

# Medicine Knowledge and Purchasing Behaviour in a South African Township: Lessons Learnt From a Pilot Study on Awareness of Substandard and Falsified Medical Products

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## Research

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# Abstract

## Background:

Substandard and falsified (SF) medical products are available in informal as well as formal markets globally. South Africa has a large formal, regulated pharmaceutical sector but there has been limited attention to the existence of SF medical products and the risks posed to people in need of medication. Little is known about individuals' medicine consumption behaviour, especially from a social sciences perspective. This study presents findings on knowledge and awareness of medicine risks amongst residents in a lower-income community in Khayamnandi in the Western Cape province of South Africa. We also reflect on challenges and lessons learnt from the data collection process.

## Results:

Quantitative and qualitative data, using a mixed-methods approach, were collected from 41 adult ( $\geq 18$  years) respondents through a survey and audio-recorded discussions around the survey questions. Comparison of the two types of data through bricolage and mixed-methods revealed inconsistencies in responses. We argue that multi-disciplinary research using a mixed-methods approach, including reflexivity regarding empirical observations, not only provides a broader knowledge, but that it also brings insights into the complex processes and ambivalent statements collected from research participants. In addition, research participants were not always open about their health-seeking behaviour and provider choices due to concerns about potential conflict of interests among different types of medical care providers in the local community.

## Conclusions:

This is one of the few studies focusing on demand-side attitudes with regards to medicine purchasing behaviour and the potential risks this behaviour holds for the use of SF medical products in South Africa. Multi-disciplinary research using a mixed-methods approach can bring insights into the complex processes and ambivalent statements collected from research participants.

# Background

Medication constitutes an important and almost self-evident component of life for most people around the world. The availability, however, whether it is pharmaceutical or traditional medicine, depends on historical as well as cultural and socio-economic factors (1). This means that medicines for many are something desirable but unattainable. Against this background, the increasing spread of substandard and falsified (SF) medical products poses a large global health risk (2).

Substandard and falsified (SF) medical products are present in formal as well as informal medical markets in all regions of the world and pose severe risks to public health (3). The real scale of the problem remains unclear, but this illicit trade is expanding and growing dramatically, penetrating both

online and offline marketplaces (4, 5). According to case reports received by the World Health Organization (WHO) both high-income and low- and middle-income countries (LMICs) are affected (6). However, as documented by an increasing body of scientific literature, LMICs and those with large social differences are the areas most affected (3, 7). Sub-Saharan Africa is considered one of the areas in the world most seriously affected by SF medical products (3).

Scientists from the fields of medicine, law and public health dominate research on SF medical products focusing mainly on the supply side as well as on drug testing technologies and the harmonising of international legal frameworks (8, 9). There is significantly less knowledge of the demand side and end-users' awareness and perception of risks of these products (10, 11). Considering the potential threatening effects of SF medical products on individuals and society, there is a need to investigate what knowledge exists among individuals and what the prevalent attitudes are with regards to consuming medicines outside the regulated market. Studies with socio-cultural perspectives have shown that consumption of medicines is situated in everyday practices and that it needs to be examined in a context where political, economic and cultural forces intersect (11-13).

South Africa, where our study was conducted, has high public health expenditure on pharmaceuticals due to a heavy burden of both non-communicable diseases (HIV/TB) and a growing burden of communicable diseases (14). South Africa also has the strongest pharmaceutical sector amongst sub-Saharan African countries (15). A recent change in the pharmaceutical regulatory authority, from the Medicines Control Council to the South African Health Products Regulatory Authority, created backlogs and uncertainty while the new regulatory agency was in the set-up phase (16). This combination of high medical expenditure and potentially still weak pharmaceutical regulatory capacity given the transition to a new regulatory authority provides the potential for SF products to spread.

A 2011 Gallup poll showed that only one in four South Africans were aware that falsified medicines were in the country compared with much higher percentages of people being aware of the presence of these medicines in East and West African countries (17). South Africa is being targeted by falsified medicine traffickers (18, 19) and is more vulnerable than its neighbours to the online distribution of these products due to relatively high internet penetration (20) and online purchase rates compared to other African countries (21).

South Africa is lacking in its reporting to the WHO's Medical Product Rapid Alert (6). The purpose of this alert system is to warn WHO Member States and populations of the existence of dangerous SF medical products and to encourage appropriate regulatory action by National Medicines Regulatory Authorities or Ministries of Health to protect populations and supply chains. The absence of reporting does not, however, imply non-existence of SF medical products. Scattered evidence from a variety of sources suggest the circulation of SF medical products in South Africa (18, 19, 22).

Against this background, the objective of this study is to explore medicine consumption behaviour and risk attitudes to medicines in a low- to middle-income neighbourhood in South Africa. In addition, we

present lessons learnt from the fieldwork process, and suggest what future research is required to inform gaps in our understanding of the demand side's engagement with SF medical products.

We find that overall knowledge levels on regulatory requirements that apply to medication are low. Certain riskier consumption and purchase intention strategies are also employed by respondents which they share during the qualitative rather than quantitative data collection process. This means that knowledge and awareness creation of SF medical products are required while a stronger regulatory response may also be needed to ensure that these medicines are not within easy reach of consumers.

## **Methods**

### **2.1 Research setting**

This is a multidisciplinary study collecting quantitative and qualitative data through a mixed-methods approach in the low- to middle-income setting of Khayamnandi, a township consisting of formal and informal houses (commonly known as "shacks", and constructed of mostly tin). Khayamnandi forms part of the town of Stellenbosch and is situated in the Western Cape province of South Africa. Townships refer to a neighbourhood that were established in often underdeveloped, racially segregated urban areas of South Africa due to the racial segregation laws of South Africa during the Apartheid era (23). The data were collected during 2018.

At the time of the 2011 National Census, the majority of Khayamnandi residents (94.6%) were of Black African ethnic origin and isiXhosa was the first language of most (84.9%) residents (24). It had a population of 24 645 in 2011, which has since grown significantly (24). There is no recent representative data available on average incomes in Khayamnandi. However, the average per capita income for Stellenbosch during 2016 was R61 871 (approximately \$3,500 at current exchange rates) (25). The average per capita income of Khayamnandi residents are likely to be lower than this given the high-income inequality in Stellenbosch (Gini coefficient of 0.62 in 2016) (25).

### **2.2. Approach, methods and analytical strategies**

This is a study employing a combination of quantitative and qualitative data using a mixed-method approach in order to investigate people's awareness of SF medical products in Khayamnandi. The quantitative data were collected through a survey in the form of a questionnaire containing close-ended questions. The qualitative data (recorded and transcribed) entailed conversations that took place between respondents and fieldworkers regarding the survey questions.

The study was organised and administrated by the authors. It was planned on the basis of well proven mixed-methods research that provide insights into the fact that empirical data is multifaceted. Following Donna Haraway's ground-breaking studies (26), applied and further developed in both social and cultural sciences as well as natural disciplines in recent decades, we assume that data is produced through particular ways of seeing and experiencing the world and is best understood by methodological

eclecticism applying techniques from multiple scientific toolboxes (27-30). Based on such a mixed-methods approach the planning of our study is not merely built on a protocol but rather on engaging in a process with unpredictable and unexpected results (31). This study, thus, is not designed for either quantitative or qualitative data only, but for acquisition of knowledge where quantitative results interact with qualitative findings. We specifically lean towards the bricolage approach for collecting data and forming a platform for analysis (32, 33).

The questionnaire was pre-tested by five volunteers in the surveyed area who did not participate in the study themselves. This allowed us to identify questions that were difficult to understand or misleading. This showed the importance of adapting the language in the survey to respondents' level of knowledge, e.g. to avoid specific technical terms and use formulations well-known by the group amongst whom the research was conducted.

Data were collected by two fieldworkers (one male and one female) from the Khayamandi community. Both were associated with the authors' project, trained by the authors and affiliated to the non-governmental organization (NGO), IMBILA Strategic Services. Recruitment of respondents was managed by IMBILA Strategic Services, and through the fieldworkers' personal networks in the surrounding area. The fieldworkers met with individuals who had shown interest in the study. Fieldworkers informed respondents about the study's aim, however, not by specifically referring to SF medical products but to more general issues such as whom people consulted when ill, where they purchased medication and their use of medication.

The questionnaire included thirteen (13) questions. Although all questions in the survey were answered by the respondents, we have for this article chosen to analyse five (5) of them (results are presented in section 3.1). These questions were particularly provocative in terms of stimulating conversations between respondents and the fieldworkers. During analysis of the qualitative and the quantitative material, two main themes (results are presented in section 3.2) were identified: 1. Trust, risk and self-medication; 2. Bonds that matter.

Forty-one (41) adult respondents ( $\geq 18$  years) participated in the survey. Since we also aimed for one-on-one survey conversations, the process was speculated to be time consuming. In addition, due to budgetary constraints we did not aim for a larger sample size. Furthermore, as this was a pilot study, the sample only had to be sufficient to test the viability of the survey questions.

The quantitative data were analysed through univariate methods. Due to the limited sample size it was not possible to calculate confidence intervals for most responses. Confidence intervals are therefore not reported. The quantitative responses should be viewed as only indicative of likely responses in a larger sample. We report all responses received and do not limit the sample to a sub-sample of adults who provided responses to all questions. The qualitative data were examined by using a bricolage approach and analysed through the concept of situated knowledge (26, 35) that puts respondents' statements in a historical and socio-cultural context.

The survey questionnaire was written in the languages used by participants in the study, isiXhosa and English. The conversations around the questionnaires were transcribed in both languages by the authors who speak isiXhosa as well as English. Additional data collected included the written notes made by the fieldworkers to note respondents' clarifications and fieldworkers' own reflections on the conversations. All participants were anonymised in the data collection process and pseudonyms are used in the analysis presented here.

### **2.3. Ethical approval**

The study received ethical approval from the Health Research Ethics Committee of the University of Cape Town (N18/10/109\_RECIP\_UCT\_575/2017). Reciprocal ethical approval was also received from Stellenbosch University. The participants provided informed consent.

## **Results**

### **3.1. Selection of questions**

All 41 adult respondents ( $\geq 18$  years) provided responses to the survey's thirteen (13) questions. We chose for this article to examine five (5) questions as they revolved around topics that most of the respondents wanted to comment on. These five questions are:

Q1. Do you know if there is a difference between prescribed and non-prescribed medicine?

Q2. Do you think it is safe to purchase prescribed medicines (without seeing a doctor before) from a local market, shops, neighbours, the Internet, etc.?

Q3. Where do you normally receive/buy prescribed medicines?

Q4: What factors do you consider when you purchase prescribed medicines? (Multiple mentions possible, total responses exceed

Q5. Have you ever questioned the quality and efficacy of the medicines you have purchased?

Regarding the first selected question we found that little more than half of respondents (55.3%, n=21) claimed to be aware of the difference between prescribed medicines and non-prescribed medicines. On a follow-up question, the second question, again just more than half (52.5%, n=21) said it was not safe to purchase prescribed medicines (without seeing a doctor) at local market shops, from neighbours, the internet or other sources. In the third question, the majority (71.8%, n=28) of respondents stated that they normally bought their medicines from pharmacies, while 12.8% (n=5) said they obtained medicines from the clinic. No respondents indicated that they bought medicines from the internet. The fourth question showed that the factor that respondents most frequently considered when buying prescribed medicines was price (43.9% or n=18), with the second biggest factor being packaging (24.4% or n=10). Some respondents (19.5% or n=8) did not know what factors influenced their medicine purchasing decisions.

The fifth question revealed that less than third of respondents (30% or n=12) indicated that they had questioned the quality and efficacy of the medicines they had purchased.

### 3.2. Results from the bricolage toolbox

A comparison of the quantitative and qualitative data revealed that respondents often gave different answers to the same question depending on whether it was asked as part of the survey (asked in a direct way with categorical answer options) or in the recorded conversation. The fact that oral conversations provide more complex responses than the closed-ended questions is not surprising and a well-documented phenomenon (36). However, in a number of cases, the recorded data from the same respondent was not only more nuanced but also contradictory to their responses documented in the survey. This called for a deeper comparison of how the two response categories interact, such a cross-border and bricolage approach which was intended to provide knowledge of respondents' actual opportunities to obtain medicine and their attitude towards it. In this section, we present findings on two major themes that emerged from respondents' more elaborate answers to the survey questions.

#### 1. Trust, risk and self-medication

The majority of respondents stated they used clinics and pharmacies as healthcare providers. Purchasing medicines via the internet or at local marketplaces was deemed by many as risky, or not done at all. Consequently, these respondents pointed to the importance of seeing a doctor when asked *Q2. Do you think it is safe to purchase prescribed medicines (without seeing a doctor before) from a local market, shops, neighbours, the Internet, etc.?* However, we found evidence in the fieldworkers' handwritten notes on the survey that respondents, who had just emphasised the importance of a doctor's visit, "bought prescription drugs elsewhere" without receiving a prescription.

Statements in the survey, as illustrated in the conversation with 25-year-old Nonhlanhla, do not always correspond to the recorded conversation. During the survey Nonhlanhla said, her first option "should be to ask the nurse", but during the conversation she admitted that she always first self-diagnosed and self-medicated. She then explained what hindered her from approaching formal medical care was because "it is crowded and stressful and there is only one doctor some day during the week". There are thus high opportunity costs associated with accessing free public clinics and getting a prescription. Consequently, Nonhlanhla only visited the clinics when "it's really necessary". Otherwise she would purchase medication such as Medlemon, a well-known all-round cold and flu drug used by many in the respondent's neighbourhood, from local stores. These stores, as Nonhlanhla and other informants claimed, were often run by Somali owners "who have a reputation for selling low-quality goods".

Another respondent, the 30-year-old Luzuko who moved to Khaymandi in 2009 from a community outside of Cape Town, acts similarly. He said: "No, no, not to the clinic ...well, it will depend on if the budget permits it". In the conversation he also admitted to avoiding going to the clinic "because of the long time it takes waiting for help". The concern about long waiting time and all the stress around visiting doctors, as expressed by Luzuko and Nonhlanhla, turned out to be not uncommon among the respondents. From

the conversation transcripts, we also noticed that many respondents spoke about their personal situations including their economic status and family relations, which might also contribute to the high opportunity cost.

Another respondent, Onako, the mother of a nine-month baby, stated in the survey that she trusted the expertise of the clinic and the pharmacy. Nevertheless, when the fieldworker wrote her answer on the form, she emphasised the importance of being alert regarding the condition of the drug packaging purchased at the pharmacy. She made sure that “it is similar to the one I got before” as well as ensured “it is properly sealed compared to others I had before [that were not sealed, authors’ explanation]”.

## 2. Bonds that matter

Although most respondents claimed that they only sought care from medical providers at the clinic (mostly nurses) or in some cases a private doctor, the actual circumstances seemed different. Besides the fact that some purchased medicines from a place like “the Somalis’ stores” as shown in the first theme, there existed other important actors that influenced people in the local community. Two such authorities that had an impact on respondents’ lives and use of medicines were the Christian Church and traditional healers.

For some of the surveys, where respondents said they received their medicines from the doctor, we found in fieldworkers’ handwritten comments alongside the survey answers a different picture. Sometimes, the medicines were obtained not only through the formal healthcare system, but through the church. In the recorded conversations, there were remarks on the fact that the church now and then shared medicines with people in the community. “It’s for free,” a respondent said, “and then you take it ... though it’s not completely ‘free’ so to speak”. The person continued implying that the church expected gratefulness and loyalty in return.

Besides churches, there also existed completely different bonds that mattered to the local people when it came to health and medicine: culturally-rooted and historically-embedded African traditional medicine (1, 37). Even if traditional medicine is a culturally well-researched field, our study was designed to not ask questions about the topic. We wanted to focus on the grey areas that could arise in connection with biomedical products and not to discuss any falsified traditional medicines. We assumed that specific questions on traditional healers would give too much focus to the use of folk medicine instead of the consumption of biomedical products, which might lead respondents’ attention away from questions on trust in medical expertise and their awareness of SF medical products. Therefore, no quantitative data on traditional healers were captured. However, it turned out that it was not possible to keep the various medical fields separate: traces of the role of traditional healers could be found in the recorded conversations. An illustrative example comes from the conversation with Luzuko and the reaction of the fieldworker. “I go to the doctor or the clinic”, Luzuko declared, “what other options do I have?” He then continued with a laugh, as if he wanted to provoke the fieldworker in terms of there existing alternatives besides the clinic. The laughter was followed by him asking a question, almost making a statement, in a teasing way: “Sangoma, maybe?” Sangoma refers to a traditional healer, commented by the fieldworker



on the conversation. “The Sangoma is a central figure in South Africa. Everyone consults a Sangoma”. Further reading of the fieldworkers’ notes showed that consultations with traditional healers were something that neither doctors nor the churches were happy about.

## Discussion

### 4.1 Making sense of the data

There is a need to understand how local processes create the opportunity for the global circulation of SF medical products and have an impact on individual lives. Data about SF medical products emanate mainly from legal and medical scientists focusing on identifying falsified packaging and chemical ingredients, while there is little intelligence about how these products are spread and consumed by end-users, i.e. the demand-side dimensions of SF medical products. From previous studies we know that purchases are made on the internet and at shops, informal local markets and sometimes even at pharmacies (10). However, we have much less understanding of the interaction between the thoughts and actions of individuals, or the other the underlying processes and mechanisms driving these behaviours. Such knowledge demands social, cultural and medical insights in peoples’ attitudes, health behaviour, awareness and risk perceptions.

The results from the quantitative data show that the majority of respondents have not heard of the SF medical products. Our study shows that there are generally low knowledge levels and awareness of the regulatory requirements for safe medication. Comparison of the quantitative and qualitative data show inconsistencies in respondents’ responses. Analysis of conversations between fieldworkers and respondents often point to a different, even a contrasting reality to the survey data. For example, respondents claim they trust the clinics and pharmacies, but what they mean by “trusting” does not seem to correspond to their actual consumption practice. As presented in the case of Onako (theme 1), when she talks about strategies to check the quality of medicines, such as ensuring that the packages are properly sealed, it seems that the trust in formal healthcare services is rather flexible. We could infer that the medicines she buys at the pharmacy are not always properly packaged. In South Africa, it is common for pharmacists in the public sector as well as dispensing doctors to pack some medicines in a small paper or plastic bag instead of dispensing a pre-packaged product (38). Clinic dispensaries also dispense medication in small plastic bags. Such handling may involve risk factors regarding the originality of the medicine as well as cause uncertainty for the buyer. A qualitative study focusing on public perceptions of generic medicines in South Africa found that generic medicines as well as those supplied free-of-charge by public clinics were generally viewed as being of a poorer quality than other medicines (38).

Based on our findings, we also argue that respondents’ choices about management of their illness and medicine purchase behaviour should be contextualised in the socio-cultural structures where people live their everyday lives. As described in the Methods section, our analysis is guided by Haraway’s discussion on the importance of a situated knowledge that puts individuals’ narrations in a historical and socio-cultural context (26). We learn from the transcripts of the conversations that many respondents do not

feel comfortable with their personal situation including their economic status and family relations, which relates to feelings of uncertainty, lack of control and the financial constraints. All these factors limit respondents to only a few opportunities to influence their life situation, including where to obtain basic medications. Drawing on relevant literature (11, 22, 39), risk is a contingent concept. The risk of purchasing and consuming medicines in informal markets is perhaps experienced as rather minimal compared to all the other risks faced on an everyday basis by the residents of Khayamnandi. This fluid conception of risk also indicates that there are different strategies to manage various risk scenarios. Individuals are always inclined to make personal assessments of what is risky and how it can be avoided. As Zygmunt Bauman repeatedly argues, people act – whether they are faced with critical decisions in their lives or not - both on the basis of general criteria that exist in their environment and on the basis of individual rationality (40). Rationality, as illustrated in the case of Luzuko (theme 2), is negotiable depending on circumstances such as material conditions, power relations and cultural affiliation. It is clear that the flexible and negotiable view of what is risky or not points to the existence of unspoken values and norms that order society and affect consumption behaviour. In other words, people live in an interconnected lifeworld where individuals are more or less rooted in different sociocultural systems that can give rise to various and sometimes contradictory actions (41).

What is apparent from comparing the two types of data is the existence of plural medical authorities in this local community. From the limited amount of qualitative data, we do not know to which extent respondents visit traditional healers or churches. This was not an explicit focus of the survey. However, the data show that respondents are well aware of various options in selecting whom they want to turn to when they get sick.

Regardless of whether the majority of respondents have heard of the term SF medical products, a between-the-lines reading of their statements indicates that there is awareness that some medicines may be more or less effective, and that some places are considered safer than others in obtaining medicines. Linking this insight to the second theme, risk is not only about medicine quality, but is also inherent to coordinating people's daily lives and the maintenance of their social bonds within the community. Interestingly, however, but not surprisingly, is that these underlying conditions are not captured by the quantitative data. To some extent respondents seem to want to give the fieldworkers a "right" answer, that is, by not going beyond those default options. Although this poses a challenge to interpret the quantitative data, it actually points to a need, in a mixed-methods and bricolage approach (32), to put quantitative data and qualitative data in the same analytical framework to make sense of the seemingly contradictory narratives offered by respondents.

Some of the co-authors of this paper conducted a similar survey among the Swedish public (42). Despite different socio-economic structures and healthcare systems, we propose that there are similarities to people's consumption patterns between high-income Sweden and upper-middle-income South-Africa. Parallel patterns are identified regarding fluid risk perceptions and conditional consumption strategies. For example, price and packaging are also considered to be the indicators of medicine quality among Swedish respondents (11). In the South African context, the appearance of traditional healers makes it

somewhat distinct from the Swedish case. Yet, it is by no means unique as the interplay between Western biomedicine and traditional medicine has been well documented in many societies (43, 44). Although the tensions are not explicitly shown in our collected data, they are reflected through the inconsistencies between different data types. What it suggests is that people negotiate in the eclectic therapeutic landscape where biomedicine is not the only authority. This furthermore points out that it is not sufficient to measure and report on only medicine consumption behaviours, but that they always need to be contextualised.

## **4.2 Lessons learnt**

Respondents were not always open about health seeking behaviour and provider choices (e.g. consulting a traditional healer) due to potential conflict of interests between churches and traditional healers, which might adversely affect their healthcare experience, even their daily life in a social community. The majority of South Africans self-identify as Christian (45). However, many South Africans also adhere to a traditional and indigenous belief system that provides traditional healers and medicine a place of central importance in their lives (46, 47). Considering the church's influence in the community, respondents may have been reluctant to admit to the use of traditional medicine because of fear of being excluded from the social and financial benefits provided by the church.

We also learned that multi-disciplinary research using a mixed-methods approach, including reflexivity regarding empirical observations, not only provides a broader knowledge but also insights into the complex processes and ambivalent statements collected from research participants. Thus, more studies are needed to find out which levels of understanding and awareness exist among people in vulnerable areas. Above all, targeted efforts are essential for the residents in the form of knowledge about medicines and how they can be obtained. Collaboration with local NGOs can be a way of reaching residents with information and awareness-raising about what SF medical products are, and what the consequences of using these products could be.

## **Limitations**

This was a pilot study during which the feasibility of both a quantitative survey and an open-ended conversation about medicine knowledge and medicine consumption behaviour was tested in a mainly low-income setting. The sample was small and not representative of the population as a whole. The findings are therefore not generalisable to the population of South Africa.

## **Conclusions**

This study uses mixed-methods and the bricolage approach to study people's medicine consumption strategies in the neighbourhood of Kayamandi, South Africa. By combining quantitative data with conversations between respondents and fieldworkers, we are able to provide a 'thick description', situating what people say they do in contextual details (34). Such an analytical strategy reveals underlying and

alternative answers. Throughout the analysis, we present that the idea of risk is fluid and situated in people's lifeworld, intersecting not only with individuals' financial constraints, but also their social bonds. These socio-cultural elements have to be taken into consideration to gain a deeper understanding of the complexity and often contradictory ideas that permeate people's responses and actions. Thus, except that we need to learn more about how people relate to accessing medicines as well as existing knowledge levels about medicines, it is equally important to know more about people's risk perceptions.

In addition, we need more knowledge about the respondents' socio-cultural conditions in order to be able to ask adequate questions. Care has to be taken in a simplifying language to ask questions about medicine consumption behaviour and all questions have to be carefully aligned with education levels of the group amongst whom the research is being conducted. This points to the importance of not only relying on questions asked in a survey but supplementing it with other data collection methods. Suitable methods include interviews, or conversations around a survey as in our study, where the language use is adapted to the interviewees' knowledge situation. Another complement may be to draw on visual tools such as cartoons to make the subject area more accessible to respondents (48).

To conclude, this study adds insight to the demand-side attitudes and behaviour with regards to medicine purchasing and the potential risks this behaviour holds for the use of SF medical products in South Africa. Little is still known about the topic, and more supply-side and demand-side focused studies are required to create a full understanding of the scale of the problem, the knowledge and behaviour that sustains SF medical products and the impacts on individuals' lives.

## List Of Abbreviations

LMIC low- and middle-income country

NGO non-governmental organization

SF medical products substandard and falsified medical products

WHO World Health Organization

## Declarations

*Ethics approval and consent to participate*

The study received ethical approval from the Health Research Ethics Committee of the University of Cape Town (N18/10/109\_RECIP\_UCT\_575/2017). Reciprocal ethical approval was also received from Stellenbosch University. The participants provided informed consent. All participants were anonymised in the data collection process and analysis presented here.

*Consent for publication*

Not Applicable

### *Availability of data and materials*

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

### *Competing interests*

The authors declare that they have no competing interests.

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### *Authors' contributions*

SL and EM conceptualized the research design and developed methodology. SL secured the funding for this study. TG and PRK administered data collection and curation. AS, RL and SL analysed the data and wrote the original manuscript. All authors are active in the project either as scientific researchers or as NGO-based collaborators.

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