially affected the relationship between corrections staff and incarcerated HIV positive individuals although its effect on health seeking behaviour was uncertain as explained below.

“There are good and understanding about HIV status, but some are rude. One official once insulted me and I should have retaliated but then again I just respected his position. That is why I prefer to stay on my bed because I am trying to avoid problems”.

Male, 34 years, PLHIV.

Gossiping from staff or fellow inmates, defined as talking negatively about HIV-positive individuals mostly occurred after inadvertent or deliberate disclosure of one’s status. Participants mentioned having feelings of shame when peers talked about them. They often felt enraged; enough to resort to physical abuse such as explained by one participant.

“Yes, there were two girls talking about my status, one of the unsentenced (girls) shouted at me about my status and then we fought …then they moved her. When I came to the sentenced yard, a few months later, another girl also shouted me about my status and then the two of us also fought.”

Female, 23 years, PLHIV.

**Negative self-coping mechanisms and disengagement from care.** Negative self-coping strategies were reported as denial of status and/or isolation through experiences of stigma. Due to the inaccurate HIV beliefs from peers, some incarcerated PLHIV were anxious about using communal facilities for fear of victimization leading some to report social distancing. As one participant reported:
"At that point I didn’t have knowledge about HIV, so I was thinking all of those things that the people that I’m living with, are they going to accept me as I am? ‘Will they mind sharing a cup with me knowing that I’m HIV positive?’ ‘Will they mind sharing a toilet with me, knowing that I’m HIV positive? Isolating myself from a lot of people because I know that I am HIV positive, you understand instead of being around them’.

Male, 34 years, PLHIV.

**Positive self-coping mechanisms and engagement in care.** Incarcerated PLHIV showed positive self-coping mechanisms, for instance personal resilience by investing in improving one’s health and that of others, after becoming comfortable with their status while incarcerated. The need to uphold a healthy status was important especially for male participants who would continue with the leadership role in their families upon release as reported in this extract.

“So, there are kids that are younger than me that are looking up to me. I want to go outside get a job maybe. So, that’s why I get motivated to take my treatment so I don’t get sick."

Male, unknown age, PLHIV.

Some participants cited anchoring their faith in religious beliefs encouraging acceptance of HIV status and engagement in care.

“I thought to myself that no I do not have a choice you see being in HIV positive and in prison. I have to accept the road that I travel, you see. First, I am a Christian. Not a playing Christian. I do not play at church. I worship. I am holding on to Jesus. Only God knows and so you will not complain when you are with Him, you see”.

Male, 33 years, PLHIV.

Some participants formed informal support groups that provided social support and counselling. This facilitated adherence to medication at a specified time despite the side effects and stigma by talking openly about HIV.

“I do not find any challenges, because most of us, maybe 99.9% here in prison, all are HIV positive. Yes. I am open about my status. We are free to talk, especially here in our cell. We remind each other to take our medication. The ladies say, you will never die when I’m still here”

Female, 33 years, PLHIV.

Altruism emerged when participants reported helping fellow incarcerated PLHIV peers cope with their experiences and urging them to stay in care as expressed below.

“Even if you can give him treatment, but you need to be there for him. Because really? Maybe it is important for him to start immediately, but you need to be there for him. Or, you need to get some support somehow. Because remember this person never scheduled his life to getting this treatment the way it happens here”

Male, 36 years, PLHIV.
Discussion

In this study, we described HIV-related stigma and care engagement in correctional facilities. Our findings confirm the existence of stigma in correctional settings for incarcerated people living with HIV; and the fear of involuntary disclosure while seeking HIV care. Participants in this study demonstrated high uptake of antiretroviral treatment (92%) despite a high reported prevalence of HIV-related stigma. Our findings also suggest that in this population the adoption of positive self-coping mechanisms and a positive relationship between the staff contributed to their sustained HIV care engagement.

Concerns around the consequences of inadvertent HIV status disclosure in correctional settings have been widely documented [13,25,32,33]. There was fear among participants that the correctional services environment neither promoted confidentiality of HIV diagnosis nor allowed for privacy when receiving HIV services. Similar to community and clinic settings, the consequences for disclosure of HIV status in this setting could lead to enacted stigma and may have affected engagement in care [15]. Perhaps, the consequences of disclosure and impact of stigma among incarcerated populations is less severe than in non-correctional settings without the associated risks of partner abandonment, loss of employment or social standing in the community [34]. This may also explain the high proportion of PLHIV that were comfortable with their status while incarcerated.

The study illuminated the lack of confidentiality when accessing HIV care in the correctional facilities. Similar to previous findings, our study highlighted how privacy concerns during distribution of HIV care and treatment affected health service utilization by incarcerated PLHIV inmates [35–37]. The distribution of HIV treatment on specific days by nurses or peer educators at ART clinics and/or patient queueing [17,38] are modes of delivery of care revealed by inmates as having little regard for privacy. Consequently, some participants reported avoiding engagement in care due to a fear of disclosure and anticipated stigma [15]. In some cases, incarcerated PLHIV reported attempts to conceal medication from peers [24] or shun engagement in care [38]. As reported by Shalihu et al (2014), the provision of special meals with additional protein-rich foods for PLHIV initiating HIV treatment in Namibia exposed inmates to unintended disclosure and potential stigmatization [16]. Despite this being a standard practice across different settings, the loss of confidentiality from the delivery of these meals in correctional facilities may increase enacted HIV-related stigma [38].

Our study findings highlighted intersectional stigma occurring as a result of the convergence of being incarcerated while living with HIV. Our findings showed the negative consequences of individual and structural stigma on incarcerated PLHIV which worsened health seeking behaviours and outcomes [34]. Denial of HIV positive status and social exclusion from healthcare services and peers were reported to decrease HIV disclosure, delay treatment initiation and worsen adherence [31]. On the other hand, intersectionality highlighted the protective factors such as social support, religious beliefs, personal resilience and altruism as some positive adaptive coping strategies from this population. The positive effects of this shared identity could be protective against undesirable effects from individual and structural stigma and applied to improve health seeking behaviours and outcomes [31,34].

Being sensitive to HIV-related stigma may inform implementers in correctional facilities on ways to deliver HIV care that provide greater privacy. These findings have shown that supportive relationships with staff and other inmates could improve privacy, avoid confidentiality concerns and augment trust [39]. We agree with findings from Kemnitz et al (2017) where recommendations were made to foster relationships that improve social support structures and encourage engagement in HIV care and treatment [40].
Our study had several strengths. The mixed-methods approach provided confidence and validated the findings drawn from the study. Findings from this approach add to existing knowledge gaps. This is likely to improve our understanding of how intersectional stigma affects healthcare seeking behaviour and subsequently design appropriate HIV-related stigma reduction interventions from the positive aspects of shared identities for this population. The purposive sampling of participants at different levels of engagement in HIV care provided representation of the level of care. ART uptake was assessed over 6 months and qualitative findings provided insights into the continuity of care across correctional facilities in South Africa. The recruitment of participants from high and low volume facilities with varied human resource capabilities and HIV prevalence was representative of correctional facilities in South Africa.

Our study had some important limitations. The measures of stigma in the survey instrument were not validated for this population and sample size was too small to enable robust assessment of stigma among our study participants and directly make comparisons to previously published studies. The study findings are not generalizable to all correctional facilities in South Africa and should be interpreted with caution.

Conclusions
Our study describes ART use and stigma related to HIV status in correctional facilities. Involuntary HIV positive status disclosure was a key facet of ART distribution in correctional facilities that led to anticipated HIV-related stigma from incarcerated people not living with HIV. Providing parallel education campaigns to this population will likely lead to destigmatization. HIV stigma-reduction interventions should target all stakeholders in these settings including corrections staff. Programs that promote social interaction among those incarcerated, education on inaccurate HIV beliefs and supportive relationships with corrections staff are also encouraged. Lastly, the development of data collection instruments to better characterize the effects of intersectional stigma on health seeking behaviour is necessary.

Supporting information
S1 Checklist. Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist.
(DOCX)
S1 File. Questionnaire.
(PDF)
S2 File. In-depth interview guide.
(PDF)

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**References**

1. Dolan K, Kite B, Black E, Aceijas C, Stimson GV, Reference Group on HIVAP, et al. HIV in prison in low-income and middle-income countries. The Lancet Infectious diseases. 2007 Jan; 7(1):32–41. https://doi.org/10.1016/S1473-3099(06)70685-5 PMID: 17182342.

2. Department of Correctional Facilities. Annual Report 2014|2015. Vote 21. http://www.dcs.gov.za/wp-content/uploads/2016/08/DCS-Annual-Report-2014-2015.pdf. Accessed on 20/11/2016. Pretoria, Johannesburg: DCS, 2016.

3. Braithwaite RL, Arriola KR. Male prisoners and HIV prevention: a call for action ignored. Am J Public Health. 2003 May; 93(5):759–63. https://doi.org/10.2105/ajph.93.5.759 PMID: 12721138. Epub 2003/05/02. eng.

4. Fleming EB, LeBlanc TT, Reid LC. The status of HIV prevention efforts for women in correctional facilities. Journal of women's health (2002). 2013 Dec; 22(12):1005–8. https://doi.org/10.1089/jwh.2013.4522 PMID: 24116966. Epub 2013/10/15. eng.

5. Macher A, Kibble D, Wheeler D. HIV transmission in correctional facility. Emerging infectious diseases. 2006 Apr; 12(4):669–71. https://doi.org/10.3201/eid1204.050484 PMID: 16704817. Epub 2006/05/18. eng.

6. Davies NE, Karstaedt AS. Antiretroviral outcomes in South African prisoners: a retrospective cohort analysis. PloS one. 2012; 7(3):e33309. https://doi.org/10.1371/journal.pone.0033309 PMID: 22470448. Epub 2012/04/04. eng.

7. World Health Organization. Treat all people living with HIV, offer antiretrovirals as additional prevention choice for people at “substantial” risk. https://www.who.int/mediacentre/news/releases/2015/hiv-treat-all-recommendation/en/. Accessed on 22/05/2019 Geneva, Switzerland: WHO; 2015.

8. National Department of Health. Implementation of the universal test and treat strategy for HIV positive patients and differentiated care for stable patients. https://sahivsoc.org/Files/22%20Circular%20UTT%20%20Correct%20CCMT%20Directorate%20(2).pdf. Accessed on 25/04/2019. In: NDOH, editor. Pretoria, South Africa2016.

9. Meyer JP, Cepeda J, Wu J, Trestman RL, Altice FL, Springer SA. Optimization of human immunodeficiency virus treatment during incarceration: viral suppression at the prison gate. JAMA internal medicine. 2014 May; 174(5):721–9. https://doi.org/10.1001/jamainternmed.2014.601 PMID: 24687044.

10. Milloy MJ, Montaner JS, Wood E. Incarceration of people living with HIV/AIDS: implications for treatment-as-prevention. Current HIV/AIDS reports. 2014 Sep; 11(3):308–16. https://doi.org/10.1007/s11904-014-0214-z PMID: 24962285. Epub 2014/06/26. eng.

11. Earnshaw VA, Chaudoir SR. From conceptualizing to measuring HIV stigma: a review of HIV stigma mechanism measures. AIDS and behavior. 2009 Dec; 13(6):1160–77. https://doi.org/10.1007/s10461-009-9593-3 PMID: 19636689. Epub 2009/07/29. eng.

12. Kavasery R, Maru DS, Sylla LN, Smith D, Altice FL. A prospective controlled trial of routine opt-out HIV testing in a men’s jail. PloS one. 2009 Nov 25; 4(11):e8056. https://doi.org/10.1371/journal.pone.0008056 PMID: 1994371.

13. Derlega VJ, Winstead BA, Brockington JE Jr. AIDS stigma among inmates and staff in a USA state prison. International Journal of STD & AIDS. 2008 Apr; 19(4):259–63. https://doi.org/10.1258/ijsa.2007.007141 PMID: 18462946.

14. Derlega VJ, Winstead BA, Gamble KA, Kelkar K, Khuanghla W. Inmates with HIV, stigma, and disclosure decision-making. Journal of health psychology. 2010 Mar; 15(2):258–68. https://doi.org/10.1177/1359105309348886 PMID: 20207669.
15. Haley DF, Golin CE, Farel CE, Wohl DA, Scheyett AM, Garrett JJ, et al. Multilevel challenges to engagement in HIV care after prison release: a theory-informed qualitative study comparing prisoners’ perspectives before and after community reentry. BMC public health. 2014 Dec 9; 14:1253. https://doi.org/10.1186/1471-2458-14-1253 PMID: 25491946. Epub 2014/12/11. eng.

16. 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. https://doi.org/10.1080/09540121.2014.880398 PMID: 24499371.

17. Swan H. A Qualitative Examination of Stigma Among Formerly Incarcerated Adults Living With HIV. SAGE open. 2016 Jan-Mar; 6(1). https://doi.org/10.1177/2158244016629524 PMID: 27182459. Epub 2016/05/18. eng.

18. Katz IT, Ryu AE, Onuegbu AG, Psaros C, Weiser SD, Bangsberg DR, et al. Impact of HIV-related stigma on treatment adherence: systematic review and meta-synthesis. Journal of the International AIDS Society. 2013 Nov 13; 16(3 Suppl 2):18640. https://doi.org/10.7448/IAS.16.3.18640 PMID: 24242258.

19. Culbert GJ, Earnshaw VA, Wulanyani NM, Wegman MP, Waluyo A, Altice FL. A Qualitative Examination of Stigma Among Formerly Incarcerated Adults Living With HIV. SAGE open. 2016 Jan-Mar; 6(1). https://doi.org/10.1177/2158244016629524 PMID: 27182459. Epub 2016/05/18. eng.

20. Dos Santos MM, Kruger P, Mellors SE, Wolvaardt G, van der Ryst E. An exploratory survey measuring stigma and discrimination experienced by people living with HIV/AIDS in South Africa: the People Living with HIV Stigma Index. BMC public health. 2014; 14:80. https://doi.org/10.1186/1471-2458-14-80 PMID: 24461042. Epub 2014/01/28. eng.

21. Earnshaw VA, Smith LR, Cunningham CO, Copenhagen MM. Intersectionality of internalized HIV stigma and internalized substance use stigma: Implications for depressive symptoms. Journal of health psychology. 2015; 20(8):1083–9. https://doi.org/10.1177/1359105313507964 PMID: 24170015. Epub 10/29. eng.

22. Weissman M, Thorsteinsson K, Storgaard M, Ronsholt FF, Johansen IS, Pedersen G, et al. HIV disclosure and stigma among women living with HIV in Denmark. Journal of virus eradication. 2017 Jul 1; 3(3):140–4. PMID: 28758021.

23. Muessig KE, Rosen DL, Farel CE, White BL, Filene EJ, Wohl DA. “Inside These Fences Is Our Own Little World”: Prison-Based HIV Testing and HIV-Related Stigma Among Incarcerated Men and Women. AIDS education and prevention: official publication of the Association of Nurses in AIDS Care: JANAC. 2015 Nov-Dec; 26(6):73–57. https://doi.org/10.1016/j.jana.2015.07.006 PMID: 26304049. Epub 2015/08/26. eng.

24. Bolenko S, Dembo R, Copenhagen M, Hiller M, Swan H, Albizu Garcia C, et al. HIV Stigma in Prisons and Jails: Results from a Staff Survey. AIDS and behavior. 2016 Jan; 20(1):71–84. https://doi.org/10.1007/s10461-015-1098-7 PMID: 27459162.

25. Bolenko S, Hiller M, Visher C, Copenhagen M, O’Connell D, Burdon W, et al. Policies and practices in the delivery of HIV services in correctional agencies and facilities: results from a multisite survey. Journal of correctional health care: the official journal of the National Commission on Correctional Health Care. 2013 Oct; 19(4):293–310. https://doi.org/10.1080/1078345813499313 PMID: 24078624. Epub 2013/10/01. eng.

26. Johnson L. Access to antiretroviral treatment in South Africa, 2004–2011. South Afr J HIV Med. 2012; 13:22–7.

27. Loeliger KB, Niccolai LM, Mtungwa LN, Moll A, Shenoi SV. Antiretroviral therapy initiation and adherence in rural South Africa: community health workers’ perspectives on barriers and facilitators. AIDS care. 2016 Aug; 28(8):982–93. https://doi.org/10.1080/09540121.2016.1164292 PMID: 27043077. Epub 2016/04/05. eng.

28. Creswell JW, Plano Clark VL. Designing and conducting mixed methods research. 2nd ed. California, USA: Sage Publication, Inc.; 2011.

29. StataCorp. Stata Statistical Software: Release 14. College Station, TX: StataCorp LLC; 2015.

30. QSR International. NVivo qualitative data analysis software; Version 10. Victoria, Australia: QSR International Pty Ltd; 2014.

31. Turan B, Hatcher AM, Weiser SD, Johnson MO, Rice WS, Turan JM. Framing Mechanisms Linking HIV-Related Stigma, Adherence to Treatment, and Health Outcomes. Am J Public Health. 2017 Jun; 107(6):863–9. https://doi.org/10.2105/AJPH.2017.303744 PMID: 28426316.

32. Seal DW, Eldridge GD, Zack B, Sosman J. HIV testing and treatment with correctional populations: people, not prisoners. Journal of health care for the poor and underserved. 2010 Aug; 21(3):977–85. https://doi.org/10.1353/hpu.0.0351 PMID: 20693739. Epub 2010/08/10. eng.
33. Jürgens R, Nowak M, Day M. HIV and incarceration: prisons and detention. Journal of the International AIDS Society. 2011; 14:26. https://doi.org/10.1186/1758-2652-14-26 PMID: 21595957. Epub 2011/05/21. eng.

34. Turan JM, Elafros MA, Logie CH, Banik S, Turan B, Crockett KB, et al. Challenges and opportunities in examining and addressing intersectional stigma and health. BMC medicine. 2019 2019/02/15; 17(1):7. https://doi.org/10.1186/s12916-018-1246-9 PMID: 30764816

35. Altice FL, Mostashari F, Friedland GH. Trust and the acceptance of and adherence to antiretroviral therapy. Journal of acquired immune deficiency syndromes. 2001 Sep 1; 28(1):47–58. https://doi.org/10.1097/00042560-200109010-00008 PMID: 11579277.

36. Esposito M. "Double burden": a qualitative study of HIV positive prisoners in Italy. International journal of prisoner health. 2012; 8(1):35–44. https://doi.org/10.1108/17449201211268273 PMID: 25757860.

37. Small W, Wood E, Betteridge G, Montaner J, Kerr T. The impact of incarceration upon adherence to HIV treatment among HIV-positive injection drug users: a qualitative study. AIDS care. 2009 Jun; 21(6):708–14. https://doi.org/10.1080/09540120802511869 PMID: 19806487.

38. Culbert GJ. Violence and the perceived risks of taking antiretroviral therapy in US jails and prisons. International journal of prisoner health. 2014; 10(2):94–110. https://doi.org/10.1108/IJPH-05-2013-0020 PMID: 25764073. Epub 2015/03/13. eng.

39. Rozanova J, Brown SE, Bhushan A, Marcus R, Altice FL. Effect of social relationships on antiretroviral medication adherence for people living with HIV and substance use disorders and transitioning from prison. Health & justice. 2015; 3:18. https://doi.org/10.1186/s40352-015-0030-6 PMID: 26709367.

40. Kemnitz R, Kuehl TC, Hochstatter KR, Barker E, Corey A, Jacobs EA, et al. Manifestations of HIV stigma and their impact on retention in care for people transitioning from prisons to communities. Health & justice. 2017 Dec; 5(1):7. https://doi.org/10.1186/s40352-017-0054-1 PMID: 28589252. Epub 2017/06/08. eng.