

# Patients and healthcare professionals' experiences of medicine stock-outs and shortages at a community healthcare centre in the Eastern Cape

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## Abstract

**Background:** Medicine stock-outs and shortages are a global issue and a rising concern in South Africa. The World Health Organization has reported shortages of essential medicines in high-, middle- and low-income countries globally. However, there is currently no standard intervention as the causes of medicine stock-outs vary across countries. When medicine stock-outs happen, they have consequences for both patients and healthcare professionals working at the facilities. Hence the need to explore and understand the effect of medicine stock-outs and shortages on both patients and healthcare professionals.

**Objective:** The main aim of this study was to explore and describe both patients and healthcare professionals' experiences of medicine stock-outs and shortages at a primary healthcare centre in the Nelson Mandela Metropole.

**Methods:** A qualitative in-depth interview approach and thematic analysis of transcribed interviews were used to determine the experiences of participants. Eight patients and twelve healthcare professionals (including doctors, nurses, a pharmacist and pharmacy support personnel), were recruited to the study, using a convenience sampling method at a community healthcare centre in the Eastern Cape.

**Results:** Major themes identified included the psychological impact on both patients and healthcare professionals, perceptions of the causes of stock-outs and shortages, and compensatory measures adopted to counteract the effect of stock-outs and shortages. Patient experiences included dissatisfaction, anger, frustration and a loss of confidence in the healthcare service. Moreover, medicine stock-outs resulted in stress and burn out in healthcare professionals who felt useless when they prescribed medicines that were not available for dispensing. Healthcare professionals also experienced violence and verbal abuse from patients because of medicine stock-outs. Inadequate administration and lack of communication were perceived as significant causes of stock-outs, which negatively influenced relationships between healthcare professionals and patients

**Conclusion:** In this study, strained patient-professional and professional-professional relationships were identified as a consequence of medicine stock-outs and shortages. Also, the lack of inter-professionalism and communication were perceived as causes of medicine shortages. The results suggest that better communication and information flow throughout the medicine supply chain could result in better stock management and availability of medicines and improve the experience of healthcare professionals and patients.

**Keywords:** medicine, medicine unavailability, medicine stock-outs, medicine shortages

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## Introduction

Medicine unavailability has had an impact on healthcare in numerous countries in Africa and across the world, including the United States of America, Australia and Canada.<sup>1</sup> This phenomenon can deny patients the universal right of access to medicines.<sup>2</sup> A stock-out is defined as the absence of medicine required for patient therapy, and medicine shortage is defined as having less stock of medicines than that needed for a healthcare facility.<sup>3</sup> Since the terms stock-out and shortage are often used interchangeably, the term *medicine unavailability* will be used in this paper to include both terms.

The occurrence of incidents of medicine unavailability indicates that efforts to ensure accessibility to medicines fall short of the mission of the National Department of Health (NDoH) in South

Africa, which is to provide a consistent healthcare delivery system through improved access, equity, efficiency, quality and sustainability.<sup>4</sup>

Medicine unavailability negatively impacts therapeutic outcomes for patients.<sup>5,6</sup> In the event of medicine unavailability, patients tend to receive no or delayed therapy, and this may result in patients defaulting, loss of disease control or even death. For example, Doctors Without Borders (*Medecins Sans Frontières – MSF*) Southern Africa reported a patient who went two weeks without her antiretroviral (ARV) treatment; this resulted in a decreased CD4 count from 987 to 530 cells per cubic millimetre and an increased viral load of 149 from 40 (copies/mL).<sup>3</sup>

Human immunodeficiency virus (HIV) and tuberculosis (TB) epidemics are widespread in South Africa compared to other

countries worldwide. The unavailability of treatment required for HIV and TB may lead to increased mortality and morbidity.<sup>6</sup> Moreover, treatment interruptions due to medicine unavailability may lead to an increased occurrence of medicine resistance, illness, death, spreading resistant forms of HIV and TB, increased immunosuppression for HIV-positive patients and increased risk of opportunistic infections.<sup>3</sup>

Medicine unavailability is a complex problem which affects various classes of medicines, including chronic medication, injectables, paediatric formulations and reproductive and contraceptive treatment.<sup>1</sup> In July 2018 the Stop Stock-outs Project (SSP), an independent civil society of associations which aims to monitor and report events of medicine stock-outs and shortages, reported a shortage of contraceptives in the public sector in South Africa, and this was due to the inability of suppliers to meet the demand.<sup>7</sup> Such events may have resulted in an increased risk of unwanted pregnancies and women who were deprived of their right to preventive healthcare.<sup>7</sup> Though alternatives were supplied to counteract the issue, stock levels were also depleted at several clinics. Similarly, the North-West province in 2018, experienced significant incidents of medicine unavailability due to the closure of the medical depot. The most affected medicines were ARVs.<sup>8</sup>

The present study sought to provide a clear and better understanding of patients and healthcare professionals' experiences of incidents of medicine unavailability and to assist in providing a foundation for identifying strategies on how to overcome this global concern. In support of this aim, the study objectives were to describe and analyse patients' and healthcare professionals' experiences of the unavailability of medicines at a healthcare facility and the implications this has on their health care. The study also sought to describe healthcare professionals' perceptions of the causes and effects of medicine stock-outs and shortages.

## Literature review

The South African health system is comprised of the public and private sector. The public health services are further categorised into primary, secondary and tertiary health facilities within each province. The South African Constitution assures every citizen access to health services (section 27 of the Bill of Rights). In theory, everyone can access both public and private health services. However, public sector health services, particularly at a primary healthcare level, are free and run by the government. Still, in the private sector health services, the individual is responsible for their medical bills. The public sector, which serves approximately 84% of the population, is under-resourced and experiences the most incidents of medicine unavailability.<sup>9</sup> Medicine unavailability is, however, a problem in both the public and private sectors in South Africa and other countries globally.

### Causes of medicine stock-outs and shortages

The unavailability of medicines may be due to disruptions at any stage in the medicine supply chain. The supply chain includes multiple stakeholders, such as suppliers of raw material, manufacturers, regulators, wholesalers/distributors, prime vendors, group purchasing organisations and the end-users in the healthcare system.<sup>10</sup> Disruptions that occur in the supply chain

are not consistently reported, for example, 54% of medicine shortages in 2011 did not have an identifiable cause according to the University of Utah Drug Information Service in the USA.<sup>10</sup>

Other causes of stock-outs or shortages are related to financial issues, which have been reported in some European countries,<sup>11</sup> the lack of pharmacy staff, the lack of training for responsible individuals, theft of medicines by staff members, and the long process of ordering medicine.<sup>10-12</sup> Although these factors vary across countries, they all contribute to the unavailability of medicines.

### Reported outcomes of medicine stock-outs and shortages

Medicine stock-outs and shortages negatively affect the patient care process.<sup>5,13</sup> These shortages can adversely affect the choice of medicine therapy, cause delays in medication therapy, lead to an increase in medicine resistance, escalate the costs of products, consume resources in the management of shortages, and increase the risk of medicine errors and unfavourable patient therapeutic outcomes.<sup>11,12,14</sup>

Medicine unavailability may also frustrate healthcare professionals and cause unnecessary conflicts between the healthcare professionals involved, including pharmacists, nurses, doctors, manufacturers and suppliers.<sup>13-15</sup> In a 2013 press release, MSF Southern Africa confirmed the negative effects of medicine stock-outs on healthcare professionals, citing Dr Indira Govender of the Rural Doctors Association of South Africa as stating: 'Having to turn away a patient because medicines are unavailable goes against the core of a healthcare providers' duty'.<sup>16</sup>

### The current situation in South Africa

SSP reported that following a strike at the Mthatha medical depot in Eastern Cape in 2012, 53% of the facilities supplied by this depot experienced stock-outs.<sup>3</sup> The SSP further said that in a national telephonic questionnaire survey conducted between September and October 2013, 21% of ARVs and/or TB medicines were unavailable at healthcare facilities. Due to these shortages, 29% of patients required a change in dose or regimen and 20% of patient cases were sent home without treatment or referred to other facilities.<sup>3</sup> The SSP conducted further surveys in 2014 and 2015. The 2015 report included an increased percentage of stock-outs of at least one ARV or TB treatment during the three months before the facilities were contacted telephonically.<sup>17</sup> The Eastern Cape had a 9% increase in stock-outs from 2013 to 2014, which decreased by 2% in 2015 to 17%.<sup>17</sup> In the 2017 survey, the SSP reported that the percentage of facilities experiencing medicine unavailability varied widely by province. In the Northern Cape, approximately 30% of all facilities were undergoing or had recently experienced a stock-out of an ARV or TB medicine at the time the survey was conducted. In some districts of the Eastern Cape and Gauteng about 50% of facilities reported current or recent stock-outs.

Although there is currently little literature on the state of medicine availability in the Nelson Mandela Metropole, a study conducted in five healthcare facilities in the Eastern Cape, including two clinics, a community health centre (CHC), a district hospital and a tertiary hospital, reported frequent stock-outs of products on the Essential Medicines List (EML).<sup>15</sup> It was further reported that

stock-outs were mostly experienced by clinics with no pharmacist or pharmacy support personnel (PSP). When a medicine stock-out occurs, networks of alternative communication to overcome the issue were established, and a borrowing system was adopted by these clinics. However, this resulted in inconsistencies in the reporting of medicine shortages, and only stock-outs of supplies that could not be borrowed were reported.<sup>15</sup>

## Methodology

A qualitative and hermeneutical phenomenological approach was used to explore the experiences and perspectives of participants from a CHC in the Eastern Cape, South Africa.

A convenience sampling technique was used to recruit study participants from different groups of people affected by medicine unavailability, including patients, doctors, nurses, pharmacists and PSP. The sample size was determined by data saturation, i.e. further interviews were conducted until no new information was yielded.<sup>18</sup> Furthermore, in-depth interviews were conducted using open-ended questions on an interview guide, and interviews were digitally recorded. The first question was posed to participants, and after that, the interviewer explored aspects of participants' responses or asked further questions from the interview guide such as "Have you been sent home or to another facility without all your medication? How did this affect you?"

A pilot study was initially performed at another primary healthcare (PHC) centre within the same metropole. The pilot study explored the clarity of questions asked, leading to minor changes being made to the interview guide. It also served to determine the length of time required for the interviews and provided insight on the relevance of questions and their ability to elicit the desired information.

In the study, in-depth interviews were conducted over two days with eight patients and 12 healthcare professionals (three medical doctors, four PSP, one pharmacist and four nurses). Although several patients visited the pharmacy during data collection, only a few initially admitted to experiencing medicine stock-outs or shortages.

Interviews were transcribed and thematically analysed using Altas.ti® software. Dominant and relevant sentences, statements and phrases were identified from the interviews for efficient analysis and interpretation of data. These units were selected, coded and themed based on the research objectives.<sup>19</sup>

## Results and discussion

The following major themes were identified: experiences of medicine unavailability (including types of medicines that were unavailable), causes of unavailability incidents and outcomes of medicine unavailability (effects on relationships, psychological influence, and compensatory measures). Each of these themes is discussed in the context of the research objectives and the existing literature.

### Experiences of medicine unavailability

Most of the patients interviewed initially reported that they often receive their medicines. Yet, as the interviews progressed, it became

clear that the patients do experience stock-outs as the majority said that they did not receive their pain medication. A patient said, for example: 'No, I have never experienced that. However, there is one thing that was unavailable, my ointment for rash' (P1). Similarly, another patient reported: 'No, I don't experience stock-outs, but at times I don't receive Panado® [paracetamol] and other pain medicines' (P3).

The unavailability of medicines results in patients not receiving optimal access to healthcare services. In this study, stock-outs and shortages led to patients being turned away without treatment. Patients were either told to come back the following day or even the next month. One of the patients said: 'It sometimes happens that two months go by, and they keep on telling you that the treatment is unavailable' (P2). Having to return to the clinic is costly for patients in terms of time and money and not receiving medicines has obvious negative health implications.<sup>14,15,20</sup>

The leading cause of stock-outs appeared to be the delay in delivery of medicines by the medical depot, and this led to dissatisfied patients, who were reported to be violent towards healthcare professionals because of not receiving medication. A doctor said: 'Patients can become violent' (D3). Also, a PSP described a similar experience: 'They then end up attacking you in an unpleasant manner while you are explaining' (PSP2). It was apparent that at this CHC, healthcare professionals sometimes become victims of violent patients whose expectations are not met. Consequently, patients lose confidence in services provided by professionals at the PHC centre as their level of trust is affected, and this can be associated with patient violence. Similarly, it has been reported by Wagenaar and colleagues that low patient satisfaction is a consequence of the lack of medicines at public hospitals.<sup>21</sup>

Although the unavailability of medicines is a rising concern in South Africa, having a pharmacist at the CHC appeared to alleviate the problem. The pharmacist stated: 'Well, we don't really have major issues here because we have got a pharmacist here, so that makes a huge difference to availability' (Ph). As a custodian of medicines, one of the pivotal roles of the pharmacist is in ensuring stock availability.<sup>22</sup> The pharmacist and PSP focus mainly on medicine-related services. They are intensively trained in inventory management, and this competency should lead to efficient management and monitoring of medical stock.<sup>22</sup> Ensuring that competent people are hired to do the job can reduce and prevent the occurrence of medicine stock-outs and shortages, and even overstocking of medicines and medical products can be avoided.<sup>23,24</sup> In a study describing nurses' perceptions about stock-outs of essential medicines at primary healthcare facilities in Vhembe district, the researchers established that the presence of a pharmacist or a PSP at facilities resulted in reduced stock-out rates.

In this study, medicines that were frequently reported as being unavailable included chronic medicines, antibiotics, antispasmodics, vaccines, psychiatric medication, dermatological medicines, pain medicines and paediatric formulations. These reports were consistent with other South African studies which have frequently reported the shortage, and stock-out of chronic medicines and paediatric formulations.<sup>1,7,15,25-27</sup> Additionally, several SSP surveys have indicated that frequent stock-outs in South Africa occur with first- or second-line HIV medicines and isoniazid preventative treatment (IPT) for preventing TB.<sup>3,6,7,17</sup>

### Causes of stock-outs

The causes of stock-outs reported by participants included inadequate funds, administrative inadequacies, delays of imported medicines, depot shortfalls, inadequate staffing, and ineffective government, manufacturing and tender systems. However, most stock-outs were perceived to have resulted from administrative inadequacies, including poor forecasting and shortfalls by the medical depot. A PSP reported: 'I forgot to order and there is like one box left' (PSP3). Also, the pharmacist mentioned that the medical depot is the only supplier of medicines to PHC centres within the Nelson Mandela Metropole. The PSP reported: 'Mainly our problem would come from the depot, not receiving stock from them' (PSP3). Similarly, the pharmacist added: 'You can't get stock from anywhere else unless it's in your cluster or from the different clinics, but our main issue is only one supplier, and that's the depot' (Ph).

Delays in the delivery of stock may also be due to interruptions in processing stock orders or delivery of stock to the incorrect facility. However, miscommunication within the supply chain appears to be a common problem.<sup>1,17,26,28</sup> The 2015 SSP report suggests that poor planning and a lack of communication with and within the supply chain, particularly prior to changes in standard treatment regimens, has resulted in stock-outs.<sup>17</sup> Thus, efficient communication and information flow between stakeholders involved in the supply of medicines is called for.

### Experiences of healthcare professionals

Participants reported that the staffing numbers are insufficient to service the large patient base. Therefore, when medicine unavailability is experienced in an already strained healthcare system, it places an added burden on healthcare professionals. A doctor reported: 'It creates a different burden' (D3). While a nurse reported: 'It stresses us but there is nothing we can do' (N3). Similarly, Wagenaar and colleagues reported that a lack of essential health products may increase the workload of healthcare staff members who are already stressed.<sup>21</sup>

The core purpose of healthcare professionals is to provide patients with optimal care. However, burdened healthcare professionals may be further stressed and frustrated by problems, such as the unavailability of medicines which disempowers them and prevents them from efficiently performing their functions. Furthermore, stress may negatively affect relationships between medicine suppliers and manufacturers, pharmacy staff, other healthcare professionals (prescribers), and patients, leading to the expression of negative emotions such as frustration, anger, anxiety and mistrust.<sup>11</sup>

Work-related stress is a growing concern worldwide, and it can negatively affect one's competency and performance and the productivity of organisations.<sup>29-31</sup> Similarly, stress is a major contributor to exhaustion, fatigue, job burn-out and strained interactions amongst workers.<sup>30,31</sup>

In this study, poor inter-professional relationships amongst healthcare professionals were identified as a consequence of poor communication between healthcare professionals. Strained relationships made a collegial approach to finding solutions and compensating for unavailable medicines difficult. One of the

doctors reported: 'So, I think directly with the pharmacy staff at the clinic, I don't think we are very good at having a relationship from either side' (D2). The tension that medicine unavailability places on the relationships between healthcare professionals has been reported in other studies as well.<sup>14</sup> However, Hodes and colleagues describe how personal motivation and collegiality can contribute to compensatory measures being implemented to ensure a continuous supply of medicines for patients.<sup>15</sup>

### Compensatory measures

Despite strained staff relationships, this study demonstrated how healthcare professionals still attempt to compensate for medicine unavailability for the benefit of the patients. In this study the pharmacist created a social media group including all PSP working at clinics within the same cluster. A PSP reported: 'Normally what we try and do, we have a little WhatsApp group for all the clinics in the area. So, what we do normally is to try and lend stock from other clinics; see where there is some available where we try and help each other, or we ask from the local provincial hospital. You know, you try to make a plan for the patient if it's possible' (PSP2).

This 'borrowing and sharing' phenomenon has previously been described by Hodes and colleagues, who said it is an essential element of compensating for inadequate medical supplies in the Eastern Cape.<sup>15</sup> The borrowing of medicines from other facilities is via informal and internal networks which have been established by healthcare professionals when dealing with stock-outs. However, borrowed medical stock needs to be returned when available, and, borrowing medicines may cause a disruption in the forecasting patterns of each facility and lead to a lack of reporting of stock-outs. Thus, the person responsible for ordering stock may lose track of the actual figures of stock on-hand and the amount required to maintain adequate stock levels.<sup>15</sup> This can either lead to over- or under-stocking; therefore, a recording system needs to be adopted for medicines borrowed to link borrowed stock to actual stock levels monthly.

Healthcare professionals are not the only ones adopting compensatory measures. Patients reported that they borrow medication from other patients, or they end up borrowing money to purchase medicines at a private pharmacy. A patient reported: 'You don't get it and you then have to go home. So, you end up asking for medication from people when you don't have. You go around asking for pain medication or you end up buying the treatment yourself at the chemist or Shoprite' (P3).

The National Drug Policy (NDP) was developed to make drugs more accessible to those that cannot afford them, hence the need for the availability of medicines to all South Africans who cannot afford to purchase their medicines.<sup>32</sup> Also, borrowing medicines from other patients may result in detrimental outcomes for both patients.<sup>33</sup> Individuals who borrow medications may lose an opportunity to receive optimal treatment and may delay seeking professional help.<sup>33</sup>

### Conclusion

Consideration of the experience of medicine unavailability from the perspective of both patients and healthcare professionals demonstrates that everyone suffers as a consequence of medicine

stock-outs and shortages. Although the causes of medicine unavailability are complex and multi-factorial, in this study, medicine stock-outs and shortages are perceived to mainly result from the lack of communication between the parties involved. A lack of communication leads to an inadequate flow of information between healthcare professionals and strained inter-professional relationships. Thus, difficulties are experienced in counteracting the issue and managing patient therapeutic outcomes. The frustrations resulting from medicine unavailability also negatively influenced the psychological behaviours of both patients and healthcare professionals, further resulting in unhealthy relations between healthcare professionals and patients.

Formally introducing a borrowing system via social media or reporting software at all PHC centres could mitigate the problem on a short-term basis. However, developing and maintaining clear communication channels and improved inter-professional relationships amongst stakeholders involved in the supply chain would create better information flow, with the potential of preventing and managing the unavailability of medicines.

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### Conflict of interest

None.

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