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Healthcare for truck drivers: Assessing accessibility and appropriateness of South African Roadside Wellness Centres

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ABSTRACT

Background: Truck drivers occupy a pivotal role in the economies of southern Africa, due to limited rail, water and other forms of transport of goods. The occupational nature of truck driving limits access to healthcare. North Star Alliance (North Star) offers a tailored primary healthcare service for truck drivers along the sub-Saharan trucking corridor.

Objectives: The overall objective of this study was to explore truck drivers' views regarding access to, and appropriateness of, selected South African North Star Roadside Wellness Centres (RWCs) coupled with understanding their health-seeking behaviour.

Methods: We conducted semi-structured interviews with two groups of purposively-sampled truck drivers: 24 who accessed North Star RWCs and 22 who knew about the centres but did not use them. The interviews explored access, health-seeking behaviour, and healthcare experiences. Additional information on risk perceptions emerged. Qualitative data were organised into four themes: client satisfaction, health-seeking behaviour, risk perception and behaviour, and service delivery strengthening.

Results: The majority of those interviewed were older (36–65 years old), South African, with secondary education, employed full-time, in stable relationships, and having children.

Overall users were satisfied with RWC locations, operating hours, infrastructure, and healthcare worker attitudes. Half of the non-users did not access routine healthcare anywhere. Non-users primarily did not access the RWCs because they did not know the operating times and preferred local facilities. Both groups used traditional healers and pharmacies. RWC users accessed traditional healers and pharmacies for services not available to them at the RWCs. Both groups reported not using private general practitioners or specialists. Both groups provided recommendations for strengthening the service delivery model including an increased focus on non-communicable diseases and occupationally-required health services including vaccinations. **Conclusion:** Comprehensive care packages delivered through accessible satellite facilities should form the foundation of service delivery models for truck drivers and other mobile populations.

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1. Introduction

Long working hours present limited opportunities for truck drivers to access healthcare facilities with limited opening hours, and make them vulnerable to unfavourable clinical outcomes (Lalla-Edward and Gomez, 2015; Lalla-Edward et al., 2016; DeVries et al., 2013; Olson et al., 2016; Robb and Mansfield, 2007; Apostolopoulos et al., 2013; Greenfield et al., 2016). Similar to its role in the United States economy (Harrison, 2009), the South African trucking industry has a major impact on the health and well-being of the overall economy, as it facilitates the movement of products nationally and internationally and contributes to social development (Fourie and Schoeman, 2006). With an approximate total of over 70 000 truck drivers in South Africa (Lalla-Edward and Gomez, 2015), efforts need to be directed towards prioritised healthcare interventions to maintain a healthy truck driver work force.

In response to this priority, several funders and implementers have developed interventions to address truck driver health needs. North Star Alliance (North Star) is a non-governmental organisation that engages in several public-private partnerships to alleviate healthcare challenges faced by truck drivers, sex workers and local communities around sub-Saharan transport corridors by providing services in Roadside Wellness Centres (RWCs) (North Star Alliance, 2014). RWCs are located in hotspots (identified through mapping exercises). These hotspots are typically areas where there would be a congregation of truck drivers daily; including areas on the trucking route, near depots (or hubs for freight and logistics companies) and within truck stops. They make use of converted shipping containers painted in blue (thus known in the communities they serve as the *blue box*) to provide an array of outreach and primary healthcare services, including sexual reproductive health services. Although largely focussing on screening clients for diseases and referring them to the nearest appropriate fixed healthcare facilities (where prior referral relationships have been established), North Star has partnered with organisations like Wits Reproductive Health and HIV Institute (Wits RHI) to expand and strengthen HIV and ART clinical services. North Star uses a networked patient record system (COMETS) which facilitates paperless retrieval of client records at any RWC along the corridor. Data for nine South African RWCs showed that at the end of September 2015 34 237 separate visits were recorded. Of this 16 784 were visits made by 13 328 different truck drivers (Fobosi et al., 2017).

Little is known about the health, health seeking and risk behaviour profiles of truck drivers in South Africa. A survey conducted in 1999 reported HIV prevalences of 69% in the 55–59 year age group (Ramjee and Gouws, 2002) while others reported 26% in 2003/4 (Delany-Moretlwe et al., 2014) and a sexually transmitted infection (STI) prevalence of 66% (Ramjee and Gouws, 2002). The lack of truck driver health evidence is compounded by the paucity of available, reported information on the acceptability and appropriateness of RWCs for the truck driver population. Using the North Star model of service delivery as a case study we gathered in-depth qualitative information on truck drivers' views about access to, and appropriateness of, the RWC concept for selected President's Emergency Plan for AIDS Relief (PEPFAR) supported South African RWCs. To be able to comprehensively understand truck drivers' views we chose to collect information from both users and non-users of the RWCs. The aim of this paper is to therefore present all these truck driver perspectives of, opinions about, and recommendations for, RWCs in South Africa. To contextualise recommendations the data on risk perceptions that emerged during the interviews are also reported on in this paper.

2. Methods

2.1. Setting

Six South African sites in six provinces (Cato Ridge (KwaZulu Natal), Bloemhof (North West), Ngodwana (Mpumalanga), Musina (Limpopo), City Deep (Gauteng) and Upington (Northern Cape)) were included in this evaluation. These sites were chosen because they were operational at the start of the evaluation.

Clinics became operational at different time points. Cato Ridge, City Deep and Ngodwana were all opened in September 2013. For logistic reasons City Deep was closed in September 2014 (and relocated to a more accessible location in Pomona). Musina, Upington and Bloemhof were opened in January 2014, February 2014 and March 2014 respectively (Fobosi et al., 2017).

All clinics operate on weekdays and are typically open for a minimum of six hours. Operating hours for some clinics have changed in the period after this research. However at the time of the data collection, Cato Ridge and Bloemhof were operating 14:00–22:00; Upington 18:00–22:00; Ngodwana 11:00–19:00 and Musina 07:00–15:00. The City Deep site primarily functioned as a mobile clinic. Healthcare workers are proficient in the vernacular mostly spoken in the location of the RWC that they co-ordinated and offered services from, as well as other South African official languages including English. This facilitates communication and service provision to both local and international clients.

All RWCs are classified as urban and located on busy routes in the South African trucking corridor. Cato Ridge and Upington are located slightly parallel to the major N3 and N10 highways respectively. Bloemhof and Ngodwana are situated on the very busy N12 and N4 highways respectively. Musina RWC is located close to the South Africa/ Zimbabwe border and is recognised as the busiest border crossing in Southern Africa. City Deep RWC was located in a retail centre which was a hub for the transport and freight industry using the N17 highway.

2.2. Pilot

Pilot interviews were conducted with five truck drivers at the City Deep RWC to ensure that the contents of the semi-structured interview guide were being interpreted (and administered) correctly by both the interviewer and truck drivers. During this pilot process we found that questions and discussions could not always be as long and in-depth as preferred because, in the case of the City Deep RWC which was located in a retail park central to many fast moving consumer goods (FMCG) companies, some truck drivers

Table 1
Outline of topics included in the semi-structured interview.

Who	Topic	Probes
Users	Access	Location Operating hours Services offered
Users and Non-users	Health seeking behaviour	General Health Healthcare access points Intrinsic health seeking decision making Occupational health Services accessed
User and Non-users	Overall experience	RWC awareness Overall experience Opinion on non-usage Recommendations

needed to load (mainly meat and fresh produce) and leave. Truck drivers did not have any objections to the topics covered neither did they have suggestions for inclusions to or exclusions from the guide. Instead of removing items from the guide, interviewers got experience on how to explain and conduct the discussion a bit faster if the situation required.

2.3. Data collection

Data collection took place over four months from December 2014 to March 2015. We used purposive sampling to recruit participants. Truck drivers were recruited from the truck stops and the immediate area surrounding the RWCs. These truck drivers were either classified as users (truck drivers who access(ed) any of the South African North Star RWCs) and non-users (truck drivers who knew about the South African North Star RWCs but chose not to use them). A total of 96 truck drivers were approached. 1 in every 1.5 truck driver users ($n = 35$) and 1 in every 2 non-users ($n = 44$) approached agreed to participate. The remaining 17 were not familiar with the RWCs. One major recruitment barrier was that truck drivers lacked time during the day to participate in the interviews.

Data were collected by a male interviewer using the final semi-structured interview guide and covered three main areas as outlined in Table 1. Since the primary function of the interviews was to gather information on access to care and appropriateness of the RWC in meeting the healthcare needs of truck drivers we probed on healthcare experiences, assessing access on the three components of geographic location, operating hours and package of services offered, and appropriateness. To enhance our understanding of service delivery gaps for all truck drivers and the user truck drivers' perspectives on access and appropriateness, we collected information on their health seeking behaviour.

Given the nature of truck driving, non-conventional methods of data collection had to be employed to overcome recruitment challenges. These included conducting interviews in the truck while truck drivers were waiting in the depot line (City Deep) to load or while having layovers late in the evening at truck stops. Additionally truck drivers were asked to complete a demographic questionnaire after the interviews. There was no reimbursement for participating in the interviews.

2.4. Data analysis

Interviews were audio-recorded and transcribed verbatim. Interviews that were conducted in isiZulu were translated into English and then back translated by a second transcriber. Timeous quality checking of all transcripts permitted real time changes to be made to the interview and transcribing/translating processes. All transcripts were imported and analysed using NVIVO 10. Our analytical process was guided by the framework method of analysis (Gale et al., 2013), in which we applied inductive reasoning using the grounded theory approach. After independently following the three steps of coding (1. open coding – data reduced to units of analysis/codes; 2. axial coding – focussing on themes as opposed to the actual codes and 3. selective coding – data is paired with the relevant theme for comparison and contrast) (Neuman, 2006) two members of the study team compared and finalised the coding framework. For reliability, data were coded independently by two researchers and reviewed by a third. Transcripts were reviewed, coded and organised into themes outlined in Table 2. Fig. 1 shows the interrelatedness of the themes. A selection of supporting statements are included in the results.

2.5. Ethical considerations

Ethical clearance was provided by the University of the Witwatersrand Human Research Ethics Committee (M140506) on 30 May 2014. Participants signed individual consent forms to participate in the interviews and completed demographic questionnaires. All consent forms, demographic questionnaires, voice files, field notes and transcripts are stored by Wits RHI in accordance with good clinical practice (GCP) standards.

Table 2
Description of themes, sub-themes and categories.

Themes	Sub-themes/Concepts	Categories
Client satisfaction	Access	Location, operating times, service delivery
	Healthcare worker attitudes	Friendly, judgemental, helpful, nice, good, bad
Health seeking behaviour	Services accessed	HIV, blood, sugar/diabetes, urine, flu, headache
	Non-RWC facilities accessed	Hospitals, clinics, pharmacy
	Alternate care	Traditional healers, church, God, Christian, modern medicine
Risk perception and behaviour	Health	Physiological, kidney failure, swollen feet, fat, unhealthy food, diet, physical, psychological
	Occupational	Accidents, hijacking
	Sexual	Sex worker engagement, condom
Service delivery strengthening		Recommend, improve, change

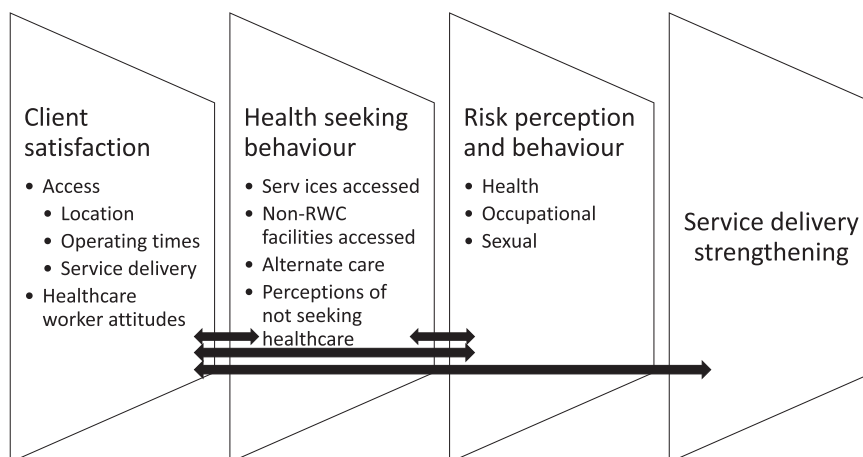


Fig. 1. Relationship between themes. RWC: roadside wellness centre.

3. Results

3.1. Socio-demographic information

We conducted 46 interviews across the six RWCs with 24 users and 22 non-users. All the truck drivers were male. Non-users were older, had more English speakers, had more children and were more likely to be in the R5000-R10000 income bracket. Both groups were comprised mainly of married South Africans who had completed some secondary education and were employed on a full-time basis. There were no widowers. With the exception of one South African truck driver, all listed their partners as female. A summary of the demographic characteristics of the participating truck drivers has been included in the supplementary material (see Table A1).

3.2. Main themes

The main themes that emerged from the analysis were client satisfaction, health seeking behaviour, risk perception and behaviour, and service delivery strengthening.

All individuals provided information on health seeking behaviour while 59%, 48%, and 30% of individuals provided information on client satisfaction, service delivery strengthening and risk perception and behaviour, respectively. A table showing the thematic distribution of responses disaggregated by RWC and category of participant, derived during the thematic analysis, has been included in the supplementary material (see Table B1).

3.2.1. Client satisfaction

3.2.1.1. Access – location: The majority of the truck drivers knew and were happy with RWC locations. Users and non-users (although not directly asked) of the RWCs stated:

Yes, it is in a right location because many truck drivers sleep here. (Cato Ridge, Non-user)

Where it is actually is very accessible to anyone, because it is on a National road. Everyone can go there, not specifically the truck drivers. Now that I know what times it opens, I can come anytime. (Bloemhof, Non-user)

The clinic is in a good place. (Upington, User)

However, there were some (e.g. from Ngodwana RWC) who had not seen the RWC itself but had accessed mobile/outreach services (e.g. HIV counselling and testing, education sessions) offered by the centre staff:

No, I don't go there. Those sisters come to us. (Ngodwana, User)

No I don't hear from anyone. Those sisters came and asked me if I don't want to know my status. I said I want, then they tested me. (Ngodwana, User)

A total of 7 truck drivers (3 non-users (Bloemhof, Cato Ridge, Musina)) and 4 users (3 City Deep, 1 Cato Ridge) mentioned the lack of visibility/ poor signage whereby centres could not be seen from the road/entrance of the truck stops. Comments included:

Maybe a sign directing people to where the clinic is situated. When the clinic is visible it would really help. Even if I walk past, I would just decide to go in and be checked. (City Deep, User)

It's actually fine if you put up a sign there (reference to a spot). People will be more educated, that's more information, that's enough, when I am sick I know where to go. (Musina, Non-user)

The drivers noted that locations that facilitated them parking their trucks close by were highly valued (this was all facilities we surveyed, except City Deep RWC). They mentioned that this is not possible with local fixed facilities and is a barrier to accessing conventional healthcare for truck drivers.

3.2.1.2. Access – operating times: There was varied knowledge about the operating times. Some truck drivers did not know the operating hours and found the centres open by chance while others were fully aware of the operating hours due to the positive marketing of the RWCs by the healthcare workers. There was also a group of non-users who did not know the operating hours but used the interview as an opportunity to gain more information about the wellness centres.

There were mixed opinions on the times that RWCs should operate, depending on the RWC location and whether a long-or short-haul driver was providing the suggestion. Some truck drivers felt that the evening worked best (*If they can try to work from 4 p.m. up to 10 p.m. at night, because there are plenty of trucks (Upington, User)*) while many were in favour of 24 hour (*I think for 24 h (Bloemhof, User); 24 h like a whole sweet (Cato Ridge, User); ...however it is limited in operating hours. Preferably if the clinic was 24 h (Cato Ridge, Non-user)*). Several felt that the clinic should be accessible all the time (*24 h 7 days a week (Musina, User)*). One non-user in Cato Ridge emphasized the convenience of a 24 hour centre citing that driving times vary and having the option of being able to go into a RWC even at midnight might be appealing for truck drivers.

3.2.1.3. Access – service delivery: Overall, truck drivers did not complain about the package of services delivered. Some dissatisfaction was expressed about medication, with two users complaining about unavailability of the hypertension medication dosage they specifically required and one non-user not finding malaria medication available. The majority said that they did not have to wait to be seen and for the truck drivers who did wait, they reported waiting times to be between five to fifteen minutes. The only recommendations provided concerning RWC infrastructure were having more covered seating space in the case of rain, controlled temperature (warmer in winter), and multiple consultation rooms to avoid waiting. All truck drivers felt that the wellness centre set up did not pose any issues to their privacy.

3.2.1.4. Healthcare worker attitudes: Globally healthcare workers attitudes have been linked to barriers of healthcare access for mobile and at risk populations. Based on the commentary, RWCs are an enabling environment for healthcare for truck drivers. Truck drivers who accessed the RWCs praised healthcare workers for their knowledge, professionalism (*It was right. I never had stress, they never forced me (Ngodwana User)*) and patience (*Their sense of caring is right to me (Ngodwana, User)*). They felt comfortable with the healthcare workers and that they could discuss their healthcare needs without being judged. When asked how they would rate the healthcare workers out of a score of five, most gave ratings of either four or five. They supported their ratings with statements of recommendation of the clinic and nurses to other truck drivers and motivation for their own continued use of the RWCs.

3.2.2. Health seeking behaviour

3.2.2.1. Services accessed: Over three quarters of the truck drivers accessed the RWCs for 3 services: HIV testing, blood pressure measurement, and diabetes screening. A small percentage went to get chronic medication refills en route travelling across the border and an even smaller number presented at the centres because they had pain and flu symptoms. This pattern of service utilisation was similar in non-users who did report accessing care at other facilities. Approximately half of the non-users said that they do not access routine care (though available) but only seek medical attention if they are sick (*I only go to the clinic when I am sick, I do not go to the clinic for check-ups (Cato Ridge)*).

3.2.2.2. Non-RWC facilities accessed: When they did not access the RWCs truck drivers accessed care at their local clinics and hospitals. The local clinics were primarily to receive chronic medication. They accessed hospitals if they had to undergo procedures ranging from dentistry to minor operations. Both user and non-user groups reported using pharmacies if they had headaches. Noticeably none of the drivers mentioned accessing care at a private general practitioner or specialist.

3.2.2.3. Alternate care: traditional healing and religious support: Many truck drivers reported the past and current use of traditional healers. Some acknowledged both the differences and complementarity between traditional healing and conventional medical services.

.... Modern medicine has side effects. (Upington, User)

Most of the time I use a traditional healer, but the problem is that they can't check for high blood pressure and sugar diabetes. This is why sometimes I go to the clinic for my blood to be checked. (Ngodwana, User).

Other truck drivers explained that accessing traditional healing was in conflict with their religious beliefs and practices.

To be honest, since growing up I have never visited one because at my home we are Jehovah's Witnesses. (Upington, User)

There was more use of traditional healers among the RWC non-users. One non-user highlighted that truck drivers do believe in traditional healers.

We go there so that we can get the traditional medicine, so that it can help us with our kidneys, and truck drivers believe in traditional medicine. (Bloemhof, Non-user)

Another non-user spoke about the frequency and reasons for visiting traditional healers.

Many times... No, I do not remember. I do go to a traditional healer, especially when we have problems or something traditional that we have to do at home... Sometimes, when there is a disease in the family. Sometimes a kids gets sick – things like that. I go to the traditional healer and get something to heal the sick person. I am a man of culture, man; I service myself. (Ngodwana, Non-user)

Two of the truck drivers from the City Deep non-user group sought assistance from their churches when they had problems (*When I don't feel well I go to church; Like, when I don't feel well – that something is not right – I go and see the church*).

3.2.2.4. Perceptions of not seeking healthcare: Truck drivers who accessed care at the RWCs and RWC non-users expressed similar views on why their colleagues did not seek healthcare. Both groups were of the opinion that fear was the barrier to accessing care for those truck drivers who did not go to any clinics or doctors. A non-user from Bloemhof said *...And then there is a group that has a phobia – their phobia is the fear of what people will say when they see me going to the clinic, you understand*. Many felt that truck drivers are conscious of both non-communicable and communicable diseases. Although a few mentioned testing for HIV was scary, many, unexpectedly, listed truck drivers being afraid of finding out that they are diabetic or hypertensive. Knowing the state of one's health seemed to present complications in the life of the truck driver. Aside from the explicit knowledge that being off the road (either to get diagnosed or when one is ill) means there is no pay, there were a few implicit complications to knowing that one was ill. Firstly, majority of the men were married and because of this, men knew that if they were diagnosed with illnesses they would need to make a concerted effort to remain healthy for the sake of their families. Also dependent on what they were diagnosed with they would need to inform their partners. Secondly, there was a sense of vulnerability. Although truck drivers knew the effects of their sedentary lifestyle they knew that the nature of the job was not conducive to always eating healthily, getting adequate exercise and resting when required. Therefore it was pointless to know what was wrong with them as they were partially helpless in executing a solution. Lastly, there was the issue of the challenge to their masculinity. Once diagnosed, it was confirmed that the man was sick and this illness did not lend well to those truck drivers who subscribed to hegemony.

Nevertheless amid all this mention of fear there was the feeling that truck drivers needed to take charge of their health (*... Such people I say they are not strong enough, because it is your own life. I for one am saving also my wife, because when I am at home I go and check (Bloemhof, Non-user); People need to change their minds (Upington, Non-user)*). Not all the truck drivers in this study explicitly expressed themselves as being afraid of getting help when they were sick. However, through a little self-reflection, there were hints that support (*What made me to come to this clinic is that you came to me... and my wife has been telling me to go to the clinic and get tested. I felt that fear that I had disappear (Bloemhof, User)* and persuasion (*...they know that there is a Wellness Centre there to get tested, for someone to get up and go and get tested it brings some fear. Maybe they need influence, if you know what I am saying (Musina, Non-user); You should talk to them and be friendly and convince them that they should come for 1, 2, 3 reasons (Ngodwana, Non-user)*) could assist with improving the numbers of truck drivers who access any form of healthcare.

3.2.3. Risk perception and behaviour

Risk presented itself in the interviews from the perspectives of health, non-health related occupational risks, and sexual behaviour. In speaking about the perceived risks of their jobs, the truck drivers showed their vulnerabilities and the challenges of balancing being a breadwinner, man and family person against being physically and mentally happy.

3.2.3.1. Health (physiological, physical, psychological): There was recognition that truck drivers in general have poor health linked to sedentary lifestyles and poor diet. The majority viewed themselves at risk for hypertension and obesity. One Bloemhof (Non-user) driver elaborated further that *kidney failure is first. It is caused by driving for a long time, swollen feet, you see swollen feet can be gout, high blood and sugar diabetes. We drink cool drink and we don't drink water. Also, too much sugar and food that has too much oil in it because we don't eat food that is cooked from home*. Another user spoke about the disadvantages of the nature of their work on their health – *Most of our guys are overweight and the risk of HIV is too much... We are not taught on what to eat and on what not to eat. Maybe we lack information, those are the disadvantages of our work. We are not aware of anything about risks and STIs. I eat every food that I get because I*

have no choice (Musina, User).

Some drivers also touched on exercise. *Exercises, because some of the drivers when they are sleeping here and sitting inside the truck for 24 hours are not good and that's why we are sick because we don't exercise (Cato Ridge, User).*

Many truck drivers work under agents who allocated jobs to them. In order to make the maximum amount of money they have to avail themselves to all opportunities. This therefore affects how much time drivers have available to go home/see family as well as sleep (*You see, I do not have a time to spend with my family, because most of the time I am on the road (Ngodwana, Non-user); Sometimes, it's not all the time. You see, all the time we are wasting on the road, loading point, offloading point; at home you can rest two days only. It's not right but we have to if we want a job (City Deep, User)*). Implicit in these narrations is the psychological strain from the lack of comfort associated with family, home and rest (*That's the main thing that I told you, that this transport to get home is difficult. Even now I have a load that is going to Nelspruit, even to see my wife is difficult...now I am getting stress because of this (User, Cato Ridge)*).

3.2.3.2. Occupational: The major occupational risk cited was accidents. Reasons offered included; non-South African drivers lacking familiarity with South African road signs and road rules, drivers getting sleepy and losing concentration, drivers having vision and visibility issues – especially linked to seeing bright lights and oncoming traffic, and truck malfunctions (*...the body of the truck capsizing as a result of a burst tyre (Cato Ridge, Non-user)*). An additional reason offered was drunk driving (*The first thing related to risks when driving is drunk driving, and the problem of money (Ngodwana, User)*). Responses around drunk driving indicated that truck drivers were referring to their colleagues being drunk causing them to 1) not be able to react timeously to events on the road (e.g. braking); 2) speed and 3) have altered judgement (speed bumps, potholes, roadworks etc.) as well as being victims of drunk non-truck drivers. Hijacking was the other occupational risk mentioned. Cargo is expensive and placed them at risk.

3.2.3.3. Sexual: All men spoke freely about sex worker engagement. When probed they responded without hesitation or reservation giving the impression that they were answering truthfully since they were not deliberating about what the desirable answer (for either them or the interviewer) would be. The varied justifications gave insight into the truck drivers' insecurities, knowledge and values. All men confirmed sex worker availability on the truck routes, even if they did not use their services. Together with City Deep, Cato Ridge participants reported very easy access to sex workers (*...when they are with these magoshas (sex workers) because they are plenty of them, even here outside (Cato Ridge, User); They are everywhere – they are some of the people that the government should really deal with (Cato Ridge, Non-user)*). Although some men reported having engaged with sex workers at some stage in their early truck driving career none of the men reported engaging with sex workers in the six months prior to and at the time of the interviews. Majority of the men were in stable relationships and knew about the risks of multiple sexual partners. Some went as far as saying that they do not interact with females while on the road because they could engage in consensual sex or even give ladies a lift and then be accused of rape (*You would be lucky when there are police around, for she would cry and say you raped her (City Deep, Non-user)*) and the men feared going to jail. Risky sexual behaviour was also linked to death. Truck drivers were aware that sex without a condom is risky (*Another risk is that of sleeping with girls without a condom (Ngodwana, User)*) and can lead to STIs (*STIs still torments truck drivers...if we can't control ourselves we should use a condom and they (the clinic) do supply them (Upington; User)*). One truck driver in Bloemhof cited non-engagement with sex workers being related to his empathy for them, sharing his thoughts on the type of circumstances that would force young women into prostitution. He could not be comfortable with himself knowing that he had potentially taken advantage of a vulnerable woman and the fact that once the woman was done with him she seamlessly moved on to the next customer.

3.3. Service delivery strengthening

Truck drivers were aware of their healthcare needs. The majority of the recommendations came from users (n = 14) and from the Cato Ridge RWC (n = 8 truck drivers). Supplementary to the prior mentioned suggestions there was the recurring idea of the availability of vaccinations at RWCs– especially for yellow fever, particularly as it is a requirement for cross-border travel (*If they have vaccination, most of the drivers would come and join, I am sure (Cato Ridge, Non-user); ...I don't know how you are going to solve it...about this vaccination of this fever, the yellow fever, we are having this problem...Why don't you guys put this vaccination in your what you call North?(Musina, Non-user)*). Predominantly non-users indicated that this would speak to their healthcare needs. While users were happy with the healthcare workers there was a strong recommendation from both users and non-users to have a doctor available to deal with illnesses outside the scope of nurses and counsellors. There was an implicit suggestion that doctors would add more credibility to the whole concept of the RWCs (*...because it is only the doctor who can know the problem I have (Musina, User); There should be a full time doctor, that will make this clinic to be a proper clinic (City Deep, User)*).

4. Discussion

4.1. Comparison to existing evidence

While there is limited published information about the socio-demographic profile of truck drivers in South Africa, the mean age of our respondents was similar to those who participated in two earlier South African studies in 1992 (average age of 39 years) (Karim et al., 1995) and 1999 (mean age of 37 years) (Ramjee and Gouws, 2002), and to our analyses in another component of this evaluation (Lalla-Edward et al., 2017). We can assume that the respondents in our study may be representative of the general South African trucking population however this result also highlights that there has not been a shift in the average age of truck drivers in South Africa over a long period of time. A survey conducted in South Africa using 1528 data sources including employees, employers

and recruitment points reported that the average monthly salary for a truck driver in South Africa is ZAR13 387 (Truck Driver Salaries in South Africa, 2017) with the average monthly gross salary in South Africa as at July 2017 being ZAR19 170 (South Africa Average Monthly Gross Wage, 2017). We found that the majority of our clinic users reported earning more than ZAR10 000 while the majority of the non-users reported earning between ZAR 5000 and ZAR 10 000.

Truck drivers were cognisant of the consequences of risky sexual behaviour. Converse to findings in some other African (Aniebue and Aniebue, 2009; Gysels et al., 2001; Morris et al., 2009) and Indian (Khan et al., 2015; Chaturvedi et al., 2006) studies, our findings indicate that there was little interaction with sex workers prior to, and at the time of the interviews. This could be attributed to more of the truck drivers being in stable relationships. Where ages were reported (Aniebue and Aniebue, 2009; Chaturvedi et al., 2006) we could not definitely conclude that age was a common contributing factor to risky behaviour. In relation to our study, the Indian study had a younger group of men reporting risky sexual behaviour while the African study had older men mostly likely to engage with commercial sex workers. We did observe that aside from the one Indian study (Khan et al., 2015) all the others were conducted and reported prior to 2010. This could be indicative of a shift in truck driver sexual behaviour in the recent years attributed to increased exposure to behaviour change communication interventions and healthcare information. Irrespective of the comparisons, we do acknowledge the negligible possibility of reporting bias in our study with the truck drivers not being completely honest about their interactions with sex workers.

It was evident that truck drivers recognized that both their fellow truck drivers and they were in poor health. Further they understood some of the key underlying determinants with many speaking about the fact that they had to sit for long periods, their work was controlled by others, and the stress caused by several aspects of their job. Although there is a dearth of supporting data from national studies in South Africa on these health risk behaviours and the rates of obesity, diabetes, cardiovascular disease or mental health in truck drivers, these truck drivers are clearly highlighting factors which affect their health. These factors require consideration to develop broader (health and governance) solutions to improve their health.

Road accidents remain one of the leading causes of death in the workplace (Boyce, 2016) with truck drivers having the most exposure to work related road risk (Fort et al., 2016). Drunk driving was a noteworthy occupational risk mentioned primarily related to it being a contravention of the law as well as the accompanying danger to other road users. From our results truck drivers were at risk of being driven into by drunk truck drivers and other motorists. Further there was reference to the truck drivers themselves being drunk and having poor judgement to timeously react to events on the road. Drunk driving coupled with them speeding placed them at risk of causing accidents (and possible fatalities) with any other road user in close proximity. Lastly, there were instances of fatigue and lapses in concentration cited as risks of the job. It clearly came across that these last-mentioned factors were strongly related to the monetary aspect of truck driving. Time on the road is directly proportional to the amount of money a truck driver would earn. Therefore they forgo sleep in order to fulfil the requirements of their job. Law makers and trucking industry stakeholders need to implement more interventions related to curbing reckless driving and enforcing stricter policies on the number of hours a motorist is allowed to drive, to improve road safety for all road users.

4.2. Considerations for health programming for truck drivers

Our findings suggested that truck drivers are generally aware of the occupational health risks of long distance truck driving and have clear ideas about how health services should be tailored to their needs. Some truck drivers (similar to the general population) are less proactive in seeking healthcare (although available) and will need to be attracted into attending clinics. One potential opportunity to increase utilisation of services would be the offering of occupation-relevant services including vaccinations and routine screenings required for professional driving permits.

Exercise and sport are recognised as being beneficial to health and wellbeing (Nesti, 2016). Since truck drivers said that they sleep at truck stops while they wait for their loading instructions, wellness centres could consider housing an exercise room with basic exercise equipment that drivers could use when they are not working. The advantages of this are two-fold; 1) increased visibility and utilisation of the RWCs and 2) improved overall health of truck drivers.

Generally, the burden of chronic illnesses in low-and middle-income countries is increasing (Goudge et al., 2009). Self-reports in this study were no different with the major healthcare needs focussing on hypertension and diabetes. Truck drivers mainly accessed services for hypertension, followed by diabetes, and spoke about how these services together with services for musculoskeletal illnesses would be appropriate for them.

The nature of trucking lends to long periods away from home and increased loneliness (Gomez et al., 2013). Although not an explicit finding, truck drivers exhibited some emotional tension when speaking about the trade-offs between spending time with their families and generating income to provide for those families. Our findings of the presence of mental health stresses is in keeping with the work of Shattell et al., (2012) conducted in the United States. This anxiety is exacerbated by the physical strain that accompanies overworking the body and mind. Therefore additional to exploring non-communicable disease treatments related to cardiovascular and musculoskeletal diseases it is important for truck driver healthcare to incorporate aspects of mental health screening and treatment. Focussing on the mental health aspect will also assist with allaying fears and address the many vulnerabilities that truck drivers have but may not be able to deal with.

Participatory approaches have been successfully used in advancing the development of health programmes (Kawakami et al., 2004; Lee et al., 2016). Noting the vulnerabilities truck drivers expressed around not being able to improve their health (eating healthily, getting adequate sleep and exercising) due to the obligations of their job, healthcare interventions aimed at improving truck driver health needs to be remodelled with large considerations for engaging in a participatory approach to development and leveraging on sources like the Fundamentals of Total Worker Health Approaches (which is aimed at collectively addressing health,

wellbeing and safety of workers) (Lee et al., 2016).

Truck drivers did report seeking help in a variety of settings. Conventional health care offerings need to be conscious of the overlap with less formal health care provision through traditional health workers and pharmacies.

4.3. Limitations

The study's limitations include conducting interviews with only a small sample of male-only truck drivers. This limits the generalizability of our findings in terms of gender (albeit there being a small female truck driver population) and the wider population. Truck drivers had limited amounts of time as they needed to load and get on the route. The shorter than anticipated interview durations did not lend themselves to the gathering of in-depth information. Recruitment was only done near and about the North Star RWCs. Finally, we did not interview the same number of truck drivers per site therefore the opinions about satellite services and other RWCs may be different.

5. Conclusion

Overall we found that truck drivers are willing to access healthcare at RWCs and they found the concept a RWC suitable. However, currently, access is sometimes hindered by minor operational factors (e.g. signage and operating times) that can easily be addressed to increase utilization. Inclusion of truck drivers who did not access the clinic highlighted the need for conscious recognition that mobile populations' health care needs extend beyond infectious diseases. Comprehensive care packages (incorporating services for mental health and other non-communicable diseases), which acknowledge the role of traditional healing and alternative medicine, delivered through accessible satellite facilities should form the foundation of service delivery models for truck drivers and other mobile populations. Finally, subsequent to the establishment of these accessible and appropriate healthcare delivery models there needs to be increased health promotion efforts to increase uptake among truck drivers for enhanced health outcomes.

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Competing interests

The following author has competing interests: PM is the Regional Director, Southern Africa at North Star Alliance. All other authors have declared that they have no competing interests.

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Authors' contributions

Designed the study: STLE, WDFV and GBG. Analysed the data and interpreted results: STLE. Wrote the initial draft: STLE. All authors critically reviewed and approved of the final draft.

Appendix A. Supplementary material

Supplementary data associated with this article can be found in the online version at <https://doi.org/10.1016/j.jth.2018.01.007>.

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