Exploring how outreach team leaders perceive community health workers' experiences of providing HIV services in KwaZulu-Natal, South Africa

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Objectives: **In 2018, the KwaZulu-Natal Department of Health launched the ward-based primary health care outreach teams policy framework which sought to expand the community health worker (CHW) programme's provision of longitudinal patient support, including human immunodeficiency virus (HIV) services in communities. This study sought to explore the perceptions of outreach team leaders who supervise CHWs on their experiences of providing HIV services in the province.**
Study design: **This was a qualitative, phenomenology study.**
Methods: **Convenience sampling was done to select one outreach team leader from each of the 11 KwaZulu-Natal health districts to be interviewed using an interview guide. Thematic analysis, guided by the Ritchie and Spencer framework analysis, was used to analyse the data.**
Results: **The challenges faced by CHWs in delivering HIV services were: the absence of individuals when CHWs visited their homes, self-HIV stigma, rejection of CHWs' HIV services due to traditional beliefs, CHW shortages, lack of other resources, low levels of CWH education and a lack of training. On the other hand, the provision of HIV services was fascilitated by: supportive supervision, training, having cell phones and having a positive attitude towards providing HIV services by CHWs that were HIV-positive.**
Conclusion: **The CHWs in KwaZulu-Natal face more challenges than enablers in the provision of HIV services. The delegation of HIV services to CHWs should be aligned with their holistic empowerment by eliminating barriers to the provision of HIV services.**

Keywords: barriers, facilitators, rendering HIV services

Introduction

As part of gearing up to implement National Health Insurance (NHI), the South African Department of Health (NDoH) launched in 2011 a programme of primary health care (PHC) re-engineering through three streams: (1) ward-based primary health care outreach teams; (2) school health teams; and (3) district clinical specialist teams (Assegaai & Schneider, 2019; Cobbing et al., 2017; South African National Department of Health, 2018). Subsequently, in 2018, a policy framework was launched that stipulated the roles of ward-based PHC outreach teams (South African National Department of Health, 2018). The ward-based PHC outreach team comprises six to ten community health workers, one data capturer and one outreach team leader (South African National Department of Health, 2018). The CHWs — a key component of the ward-based PHC outreach team stream — are supervised by an outreach team leader (OTL) and act as a link between communities and the health system (Assegaai & Schneider, 2019; South African National Department of Health, 2018). In KwaZulu-Natal province (KZN), community health workers (CHW) are sometimes referred to as community caregivers (Lister et al., 2017; Mottiar & Lodge, 2018). In KZN, the CHW model started in the early 1940s with the Pholela Health Centre as the forerunner (Tollman, 1994). In the early 2000s, evidence mounted on the important role that CHW play in supporting home-based care and PHC (Dageid et al., 2016). The roles of CHW have been expanded as a strategy to strengthen HIV health care services and provide longitudinal patient support in KZN (Kubheka et al., 2020; Loeliger et al., 2016a, 2016b). Community HIV interventions by CHWs have been seen as an important predictor of HIV treatment success (Daviaud et al., 2018) and these interventions include linking people living with HIV (PLWH) to health care, promoting ART adherence and improving retention in care (Johnson et al., 2017; Loeliger et al., 2016b; Naidoo et al., 2019; Ndaba et al., 2019).

The HIV incidence is high in KZN (Dzomba et al., 2019; Human Sciences Research Council, 2018; Kharsany et al., 2018; Shamu et al., 2020), especially among the youth and young adults (Mebane, 2020; Wand et al., 2020), and

has been reported to be between 2.6 and 3.6 per 100 person-years (Chimbindi et al., 2018; Dzomba et al., 2019). Since HIV infection is now managed as a chronic disease (Erlandson & Karris, 2019; Hing et al., 2019; Levin & Montano, 2019; Yang et al., 2019), in 2011, the KZN-DoH implemented a strategy of expanding the CHW programme to provide longitudinal patient support (Schneider et al., 2020). Until 2011, CHWs played a vital role in providing HIV services (Mottiar & Lodge, 2018; Naidoo et al., 2018; Schneider et al., 2020; Uwimana et al., 2012; White et al., 2017), but this role has expanded because of the increasing number of people on ART (Naidoo et al., 2018).

The main aim of this study was to explore outreach team leaders' perceptions of the delivery of HIV services by community health workers in KZN in order to identify challenges to and facilitators thereof. The OTLs have the main responsibility for ensuring the functionality of the ward-based PHC outreach teams, hence their view is crucial. The findings and recommendations of the study will be submitted to the provincial PHC programme to guide interventions and strategies for strengthening the delivery of HIV services by CHWs in the province.

Methodology

The study was a qualitative, phenomenological design, oriented by an interpretive paradigm. Phenomenology focuses on peoples' lived experiences and the way they perceive a phenomenon as it appears (Günbayi & Sorm, 2018; Ponelis, 2015). Sampling was done according to Robinson's four-point approach for interview-based qualitative research (Robinson, 2014). As seen in Table 1, the study adapted this four-point approach for purposive sampling. The study was conducted in June 2020 amongst OTLs who had been in their positions for one year or more, located in each of the 11 districts of the KZN province in South Africa. The OTLs were recruited among other CHW programme stakeholders such as CHWs and people living with HIV as part of a main study that sought to investigate the utilisation of CHWs in providing HIV services in KZN. As supervisors of CHWs, OTLs serve as key informants in understanding the barriers to and facilitators of providing HIV services by CHWs. During the study period, there was a total of 135 OTLs in KZN and each district had between 3 and 14 of them (KwaZulu-Natal Department of Health, 2019). Convenience sampling of OTLs was done by selecting all the 11 district managers who, in turn, gave us names and contact details of any one OTL in their districts. Due to the COVID-19 regulations at the time of the study, the OTLs were interviewed telephonically using a semi-structured interview guide in the two languages most commonly used in KZN, English and isiZulu. All 11 OTLs gave verbal consent to participate in the study and opted to be interviewed in English.

The interviews were around the general perceptions of OTLs on the barriers to and facilitators of delivering HIV services by CHWs to the communities. According to the ward-based PHC outreach team policy framework, the HIV-related tasks that CHWs should deliver to communities are as listed in Table 2.

Interviews were between 25 and 40 minutes, depending on the depth of information that each interviewee gave. All the interviews were recorded using the smart phone call recorder application from Google Play store. Interviews were transcribed verbatim in English. Data were analysed inductively using thematic analysis guided by the Ritchie and Spencer thematic framework analysis (Ritchie & Spencer, 2002). After data familiarisation by two researchers, themes and subthemes were developed based on the identified challenges to or facilitators of HIV service delivery by CHWs. The transcripts were entered in Nvivo Pro 25 and the data were organised by coding extracts to the relevant themes.[1]

Ethics approval

This sub-study falls under the main study titled "Investigating the utilization of community health workers in rendering HIV services in KwaZulu-Natal, South Africa" which was approved by the Biomedical Research Ethics Council of the University of KwaZulu-Natal (#BREC 00000765/2019). Permission to interview OTLs was obtained from the KZN-DoH Health Research and Ethics Committee (#KZ_202002_008). All participants gave verbal consent to participate in the study after being given details about the study and the interview process.

Results

Characteristics of outreach team leaders

Table 3 shows the characteristics of the OTLs interviewed. Among the 11 OTLs, 10 (90.9%) were females and the majority had post-matric education (90.9%). Most (63.6%) of the OTLs have been working in the current clinic for more than one to five years.

Table 1. Four-point approach for sampling adapted for the study

	Name	Definition	Sampling and sampling strategy decisions for the study
Point 1	Define a sample universe	Establish a sample universe, specifically by way of a set of inclusion and/or exclusion criteria.	Community health workers employed by KZN-DoH for one year or more.
Point 2	Decide on a sample size	Choose a sample size or sample size range, by considering what is ideal and what is practical.	One outreach team leader from each of the 11 KZN districts (i.e. 11 OTL).
Point 3	Devise a sample strategy	Select a purposive sampling strategy to specify categories of persons to be included in the sample.	Convenience sampling strategy: district managers requested to select any one outreach team leader in their districts.
Point 4	Source the sample	Recruit participants from the target population.	Outreach team leaders requested to participate and give consent to participate.

Table 2. Scope and HIV related services offered by CHWs in KwaZulu-Natal

General scope of CHWs	HIV-related tasks
Promote health and prevent illness	• Promote HIV prevention, including HIV testing, encouraging condom use, encouraging partner reduction, promoting medical male circumcision, sexually transmitted infections (STI) treatment, promoting voluntary counselling and testing for HIV, distributing condoms.
Conduct community assessments & mobilise around community needs	• Support HIV educational and treatment literacy campaigns. • Distribute condoms in non-traditional outlets.
Conduct structured assessment to assess households	• Identify persons who are at risk of contracting HIV and refer them for HIV testing and counselling (HCT). Provide adherence support and counselling for those on ART treatment. • Facilitate early referral for CD4 testing.
Provide psychosocial support	• Provide an integrated approach to adherence support for HAART.
Identify and manage minor health problems	• Identify persons with opportunistic infections and refer persons with sexually transmitted diseases. • Promote and support good nutrition and nutritional supplements.
Support screening and other programmes in schools	• Support gender-sensitive school & youth HIV-prevention programmes
Promote and work with other sectors & undertake collaborative community-based interventions	• Participate in intersectoral prevention campaigns: HIV
Support continuum of care through service coordination with other relevant service providers	• Assist community members to access services (health and other required services). • Provide follow-up support and care. • Refer community members to health services and social and other community-based services offered by other sectors.

Thematic analysis

The thematic analysis of the data resulted in four main themes: (1) community dynamics; (2) community health worker HIV-positive status; (3) health system associated factors; and (4) fear of COVID-19. Some of the main themes had sub-themes. Some themes or sub-themes acted as both barriers and facilitators or as either a barrier to or a facilitator of providing HIV services, depending on the context in which they existed in a district.

Theme 1: community dynamics

Sub-theme: household unavailability

The coincidental absence of household members during CHW visits presented a barrier in the provision of HIV services by CHWs. The CHWs could provide HIV services only to those present at the time of their visits with the absent members missing this opportunity. Additionally, the OTLs mentioned that the communities often expect the CHWS to come back the same day to visit the family members that were absent during the day's visit which is impossible. The coincidental absence of family members during CHWs' visits was perceived as a barrier by some OTLs:

> *There are too many members who are not present at the same time during the CHWs' visit. The CHW cannot afford to repeatedly go back in the same household to render services to the family members that were not present during the allocated day visit* (District 3).

Similarly, when CHWs visit households, they often find locked gates with no one at home. According to the OTLs, CHWs do not make appointments with families and so when they visit households there is a possibility of not finding the house occupants. This unavailability of household members poses a barrier to providing HIV services by CHWs. Furthermore, if a household misses this opportunity of receiving HIV services, it may take months before the CHW visits the same household, as expressed by the OTL from District 5.

> *Sometimes you find that a community caregiver visits a home and then finds no one. She will then leave and may only come back months later to the same household. Their [CHW] visits are ad hoc and they do not make appointments with anyone. They just come and knock at the door* (District 5).

Sub-theme: HIV stigma within communities

Due to some household members suffering from HIV stigma, OTLs mentioned that some family members do not want to inform CHWs during house visits that one or more of the family members have HIV:

> *The communities hide HIV-positive people so that community care givers are not able to provide the*

Table 3. Characteristics of study participants (*N* = 11)

Variable	Categories	Frequency *n* (%)
Sex	Female	10 (90.9)
	Male	1 (9.1)
Education level	Grade 5–12	1 (9.1)
	Post matric	10 (90.9)
Duration of outreach team leader post	1–5 years	7 (63.6)
	6–10 years	4 (36.4)
	1 year	1 (9.1)
Duration in current clinic	>1–5 years	7 (63.6)
	6–10 years	3 (27.3)
	1–10 years	2 (18.2)
Number of community health care workers supervising	11–15	2 (18.2)
	16–20	2 (18.2)
	21–25	2 (18.2)
	More than 25	3 (27.3)

service. When the person is critical, the family take them to the facility where they die. The district then comes to community care givers and says how come the patient never received treatment (District 9).

In these cases, the family members who are HIV-positive missed benefiting from the HIV services offered by CHWs, for example, free condoms, as articulated by the OTL from District 3.

Sisi [sister], my CHWs sometimes tell me that they know that so and so has HIV because they see them collecting ARVs at the clinic but when they go to that person's house the person tell lies and says he is HIV negative and does not need condoms. Now my CHWs cannot force him to take the condoms (District 3).

According to the OTL's perceptions, the HIV stigma came either from the family members of HIV-positive people or from HIV-positive people themselves.

Sub-theme: traditional beliefs

Due to traditional beliefs in traditional medicines as opposed to modern medicine, some people did not want to accept the HIV services offered by the CHWs. In these instances, the CHWs are hindered from providing their routine HIV services since they cannot coerce anyone to receive them. Therefore, OTLs perceived traditional beliefs as a barrier to rendering HIV services by the CHWs:

Communities don't accept their [CHWs'] services because they believe in using traditional muthi [medicine]. They do not want to even hear what they want to tell them and that hinders the provision of HIV services that community care givers are bringing in their homes (District 5).

I was told by one of my community care givers that some people tell them that the traditional medicine has helped them to gain weight and therefore will refuse any counselling and referral to the nearby clinic by the community care givers in order to initiate antiretroviral treatment in the clinic (District 1).

The above quotes also allude to the non-acceptance of CHWs' HIV services due to the overpowering trust in traditional medicine, to the extent that CHWs are not even given a chance to educate them about modern medicine.

Theme 2: community health workers' HIV-positive status

The OTLs perceived that CHWs' personal experiences as a result of being HIV-positive culminated in a positive attitude towards delivering HIV services among these CHWs which, in turn, facilitated the provision of HIV services. This came up in most districts, as evidenced below:

The *community care givers that are HIV-positive themselves have mentioned that when they disclosed about their positive HIV status to the family members, they are also able to relate to her and open up freely to her* (District 5).

The OTL from District 9 expressed the same perception as other OTLs, that is, when CHWs disclose their HIV status to the communities, their HIV services were welcomed with ease by the communities:

What I can also say is that most of our community care givers are also HIV-positive. They disclose this to us and also to the people during house visits, so the people out there can easily accept them and the HIV services that they give (District 9).

Theme 3: health system associated factors

Sub-theme: human resources

All the district OTLs perceived that the shortage of CHWs hindered the provision of HIV services by CHWs to many households:

Can I say something. You know in our district, for years now, there are some people who have never seen a caregiver (CHW) in their homes because the number of community care givers allocated to our district is very small compared to the huge numbers of people. Bayobaqeda nini? [When will they ever reach them?] It is tough for them [CHW] (District 7).

Most OTLs mentioned that the scarcity of CHWs is chronic since some of the areas have not even one CHW allocated to them. The OTLs called the areas with no CHWs '*grey areas*' as articulated by an OTL from District 8:

Some areas are grey areas [have no community health care workers assigned to them]. community care givers need to cover 80 households but instead community care givers end up covering also these grey areas ending up doing more than 80 households. Some areas are not covered by community care givers. DoH needs to employ more community care givers (District 8).

When it comes to HIV services provided by CHWs in this district, we have noticed that not all the people receive these services because CHWs are not able to visit them. When they [CHWs] retire or die, they are never replaced. For this reason, their number become lesser and lesser, making it difficult to cover our whole district (District 2).

Generally, the shortage of CHWs was voiced as one of the major concerns by the District OTLs who felt that it is a long-standing problem. Furthermore, the non-replacement of CHWs when they die or retire seems to exacerbate the CHW shortage problem.

Sub-theme: other resources

Other resources referred to any other resources excluding human resources required by CHWs in order to provide HIV services in the communities (e.g., equipment, transport, personal protective equipment).

First, in most the districts, CHWs are not provided with transport by the health system, leading to households not being visited by the CHWs:

They cannot go to other places especially those that are in deep rural areas because the households are too far. They have no transport allocated for their (CHWs) services. I have to organise transport with the clinic and drive them to the households on certain days, but I cannot do this all the time (District 1).

The CHWs are willing to help the people all the time. People are very sick with HIV and they refuse to go to the clinic so with the help of the CHWs they are

able to be linked to the clinics to receive care but unfortunately the Department does not give us a car so that we can be able to reach these people. Our community care givers walk daily to visit households and it is impossible to cover all houses in this district on foot (District 3).

According to most OTLs, CHWs are not provided with transport to visit households and are then required to walk to provide HIV services. Without a car, some households are not reached and end up not receiving the HIV services. However, this was not the case in District 4. The OTL from District 4 mentioned that their CHWs are recruited from and deployed to areas closest to their residences and therefore these CHWs were not hindered by transport in providing HIV services as they could easily walk to the nearby households. Seemingly, recruitment and deployment of CHWs to areas closest to their residences mitigated the transport dilemma faced by the other districts:

What I can say helps our community care givers is that all of them are working in an area closest to them so transport is not an issue (District 4).

This was the first district variation in the provision of HIV services construed from the OTLs' perceptions. Transport was either a facilitator or a barrier in the provision of HIV services based on the recruitment and the deployment of CHWs.

Second, some OTLs perceived that due to lack of resources (for example, gloves, health screening forms, cooler boxes for medicine, cell phones), CHWs cannot provide HIV services effectively:

We have a problem whereby we order things like gloves, personal protective equipment but they do not come. As a ward-based outreach team supervisor, I now rely on the stocks from the clinic. Sometimes the clinic as well doesn't have the stuff and so we cannot send caregivers without the necessary resources (District 7).

*Community care givers have really limited resources. Whatever they have it's provided by the stock ordered by the clinics for the clinics. They also do not have cell phones which makes it difficult to track them and assist them when they need help. They also have no cooler bags to put medication, so they carry a cardboard with ice packs and carry that to household*s (District 2).

However, an OTL from District 1 mentioned that CHWs in her district had cell phones which facilitated the provision of HIV services by CHWs. Cell phones assisted CHWs with HIV screening since the form was available online. Furthermore, cell phones were used as a vital communication tool between the CHWs and OTLs, allowing prompt assistance to problems encountered by CHWs during home visits:

They [CHWs] also got cell phones from last year from a supporting partner. They register new patients and screen them for HIV using the phone. With their phones, you can see what they have done every day so that if I suspect problems I can assist them immediately. They can also contact me anytime as we all have mobile phones should they need my assistance (District 1).

This was the second district variation noted. Only one district out of 11 provided cell phones to CHWs. However, the cell phones were not provided by the provincial Department of Health but were donated by a non-government organisation (NGO).

Sub-theme: CHW education and training

All OTLs except for one at District 6 perceived that the poor education and lack of formal training of CHWs was a barrier to their provision of HIV services:

Because community care givers are not educated, they must be thoroughly monitored, and it takes time to explain concepts to them. There are immunization cards for HIV positive children and they need to check if the appointments are kept so if they are not too educated, they cannot do a proper check (District 4).

They [CHWs] can't go into details how ART works so they cannot go into deeper details about the pills and their side effects. You must understand that community care givers are not too educated (District 1).

However, in District 6, the OTL thought that the training received by the CHWs when they are first employed facilitates delivery of efficient HIV services to the communities:

The community care givers have knowledge regarding HIV because of the course they attended so it is easier for them to explain about HIV and communities do understand (District 6).

The OTLs had mixed perceptions regarding training received by CHWs in their districts. However, the majority of OTLs perceived that lack of education and training was a barrier to the provision of HIV services among CHWs.

Sub-theme: CHW supervision

In all districts, OTLs had a perception that their support and supervision was a key facilitator for the provision of HIV services by the CHWs.

We have weekly meetings so that they [CHWs] can tell us their difficulties so that I can offer advice and help. When they go back to the households, they are able to answer any questions that were not answered before. If it needs me to be there, I go with them to the household to ensure that there is an agreement between the community care giver and the family members (District 8).

You must understand that sometimes the people in the communities test them [CHWs] to see how much they know. So, I always avail myself to teach community care givers about HIV concepts like CD4 count, viral load and PrEP so that when they approach households, they do so with confidence. In return communities respect them when they can answer their questions (District 3).

Theme 4: fear of COVID-19

The study was conducted during South African lockdown level 3 of the corona virus disease 2019 (COVID-19) pandemic. The fear of COVID-19 by CHWs was a barrier to the provision of HIV services by CHWs and this was repeatedly mentioned by all OTLs:

In our district the community care givers are not going to the households because of Covid. So, the people are not receiving any health care services that are normally provided by our community care givers. It is terrible at the moment (District 2).

For some time now the community care givers have not been able to visit the people in their homes because of Covid. They are scared that they are going to get Covid. They stay in the clinic and assist with other errands. Some have stayed away from work (District 7).

The fear of COVID-19 was expressed as a major barrier to the delivery of HIV services by CHWs in all the KZN districts.

Discussion

The study aimed to explore the perceptions of OTLs regarding the barriers to and facilitators of providing HIV services in KZN. Overall, our study identified four emergent themes and sub-themes to which barriers to and facilitators of the provision of HIV services were linked. The four themes were: (1) community dynamics (sub-themes: unavailability of communities during CHW visits; HIV stigma and traditional beliefs); (2) community health worker HIV-positive status; (3) health system associated factors (sub-themes: human resources; other resources; CHWs' education and training and OTL supervision and support); and (4) fear of COVID-19. The barriers identified in the study were family members that were absent during CHW visits, HIV stigma within the communities, shortage of CHWs, lack of transport, lack of equipment and other resources required for the provision of HIV services, lack of education and training among CHW and fear of Covid-19 among CHWs. The facilitators identified in the study were CHWs positive attitude towards providing HIV services when they were HIV-positive themselves, ease of access to households when CHWs were recruited and deployed to the areas in which they resided since they did not require transport, having cell phones, receiving training, supervision and support from OTLs. There was slight variations in the districts concerning transport, cell phones and CHW training with most districts reporting them as a barrier to the delivery of HIV services by CHWs and some as a facilitator.

Regarding community dynamics in KZN, CHWs' visits are not appointment-based so there remains a likelihood of not finding the house occupants during home visits. This is detrimental when CHWs' home visits have shown that they escalate HIV prevention and early detection of serious conditions that require referral, not only in South Africa but worldwide (Laurenzi et al., 2021; Loeliger et al., 2016a; Peretz et al., 2020)

The HIV stigma is a key barrier to the provision of HIV services by the CHWs as found in other studies conducted in KZN (Iwuji et al., 2020; Maddocks et., 2020). Similarly, our study found that HIV stigma, which HIV-positive individuals have (self-stigma) or their families have hindered the provision of HIV services. The HIV positive individuals and their families did not want CHWs to find out about their HIV-positive status or that of their family members, respectively. Stigma around HIV is a global challenge that undermines the fight against HIV and make people afraid to disclose their HIV status, seek out HIV information and services to reduce their risk of infection, and to adopt safer behaviours (Armstrong-Mensah et al., 2019; Mumin et al., 2018). Progressive community education on behavioural change about HIV facts is necessary in eliminating HIV stigma as successfully done in some parts of Kenya and the USA (Chenneville et al., 2019; Gwadz et al., 2018).

Similar to other study findings from South Africa and other sub-Saharan African countries, our study found that traditional beliefs were a barrier to the provision of HIV services by CHWs whereby the promise of a short-term, "curative" traditional remedy was more attractive than lifelong ART (Iwuji et al., 2020; Kok et al., 2017). Traditional beliefs outweighed faith in the health care system among communities.

Our study also showed that if CHWs were HIV-positive themselves and had a positive attitude towards delivering HIV services, communities could relate to them and receive the HIV services that they provide with ease. This enabling factor to providing HIV services was shown in previous studies in KZN whereby CHWs found it easy to provide HIV services and in turn were accepted by the communities when they divulged their HIV-positive status (Dageid et al., 2016). In Zimbabwe, CHWs that were HIV-positive felt that providing HIV services was a way of giving back the care they had received when they tested HIV-positive (Busza et al., 2018).

Generally, in South Africa and in sub-Saharan Africa, especially in rural areas where CHWs are mostly allocated, the health care workforce is seriously understaffed (DiCarlo et al., 2018; Katzen et al., 2020). In recent years, African countries, as well as KZN, have striven to expand and strengthen the CHW programme to mitigate the shortage of the general health care workforce (Katzen et al., 2020) and as a task-shifting initiative from WHO (World Health Organization, 2013). The scarcity of CHWs revealed in this study paints a more serious picture of the challenges in accessing and providing HIV health services by communities and CHWs, respectively. In fact, KZN is a typical case found in sub-Saharan countries which where a shortage of CHWs is prevalent, thus negatively affecting the delivery of health services to the communities (Baatiema et al., 2016; De Neve et al., 2017a).

Regarding transport, the majority of the districts indicated that there was no transport allocated to the CHWs and hence they had to walk long distances to provide HIV services to households. This resulted in some of the households not being visited by the CHWs, especially those that were very far from the clinics at which CHWs were based. This finding has also been reported in previous KZN studies (Cobbing et al., 2017; van Heerden et al., 2017) and in other low- and middle-income countries where CHWs are unable to access marginalised and hard-to-reach populations (Austin-Evelyn et al., 2017; Doherty et al., 2017). However, there was variation in this perception since one District (District 4) did not view the lack of transport as a barrier to the provision of HIV services since CHWs in the district were recruited in and deployed to their residence areas and therefore simply walked to neighbouring households and did not need transport. Recruiting and deploying CHWs in

their residence areas has been reported to be beneficial for communities since CHWs can relate to the challenges faced by the communities and can transcend cultural barriers in order to provide the necessary health services (Shahidi et al., 2015). Furthermore, deploying CHWs closest to their homes has been a tool for community empowerment, that is, the communities taking control of the health challenges they face (Shahidi et al., 2015).

Pertaining to other resources, most districts reported a shortage of equipment as a barrier to HIV services. For example, when CHWs do not have screening forms, they cannot conduct HIV screening of clients. However, in one district, CHWs who had cell phones used them for HIV screening and for constant support and supervision by OTLs. This particular cell phone variation may be due to the level of stakeholder support in each district. Generally, in SA, the districts have varied external stakeholder support for the CHW programme who are accountable at either district, provincial or national level (De Neve et al., 2017b). Since 2016, cells phones are progressively reported as an important facilitator in providing health and HIV services by CHWs in low- and middle-income countries (Bennett, 2016; Ilozumba et al., 2018). Not only have they been reported as facilitating support and supervision between CHWs and OTLs, but also between communities and CHWs whereby communities can seek HIV-related health advice from CHWs or they send text clinic-appointment reminders to their clients (Bennett, 2016; DiCarlo et al., 2018).

In our study, OTLs themselves reported that their supervision assisted CHWs in solving various problems hence enabling the provision of HIV services. Our study findings concur with the study conducted in SA which showed that CHWs have a good working relationship with the OTLs which contributes to effective health service delivery by CHWs (Ramukumba, 2020). However, our findings contradict those in other African countries, as well as in South African and KZN, which reported the lack of CHW supportive supervision as a barrier to the provision of HIV services (Bell et al., 2019; Busza et al., 2018; Celletti et al., 2010; De Neve et al., 2017b; Mburu & George, 2017; Mottiar & Lodge, 2018; Suri et al., 2007; Visagie, 2015; White et al., 2017). These contradictory findings demand a standardised but flexible method for assessing CHW service delivery, which takes into account the every-changing the local context (Miller et al., 2020)

There was variation in the training offered to CHWs in KZN that needs to be explored in future research. There was a double dilemma caused by the lack of CHW training and low education levels, which hindered CHWs from providing communities with clear and accurate HIV guidance. Studies conducted in some low- and middle-income countries have shown that inadequate CHW training leads to poor HIV service delivery and health outcomes (Cobbing et al., 2017; Geldsetzer et al., 2017; Mireku et al., 2014). Our study findings showed that adequate CHW training facilitates HIV service delivery by this cadre. This was the third variation noted in KZN where some districts had CHWs who lacked training and one district that was confident in the training that their CHWs received. Nevertheless, when CHWs have received training, this has been reported as a facilitator of delivering HIV services by CHWs in studies conducted in KZN and in low- and middle-income countries (Bennett, 2016; Busza et al., 2018; Cataldo et al., 2015). Furthermore, as new HIV information evolves, the training offered to CHWs must be continuous with refresher training at agreed intervals, as is the case for CHWs in Zimbabwe (Busza et al., 2018). This will ensure that CHWs have current and relevant HIV information.

In terms of the last theme, Fear of COVID-19, this was one of the major barriers in the provision of HIV services by CHWs. Globally, the fear of COVID-19 by CHWs hindered the provision of HIV services (Gonzalez et al., 2020; Gribble et al., 2020; Handayani et al., 2020; Kazlauskas & Quero, 2020; Marmarosh et al., 2020; Ming-Chu et al., 2020). A six-month disruption in antiretroviral therapy (ART) delivery for HIV could result in increased deaths (Keene et al., 2020) and therefore continuation of HIV services must be prioritised. The South African president encouraged South Africans to "*learn to live with the virus*" (Khoza, 2021) which translates into CHWs finding means to overcome their fear and continue to provide uninterrupted HIV services safely that are desperately needed by the communities of KZN. However, without the KZN health system's support for the CHWs to overcome the fear of COVID-19, the CHWs will remain bound by this fear. Moreover, CHWs in KZN have been reported to believe false information about COVID-19 which exacerbates their fear of COVID-19 (Schmidt et al., 2020). Although it is not the sole and ultimate support for CHWs in overcoming COVID-19 fear, the South African government has ensured timeous dissemination of correct COVID-19 information on major platforms that are easily accessible by most citizens (Staunton et al., 2020). It is crucial that the KZN-DoH finds strategies to alleviate COVID-19 fear among this cadre, especially when they have shown to be a vital community health resource during the COVID-19 pandemic (Ray & Mash, 2021).

To optimise the role of CHWs, the CHW programme must endeavour to maintain and even maximise facilitators of delivering HIV services. Furthermore, the CHW programme may need to collaborate with the key informants in the KZN-DoH to ensure that enough CHWs are recruited and deployed in areas where the CHWs reside to mitigate CHW shortages and CHW transport challenges, respectively. Also, training and supportive supervision of CHWs must be enhanced. Additionally, CHWs must be trained continuously and be equipped with the necessary resources for efficient HIV delivery in their communities. Community health workers are the cornerstone of the imminent roll-out of the country's universal health coverage (National Health Insurance). This study shows that the current setup of CHWs and the variations in the KZN districts are dire and call for an urgent mitigating strategy in order for universal health coverage to be successful.

The strength of this study lies in the methodology. We applied all the qualitative study measures as advised in the literature, for example, the four-point sampling, the recruiting strategy and an analysis that was guided by a widely used framework (Ritchie and Spencer framework). Additionally, as South Africa anxiously awaits the roll-out of the NHI, the results of this study will guide policy and strengthen the utilisation of CHWs in the NHI roll-out.

The study was limited by telephonic interviews which deprived the researcher of observing interviewees' physical visual reactions, for example body language and facial expression. Also, for qualitative research, sample size still remains an area of conceptual debate and practical uncertainty (Vasileiou et al., 2018). The conveniently selected sample size of one OTL per district is small and is a limitation to our study. Furthermore, self-reporting bias with regards to supervision of CHWs poses a limitation to the study since OTLs are bound to report in positive terms. Therefore, the authors recognise that the study findings are based on the OTLs' perceptions and hence cannot be treated as actual facts but can be viewed in parallel with other similar findings or phenomena.

Conclusion

The KZN-DoH, CHW programme shows a weakness in its setup and is faced with more barriers than facilitators in the provision of HIV services in communities. Additionally, the historic heterogeneity in the districts' barriers, support, and resource allocation calls for individual, district-targeted approaches that will alleviate the existing barriers. In spite of the challenges the CHWs face, they continue to do their best in delivering HIV services with the limited resources (human and other) at their disposal because of their commonly known altruistic nature (Chibanda et al., 2017; Cobbing et al., 2017; Declaration of ALMA-ATA, 2015; White et al., 2017). The effective utilisation of CHWs in providing HIV services may have positive health outcomes in KZN communities with high HIV-prevalence.

Note

1. The data underlying this article will be shared on reasonable request to the corresponding author.

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References

Armstrong-Mensah, E., Hernandez, P., Huka, M., Suarez, A., Akosile, A., Joseph, A., & Ramsey-White, A. J. (2019). HIV Stigma among women and adolescent girls in South Africa: Removing barriers to facilitate prevention. *Madridge Journal of AIDS, 3*(1), 69–74. https://doi.org/10.18689/mja-1000112

Assegaai, T., & Schneider, H. (2019). National guidance and district-level practices in the supervision of community health workers in South Africa: A qualitative study. *Human Resources for Health, 17*, Article 25. https://doi.org/10.1186/s12960-019-0360-x

Austin-Evelyn, K., Rabkin, M., Macheka, T., Mutiti, A., Mwansa-Kambafwile, J., Dlamini, T., & El-Sadr, W. M. (2017). Community health worker perspectives on a new primary health care initiative in the Eastern Cape of South Africa. *PLoS One, 12*(3), e0173863. https://doi.org/10.1371/journal.pone.0173863

Baatiema, L., Sumah, A. M., Tang, P. N., & Ganle, J. K. (2016). Community health workers in Ghana: the need for greater policy attention. *BMJ Global Health*, *1*(4), e000141. https://doi.org/10.1136/bmjgh-2016-000141

Bell, J., Sharma, S., Malone, S., Levy, M., Reast, J., Little, K., & Hasen, N. (2019). Understanding barriers to HIV testing and treatment: A study of young men and healthcare providers in KwaZulu-Natal and Mpumalanga. *South African Health Review, 2019*(1), 125–132.

Bennett, C. A. (2016). *Urban health systems strengthening: The community defined health system for HIV/AIDS and diabetes services in Korogocho, Kenya.* (PhD dissertation, George Washington University). Retrieved from https://scholarspace.library.gwu.edu/etd/9593tv387

Busza, J., Dauya, E., Bandason, T., Simms, V., Chikwari, C. D., Makamba, M., Mchugh, G., Munyati, S., Chonzi, P., & Ferrand, R. A. (2018). The role of community health workers in improving HIV treatment outcomes in children: Lessons learned from the ZENITH trial in Zimbabwe. *Health Policy and Planning, 33*(3), 328–334. https://doi.org/10.1093/heapol/czx187

Cataldo, F., Kielmann, K., Kielmann, T., Mburu, G., & Musheke, M. (2015). 'Deep down in their heart, they wish they could be given some incentives': A qualitative study on the changing roles and relations of care among home-based caregivers in Zambia. *BMC Health Services Research, 15*, Article 36. https://doi.org/10.1186/s12913-015-0685-7

Celletti, F., Wright, A., Palen, J., Frehywot, S., Markus, A., Greenberg, A., de Aguiar, R. A. T., Campos, F., Buch, E., & Samb, B. (2010). Can the deployment of community health workers for the delivery of HIV services represent an effective and sustainable response to health workforce shortages? Results of a multicountry study. *AIDS (London, England), 24*(Suppl 1), S45–S57. https://doi.org/10.1097/01.aids.0000366082.68321.d6

Chenneville, T., Gabbidon, K., Drake, H., & Rodriguez, L. (2019). Preliminary findings from the HIV SEERs project: A community-based participatory research program to reduce HIV stigma among youth in Kenya. *Journal of the Association of Nurses in AIDS Care, 30*(4), 462–473. https://doi.org/10.1097/JNC.0000000000000019

Chibanda, D., Cowan, F., Verhey, R., Machando, D., Abas, M., & Lund, C. (2017). Lay health workers' experience of delivering a problem solving therapy intervention for common mental disorders among people living with HIV: A qualitative study from Zimbabwe. *Community Mental Health Journal, 53*(2), 143–153. https://doi.org/10.1007/s10597-016-0018-2

Chimbindi, N., Mthiyane, N., Birdthistle, I., Floyd, S., McGrath, N., Pillay, D., Seeley, J., Zuma, T., Dreyer, J., Gareta, D., Mutevedzi, T., Fenty, J., Herbst, K., Smit, T., Baisley, K., & Shahmanesh, M. (2018). Persistently high incidence of HIV and poor service uptake in adolescent girls and young women in rural KwaZulu-Natal, South Africa prior to DREAMS. *PLoS One, 13*(10), e0203193. https://doi.org/10.1371/journal.pone.0203193

Cobbing, S., Chetty, V., Hanass-Hancock, J., & Myezwa, H. (2017). "Knowing I can be helpful makes me feel good inside, it makes me feel essential": Community health care workers' experiences of conducting a home-based rehabilitation intervention for people living with HIV in KwaZulu-Natal, South Africa. *AIDS Care, 29*(10), 1260–1264. https://doi.org/10.1080/09540121.2017.1290208

Dageid, W., Akintola, O., & Sæberg, T. (2016). Sustaining motivation among community health workers in AIDS care in KwaZulu-Natal, South Africa: Challenges and prospects. *Journal of Community Psychology, 44*(5), 569–585. https://doi.org/10.1002/jcop.21787

Daviaud, E., Besada, D., Budlender, D., Sanders, D., & Kerber, K. (2018). Saving lives, saving costs: Investment case for community health workers in South Africa. Cape Town: South African Medical Research Council. https://www.samrc.ac.za/sites/default/files/files/2017-10-30/SavingLivesSavingCosts.pdf

Declaration of ALMA-ATA. (2015). *American Journal of Public Health, 105*(6), 1094–1095. https://doi.org/10.2105/AJPH.2015.10561094

De Neve, J.-W., Boudreaux, C., Gill, R., Geldsetzer, P., Vaikath, M., Bärnighausen, T., & Bossert, T. J. (2017a). Harmonizing community-based health worker programs for HIV: A narrative review and analytic framework. *Human Resources for Health, 15*, Article 45. https://doi.org/10.1186/s12960-017-0219-y

De Neve, J. W., Garrison-Desany, H., Andrews, K. G., Sharara, N., Boudreaux, C., Gill, R., Geldsetzer, P., Vaikath, M., Bärnighausen, T., & Bossert, T. J. (2017b). Harmonization of community health worker programs for HIV: A four-country qualitative study in Southern Africa. *PLoS Medicine, 14*(8), e1002374. https://doi.org/10.1371/journal.pmed.1002374

DiCarlo, A., Fayorsey, R., Syengo, M., Chege, D., Sirengo, M., Reidy, W., Otieno, J., Omoto, J., Hawken, M. P., & Abrams, E. J. (2018). Lay health worker experiences administering a multi-level combination intervention to improve PMTCT retention. *BMC Health Services Research, 18*, Article 17. https://doi.org/10.1186/s12913-017-2825-8

Doherty, T., Besada, D., Goga, A., Daviaud, E., Rohde, S., Raphaely, N. J. G., & health. (2017). "If donors woke up tomorrow and said we can't fund you, what would we do?" A health system dynamics analysis of implementation of PMTCT option B+ in Uganda. *Global Health 13,* Article 51. https://doi.org/10.1186/s12992-017-0272-2 .

Dzomba, A., Tomita, A., Vandormael, A., Govender, K., & Tanser, F. (2019). Effect of ART scale-up and female migration intensity on risk of HIV acquisition: Results from a population-based cohort in KwaZulu-Natal, South Africa. *BMC Public Health, 19*, Article 196. https://doi.org/10.1186/s12889-019-6494-x

Erlandson, K. M., & Karris, M. Y. (2019). HIV and aging: Reconsidering the approach to management of comorbidities. *Infectious Disease Clinics, 33*(3), 769–786.

Geldsetzer, P., Francis, J. M., Ulenga, N., Sando, D., Lema, I. A., Mboggo, E., Vaikath, M., Koda, H., Lwezaula, S., Hu, J., Noor, R. A., Olofin, I., Larson, E., Fawzi, W., & Barnighausen, T. (2017). The impact of community health worker-led home delivery of antiretroviral therapy on virological suppression: A non-inferiority cluster-randomized health systems trial in Dar es Salaam, Tanzania. *BMC Health Services Research, 17*, Article 160. https://doi.org/10.1186/s12913-017-2032-7

Gonzalez, A., Cervoni, C., Lochner, M., Marangio, J., Stanley, C., & Marriott, S. (2020). Supporting health care workers during the COVID-19 pandemic: Mental health support initiatives and lessons learned from an academic medical center. *Psychological Trauma: Theory, Research, Practice, and Policy, 12*(S1), S168–S170. https://doi.org/10.1037/tra0000893

Gribble, K., Mathisen, R., Ververs, M.-T., & Coutsoudis, A. (2020). Mistakes from the HIV pandemic should inform the COVID-19 response for maternal and newborn care. *International Breastfeeding Journal, 15*, 67. https://doi.org/10.1186/s13006-020-00306-8

Günbayi, I., & Sorm, S. (2018). Social paradigms in guiding social research design: The functional, interpretive, radical humanist and radical structural paradigms. *International Journal on New Trends in Education and their Implications 9*, 57–76.

Gwadz, M., Leonard, N. R., Honig, S., Freeman, R., Kutnick, A., & Ritchie, A. S. (2018). Doing battle with "the monster": How high-risk heterosexuals experience and successfully manage HIV stigma as a barrier to HIV testing. *International Journal for Equity in Health, 17*, Article 46. https://doi.org/10.1186/s12939-018-0761-9

Handayani, R. T., Kuntari, S., Darmayanti, A. T., Widiyanto, A., & Atmojo, J. T. (2020). Factors Causing Stress in Health and Community When the Covid-19 Pandemic. *Jurnal Keperawatan Jiwa, 8*(3), 353–360. https://doi.org/10.26714/jkj.8.3.2020.353-360

Hing, M., Hoffman, R. M., Seleman, J., Chibwana, F., Kahn, D., & Moucheraud, C. (2019). 'Blood pressure can kill you tomorrow, but HIV gives you time': Illness perceptions and treatment experiences among Malawian individuals living with HIV and hypertension. *Health Policy and Planning, 34*(Supplement_2), ii36–ii44. https://doi.org/10.1093/heapol/czz112

Human Sciences Research Council. (2018). *The fifth South African national HIV prevalence, incidence, behaviour and communication survey, 2017*. Cape Town: HSRC Press. http://www.hsrc.ac.za/uploads/pageContent/9234/SABSSMV_Impact_Assessment_Summary_ZA_ADS_cleared_PDFA4.pdf

Ilozumba, O., Dieleman, M., Kraamwinkel, N., Van Belle, S., Chaudoury, M., & Broerse, J. E. W. (2018). "I am not telling. The mobile is telling": Factors influencing the outcomes of a community health worker mHealth intervention in India. *PLoS One, 13*(3), e0194927. https://doi.org/10.1371/journal.pone.0194927

Iwuji, C., Chimukuche, R. S., Zuma, T., Plazy, M., Larmarange, J., Orne-Gliemann, J., Siedner, M., Shahmanesh, M., & Seeley, J. (2020). Test but not treat: Community members' experiences with barriers and facilitators to universal antiretroviral therapy uptake in rural KwaZulu-Natal, South Africa. *PLoS One, 15*(9), e0239513. https://doi.org/10.1371/journal.pone.0239513

Johnson, L. F., Dorrington, R. E., & Moolla, H. (2017). Progress towards the 2020 targets for HIV diagnosis and antiretroviral treatment in South Africa. *South African Journal of HIV Medicine, 18*(1), a694. https://doi.org/10.4102/sajhivmed.v18i1.694

Katzen, L. S., Tomlinson, M., Christodoulou, J., Laurenzi, C., le Roux, I., Baker, V., Mbewu, N., le Roux, K. W., & Rotheram Borus, M. J. (2020). Home visits by community health workers in rural South Africa have a limited, but important impact on maternal and child health in the first two years of life. *BMC Health Services Research 20*(1), 1–10. https://doi.org/10.1186/s12913-020-05436-7

Kazlauskas, E., & Quero, S. (2020). Adjustment and coronavirus: How to prepare for COVID-19 pandemic-related adjustment disorder worldwide? *Psychological Trauma: Theory, Research, Practice, and Policy, 12*(S1), S22–S24. https://doi.org/10.1037/tra0000706

Keene, C., Mohr-Holland, E., Cassidy, T., Scott, V., Nelson, A., Furin, J., & Triviño-Duran, L. (2020). How COVID-19 could benefit tuberculosis and HIV services in South Africa. *The Lancet. Respiratory Medicine, 8*(9), 844–846. https://doi.org/10.1016/S2213-2600(20)30311-8

Kharsany, A. B. M., Cawood, C., Khanyile, D., Lewis, L., Grobler, A., Puren, A., Govender, K., George, G., Beckett, S., Samsunder, N., Madurai, S., Toledo, C., Chipeta, Z., Glenshaw, M., Hersey, S., & Abdool Karim, Q. (2018). Community-based HIV prevalence in KwaZulu-Natal, South Africa: Results of a cross-sectional household survey. *The Lancet. HIV, 5*(8), e427–e437. https://doi.org/10.1016/S2352-3018(18)30104-8

Khoza, A. (2021). Ramaphosa calls for calm amid rising Covid-19 infections. *TimesLive*. Retrieved from https://www.timeslive.co.za/politics/2021-12-04-ramaphosa-calls-for-calm-amid-rising-covid-19-infections/

Kok, M. C., Broerse, J. E. W., Theobald, S., Ormel, H., Dieleman, M., & Taegtmeyer, M. (2017). Performance of community health workers: Situating their intermediary position within complex adaptive health systems. *Human Resources for Health, 15*, Article 59. https://doi.org/10.1186/s12960-017-0234-z

Kubheka, S. E., Archary, M., & Naidu, K. K. (2020). HIV viral load testing coverage and timeliness after implementation of the wellness anniversary in a paediatric and adolescent HIV clinic in KwaZulu-Natal, South Africa. *Southern African Journal of HIV Medicine, 21*, 1–5. https://doi.org/10.4102/sajhivmed.v21i1.1016

KwaZulu-Natal Department of Health. (2019). *Annual Performance Plan: 2017/18–2019/20*. Pietermaritzburg, KwaZulu-Natal. Accessed at https://www.kznhealth.gov.za/app.htm

Laurenzi, C. A., Skeen, S., Coetzee, B. J., Notholi, V., Gordon, S., Chademana, E., Bishop, J., & Tomlinson, M. (2021). Instructive roles and supportive relationships: Client perspectives of their engagement with community health workers in a rural South African home visiting program. *International Journal for Equity in Health, 20*, Article 32. https://doi.org/10.1186/s12939-020-01377-z

Levin, J., & Montano, M. (2019). What aging with HIV means in the year 2019. *AIDS Research and Human Retroviruses, 35*(11-12), 982–984. https://doi.org/10.1089/aid.2019.0114

Lister, H., White, M., & Govender, P. J. A. J. o. D. (2017). Community health workers lensed through a South African backdrop of two peri-urban communities in KwaZulu-Natal. *African Journal of Disability, 6*(0), a294. https://doi.org/10.4102/ajod.v6i0.294

Loeliger, K. B., Niccolai, L. M., Mtungwa, L. N., Moll, A., & Shenoi, S. V. (2016a). Antiretroviral therapy initiation and adherence in rural South Africa: Community health workers' perspectives on barriers and facilitators. *AIDS Care, 28*(8), 982–993. https://doi.org/10.1080/09540121.2016.1164292

Loeliger, K. B., Niccolai, L. M., Mtungwa, L. N., Moll, A., & Shenoi, S. V. (2016b). "I have to push him with a wheelbarrow to the clinic": Community health workers' roles, needs, and strategies to improve HIV care in rural South Africa. *AIDS Patient Care and STDs, 30*(8), 385–394. https://doi.org/10.1089/apc.2016.0096

Maddocks, S., Perumal, K., & Chetty, V. (2020). Schooling for children living with human immunodeficiency virus in a community in KwaZulu-Natal, South Africa: Perceptions of educators and healthcare workers. *The South African Journal of Physiotherapy, 76*(1), a1405. https://doi.org/10.4102/sajp.v76i1.1405

Marmarosh, C. L., Forsyth, D. R., Strauss, B., & Burlingame, G. M. (2020). The psychology of the COVID-19 pandemic: A group-level perspective. *Group Dynamics, 24*(3), 122–138. https://doi.org/10.1037/gdn0000142

Mburu, G., & George, G. (2017). Determining the efficacy of national strategies aimed at addressing the challenges facing health personnel working in rural areas in KwaZulu-Natal, South Africa. *African Journal of Primary Health Care & Family Medicine, 9*(1), a1355. https://doi.org/10.4102/phcfm.v9i1.1355

Mebane, S. (2020). *Community-Based pre-exposure prophylaxis implementation in rural KwaZulu-Natal: A feasibility study.* (PhD dissertation, Harvard Medical School). https://nrs.harvard.edu/URN-3:HUL.INSTREPOS:37364962

Miller, N. P., Richards, A. K., Marx, M. A., Checchi, F., & Kozuki, N. (2020). Assessing community health worker service delivery in humanitarian settings. *Journal of Global Health, 10*(1), 010307. https://doi.org/10.7189/jogh.10.010307

Ming-Chu, F., Hsiang-Chun, W. U., Hui-Tzu, L. I. N., Lei, L. E. I., Chia-Ling, C., Chun-Mei, L. U., & Wan-Ping, Y. (2020). Exploring the stress, psychological distress, and stress-relief strategies of Taiwan nursing staffs facing the global outbreak of COVID-19. *Journal of Nursing, 67*(3), 64–74.

Mireku, M., Kiruki, M., McCollum, R., Taegtmeyer, M., De Koning, K., & Otiso, L. (2014). *Context analysis: Close-to-community health service providers in Kenya.* (Working Paper). Nairobi: Reachout Consortium. http://medbox-stage.uscreen.net/context-analysis-close-to-community-health-service-providers-in-kenya/download.pdf

Mottiar, S., & Lodge, T. (2018). The role of community health workers in supporting South Africa's HIV/AIDS treatment programme. *African Journal of AIDS Research, 17*(1), 54–61. https://doi.org/10.2989/16085906.2017.1402793

Mumin, A. A., Gyasi, R. M., Segbefia, A. Y., Forkuor, D., & Ganle, J. K. (2018). Internalised and social experiences of HIV-induced stigma and discrimination in urban Ghana. *Global Social Welfare: Research, Policy & Practice, 5*(2), 83–93. https://doi.org/10.1007/s40609-018-0111-2

Naidoo, N., Matlakala, N., Railton, J., Khosa, S., Marincowitz, G., Igumbor, J. O., McIntyre, J. A., Struthers, H. E., & Peters, R. P. H. (2019). Provision of HIV services by community health workers should be strengthened to achieve full programme potential: A cross-sectional analysis in rural South Africa. *Tropical Medicine & International Health, 24*(4), 401–408. https://doi.org/10.1111/tmi.13204

Naidoo, N., Railton, J., Jobson, G., Matlakala, N., Marincowitz, G., McIntyre, J. A., Struthers, H., & Peters, R. P. (2018). Making ward-based outreach teams an effective component of human immunodeficiency virus programmes in South Africa. *Southern African Journal of HIV Medicine, 19*(1), a778. https://doi.org/10.4102/sajhivmed.v19i1.778

Ndaba, T., Taylor, M., & Mabaso, M. (2019). Training and evaluation of community health workers (CHWs): Towards improving maternal and newborn survival in an urban setting in KwaZulu-Natal, South Africa. *The Open Public Health Journal, 12*(1), 406–413. https://doi.org/10.2174/1874944501912010406

Peretz, P. J., Islam, N., & Matiz, L. (2020). Community health workers and Covid-19—addressing social determinants of health in times of crisis and beyond. *New England Journal of Medicine, 383*(19), e108. https://doi.org/10.1056/NEJMp2022641

Ponelis, S. R. (2015). Using interpretive qualitative case studies for exploratory research in doctoral studies: A case of information systems research in small and medium enterprises. *International Journal of Doctoral Studies, 10*(1), 535–550. https://doi.org/10.28945/2339

Ramukumba, M. M. (2020). Exploration of community health workers' views about in their role and support in primary health care in Northern Cape, South Africa. *Journal of Community Health, 45*(1), 55–62. https://doi.org/10.1007/s10900-019-00711-z

Ray, S., & Mash, R. (2021). Innovation in primary health care responses to COVID-19 in Sub-Saharan Africa. *Primary Health Care Research and Development, 22*, e44. https://doi.org/10.1017/S1463423621000451

Ritchie, J., & Spencer, L. (2002). Qualitative data analysis for applied policy research. In A. Michael Huberman & Matthew B. Miles (Eds.), *The qualitative researcher's companion* (pp. 305–329). Thousand Oaks, CA: SAGE Publications, Ltd. https://dx.doi.org/10.4135/9781412986274

Robinson, O. C. (2014). Sampling in interview-based qualitative research: A theoretical and practical guide. *Qualitative Research in Psychology, 11*(1), 25–41. https://doi.org/10.1080/14780887.2013.801543

Schmidt, T., Cloete, A., Davids, A., Makola, L., Zondi, N., & Jantjies, M. (2020). Myths, misconceptions, othering and stigmatizing responses to Covid-19 in South Africa: A rapid qualitative assessment. *PLoS One, 15*(12), e0244420. https://doi.org/10.1371/journal.pone.0244420

Schneider, H., Daviaud, E., Besada, D., Rhode, S., & Sanders, D. (2020). Ward-based primary health care outreach teams in South Africa. *CHW Central: A Global Resource for and about Community Health Workers. https://chwcentral.org/ward-based-primary-health-care-outreach-teams-in-south-africa/*

Shahidi, H., Sickora, C., Clancy, S., & Nagurka, R. (2015). Community health workers recruitment from within: An inner-city neighborhood-driven framework. *BMC Research Notes, 8*, Article 715. https://doi.org/10.1186/s13104-015-1700-0

Shamu, S., Chasela, C., Slabbert, J., Farirai, T., Guloba, G., & Nkhwashu, N. (2020). Social franchising of community-based HIV counselling and testing services to increase HIV testing and linkage to care in Tshwane, South Africa: Study protocol for a non-randomised implementation trial. *BMC Public Health, 20*, Article 118. https://doi.org/10.1186/s12889-020-8231-x

South African National Department of Health. (2018). *Policy Framework and Strategy for Ward Based Primary Healthcare Outreach Teams (2018/9–2023/2024)*. Pretoria: South African National Department of Health. Retrieved from http://www.health.gov.za/wp-content/uploads/2020/11/policy-wbphcot-4-april-2018_final-copy.pdf

Staunton, C., Swanepoel, C., & Labuschaigne, M. (2020). Between a rock and a hard place: COVID-19 and South Africa's response. *Journal of Law and the Biosciences, 7*(1), lsaa052. Advance online publication. https://doi.org/10.1093/jlb/lsaa052

Suri, A., Gan, K., & Carpenter, S. (2007). Voices from the field: Perspectives from community health workers on health care delivery in rural KwaZulu-Natal, South Africa. *The Journal of Infectious Diseases, 196*(Suppl 3), S505–S511. https://doi.org/10.1086/521122

Tollman, S. M. (1994). The Pholela Health Centre: The origins of community-oriented primary health care (COPC). *South African Medical Journal, 84*(10), 653–658.

Uwimana, J., Zarowsky, C., Hausler, H., & Jackson, D. (2012). Training community care workers to provide comprehensive TB/HIV/PMTCT integrated care in KwaZulu-Natal: Lessons learnt. *Tropical Medicine & International Health, 17*(4), 488–496. https://doi.org/10.1111/j.1365-3156.2011.02951.x

van Heerden, A., Harris, D. M., van Rooyen, H., Barnabas, R. V., Ramanathan, N., Ngcobo, N., Mpiyakhe, Z., & Comulada, W. S. (2017). Perceived mHealth barriers and benefits for home-based HIV testing and counselling and other care: Qualitative findings from health officials, community health workers, and persons living with HIV in South Africa. *Social Science & Medicine, 183*, 97–105. https://doi.org/10.1016/j.socscimed.2017.04.046

Vasileiou, K., Barnett, J., Thorpe, S., & Young, T. (2018). Characterising and justifying sample size sufficiency in interview-based studies: Systematic analysis of qualitative health research over a 15-year period. *BMC Medical Research Methodology, 18*, Article 148. https://doi.org/10.1186/s12874-018-0594-7

Visagie, B. B. (2015). *Work meaning constructions by lay community health workers in an HIV/AIDS palliative care setting: Community and adult education perspectives.* (PhD thesis, University of Johannesburg). http://hdl.handle.net/10210/14821

Wand, H., Reddy, T., & Ramjee, G. (2020). Temporal trends in sexual behaviours and their impacts on HIV incidence among South African women: 2002–2016. *AIDS Care, 33*(8) 1002–1008. https://doi.org/10.1080/09540121.2020.1789054

White, M. S., Govender, P., & Lister, H. E. (2017). Community health workers lensed through a South African backdrop of two peri-urban communities in KwaZulu-Natal. *African Journal of Disability, 6*, a294. https://doi.org/10.4102/ajod.v6i0.294

World Health Organization. (2013). *Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection: summary of key features and recommendations, June 2013*. Retrieved from https://apps.who.int/iris/bitstream/handle/10665/85322/WHO_HIV_2013.7_eng.pdf?sequence=1&isAllowed=y

Yang, H.-Y., Beymer, M. R., & Suen, S. (2019). Chronic Disease Onset Among People Living with HIV and AIDS in a Large Private Insurance Claims Dataset. *Scientific Reports, 9*, Article 18514. https://doi.org/10.1038/s41598-019-54969-3

Appendix 1. Interview guide for semi-structured interviews with OTLs (english)

Record (Please obtain consent and inform the participant that you will be recording BEFORE recording)

Date: Interview number:

District code: Facility:

Sex: Male Female

Highest education level: Post matric Matric Grade 8–11

How long have you been in this post? 0–1 yr 2–5 yrs >5 years

How long have you been working in this facility? 0–1 yr 2–5 yrs >5 yrs

How many CHWs do you supervise?

Do you know about the recent ward-based PHC outreach team policy that was launched in 2017? Yes No

If you do, what does the policy say about provision of HIV services by the CHWs?

What does the policy say about your responsibiliites as an OTL?

In your observation as an OTL, what are the facilitators of rendering HIV services by the CHWs at houselholds?

In general, what is your view on these facilitators?

In your observation as an OTL, what are the barriers to rendering HIV services by the CHWs at household level?

In general, what is your view on these barriers?

How do ensure that the CHWs provide efficient HIV services at households?
(Supervisory role)

Thank you