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'Building on shaky ground' – challenges to and solutions for primary care guideline implementation in four provinces in South Africa: a qualitative study

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Abstract

Background

Clinical practice guidelines are important tools supporting evidence-informed patient care. In South Africa, although guidelines are usually developed at national level, responsibility for implementation lies with provincial government. This study explored perspectives of provincial and district health managers stakeholders regarding barriers to and enablers for primary care guideline implementation.

Methods

We used qualitative research methods, comprising in-depth interviews with twenty-two participants in four provinces in South Africa (Eastern Cape, Western Cape, Kwazulu-Natal, Limpopo). We interviewed provincial and district health managers responsible for implementation and/or training. Analysis proceeded with inductive thematic content analysis to develop categories and themes; followed by discussion of results and finalization of themes with a multidisciplinary team.

Results

Participants recommended urgent consideration of health system challenges, particularly financial constraints impacting on access to both guidelines themselves and to the basic medical equipment and supplies to adhere to the guidelines. They suggested that to overcome health service gaps, leadership should be strengthened, roles clarified and accountability measures, such as audit and feedback, be improved. Participants suggested that the inadequate numbers of skilled nursing and other clinical staff hampered guideline use and ultimately patient care. Quality assurance of training programmes for clinicians, particularly nurses; interdisciplinary training to ensure all staff are included; and strengthening post-training mentorship was recommended. Furthermore, fit for purpose guideline implementation needs to consider the unique settings in each province and district, including local

culture and geography. This should start from guideline development stages by including guideline end-users.

Conclusions

Universal health coverage is planned for the coming decade and guidelines are one of the named tools to achieve evidence-informed, effective healthcare. Increasing access to guidelines and enhancing training and clinical supervision may enable short to medium term benefits. However, investing in health system strengthening is a pre-requisite to evidence-informed practice.

Key words: qualitative research, clinical practice guidelines, implementation, primary care, quality of care, health systems research, health services research, policy implementation, quality improvement

Article summary

Strengths and limitations of this study

- Clinical practice guidelines are named tools for bridging the gap between policy and practice to support implementation of equitable and cost-effective health services. Yet, there is a paucity of research on clinical guidelines from low- and middle-income countries.
- Strengths of the study are that we report interviews with provincial and district health managers in four culturally and geographically diverse South African provinces.
- The qualitative research methods enable us to explore perspectives of those involved with guideline implementation who shared their views regarding what is working and

what can be improved. The research identified two themes impacting guideline implementation: Health system factors and socio-cultural and geographic context.

- According to participants, several insights emerged for how these factors might be addressed: Strengthening the health system through adequate financial investment and ensuring availability of medical equipment and supplies are necessary for guideline adherence.
- Strengthening leadership and putting in place constructive accountability measures, including appropriate use of audit and feedback.
- Quality assurance of training programmes for primary health care providers, particularly nurses, and facilitating interdisciplinary training to ensure all staff are adhering to guidelines.
- Mentorship and clinical support are provided through District Clinical Specialists but requires further strengthening.
- Consideration of the unique settings in each province, including culture, geography and social needs is required to ensure effective implementation.

- Limitations of the study include that there are many primary care guidelines available in South Africa with different target users. Further interviews may elucidate additional specific barriers to and enablers of guideline implementation. Furthermore, the health system is an evolving environment, and continuous research of this kind is likely necessary to keep abreast of developments to inform guideline implementation.

Background

Primary health care (PHC) remains an important focus globally and part of the foundation for Universal Health Coverage (UHC)(1). The South African government, like other lower- and middle-income countries, have indicated a commitment to enhancing in primary care for UHC (2-4). However, PHC has had faltering progress at best, and despite political will, investment has not been sufficient to overcome challenges posed by colliding communicable and non-communicable epidemics alongside recognized health system deficiencies (5, 6). Health outcomes remain poor relative to other middle-income countries with similar health spend; and healthcare remains inequitably distributed within a two tiered public and private system where 40% of the health budget is consumed by the private sector, despite serving 17% of the population (7-9).

In South Africa, several strategic initiatives aim to address health system fragmentation, including PHC re-engineering, with emphasis on district health system strengthening; and advancing policy planning for National Health Insurance (6, 10, 11). These initiatives place importance on clinical governance, with clinical practice guidelines (CPGs) one named strategy for healthcare strengthening.

CPGs are recognized tools for health policy implementation and quality improvement (12-14). Evidence-informed CPGs aim to recommend effective diagnostic, prevention and management interventions, while minimising harm, within the limits of what a health system can afford. In South Africa, at least 175 CPGs have been developed since 2012, largely for management of non-communicable diseases and mostly by the Department of Health (15). While the number of CPGs available may be substantial, they provide no benefit if inadequately implemented. Studies in South Africa and elsewhere have found potential implementation gaps where, despite the availability of CPGs, clinical care does not meet required standards (16-21).

Evidence-to-practice gaps pose a substantial challenge and the how best to overcome them has been a longstanding debate (22-25). There are checklists available that outline potential approaches for best - practice CPG implementation (26-28). However, which strategies work, under which conditions, remains a complex and evolving research field. Generally, tailored, multifaceted interventions addressing specific barriers may be better, but the benefit to health or process outcomes is often modest at best and difficult to extrapolate to different contexts (25, 29, 30). Increasingly, theory-informed approaches are used to design the complex interventions required to change behavior, yet the cost of doing this relative to the benefit remains unclear (31-34). In South Africa, several trials evaluating evidence-informed approaches for CPG implementation find a small, but consistent benefit from targeted strategies, yet, roll-out of these context-specific strategies remains a gap (35).

Given the limited resources allocated to health, particularly in low- and middle-income settings, knowing how best to intervene in efficient and effective ways is paramount. (36, 37). In this context, exploring the views of those involved with CPGs is a reasonable way to learn about local needs. The South African Guidelines Excellence (SAGE) project aimed to understand primary care CPG development, implementation and capacity needs (38). For the qualitative component of SAGE we interviewed diverse role players involved in primary care CPG development, implementation and/or use. Elsewhere we report the findings fromt national CPG developers (39, 40) and frontline healthcare workers who use CPGs (33). Related SAGE studies have engaged allied healthcare providers (41-44). In this paper, we explore findings that emerged amongst health managers occupying senior management roles in the provincial or district government offices. The district managers include those with strictly management roles and those with clinical governance and support roles (e.g. members of the District Specialist Clinical Teams) or those responsible for training. All participants we spoke to have roles in primary care

CPG implementation. We aimed to explore their perspectives regarding barriers to and enablers for primary care CPG implementation in four provinces in South Africa

Methods

Design

We used qualitative methods to understand the phenomena under investigation as experienced by those involved. The methods and study context have been described in detail elsewhere (33), and thus only a brief summary is provided here, together with more detailed description of participants and analysis methods used in this paper.

Study settings

Over several decades, the South African national government has increased emphasis on PHC services managed through district offices (6, 45-48). Districts are administrative sub-sections of the province, usually run as part of the local government. More recently, legislation has been introduced which supports the implementation of UHC, through a National Health Insurance system (11). However, its implementation is planned for the decade ahead. In general, national government develops strategies and CPGs; and provincial governments implement them through regional, district, or community healthcare facilities (7). Several programmes to strengthen district clinical governance have been introduced and are linked to CPG implementation: 1) The Ideal Clinic is defined as a 'clinic with good infrastructure, adequate staff, adequate medicine and supplies, good administrative processes, and sufficient adequate bulk supplies' includes ensuring access to and use of CPGs (49); and 2) 'primary health care re-engineering' aims to strengthen district healthcare through ward-based outreach teams; school health programmes; and District Clinical Specialist Teams (DCSTs)(10). DCSTs include clinical specialists: family physician, primary health care nurse, obstetrician, advanced midwife, paediatrician,

paediatric nurse and anaesthetist. The family physician and primary health care nurse are central to primary care CPG implementation through their clinical governance role, including provision of training and mentorship with nationally endorsed CPGs.

Sampling and recruitment

Sampling, both purposive and convenience, took place in four of nine provinces in South Africa chosen for their diversity in socioeconomic status, geography and cultures: Western Cape, Kwazulu-Natal, Eastern Cape and Limpopo provinces (33, 46). Within each province, we aimed to interview provincial and district managers, or district clinical specialists face-to-face at their place of work or preferred venue, lasting between 30 to 60 minutes. Prior to conducting interviews, we obtained approval from Provincial Research Units. In the Eastern Cape we were invited to present at a provincial research day, receiving buy-in for our planned research (33). In the Western Cape we contacted known provincial policymakers involved with PHC CPGs. In other provinces, we invited individuals recommended by the Provincial Research units. Once access was negotiated, all those invited agreed to participate.

Patient and Public Involvement

CPGs are tools that aim to directly impact patient care and guide clinician-patient engagement. In South Africa, there is little known from research evidence regarding patients views about CPGs. The research question was developed with patients in mind, but did not engage patients views in the design, conduct or analysis. In this SAGE sub-study we were seeking perspectives of health managers in primary care, and neither patients or the public were included in the sample. The results of the research will be shared with the participants.

Data collection and management

We explored experiences of CPG implementation and use for health service delivery. We used a semi-structured interview guide, asking about experiences of CPG adaptation and implementation processes and about potential barriers to and enablers of successful implementation. The guide was adapted iteratively drawing on insights from previous interviews and included open-ended questions to allow participants to direct the emphasis of the interview (50). Interviewers received training in interviewing and two interviewers were present at all interviews. Interviews were conducted in English. There were no requests for translation despite the various first languages spoken in the provinces. All interviews were individual, with two exceptions 1) a provincial manager interview in Eastern Cape, where our invited participant invited two additional colleagues to participate; 2) the district manager interview in Kwazulu-Natal, where both the district PHC manager and training coordinator were present. One interview, with a Kwazulu-Natal manager, took place telephonically at their request due to challenges with scheduling.

All interviews were recorded. After each interview, reflections and summaries were written to capture initial insights and to identify points for further exploration in subsequent interviews. Interviews were transcribed verbatim, and reviewed for accuracy (TK, TM). Data were stored electronically on password-protected computers; and consent forms stored in a locked cabinet.

Analysis

We used an iterative, thematic content analysis approach (50, 51). Two researchers read initial transcripts (TK, SA) and agreed on the general meaning and main issues presented. One researcher (TK) then re-read transcripts, performing open coding to explore barriers to and enablers of CPG implementation, extracting the relevant quotes/coding units. TK then used the quotes to develop the condensed manifest descriptions, and from these data were placed in categories (52). Categories and their related quotes were further examined (TK, SC, BS, SA) for manifest and latent meanings and to

identify meaningful themes (53). Following this, results were discussed with SA to develop the analysis further and then presented to all authors for input and verification prior to finalization.

Rigour

Credibility was ensured through detailed capturing and description of our approach to sampling, data collection, data management, and analysis. Quotations were included to provide readers the opportunity to interpret data, establish confirmability and to show data richness. Complementary research competencies and experience of the multidisciplinary team of researchers (social science, medical practice, CPG development and implementation) influenced data interpretation and strengthened study rigour.

Results

Twenty-two interviews were held from September 2015 to August 2016. Participants had previously worked in clinical positions as nurses (n = 15), or doctors (n = 7), but were currently occupying management posts. Provincial and district managers were responsible for health service delivery and worked in PHC generally or specific clinical programmes (e.g. HIV, non-communicable diseases), or in operational roles. District Clinical Specialists worked at primary and district healthcare facilities providing clinical governance support. Our final sample included provincial managers representing four provinces; district managers from two districts in each of the four provinces; and district family physicians in Limpopo, KZN and Eastern Cape. The Western Cape has not implemented the DCST programme.

Most participants considered CPGs credible sources guiding clinical practice and importantly, believed that CPGs impact positively on patients' health. Some participants described that CPGs can '*save a life'*.

District medical doctors particularly shared views regarding the value of CPGs, stating that they are '*evidence-based and it works… mortality goes down when we do things properly'.* Further arguments supporting CPGs included '*harmonisation of practice'*, '*quality improvement',* and '*rational*' medicine use.

We present the findings within two emergent themes, namely: health system factors and socio-cultural contextual issues.

Health system factors

Senior provincial managers experienced CPG implementation as challenging, under-resourced, and sometimes insufficiently planned. They suggested that CPGs were not the issue, but rather the health systems capacity to support implementation. An experienced senior manager who had worked in several provinces explained:

training and the guidelines are fine, but the bed rock on which we are building is – we are building on shaky ground (Provincial manager, doctor, WC*)*

Financial constraints

Financial constraints were recurring issues across provinces. One aspect was reflected in the frustration expressed by some that funding across different conditions was inequitable, with more funding for HIV and tuberculosis, '*but the other big killers'* such as non-communicable diseases received little or *'no support'.* This situation was driven by international donor funding, which influenced which CPGs were prioritized for implementation.

Access to the right tools and equipment was perceived as a pre-requisite for successful CPG implementation. However, all participants spoke about budgetary constraints, and resulting lack of, or poorly serviced, clinic equipment and stocks and the associated impact on implementation. A PHC district manager expressed concerns, stating:

Budgetary constraints are still a challenge, the systems are still a challenge they are hindering the implementation of these guidelines. For you to get a blood pressure machine, you have to wait for more than 2 months. If this scale is broken, you should follow a tender process for that scale to be repaired, so the systems are killing the implementation of guidelines also, the procurement and supply chain systems. (District manager, nurse, EC)

Furthermore, the simple issue of limited access to CPG copies on site, due to budgetary constraints, was highlighted as an additional barrier for using CPGs. As captured in this quote from a district doctor in rural Eastern Cape '*I mean you just lucky if you get them*'.

Several district managers also mentioned that '*the challenge is about printing the guidelines'* due to budget allocations from national government. Solutions were offered to overcome both the poor quality of, and poor access to, CPG copies. A dominant view was that digital access would mitigate these issues and increase '*click and check*' CPG access. Several managers suggested, however, that both the book and digital versions are needed, as a rural district doctor said:

'*They [older healthcare providers] like the booklet, but the young ones like the app'* (Provincial manager, nurse, LPP)

Despite many participants highlighting the potential value of increasing digital CPG access, financial barriers were expressed in all provinces, as some managers suggested:

'no computers, no internet, there's no connection' (District manager, nurse, KZN)

'I don't think you will find a single computer that's got any connection to anything' (District manager, doctor, KZN)

In addition, a district manager in an urban context explained the dilemma of investing in digital solutions in the face of limited funding. She asked: '*do you want to buy more computers, or do you want more medication'* (District manager, nurse, WC)

Governance and leadership

Senior managers explained that effective CPG implementation required strong governance including clarity regarding responsibility, and how implementation should be delivered and monitored.

…it's an issue of governance, how is implementation of guidelines governed and whose responsibility is it and do we have enough capacity to manage governance (Provincial manager2, doctor, WC)

District management were perceived as demotivated because of the volume of policies requiring implementing, leaving them feeling *'completely bombarded and confused'.* In addition, lack of support for implementation, or in some circumstances the punitive approach taken towards managers struggling with implementation within very challenging health systems, was demoralizing. A senior manager, having worked in several provinces with differing infrastructure, described his experience:

There are good people at ground level, but without a level of protection and support they kind of just get nailed. So every new policy is looked upon with dread because you are worried that at some point somebody is going to come and say you are not implementing it (Provincial manager, doctor, WC)

Managers offered solutions explaining that it was not only the remit of public servants to lead CPG implementation. Community champions and leaders were suggested as additional enablers of CPG implementation. Within the health workforce, this included senior academics who inspired junior staff;

in the community it was community leaders including traditional chiefs or religious leaders who endorsed local facilities and encouraged patients to follow guidance.

Further recommendations to support governance included developing relationships with non-governmental organizations (NGO), known as 'partners'. Given the limited provincial budgets, partners were often perceived as the only means for providing training or developing materials for CPG dissemination. Partners were mentioned, particularly in the Eastern Cape, both at the provincial and district level, as one district manager explained *'when the guideline is out, we need to call them [NGO partners] to be part of us'*. The issue of sustainability arose as there was a risk that when NGO funding ended, services were withdrawn, and local government lacked capacity to maintain the activities, potentially undermining care.

Accountability approaches

Several managers suggested accountability mechanisms to enhance implementation. For example, use of audit and feedback to measure CPG use was an accountability and quality improvement approach cited by various participants. This approach was reportedly better functioning in certain provinces. A provincial programme manager in the Western Cape described a constructive experience:

*(Based on the) situational analysis and audits ……. we pick up the gaps in quality and we start looking at what is our opportunity to, either tweak a guideline, develop a guideline or a tool or piece of stationary or an algorithm or flow chart that will close that gap (*Provincial manager, nurse, WC*)*

While accountability mechanisms were perceived by some as essential, most managers, on the contrary, described audits as punitive and obstructive with potential negative consequences. As stated by a provincial manager:

*then comes the monitoring and evaluation people to monitor that thing, not in a nurturing way, but in a 'why didn't you hit your targets kind of way' (*Provincial manager, doctor, WC*)*

This concept of punitive audits emerged from several provinces. One senior manager spoke about a '*compliance culture'* in which focus was directed primarily to what is measurable, such as structural inputs like infrastructure, and the blame that ensues if these targets are unmet. As described:

… when it comes to focusing on clinical guidelines if no one is auditing that in the same way. So, the Auditor General is this big bogey man out there. If anything goes wrong, then of course the province gets into big trouble. So, there is a lot more gravitas or seriousness attached when the Auditor General says something… (Provincial manager2, doctor, WC).

Another participant from the Eastern Cape provided an analogous account:

We will comply and complain later, if there is a time to complain. But what is emphasized, is compliance. There is that strict compliance. Compliance. If you don't comply, it means you are failing your district, or your sub-district, or your clinic or your people. *There is no time for complaining or reflecting, it is compliance*. (District manager, nurse, EC)

The compliance culture and aversion to punitive action was thought to have negative effects on CPG implementation and patient care. Participants indicated how the compliance and audit systems '*just adds to the frustration', 'distracts*' from the focus on clinical care and ultimately results in rushing ahead to meet targets, or as one manager put it: '*running around like a headless chicken' (*District manager, nurse, EC).

Human resource constraints

Health workforce constraints were emphasised as pertinent to CPG implementation. Managers described the mismatch between the growing workload and unchanging staff numbers:

*we have this burden of disease that is growing. We have resources that are shrinking. So more of our health workers are being asked to do more with less resources (*Provincial manager, nurse, WC*)*

Health workforce barriers to CPG use were described to be three-fold: staff shortages, insufficient time, and inappropriately qualified staff unable to fulfill required tasks. These issues resulted in staff being '*overstretched'* and '*not coping'*. It was suggested that staff experience considerable time pressures due to their heavy workloads, '*continuously dealing with patients'* as well as pressure from patients wanting them to work '*fast, fast, fast'.* As one provincial manager lamented:

*…they [nurses] have no time to look at guidelines, they have no time to do quality work to check the quality issues because they are continuously dealing with patients (*Provincial manager, nurse, LPP).

Capacity gaps and opportunities

Linked with human resources is capacity building. Training was emphasised as the primary means by which CPGs are implemented. Participants generally agreed that to support implementation '*you can't just automatically know how to do things, you need to be trained'*. Therefore, building skills and knowledge was understood as a pre-requisite to changing practice.

Primary care nurse training gaps

An issue raised mostly by nurse managers was the poor state of professional training of PHC nurses. Nurses were described as '*not skilled'* and the nurse training syllabuses '*outdated'*, raising concerns that nurses entering practice were inadequately prepared. In the most extreme example, a provincial

manager suggested that '*student nurses come out blank….they are the ones that are causing all these deaths.*'

Several suggestions were made for optimizing training and support through 1) training delivery approaches and 2) post-training clinical support.

Considerations during training

Regarding training itself, access to workshops and ensuring adequate coverage of staff was identified as a significant challenge. Various participants indicated that '*onsite training is the best one'*, as when training was delivered off-site, fewer staff could attend, and disseminating learning when back at facilities was ineffective: '*they [the nurses] don't cascade the information'*. However, '*lack of time*' and '*budgetary constraints'* to provide training in every facility was their reality. Therefore, finding contextually appropriate training approaches were suggested, such as '*training local people to be trainers*' and working with NGO's who have more training resources. Furthermore, ensuring DCSTs are maximally used to provide training were considered key. As a district manager in Limpopo suggested:

DCST staff are now doing the training per facility, no more calling people to a centralized place….and also [doing] the support visit in the facility (District manager, nurse, LPP)

Several participants recommended that training should be interactive, not didactic. Many commended the practical skills training, so-called '*fire drills'*, used for maternal health training. This training require staff to demonstrate a response to an emergency during the training, but also subsequently on-site at unexpected intervals.

It was reported that doctors are excluded from training. Ideally, training should be interdisciplinary, bringing all clinical disciplines onto the same level. As a senior doctor suggested, '*the nurse now knows more than the doctor. So you have to train everybody at the same time.'* (District clinician, doctor, KZN)

Post-training recommendations

Following training, a critical gap raised repeatedly was the absence of '*clinical support*' and '*mentoring*'. As a district clinician suggested, '*we desperately, desperately need mentors*'. It was emphasized that regardless of access to up-to-date, high quality CPGs, when post-training support is poor, implementation gaps were likely, as captured by the following quote:

on-site facility mentoring, it's a problem….without that, we can have much, much guidelines, good guidelines, but if there's no on-site mentoring, we are just wasting the government's money (District clinician, nurse, KZN)

Socio-cultural and geographic challenges to CPG implementation

In addition to health system factors, socio-cultural and geographic factors were raised by most participants, particularly those in district settings presumably closer to the day-to-day requirements of health service delivery. The explanation given was that there is a mismatch between what is recommended in CPGs and what was acceptable due to culture or feasible due to challenges of living in rural settings.

Acceptability and cultural considerations

Several specific CPGs that posed challenges to implementation were mentioned. The CPG recommending voluntary male medical circumcision was emphasized as being at odds with cultural beliefs and norms in settings where traditional circumcision required specific rituals. As one female nurse manager described:

…. male circumcision, it is a taboo for me to talk about circumcision. Now you tell people go and do the medical male circumcision. It is as now you are insulting their culture. (District manager, nurse, EC)

Another example related to when mothers with newborns require follow-up clinic visits after delivery, whereas, in some traditional cultures, leaving home for a specified period post-delivery is frowned upon:

*after birth, she must stay at home until 10 days (*District manager, nurse, EC*)*

Geographic barriers

Geography posed barriers to CPG implementation. The distance and difficult environmental circumstances under which many patients must travel to attend clinic appointments make the implementation of certain CPG recommendations unfeasible:

A woman in the Eastern Cape will have to travel 5 kilometers or even more to reach the clinic, so how would you ensure that you reach the clinic 6 days after birth? Those are things that, at times, are impossible when you look at the guidelines. (District manager, nurse, EC)

in rural areas, people are scattered, and there are rivers when it is raining, they can't go to that facility, …….there was rain for the whole month and then there were floods, and maybe the bridges are then just swept away with the floods. And then people who can't go to that clinic to go and fetch their treatment for diabetes and hypertension. (Provincial managers, nurses, EC)

One size fits all approach to CPG development

Critically, the disparity between CPG recommendations and their feasibility were perceived to result in unsuccessful CPG implementation and subsequent failure on standardized national indicator '*report cards':*

*Most of the time we will be Number 0 [on audit reports] …., because it [the guideline] is not implemented in the Eastern Cape. It's not working. But they [national government] will always say Eastern Cape is Number 0. It's Number 0 because the tool does not fit here, it's [the guideline] is just not right, they are using something which is round in a square hole… (*Provincial managers, nurses, EC*)*

Many provincial managers reported that consultation between national and provincial government was happening, even prior to finalization of a CPG, to address contextual barriers:

So I think in terms of implementation what I've seen works really well is when people have been part of the process from the policy development side from the word go (Provincial manager, nurse, WC)

However, many participants, particularly district managers did not feel consultations were done consistently and in meaningful ways to ensure that the final CPGs and linked indicators were aligned with geographical and cultural contexts. Many felt that CPG content was '*one size fits all*' and that examples of contextually-appropriate implementation were limited.

Despite participants emphasizing the importance of context, processes for the contextual adaption of CPGs was not routinely described. One exception was an example provided about the structured approach to adopt, adapt, or develop new CPGs in the Western Cape. A provincial manager noted:

*either use the policy from national as is or we either translate it for the local context or we develop policy, because national just hasn't done it (*Provincial manager, nurse, WC)

Discussion

This study explored perspectives of South African provincial and district health managers on potential barriers to and enablers of primary care CPG implementation. Two major themes emerged, the first

related to broader health system factors such as financial constraints, governance and health workforce capacity gaps. The second emphasized the importance of socio-cultural and geographic factors, and the need for CPGs to be adapted to fit local contexts.

Regarding health system issues, we found that despite managers' willingness to support PHC CPGs use, the relative dysfunction of the health system posed barriers to doing so. Aspects of this theme mirrored several of the often cited WHO health system building blocks, including leadership and governance; financial arrangements; health service arrangements and implementation strategies, such as training (54, 55).

Strong leadership is required to drive CPG implementation (55, 56). Participants, all of whom occupy responsible management positions, described governance gaps affecting CPG implementation, a factor also identified in other studies of countries in sub-Saharan Africa (57). Participants described volumes of incoming policies without time for consultation, adaptation or planning; and rushed implementation responding to political drivers rather than healthcare quality considerations. To address this challenge, managers often partnered with community leaders and NGOs. This was deemed necessary, particularly in the Eastern Cape, a province where many health system and financial issues were emphasised by our participants and highlighted in national reports (4, 6). CPG implementation strategies take many forms, including professional development, dissemination of summary products to patients and healthcare providers, use of key opinion leaders, to name a few (29). In the South African setting, delegating responsibility to partners with relevant skills and resources is necessary, however, participants were concerned about sustainability of donor funded activities.

Relatedly, accountability was a reported gap, specifically clarity regarding who is responsible for CPG implementation and how best to monitor success. For monitoring, audit and feedback was proposed, a quality improvement strategy premised on the notion that clinicians may change their performance when they receive feedback regarding sub-standard practice (58). Those we spoke to provided examples of constructive audit and feedback allowing managers to adapt implementation to address gaps. However, mostly, audits were experienced as punitive, driving managers to '*comply*' rather than innovate. A systematic review of 49 trials of audit and feedback found this approach should offer benefit in CPG implementation (58). Importantly, this review identified success factors that need be considered including whether the baseline performance of health professionals is low to start with; feedback is recurrent and given both verbally and in writing; and the process includes clear targets and action plans (58). Findings from our study suggest that further factors may need to be considered, such as feasibility and context, to ensure that implementers feel empowered, rather than discouraged or demotivated, by audit and feedback systems.

Most participants described CPG implementation as reactive, rather than proactive, driven by demands to implement without adequate time or funds to do so effectively. Participants spoke of a '*compliance culture'* and explained that requirements were heavily weighted towards administrative reporting rather than consideration of clinical quality improvement. Within the field of 'quality of care' measurement, a long-standing model posited by Donabedian proposed three measurable facets of quality of care, 1) structure (e.g. inputs to care such as facilities, staffing); 2) process (e.g. clinical care) and 3) outcomes (e.g. health outcomes, patient satisfaction) (59, 60). In South Africa, the apparent emphasis on structural measurement, is unlikely sufficient, as shown by a multi-country cross-sectional study in similarly poor settings which reported that infrastructure reports correlated poorly with clinical care or CPG adherence (61). Drawbacks of this narrower structural and process focus have also been described in

the UK's National Health Service, where attempts to create efficiency, resulted in '*compliance-oriented bureaucratised management*' and was felt to hinder quality service delivery rather than enable it (62).

Financial constraints were identified as critical factors limiting effective CPG implementation. Lack of basic equipment, and CPG books was described as the norm. Additionally, lack of infrastructure, including internet or devices, was a perceived barrier to using CPGs. These views mirrored those of PHC providers in the same districts that we spoke to who described that they would be more likely to use CPGs if digital access was possible (33). However, like the managers, lack of internet in facilities, and exorbitant costs of data required for downloading CPGs was a barrier (33).

Human resource constraints such as clinical workload and understaffing were another health system issue hindering CPG implementation, a finding that echoes a sub-study of PHC clinical staff in these districts (33).

Training is the mainstay of capacity building for human resources for health. Training is vital for building skills and knowledge to implement CPGs, but also as a form of enablement for teams more generally. In South Africa, like many low- or middle-income settings, nurses are the backbone of PHC services. Yet, poor quality nurse training, found in our study and others, was a concerning issue associated with outdated curricula and inaccessible training sites (63).

To overcome these challenges, many participants pointed to the importance of post-training clinical mentorship. When in place, this clinical mentorship was perceived to provide the necessary, case-based, in-facility support for CPG implementation and role-modelling CPG use. This view has been reported by other South African studies, in particular a study exploring the Ideal Clinic programme

implementation suggested that family doctors in the DCSTs have similar perspectives regarding the importance of mentorship (64, 65).

In addition to health systems issues, the importance of context emerged as a significant theme. Within the public sector, CPG production in South Africa is generally the responsibility of the National Department of Health and implementation a provincial mandate, with further devolvement of decision-making to districts (6). This decentralised approach is advocated globally, particularly for health systems progressing to UHC to enable more responsive ground-up health services (66). However, from our participants we learned that the problem with this is two-fold. Firstly, health indicators are aligned with national strategies, which do not consider differences between provinces. Secondly, local teams lack time and specific training in the adaptation of the CPGs for their setting. These concerns were also expressed by national primary care CPG developers, who described that fragmentation between and within provinces likely hampers implementation (39). According to our participants, implementation of a 'one size fits all' national CPG may result in several negative consequences including poor scores on national indicators due to unfeasible recommendations that are not adequately implemented ('round peg in a square hole' analogy); and rushed implementation to align with a national programme or political drive.

Despite, and perhaps because of, the contextual challenges these managers encountered, many of them described innovative approaches to overcome geographic barriers or cultural issues. For example, a female nurse manager in the Eastern Cape led the development of a male nurse-led programme for medical male circumcision because in her setting for women to discuss circumcision is a cultural taboo. In addition, where geographical barriers arose, such as flooding rivers, district managers tried to provide vehicles and airtime to community healthcare workers to reach patients. This was not always successful,

due to financial barriers and inadequate procurement processes. A number of managers described plans that required impressive ingenuity and commitment to overcome health system and contextual barriers, despite all odds, and seemingly with little recognition. Additionally, despite the managers' evident wealth of knowledge, experience and creative solutions, when pressed, there was a notable absence of examples provided by participants of opportunities to share lessons learned, innovative approaches, and successes or challenges between and within districts or provinces.

Taken together these health system and contextual barriers to CPG implementation are recognized in various CPG frameworks as potential challenges to implementation (27, 67) . However, arguably, those frameworks, largely developed in higher-income settings, contain more detail regarding the CPG and healthcare provider characteristics and less regarding the social, political and contextual factors. In South Africa, availability of CPGs and motivation of healthcare providers and managers to support CPG use are less of an issue than those of context and health systems (33).

Implications for policy and practice

Although substantial research about district health services and systems exists in South Africa and elsewhere, there is a paucity of evidence published through the lens of CPG implementation. CPGs are amongst the tools used for policy implementation. In this study, participants made recommendations regarding structural barriers that hinder CPG implementation and ultimately impact patient care. Participants emphasised the importance of strengthening leadership, clarifying roles and putting in place constructive accountability measures. Skilled nursing and other clinical services are required to address the health burden, along with the equipment and supplies to deliver their services as recommended by evidence-informed CPGs. Quality assurance of PHC training programmes, particularly nurses, and facilitating interdisciplinary training to ensure all staff are adhering to CPGs was suggested. Innovations,

such as the DCSTs, are filling a reported gap in providing clinical mentorship, but needs further strengthening. Finally, effective CPG implementation in health services need to consider the unique settings in each province, including culture, geography and social needs. Systematic use of available CPG implementation checklists to explore, understand and plan for implementation will assist to tailor strategies to address local needs, making best use of limited resources (27, 30, 67).

Limitations

Elsewhere we have discussed limitations within the broader SAGE qualitative study (33, 40). In brief, exploring CPG implementation for all PHC CPGs encompasses a very broad research area. Many PHC CPGs are available, each likely has different barriers. However, in our exploratory research, we found many cross-cutting issues likely to affect most of PHC CPGs, such as access, training and supply chain factors. Future research can build on our findings and identify CPG-specific barriers and enablers.

Regarding this sub-study, a potential limitation is the sample, including provincial and district managers in four provinces, which may not sufficiently capture all views for this sub-group of the health services. Additionally, we used a mix of purposive and convenience sampling, resulting in inclusion of participants who were more likely to be available or responsive. Despite this, common themes emerged and triangulated between provinces and with previous research. As this is not a static situation, research in the evolving process to UHC is likely necessary. Finally, we cannot rule out the possibility of response bias, in which participants respond according to what they believe we want to hear (50). However, from most participants, many rich issues arose. Using the individual interview approach may have provided a safe space and achieved the depth that we have been able to capture and share in this paper.

Conclusion

UHC is planned for the coming decade with CPGs one of the named tools to achieve evidence-informed, effective and cost-effective healthcare (11). We found that health system challenges; and socio-cultural and geographic context are central issues requiring attention for successful CPG implementation. Our study adds to a body of CPG implementation knowledge providing practical and local insights, from the perspective of provincial and district health managers, regarding what needs attention to effectively implement primary care CPGs in lower-resourced settings.

List of abbreviations

CPG Clinical practice guideline

DCST District Clinical Specialist Team

EC Eastern Cape

HIV Human immunodeficiency virus

KZN Kwa-Zulu Natal

LPP Limpopo

PHC Primary health care

UHC Universal health coverage

WC Western Cape

Declarations

Ethics approval and consent to participate

The study was approved by the Research Ethics Committees of the South African Medical Research Council (EC002-2/2014) and Stellenbosch University (N14/02/008). The informed-consent form was sent to the individuals prior to the interviews and was also explained and confirmed at the start of interviews. All participants provided individual written informed consent. The names of participants

have been captured and have restricted access. We referred to the Consolidated criteria for reporting qualitative research (COREQ) to ensure comprehensive reporting (36).

Consent for publication

Not applicable

Availability of data and material

The datasets generated and/or analysed during the current study are not publicly available as this may be linked to specific clinic staff that were interviewed and as such is not available open use data. Should anyone wish to have access or is interested in further exploration of the data, you may contact the author: tamara.kredo@mrc.ac.za.

Competing interests

TK has contributed evidence to the National Department of Health Essential Drugs List Adult level standard treatment guideline (non-funded); and facilitated workshops and capacity development for under and post-graduate students, researchers, policymakers and practitioners on clinical practice guidelines and evidence-informed practices. JV has been involved in guideline development globally and regionally, he has been on advisory committees for clinical guidelines in the Western Province and has facilitated workshops and capacity development for under and postgraduate students, researchers and practitioners on clinical practice guidelines and evidence-informed practices. SC, SA, AA, BS and JM have no competing interests to declare.

No financial competing interests to declare for any contributors to this research.

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Authors' contributions

TK drafted the protocol, with input from JV, and AA, amongst others involved with the initial SAGE project. TK, AA and JM were involved with data collection. TK, SA, JV, AA, JM, SC and BM contributed to discussions regarding analysis of findings. TK drafted the manuscript, with input from all authors. All authors approved the final version of the manuscript.

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Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups

SAGE provincial managers paper

1 May 2019

No / Item	Guide questions/description	Section in paper
Domain 1: Research team and reflexivity		
Personal Characteristics		
1. Interviewer/facilitator	Which author/s conducted the interview or focus group?	Details provided in methods and in previous publications
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	Provided in methods
3. Occupation	What was their occupation at the time of the study?	Outlined in methods
4. Gender	Was the researcher male or female?	All female, but not considered relevant in the context of health manager interviews
5. Experience and training	What experience or training did the researcher have?	Outlined in methods
Relationship with participants		
6. Relationship established	Was a relationship established prior to study commencement?	Described in sampling
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	Interviewers not known to participants
8. Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	Outlined in methods and limitations
Domain 2: study design		
Theoretical framework		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	Thematic content analysis outlined in methods
Participant selection		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Detail in methods
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	Included in methods
12. Sample size	How many participants were in the study?	Outlined in results

13. Non-participation	How many people refused to participate or dropped out? Reasons?	Included in methods
Setting		
14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	Provided in methods and previous publications
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	Included in methods
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	Relevant details provided in methods
Data collection		
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Approach outlined ion methods and guide provided in appendix
18. Repeat interviews	Were repeat interviews carried out? If yes, how many?	n/a
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	Use of digital recordings described in methods
20. Field notes	Were field notes made during and/or after the interview or focus group?	Described in methods
21. Duration	What was the duration of the interviews or focus group?	Described in methods
22. Data saturation	Was data saturation discussed?	Not discussed, but considered triangulation between different sites
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	Not done
Domain 3: analysis and findings		
Data analysis		
24. Number of data coders	How many data coders coded the data?	Details of analysis in methods
25. Description of the coding tree	Did authors provide a description of the coding tree?	Not provided here
26. Derivation of themes	Were themes identified in advance or derived from the data?	Described in methods, derived from data
27. Software	What software, if applicable, was used to manage the data?	Not used

28. Participant checking	Did participants provide feedback on the findings?	Not done
Reporting		
29. Quotations presented	Were participant quotations presented to illustrate the themes / findings? Was each quotation identified? e.g. participant number	Provided in results with identifier
30. Data and findings consistent	Was there consistency between the data presented and the findings?	Yes
31. Clarity of major themes	Were major themes clearly presented in the findings?	Yes, headings outlined major themes and categories
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Differing views are included

BMJ Open

'Building on shaky ground' – challenges to and solutions for primary care guideline implementation in four provinces in South Africa: a qualitative study

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'Building on shaky ground' – challenges to and solutions for primary care guideline implementation in four provinces in South Africa: a qualitative study

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Abstract

Objectives:

Clinical guidelines support evidence-informed quality patient care. Our study explored perspectives of South African sub-national health managers regarding barriers to and enablers for implementation for all available primary care guidelines.

Design:

We used qualitative research methods, including semi-structured, individual interviews and an interpretative perspective. Thematic content analysis was used to develop data categories and themes.

Setting:

We visited four of nine South African provinces with diverse geographic, economic and health system arrangements (Eastern Cape, Western Cape, Kwazulu-Natal, Limpopo). South Africa is a middle-income country with high levels of inequality. The settings represented public sector rural and peri-urban health facilities.

Participants:

Twenty-two participants with provincial and district health management roles, that comprised implementation and/or training on primary care guidelines, were included in the study.

Results:

Participants recommended urgent consideration of health system challenges, particularly financial constraints impacting on access to guidelines themselves and to medical equipment and supplies to adhere to guidelines. They suggested that overcoming service delivery gaps requires strengthening of leadership; clarification of roles and enhanced accountability. Participants suggested that inadequate numbers of skilled clinical staff hampered guideline use and ultimately patient care. Quality assurance of training programmes for clinicians, particularly nurses; interdisciplinary training; and strengthening post-training mentorship was recommended. Furthermore, fit-for-purpose guideline implementation

necessitates considering the unique settings of facilities, including local culture and geography. This requires guideline development to include guideline end-users.

Conclusions

Guidelines are one of the policy tools to achieve evidence-informed, cost-effective and universal healthcare. But, if not effectively implemented, guidelines risk having no impact. Sub-national health managers in poorly resourced settings suggested that shortcomings in the health system, along with poor consultation with end-users, affects implementation. Short-term improvements are possible through increasing access to and training on guidelines. However, health system strengthening and recognition of socio-cultural-geographic diversity, are pre-requisites for context-appropriate evidence-informed practice.

Key words: qualitative research, clinical practice guidelines, implementation, primary care, quality of care, health systems research, health services research, policy implementation, quality improvement

Strengths and limitations of this study

- The qualitative research methods enable us to explore in-depth perspectives of those involved with guideline implementation regarding what is working and what can be improved in a lower income setting with high levels of inequality.
- We report interviews with provincial and district health managers in four culturally and geographically diverse South African provinces, that likely reflect settings in other low-and-middle income countries.
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- There are many primary care guidelines available in South Africa with different target users, further interviews may elucidate specific barriers to and enablers of guideline implementation.
- The health system is an evolving environment, and continuous research of this kind is necessary to keep abreast of developments to inform effective guideline implementation.

Background

Primary health care, often a first point of contact for people within a public health system, aims to provide comprehensive, accessible, quality, cost-effective care throughout a person's life (1-3). A functioning primary health care system is considered indicative of a strong health system and a necessary precursor to achieving Universal Health Coverage (UHC) (2, 3). Despite clear goals and several multi-national agreements over several decades, a 2017 World Bank and WHO report measuring UHC success stated that at least half of the global population does not yet access basic health services (4).

Like many lower- and middle-income countries, South Africa has committed to enhancing primary care for UHC (5-7). However, despite political will encompassed in the white paper for a National Health Insurance Scheme to fund UHC, the investment has not been sufficient to overcome challenges posed by colliding communicable and non-communicable epidemics alongside recognized health system deficiencies (8-10). Health outcomes remain poor relative to other middle-income countries with similar health spend; and healthcare remains inequitably distributed within a two tiered public and private system where 40% of the health budget is consumed by the private sector, despite serving 17% of the population (11-13). Several strategic initiatives aim to address health system deficiencies in the country, including PHC re-engineering, with emphasis on strengthening district health managers; and advancing policy planning for National Health Insurance (9, 14, 15). These initiatives place importance on clinical governance, with clinical practice guidelines (CPGs) one named strategy for healthcare strengthening. CPGs are recognized tools for health policy implementation and quality improvement (16-18). Evidence-informed CPGs aim to recommend effective prevention, diagnostic, and treatment interventions, while minimising harm, within the limits of what a health system can afford. In South Africa, at least 175 CPGs have been developed since 2012, largely for management of non-communicable diseases and mostly by

the Department of Health (19). While the number of CPGs available may be substantial, they provide no benefit if inadequately implemented. Studies in South Africa and elsewhere have found potential implementation gaps where, despite the availability of CPGs, clinical care does not meet required standards (20-25).

Evidence-to-practice gaps pose a substantial challenge in all healthcare settings and the question of how best to overcome them has been a longstanding debate (26-29). There are checklists available that outline potential approaches for best -practice CPG implementation (30-32). However, which strategies work, under which conditions, remains a complex and evolving research field. Generally, tailored, multifaceted interventions addressing specific barriers may be better, but the benefit to health or process outcomes is often modest at best and difficult to extrapolate to different contexts (29, 33, 34). Increasingly, theory-informed approaches are used to design the complex interventions required to change behavior, yet the cost of doing this relative to the benefit remains unclear (35-38). In South Africa, several trials evaluating evidence-informed approaches for CPG implementation find a small, but consistent benefit from targeted strategies, yet, roll-out of these context-specific strategies remains a gap (39).

Given the limited resources allocated to health, particularly in low- and middle-income settings such as South Africa, knowing how best to intervene in efficient and effective ways is paramount (40, 41). In this context, exploring the views of those involved with CPGs is a reasonable way to learn about local needs. The South African Guidelines Excellence (SAGE) project aimed to understand primary care CPG development, implementation and capacity needs (42). For the qualitative component of SAGE, we interviewed diverse role players involved in primary care CPG development, implementation and/or use. Elsewhere we report the findings from national CPG developers (43, 44) and frontline healthcare

workers who use CPGs (37). Related SAGE studies have engaged allied healthcare providers regarding CPG development and implementation (45-48). In this paper, we build on previous work but aim to delve further into the area of health system and service governance to explore the perspectives of provincial or district health managers who have responsibility for CPG implementation. The district managers include those with strictly management roles and those with clinical governance and support/ training roles (e.g. members of the District Specialist Clinical Teams) or those responsible for training. All participants we spoke to have roles in primary care CPG implementation. We aimed to explore their perspectives regarding barriers to and enablers for primary care CPG implementation in four provinces in South Africa

Methods

Design

We used qualitative methods from an interpretative paradigm to understand the phenomena under investigation as experienced by primary care guideline implementers. The methods and study context have been described in detail elsewhere (37), and thus only a brief summary is provided here, together with a detailed description of participants and analysis methods used in this paper.

Study settings

South Africa is an upper middle-income country with a population of 58.8 million in 2019 (49); and its populations face amongst the highest rates of inequality globally (50). Over several decades, the South African national government has increased emphasis on PHC services managed through their 44 district offices across nine provinces, ranging from 2 to 10 districts in each province (9, 49, 51-53). Districts are administrative sub-sections of the province, usually run as part of the local government. More recently, legislation has been introduced which supports the implementation of UHC, through a National Health

Insurance system (15). In general, national government develops health strategies and CPGs; and provincial governments implement them through regional, district, or community healthcare facilities and their providers (11). Primary care providers include nurses, doctors, nutritionists, physiotherapists, dentists, occupational therapists and social workers. However, primary care clinics are largely nurse-run, with access to the additional providers intermittently or at larger district facilities. There are several primary care guidelines endorsed by the national government for public sector use. These include condition specific guidelines (e.g. basic antenatal care, human immune-deficiency, tuberculosis) or integrated guidelines (e.g. Essential Medicines list, Adult Primary Care, Integrated Management of Childhood Illness) (54). Several programmes to strengthen district clinical governance have been introduced and are linked to CPG implementation: 1) The Ideal Clinic, defined as a 'clinic with good infrastructure, adequate staff, adequate medicine and supplies, good administrative processes, and sufficient adequate bulk supplies', includes ensuring access to and use of CPGs (54); and 2) 'primary health care re-engineering' which aims to strengthen district healthcare management through community health workers; school health programmes; and District Clinical Specialist Teams (DCSTs)(14). DCSTs include clinical specialists: family physician, primary health care nurse, obstetrician, advanced midwife, paediatrician, paediatric nurse and anaesthetist. The family physician and primary health care nurse are central to primary care CPG implementation through their clinical governance role, including provision of training and mentorship with nationally endorsed CPGs.

Sampling and recruitment

Sampling took place in four of nine provinces in South Africa, chosen for their diversity in socioeconomic status, geography and cultures: Western Cape, Kwazulu-Natal, Eastern Cape and Limpopo provinces (37, 51). Within each province, we aimed to interview at least two provincial and five district managers or district clinical specialists face-to-face at their place of work or preferred venue. Prior to conducting

interviews, we obtained approval from Provincial Research Units. In the Eastern Cape we were invited to present at a provincial research day, receiving buy-in for our planned research (37). In the Western Cape we contacted known provincial policymakers involved with PHC CPGs. In other provinces, we invited individuals recommended by the Provincial Research units. Hence sampling was both purposive, as we sought to include individuals with specific experience in PHC CPG implementation; and through convenience, when specific individuals, meeting our criteria, were available to be interviewed. Once access was negotiated, all those invited agreed to participate.

Patient and Public Involvement

CPGs are tools that aim to directly impact patient care and guide clinician-patient engagement. In South Africa, there is little research evidence regarding patients views about CPGs. The research question was developed with patients in mind, but did not engage patients views in the design, conduct or analysis. In this SAGE sub-study, we were seeking perspectives of sub-national health managers in primary care, and neither patients nor the public were included in the sample. The results of the research will be shared with the participants.

Data collection and management

We explored experiences of health managers regarding CPG implementation and use for health service delivery. Individual interviews were considered most appropriate to provide in-depth insights into peoples' lived experiences (55). We used a semi-structured interview guide (Supplementary file 1), asking about experiences of CPG adaptation and implementation processes and about potential barriers to and enablers of successful implementation. The guide was adapted iteratively, drawing on insights from previous interviews and included open-ended questions to allow participants to direct the emphasis of the interview (55). Interviewers received training in interviewing and two interviewers were present at all

interviews. TK, a medical doctor with qualitative interview training, lead most interviews, accompanied by AA, JM or other research team members. Interviews were conducted in English and lasted between 60 – 90 minutes. There were no requests for translation despite the various first languages spoken in the provinces. All interviews were individual, with two exceptions in which colleagues joined the interview at the request of the invited participant. One interview, with a Kwazulu-Natal manager, took place telephonically at their request due to challenges with scheduling.

All interviews were recorded. After each interview, reflections and summaries were written to capture initial insights and to identify points for further exploration in subsequent interviews. Interviews were transcribed verbatim, and reviewed for accuracy (TK, TM). Data were stored electronically on password-protected computers; and consent forms stored in a locked cabinet.

Analysis

We used an iterative, thematic content analysis approach (55, 56). Three researchers read initial transcripts (TK, AA, SA) and agreed on the general meaning and main issues presented. One researcher (TK) then re-read transcripts, performing open coding to explore barriers to and enablers of CPG implementation, extracting the relevant quotes/coding units. TK then used the quotes to explore the topics raised, unpack the meanings of statements made, while categorising the arising themes (57). Categories and their related quotes were further examined (TK, SC, BS, SA) to identify meaningful themes (58). Following this, results were discussed with SA to develop the analysis further and then presented to all authors for input and verification prior to finalization. The research team was interdisciplinary including public health, medical doctors, and social scientists enabling various views to enrich the interpretation.

Validity

Credibility was ensured through detailed capturing and description of our approaches including that of sampling, data collection, data management, and analysis (58). Quotations were included to provide readers the opportunity to interpret data, establish confirmability and to show data richness. Complementary research competencies and experiences of the multidisciplinary team of researchers (social science, medical practice, CPG development and implementation) influenced data interpretation and strengthened study quality. Transferability to a broader readership was demonstrated through information about the sample, setting and provision of a sufficiently detailed report to consider relevance to others. Reflexivity and the researchers' positionings were considered throughout the process of data collection and analysis.

Results

Twenty semi-structured interviews were held with 22 participants from September 2015 to August 2016 (Table 1). Participants had previously worked in clinical positions as nurses (n = 15), or doctors (n = 7), but were currently occupying management positions. These provincial and district managers were responsible for health service delivery and worked in PHC generally or within specific clinical programmes (e.g. HIV, non-communicable diseases), or in operational roles. District Clinical Specialists worked at primary and district healthcare facilities providing clinical governance support. Our final sample included provincial managers representing four provinces; district managers from two districts in each of the four provinces; and district doctors in Limpopo, KZN and Eastern Cape. The Western Cape has not implemented the DCST programme.

Provincial and district managers and trainers: primary health care guideline implementation roles	20 interviews (22 participants) Previous clinical disciplines: nurses = 15, doctors = 7

	KwaZulu-Natal: 4 interviews (1 in province, 3 in district offices) *Limpopo*: 4 interviews (2 in province and 2 in district offices) *Eastern Cape*: 6 interviews (2 in province, 4 in district offices) *Western Cape*: 6 interviews (5 in province, 1 in district offices)

Table 1. Description of the research participants

Most participants considered CPGs credible sources guiding clinical practice and importantly, believed that CPGs impact positively on patients' health. Some participants described that CPGs can '*save a life'*. District medical doctors particularly shared views regarding the value of CPGs, stating that they are '*evidence-based and it works… mortality goes down when we do things properly'.* Further sentiments supporting CPGs included '*harmonisation of practice'*, '*quality improvement',* and '*rational*' medicine use.

Despite widespread belief in the credibility and positive impact of CPGs, participants felt that CPG implementation is currently inadequate and they described face multiple challenges in this regard. We have organised these into two main themesnamely: 1) health system factors and 2) socio-cultural contextual issues.

Health system factors

Provincial managers experienced CPG implementation as challenging, under-resourced, and sometimes insufficiently planned. They suggested that CPGs were not the issue, but rather that the health systems capacity to support implementation was what posed the greatest challenge to implementation. A provincial manager who had worked in several provinces explained: *"training and the guidelines are fine, but the bed rock on which we are building is – we are building on shaky ground"* (Provincial manager, WC*)*

Financial constraints

Financial constraints were recurring issues across provinces. One aspect was reflected in the frustration expressed by some that funding across different conditions was inequitable, with more funding for HIV and tuberculosis, '*but the other big killers'* such as non-communicable diseases received little or *'no support'*. This situation was driven by international donor funding, which influenced which CPGs were prioritized for implementation.

Access to the right tools and equipment was perceived as a pre-requisite for successful CPG implementation. However, all participants spoke about budgetary constraints, and a resulting lack of, or poorly serviced, clinic equipment and stocks and the associated impact on CPG implementation. A PHC district manager expressed concerns, stating:

> *Budgetary constraints are still a challenge, the systems are still a challenge they are hindering the implementation of these guidelines. For you to get a blood pressure machine, you have to wait for more than 2 months. If this scale is broken, you should follow a tender process for that scale to be repaired, so the systems are killing the implementation of guidelines also, the procurement and supply chain systems.* (District manager, EC)

Furthermore, the simple issue of limited access to CPG copies on site, due to budgetary constraints, was highlighted as an additional barrier for using CPGs. As reflected on by a district doctor in rural Eastern Cape '*I mean you just lucky if you get them*'.

Several district managers also mentioned that '*the challenge is about printing the guidelines'* due to budget allocations from national government. Solutions were offered to overcome both the poor quality of, and poor access to, CPG copies. A dominant view was that digital access would mitigate these issues and increase '*click and check*' CPG access. Several managers suggested, however, that both the book

and digital versions are needed; for example, one rural district doctor said: '*They [older healthcare providers] like the booklet, but the young ones like the app'* (Provincial manager, LPP)

Despite many participants highlighting the potential value of increasing digital CPG access, financial barriers were expressed in all provinces, as one manager suggested *'no computers, no internet, there's no connection'* (District manager, KZN). This was repeated by others: *'I don't think you will find a single computer that's got any connection to anything'* (District manager, KZN)

In addition, a district manager in an urban context explained the dilemma of investing in digital solutions in the face of limited funding. She asked: '*do you want to buy more computers, or do you want more medication?*' (District manager, WC).

Governance and leadership

Senior managers explained that effective CPG implementation required strong governance including clarity regarding responsibility, and how implementation should be delivered and monitored. *"…it's an issue of governance, how is implementation of guidelines governed and whose responsibility is it and do we have enough capacity to manage governance" (Provincial manager2, WC*).

District management were perceived as demotivated because the volume of policies requiring implementation left them feeling *'completely bombarded and confused'.* In addition, lack of support for implementation, or in some circumstances the punitive approach taken towards managers struggling with implementation within very challenging health systems, was perceived as demoralizing. A senior manager, having worked in several provinces with differing infrastructure, described his experience:

> *There are good people at ground level, but without a level of protection and support they kind of just get nailed. So every new policy is looked upon with dread because you are worried that*

at some point somebody is going to come and say you are not implementing it (Provincial manager, WC)

Managers offered various solutions, explaining that it was not only the remit of public servants to lead CPG implementation. Community champions and leaders were suggested as additional enablers of CPG implementation. Within the health workforce, this included senior academics who inspired junior staff; in the community it was community leaders, including traditional chiefs or religious leaders who endorsed local facilities and encouraged patients to follow guidance.

Further recommendations to support governance included developing relationships with non-governmental organizations (NGO), known as 'partners'. Given the limited provincial budgets, partners were often perceived as the only means for providing training or developing materials for CPG dissemination. Partners were mentioned, particularly in the Eastern Cape, both at the provincial and district level, as one district manager explained *'when the guideline is out, we need to call them [NGO partners] to be part of us'*. The issue of sustainability arose as there was a risk that when NGO funding ended, services were withdrawn, and local government lacked capacity to maintain the activities, potentially undermining care.

Accountability approaches

Several managers suggested accountability mechanisms to enhance implementation. For example, audits and feedback to measure CPG use was an accountability and quality improvement approach cited by various participants. This approach was reportedly better functioning in certain provinces. A provincial programme manager in the Western Cape described a constructive experience:

*(Based on the) situational analysis and audits ……. we pick up the gaps in quality and we start looking at what is our opportunity to, either tweak a guideline, develop a guideline or a tool or piece of stationary or an algorithm or flow chart that will close that gap (*Provincial manager, WC*)*

While accountability mechanisms were perceived by some as essential, most managers, on the contrary, described audits as punitive and obstructive, with potential negative consequences. This statement by one provincial manager is indicative of many similar statements by others: *"then comes the monitoring and evaluation people to monitor that thing, not in a nurturing way, but in a 'why didn't you hit your targets kind of way'" (*Provincial manager, WC*).* This concept of punitive audits emerged from several provinces. One senior manager spoke about a '*compliance culture'* in which focus was directed primarily to what is measurable, such as structural inputs like infrastructure, and the blame that ensues if these targets are unmet. *"… when it comes to focusing on clinical guidelines if no one is auditing that in the same way. So, the Auditor General is this big bogey man out there. If anything goes wrong, then of course the province gets into big trouble. So, there is a lot more gravitas or seriousness attached when the Auditor General says something…" (Provincial manager, WC).*

Another participant from the Eastern Cape provided an analogous account:

"We will comply and complain later, if there is a time to complain. But what is emphasized, is compliance. There is that strict compliance. Compliance. If you don't comply, it means you are failing your district, or your sub-district, or your clinic or your people. *There is no time for complaining or reflecting, it is compliance*" (District manager, EC).

The compliance culture and aversion to punitive action was thought to have negative effects on CPG implementation and patient care. Participants indicated how the compliance and audit systems '*just*

adds to the frustration', 'distracts' from the focus on clinical care and ultimately results in rushing ahead to meet targets, or as one manager put it: '*running around like a headless chicken' (*District manager, EC).

Human resource constraints

Health workforce constraints were emphasised as pertinent to CPG implementation. Managers described the mismatch between the growing workload and unchanging staff numbers: *'we have this burden of disease that is growing. We have resources that are shrinking. So more of our health workers are being asked to do more with less resources'* (Provincial manager, WC*)*

Health workforce barriers to CPG use were described to be three-fold: staff shortages, insufficient time, and inappropriately qualified staff unable to fulfill required tasks. These issues resulted in staff being '*overstretched'* and '*not coping'*. It was suggested that staff experience considerable time pressures due to their heavy workloads, '*continuously dealing with patients'* as well as pressure from patients wanting them to work '*fast, fast, fast'.* As one provincial manager lamented: *…they [nurses] have no time to look at guidelines, they have no time to do quality work to check the quality issues because they are continuously dealing with patients (*Provincial manager, LPP).

Capacity gaps and opportunities

Linked with human resources is capacity building. Training was emphasised as the primary means by which CPGs are implemented. Participants generally agreed that to support implementation '*you can't just automatically know how to do things, you need to be trained*'. Therefore, building skills and knowledge was understood as a pre-requisite to changing practice.

Primary care nurse training gaps

An issue raised mostly by nurse managers was the poor state of professional training of PHC nurses. Nurses were described as '*not skilled'* and the nurse training syllabuses '*outdated'*, raising concerns that nurses entering practice were inadequately prepared. In the most extreme example, a provincial manager suggested that '*student nurses come out blank… they are the ones that are causing all these deaths.*'

Several suggestions were made for optimizing training and support through 1) training delivery approaches and 2) post-training clinical support.

Considerations during training

Regarding training itself, access to workshops and ensuring adequate coverage of staff was identified as a significant challenge. Various participants indicated that '*onsite training is the best one'*, as when training was delivered off-site, fewer staff could attend, and disseminating learning when back at facilities was ineffective: '*they [the nurses] don't cascade the information'*. However, '*lack of time*' and '*budgetary constraints'* to provide training in every facility was their reality. Therefore, finding contextually appropriate training approaches were suggested, such as '*training local people to be trainers*' and working with NGO's who have more training resources. Furthermore, ensuring DCSTs are maximally used to provide training were considered key. As a district manager in Limpopo suggested:

DCST staff are now doing the training per facility, no more calling people to a centralized place… and also [doing] the support visit in the facility (District manager, LPP)

Several participants recommended that training should be interactive, not didactic. Many commended the practical skills training, so-called '*fire drills'*, used for maternal health training. This training require staff to demonstrate a response to an emergency during the training, but also subsequently on-site at unexpected intervals.

Despite many challenges outlined for nurses and their training, nurses were still considered to have better access to training that doctors, resulting in outdated practices by doctors. It was reported that doctors are excluded from training. Participants recommended that training should be interdisciplinary, bringing all clinical disciplines onto the same level. As a senior doctor suggested, '*the nurse now knows more than the doctor. So you have to train everybody at the same time.'* (District clinician, KZN)

Post-training recommendations

Following training, a critical gap raised repeatedly was the absence of '*clinical support*' and '*mentoring*'. As a district clinician suggested, '*we desperately, desperately need mentors*'. It was emphasized that regardless of access to up-to-date, high quality CPGs, when post-training support is poor, implementation gaps were likely, as captured by the following quote:

on-site facility mentoring, it's a problem… without that, we can have much, much guidelines, good guidelines, but if there's no on-site mentoring, we are just wasting the government's money (District clinician, KZN)

Socio-cultural and geographic challenges to CPG implementation

In addition to health system factors, socio-cultural and geographic factors were raised by most participants, particularly those in district settings presumably closer to the day-to-day requirements of health service delivery. The explanation given was that there is a mismatch between what is recommended in CPGs and what was acceptable due to culture or feasible due to challenges of living in rural settings.

Acceptability and cultural considerations

Several specific CPGs that posed challenges to implementation were mentioned. The CPG recommending voluntary male medical circumcision was emphasized as being at odds with cultural beliefs and norms in settings where traditional circumcision required specific rituals. As one female nurse manager described:

…. male circumcision, it is a taboo for me to talk about circumcision. Now you tell people go and do the medical male circumcision. It is as now you are insulting their culture. (District manager, EC)

Another example related to when mothers with newborns require follow-up clinic visits after delivery, whereas, in some traditional cultures, leaving home for a specified period post-delivery is frowned upon:

*after birth, she must stay at home until 10 days (*District manager, EC*)*

Geographic barriers

Geography posed barriers to CPG implementation. The distance and difficult environmental circumstances under which many patients must travel to attend clinic appointments make the implementation of certain CPG recommendations unfeasible:

A woman in the Eastern Cape will have to travel 5 kilometres or even more to reach the clinic, so how would you ensure that you reach the clinic 6 days after birth? Those are things that, at times, are impossible when you look at the guidelines. (District manager, EC)

in rural areas, people are scattered, and there are rivers when it is raining, they can't go to that facility, …….there was rain for the whole month and then there were floods, and maybe the bridges are then just swept away with the floods. And then people who can't go to that clinic to go and fetch their treatment for diabetes and hypertension. (Provincial managers, EC)

One size fits all approach to CPG development

Critically, the disparity between CPG recommendations and their feasibility were perceived to result in unsuccessful CPG implementation and subsequent failure on standardized national indicator '*report cards':*

*Most of the time we will be Number 0 [on audit reports] …., because it [the guideline] is not implemented in the Eastern Cape. It's not working. But they [national government] will always say Eastern Cape is Number 0. It's Number 0 because the tool does not fit here, it's [the guideline] is just not right, they are using something which is round in a square hole… (*Provincial managers, EC*)*

Many provincial managers reported that consultation between national and provincial government was happening, even prior to finalisation of a CPG, to address contextual barriers:

So I think in terms of implementation what I've seen works really well is when people have been part of the process from the policy development side from the word go (Provincial manager, WC)

However, many participants, particularly district manager, did not feel consultations were done consistently and in meaningful ways to ensure that the final CPGs and linked indicators were aligned with geographical and cultural contexts. Many felt that CPG content was '*one size fits all'* and that examples of contextually-appropriate implementation was limited.

Despite participants emphasising the importance of context, processes for the contextual adaption of CPGs were not routinely described. One exception was an example provided about the structured approach to adopt, adapt, or develop new CPGs in the Western Cape. A provincial manager noted:

*either use the policy from national as is or we either translate it for the local context or we develop policy, because national just hasn't done it (*Provincial manager, WC)

Discussion

This study explored perspectives of South African provincial and district health managers on potential barriers to and enablers of primary care CPG implementation. Two major themes emerged. The first related to broader health system factors, such as financial constraints, governance and health workforce capacity gaps. The second emphasized the importance of socio-cultural and geographic factors, and the need for CPGs to be adapted to fit local contexts.

Regarding health system factors, we found that, despite managers' willingness to support PHC CPGs use, the relative dysfunction of the health system posed barriers to doing so. Aspects of this theme mirrored several of the often cited WHO health system building blocks, including leadership and governance; financial arrangements; health service arrangements and implementation strategies, such as training (59, 60).

Strong leadership is required to drive CPG implementation (60, 61). Participants, all of whom occupy responsible management positions, described governance gaps affecting CPG implementation, a factor also identified in other studies of countries in sub-Saharan Africa (62). Participants described volumes of incoming policies without time for consultation, adaptation or planning; and rushed implementation responding to political drivers rather than healthcare quality considerations. To address this challenge, managers often partnered with community leaders and NGOs. This was deemed necessary, particularly in the Eastern Cape, a province where many health system and financial issues were emphasised by our participants and highlighted in national reports (7, 9). CPG implementation strategies take many forms, including professional development, dissemination of summary products to patients and healthcare providers, use of key opinion leaders, to name a few (33). In the South African setting, delegating

responsibility to partners with relevant skills and resources is necessary, however, participants were concerned about sustainability of donor funded activities.

Relatedly, accountability was a reported gap, and in particular clarity regarding who is responsible for CPG implementation and how best to monitor success. For monitoring, audit and feedback was proposed, a quality improvement strategy premised on the notion that clinicians may change their performance when they receive feedback regarding sub-standard practice (63). Those we spoke to provided examples of constructive audit and feedback allowing managers to adapt implementation to address gaps. However, mostly, audits were experienced as punitive, driving managers to '*comply*' rather than innovate. A systematic review of 49 trials of audit and feedback found this approach should offer benefit in CPG implementation (63). Importantly, this review identified success factors that need be considered, including whether the baseline performance of health professionals is low to start with; feedback is recurrent and given both verbally and in writing; and the process includes clear targets and action plans (63). Findings from our study suggest that further factors may need to be considered, such as feasibility and context, to ensure that implementers feel empowered, rather than discouraged or demotivated, by audit and feedback systems.

Most participants described CPG implementation as reactive, rather than proactive, driven by demands to implement without adequate time or funds to do so effectively. Participants spoke of a '*compliance culture'* and explained that requirements were heavily weighted towards administrative reporting rather than consideration of clinical quality improvement. Within the field of 'quality of care' measurement, a long-standing model posited by Donabedian proposed three measurable facets of quality of care: 1) structure (e.g. inputs to care such as facilities, staffing); 2) process (e.g. clinical care) and 3) outcomes (e.g. health outcomes, patient satisfaction) (64, 65). In South Africa, the apparent emphasis on structural

measurement, is unlikely sufficient, as shown by a multi-country cross-sectional study in similarly poor settings which found that infrastructure reports correlated poorly with clinical care or CPG adherence (66). Drawbacks of this narrower structural and process focus have also been described in the UK's National Health Service, where attempts to create efficiency resulted in '*compliance-oriented bureaucratised management*' and was felt to hinder quality service delivery rather than enable it (67).

Financial constraints were identified as critical factors limiting effective CPG implementation. Lack of basic equipment, and CPG books was described as the norm. Additionally, lack of infrastructure, including internet or devices, was a perceived barrier to using CPGs. These views mirrored those of PHC providers in the same districts that we spoke to who described that they would be more likely to use CPGs if digital access was possible (37). However, like the managers, they perceived lack of internet in facilities, and exorbitant costs of data required for downloading CPGs, as barriers to digital access (37).

Human resource constraints, such as clinical workload and understaffing, was another health system issue hindering CPG implementation, a finding that echoes a sub-study of PHC clinical staff in these districts (37).

Training is the mainstay of capacity building for human resources for health. Training is vital for building skills and knowledge to implement CPGs, but is also a form of enablement for teams more generally. In South Africa, like many low- or middle-income settings, nurses are the backbone of PHC services. Yet, poor quality nurse training was a concerning issue, associated with outdated curricula, inaccessible training sites and presumed impact on patient care. Similar findings have been reported from other research in South Africa, for example in the context of antenatal care guideline adherence (68). But this gap and challenge is a global challenge, with the World Health Organization recognising the importance

of quality health workforce training in realizing UHC (69). One of the contradictions from our findings was that despite training gaps and primary care provider workload, one of the doctors raised that 'nurses know more than doctors'. This was in reference to their view that nurses apparently have more opportunity for training and are also more motivated to use current CPGs than doctors. Our previous research with primary care providers reflects this finding of a potential willingness to use guidelines in nurses, rather than by doctors, but further research is needed to explore this issue (37).

To overcome these challenges, many participants pointed to the importance of post-training clinical mentorship. When in place, this clinical mentorship was perceived to provide the necessary, case-based, in-facility support for CPG implementation and role-modelling CPG use. This view has been reported by other South African studies, in particular a study exploring the Ideal Clinic programme implementation suggested that family doctors in the DCSTs have similar perspectives regarding the importance of mentorship (70, 71).

In addition to health systems issues, the importance of context emerged as a significant theme. Within the public sector, CPG production in South Africa is generally the responsibility of the National Department of Health and implementation a provincial mandate, with further devolvement of decision-making to districts (9). This decentralised approach is advocated globally, particularly for health systems progressing to UHC to enable more responsive, ground-up health services (72). However, from our participants we learned that the problem with this is two-fold. Firstly, health indicators are aligned with national strategies, which do not consider differences between provinces. Secondly, local teams lack time and specific training in the adaptation of the CPGs for their setting. These concerns were also expressed by national primary care CPG developers, who described that fragmentation between and within provinces likely hampers implementation (43). According to our participants, implementation of a

'one size fits all' national CPG may result in several negative consequences, including poor scores on national indicators due to unfeasible recommendations that are not adequately implemented ('round peg in a square hole' analogy); and rushed implementation to align with a national programme or political drive.

Despite, and perhaps because of, the contextual challenges these managers encountered, many of them described innovative approaches to overcome geographic barriers or cultural issues. For example, a female manager in the Eastern Cape led the development of a male nurse-led programme for medical male circumcision because in her setting for women to discuss circumcision is a cultural taboo. In addition, where geographical barriers arose, such as flooding rivers, district managers tried to provide vehicles and airtime to community healthcare workers to reach patients. This was not always successful, due to financial barriers and inadequate procurement processes. A number of managers described plans that required impressive ingenuity and commitment to overcome health system and contextual barriers, despite all odds, and seemingly with little recognition. Additionally, despite the managers' evident wealth of knowledge, experience and creative solutions, when pressed, there was a notable absence of examples provided by participants of opportunities to share lessons learned, innovative approaches, and successes or challenges between and within districts or provinces.

Taken together these health system and contextual barriers to CPG implementation are recognized in various CPG frameworks as potential challenges to implementation (31, 73). However, arguably, those frameworks, largely developed in higher-income settings, contain more detail regarding the CPG and healthcare provider characteristics and less regarding the social, political and contextual factors. In South Africa, availability of CPGs and motivation of healthcare providers and managers to support CPG use are less of an issue than those of context and health systems (37).

Implications for policy and practice

Although substantial research about district health services and systems exists in South Africa and elsewhere, there is a paucity of evidence published through the lens of CPG implementation. CPGs are amongst the tools used for policy implementation. In this study, participants made recommendations regarding structural barriers that hinder CPG implementation and ultimately impact patient care. Participants emphasised the importance of strengthening leadership, clarifying roles and putting in place constructive accountability measures. Skilled nursing and other clinical services are required to address the health burden, along with the equipment and supplies to deliver their services as recommended by evidence-informed CPGs. Quality assurance of PHC training programmes, particularly nurses, and facilitating interdisciplinary training to ensure all staff are adhering to CPGs was suggested. Innovations, such as the DCSTs, are filling a reported gap in providing clinical mentorship, but these collaborative working groups need further strengthening. Finally, for effective CPG implementation in health services to occur, considerations of the unique settings in each province, including culture, geography and social needs, must be undertaken. Systematic use of available CPG implementation checklists to explore, understand and plan for implementation will assist to tailor strategies to address local needs, making best use of limited resources (31, 34, 73).

Limitations

Elsewhere we have discussed limitations within the broader SAGE qualitative study (37, 44). In brief, exploring CPG implementation for all PHC CPGs encompasses a very broad research area. Many PHC CPGs are available, each likely has different barriers. However, in our exploratory research, we found many cross-cutting issues likely to affect most PHC CPGs, such as access, training and supply chain factors. Future research can build on our findings and identify CPG-specific barriers and enablers. In

particular, the thematic area on socio-cultural-geographic issues, although of equal important and impact on CPG implementation, included relatively fewer findings. The latter requires further exploration with additional participants from various groups including patients and community leaders. This will provide further specific contextual insights into important barriers to CPG uptake.

Regarding this sub-study, a potential limitation is the sample, including provincial and district managers in four provinces, which may not sufficiently capture all views for this sub-group of the health services. Additionally, we used a mix of purposive and convenience sampling, resulting in inclusion of participants who were more likely to be available or responsive. Despite this, common themes emerged and were experienced across provinces and reflect previous research. As this is not a static situation, research in the evolving process to UHC is likely necessary. Moreover, while many of the same themes reemerged amongst participants, complete data saturation was not reached in this sub-study. Time and financial restraints prevented further data collection; additional concepts may have emerged if we had spoken to further people. Further research amongst this population would thus be potentially useful.

Finally, we cannot rule out the possibility of response bias, in which participants respond according to what they believe we want to hear (55). However, from most participants, many rich issues arose. Using the individual interview approach may have provided a safe space and achieved the depth that we have been able to capture and share in this paper.

Conclusion

CPGs are amongst the suggested policy tools to achieve evidence-informed, effective and cost-effective universal healthcare (15). Sub-national health managers reported that health system challenges, along with socio-cultural and geographic context, are central issues hampering successful CPG

implementation. Our study adds to a body of knowledge regarding evidence-informed policy implementation. Our participants provide practical insights relevant to primary care CPG implementation for lower-resourced settings aiming for UHC.

List of abbreviations

CPG	Clinical practice guideline
DCST	District Clinical Specialist Team
EC	Eastern Cape
HIV	Human immunodeficiency virus
KZN	Kwa-Zulu Natal
LPP	Limpopo
PHC	Primary health care
UHC	Universal health coverage
WC	Western Cape

Declarations

Ethics approval and consent to participate

The study was approved by the Research Ethics Committees of the South African Medical Research Council (EC002-2/2014) and Stellenbosch University (N14/02/008). The informed-consent form was sent to the individuals prior to the interviews and was also explained and confirmed at the start of interviews. All participants provided individual written informed consent. The names of participants have been captured and have restricted access. We referred to the Consolidated criteria for reporting qualitative research (COREQ) to ensure comprehensive reporting (36).

Consent for publication

Not applicable

Availability of data and material

The datasets generated and/or analysed during the current study are not publicly available as this may be linked to specific health managers that were interviewed and as such is not available open use data. Should anyone wish to have access or is interested in further exploration of the data, you may contact the author: tamara.kredo@mrc.ac.za.

Competing interests

TK has contributed evidence to the National Department of Health Essential Drugs List Adult level standard treatment guideline (non-funded); and facilitated workshops and capacity development for under and post-graduate students, researchers, policymakers and practitioners on clinical practice guidelines and evidence-informed practices. JV has been involved in guideline development globally and regionally, he has been on advisory committees for clinical guidelines in the Western Province and has facilitated workshops and capacity development for under and postgraduate students, researchers and practitioners on clinical practice guidelines and evidence-informed practices. SC, SA, AA, BS and JM have no competing interests to declare.

No financial competing interests to declare for any contributors to this research.

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Authors' contributions

TK drafted the protocol, with input from JV, and AA, amongst others involved with the initial SAGE project. TK, AA and JM were involved with data collection. TK, SA, JV, AA, JM, SC and BM contributed to discussions regarding analysis of findings. TK drafted the manuscript, with input from all authors. All authors approved the final version of the manuscript.

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Guideline implementation

Supplementary file 1. Interview schedule for semi-structured interviews

BACKGROUND QUESTION: what is your experience and understanding of what a guideline is or does?
1. What is your context (role, position) as it links to clinical practice guidelines?
2. What processes of primary care clinical practice guideline development, contextualisation, adapting, and implementation are in place?
3. Who is involved/ role players?
4. What works for clinical guideline development? What could be better? (if relevant to the informant)
5. What works for clinical guideline implementation? What could be better? (if relevant to the informant)
6. If we want to know more, who should we speak to?

Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups

SAGE provincial managers paper

31 October 2019

No / Item	Guide questions/description	Section in paper
Domain 1: Research team and reflexivity		
Personal Characteristics		
1. Interviewer/facilitator	Which author/s conducted the interview or focus group?	Details provided in methods and in previous publications. See section on 'data collection and management'
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	Provided in methods – not provided in detail, but provided in 'data collection and management' section of methods
3. Occupation	What was their occupation at the time of the study?	Outlined in methods.
4. Gender	Was the researcher male or female?	Not mentioned in the manuscript. Interview teams were all female, and the research team included both sexes. However, given the interviews were with senior managers, the sex of the interview team was not deemed of central importance.
5. Experience and training	What experience or training did the researcher have?	Outlined in methods – training was provided for interviewing, along with mentoring of the lead interviewer TK. Further, post interview reflection enabled learning and enhanced practice.
Relationship with participants		
6. Relationship established	Was a relationship established prior to study commencement?	In the methods section we refer to the sampling approach which was purposive, not prior relationships existed.
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	See point 6 above - no prior relationship.
8. Interviewer characteristics	What characteristics were reported about the	The details regarding the interviewers/ researches is

	interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	reported in the section on 'data collection and management'. This includes reference to their training and the interdisciplinary mix of researchers.
Domain 2: study design		
Theoretical framework		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	This appears in the methods section along with detailed reporting of the process.
Participant selection		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Within the methods section, we outline that both purposive sampling (for the participants role in guideline implementation) and convenience sampling (where specific people were suggested and available) was used.
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	Included in methods section. We describe the face to face semi-structured interviews.
12. Sample size	How many participants were in the study?	Reported in results section in narrative and table.
13. Non-participation	How many people refused to participate or dropped out? Reasons?	Included in methods – there was no non-participation. All agreed to participate, none dropped out or refused.
Setting		
14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	Provided in methods and previous publications – all interviews took place in work place, except one telephone call that was chosen for convenience for the participant.
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	Not included, as there were no non-participants, all were interviewed following informed consent.
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	Relevant details provided in methods – however, only basics regarding their role,

		professional background and sex were gathered
Data collection		
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Approach outlined in methods and guide provided in appendix. The semi-structured guide informed the interviews, was also adapted iteratively as the interviews proceeded.
18. Repeat interviews	Were repeat interviews carried out? If yes, how many?	n/a
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	We used digital recordings which is described in methods section.
20. Field notes	Were field notes made during and/or after the interview or focus group?	Reported in methods - We captured some field notes, and also post-interview reflections on the data and process of the interviews.
21. Duration	What was the duration of the interviews or focus group?	Described in methods – approximately 60 – 90 minutes
22. Data saturation	Was data saturation discussed?	This is mentioned in the discussion, under study limitations.
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	Not done
Domain 3: analysis and findings		
Data analysis		
24. Number of data coders	How many data coders coded the data?	Details of analysis in methods – the lead researcher did the coding.
25. Description of the coding tree	Did authors provide a description of the coding tree?	Not provided here
26. Derivation of themes	Were themes identified in advance or derived from the data?	Described in methods, the codes were derived from data inductively.
27. Software	What software, if applicable, was used to manage the data?	Not used
28. Participant checking	Did participants provide feedback on the findings?	Not done
Reporting		
29. Quotations presented	Were participant quotations presented to illustrate the themes / findings? Was each quotation identified? e.g. participant number	Several quotations are included with an identifier to illustrate the data.

30. Data and findings consistent	Was there consistency between the data presented and the findings?	Aligned throughout the manuscript to ensure the results reflect the data
31. Clarity of major themes	Were major themes clearly presented in the findings?	In results - outlined major themes and categories
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Results section - differing views are included.

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'Building on shaky ground' – challenges to and solutions for primary care guideline implementation in four provinces in South Africa: a qualitative study

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'Building on shaky ground' – challenges to and solutions for primary care guideline implementation in four provinces in South Africa: a qualitative study

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Abstract

Objectives:

Clinical guidelines support evidence-informed quality patient care. Our study explored perspectives of South African sub-national health managers regarding barriers to and enablers for implementation for all available primary care guidelines.

Design:

We used qualitative research methods, including semi-structured, individual interviews and an interpretative perspective. Thematic content analysis was used to develop data categories and themes.

Setting:

We conducted research in four of nine South African provinces with diverse geographic, economic and health-system arrangements (Eastern Cape, Western Cape, KwaZulu-Natal, Limpopo). South Africa is a middle-income country with high levels of inequality. The settings represented public-sector rural and peri-urban health facilities.

Participants:

Twenty-two participants with provincial and district health management roles, that comprised implementation and/or training on primary care guidelines, were included.

Results:

Participants recommended urgent consideration of health-system challenges, particularly financial constraints, impacting on access to the guidelines themselves and to medical equipment and supplies necessary to adhere to guidelines. They suggested that overcoming service-delivery gaps requires strengthening of leadership; clarification of roles; and, enhanced accountability. Participants suggested that inadequate numbers of skilled clinical staff hampered guideline use and, ultimately, patient care. Quality assurance of training programmes for clinicians, particularly nurses; interdisciplinary training; and, strengthening post-training mentorship were recommended. Furthermore, fit-for-purpose

guideline implementation necessitates considering the unique settings of facilities, including local culture and geography. This requires guideline development to include guideline end-users.

Conclusions

Guidelines are one of the policy tools to achieve evidence-informed, cost-effective and universal healthcare. But, if not effectively implemented, they have no impact. Sub-national health managers in poorly resourced settings suggested that shortcomings in the health system, along with poor consultation with end-users, affects implementation. Short-term improvements are possible through increasing access to and training on guidelines. However, health-system strengthening and recognition of socio-cultural-geographic diversity, are prerequisites for context-appropriate evidence-informed practice.

Key words: qualitative research, clinical practice guidelines, implementation, primary care, quality of care, health-systems research, health-services research, policy implementation, quality improvement

Strengths and limitations of this study

- The qualitative research methods used enabled us to explore in-depth perspectives of those involved with guideline implementation regarding what is working and what can be improved in a lower-income setting with high levels of inequality.
- We report interviews with provincial and district health managers in four culturally and geographically diverse South African provinces, that are likely to reflect settings in other low- and middle income countries. There are many primary care guidelines available in South Africa with

different target users, further interviews may elucidate specific barriers to and enablers of guideline implementation.

- This health systems research addressed a knowledge gap important for effective guideline implementation.

Background

Primary healthcare, often the first point of contact for people within a public health system, aims to provide comprehensive, accessible, quality, cost-effective care throughout a person's life (1-3). A functioning primary healthcare system is considered indicative of a strong health system and a necessary precursor to achieving Universal Health Coverage (UHC) (2, 3). Despite clear goals and several multinational agreements over several decades, a 2017 World Bank and World Health Organization (WHO) report measuring UHC success stated that at least half of the global population does not yet access basic health services (4). Implicit in this definition is that services should be high quality, not only available (3).

Like many low- and middle-income countries, South Africa has committed to enhancing and improving the quality of primary care for UHC (5-7). However, despite the political will indicated by the White Paper for a National Health Insurance Scheme to fund UHC, the investment thus far has not been sufficient to overcome the challenges posed by colliding communicable and non-communicable epidemics alongside recognised health-system deficiencies (8-10). Health outcomes remain poor relative to other middle-income countries with similar health spend; and health care remains inequitably distributed within a two-tiered public and private system where 40% of the health budget is consumed by the private sector, despite serving only 17% of the population (11-13). Several strategic initiatives aim to address these deficiencies, including PHC re-engineering, with an emphasis on strengthening district health managers; and advancing policy planning for National Health Insurance (9, 14, 15). These initiatives place importance on clinical governance, with clinical practice guidelines (CPGs) as one named strategy for health care strengthening.

CPGs are recognised tools for health-policy implementation and quality improvement (16-18). Evidence-informed CPGs aim to recommend effective prevention, diagnostic and treatment interventions, while

minimising harm, within the limits of what a health system can afford. Guidelines represent the highest standard of healthcare quality, according to the latest evidence. In South Africa, at least 175 CPGs have been developed since 2012, largely for the management of non-communicable diseases and mostly by the Department of Health (19). While the number of CPGs available is substantial, they provide no benefit if inadequately implemented. Studies in South Africa and elsewhere have found potential implementation gaps where, despite the availability of CPGs, clinical care does not meet required standards (20-25).

Evidence-to-practice gaps pose a substantial challenge in all healthcare settings and how best to overcome them has been a longstanding debate (26-29). There are checklists available that outline potential approaches for best-practice CPG implementation (30-32). However, which strategies work, under which conditions, remains a complex and evolving research field. Generally, tailored, multifaceted interventions addressing specific barriers are better, but the benefit to health or process outcomes is often modest at best and difficult to extrapolate to different contexts (29, 33, 34). Increasingly, theory-informed approaches are used to design the complex interventions required to change behaviour, yet the cost of doing this relative to the benefit remains unclear (35-38). In South Africa, several trials evaluating evidence-informed approaches for CPG implementation find a small, but consistent benefit from targeted strategies, yet, roll-out of these context-specific strategies remains a gap (39).

Given the limited resources allocated to health, particularly in low- and middle-income settings such as South Africa, knowing how best to intervene efficiently and effectively, resulting in best quality care, is paramount (40, 41). In this context, exploring the views of those involved with CPGs is a reasonable way to learn about local needs. The South African Guidelines Excellence (SAGE) project aimed to understand primary care CPG development, implementation and capacity needs (42). For the qualitative

component of SAGE, we interviewed diverse role players involved in primary care CPG development, implementation and/or use. We have reported the findings from national CPG developers (43, 44); frontline healthcare workers who use CPGs (37); as well as allied healthcare providers regarding CPG development and implementation (45-48). In this paper, we build on this work but delve further into the area of health system and service governance to explore the perspectives of provincial and district health managers who have responsibility for CPG implementation. We aimed to explore the perspectives of these provincial and district managers regarding barriers to and enablers for primary care CPG implementation in four provinces in South Africa

Methods

Design

We used qualitative methods from an interpretative paradigm to understand the experiences and perspectives of provincial and district managers responsible for primary care guideline implementation. The methods and study context have been described in detail elsewhere (37), and thus only a summary is provided here, together with a detailed description of the participants and analysis methods used.

Study settings

South Africa is an upper middle-income country with a population of 58.8 million in 2019 (49); however, its population faces amongst the highest rates of inequality globally (50). Over several decades, the national government has increased emphasis on PHC services managed through 44 district offices across nine provinces, ranging from two to 10 districts in each province (9, 49, 51-53). Districts are administrative sub-sections of the province, usually run as part of local government. Legislation has recently been introduced that supports the implementation of UHC, through a National Health Insurance system (15). In general, national government develops health strategies and CPGs; and

provincial governments implement them through regional, district, or community healthcare facilities and their providers (11). Primary care providers include nurses, doctors, nutritionists, physiotherapists, dentists, occupational therapists and social workers. However, primary care clinics are largely nurse-run, with access to the additional providers intermittently or at larger district facilities. There are several primary care guidelines endorsed by the national government for public-sector use. These include condition-specific guidelines (e.g. basic antenatal care, human immune deficiency virus (HIV) and tuberculosis) or integrated guidelines (e.g. Essential Medicines list, Adult Primary Care, Integrated Management of Childhood Illness) (54). Several programmes to strengthen district clinical governance have been introduced and are linked to CPG implementation: 1) The Ideal Clinic, defined as a "clinic with good infrastructure, adequate staff, adequate medicine and supplies, good administrative processes, and sufficient adequate bulk supplies", includes ensuring access to and use of CPGs (54); and, 2) 'primary health care re-engineering' which aims to strengthen district healthcare management through community health workers; school health programmes; and District Clinical Specialist Teams (DCSTs) (14). DCSTs include: a family physician, primary healthcare nurse, obstetrician, advanced midwife, paediatrician, paediatric nurse and anaesthetist. The family physician and primary health care nurse are central to primary care CPG implementation through their clinical governance role, including ensuring the provision of training and mentorship to implement nationally endorsed CPGs. They have limited clinical roles, but rather take on management and supervision roles for the facilities they support.

As outlined in the introduction, this is a sub-study of the larger SAGE Project that interviewed a range of role players in primary care guideline development, implementation and use in South Africa. In this sub-study, we explore the views of provincial and district health managers responsible for guideline implementation. This includes provincial managers with oversight of programmes such as Primary Care an district managers with strictly management roles and those with clinical governance and

support/training roles (e.g. members of the District Specialist Clinical Teams) or those responsible for training. All participants we interviewed have roles in primary care CPG implementation.

Sampling and recruitment

Sampling took place in four of the nine provinces in South Africa - Western Cape (WC), KwaZulu-Natal (KZN), Eastern Cape (EC) and Limpopo (LP)- chosen for their socio-economic , geographical and cultural diversity. (37, 51). Within each province, we aimed to interview 20 participants from the about provincial office and from two district offices in person at their place of work or a preferred venue.We obtained approval from Provincial Research Units prior to conducting interviews. In the Eastern Cape we were invited to present at a provincial research day, where we received buy-in for our planned research (37). In the Western Cape we contacted known provincial managers involved with PHC CPGs. In the other provinces, we invited individuals recommended by the Provincial Research Units. Hence sampling was both purposive, as we sought to include individuals with specific experience in PHC CPG implementation; and, through convenience, when specific individuals, meeting our criteria, were recommended and available to be interviewed. Once access was negotiated, all those invited agreed to participate.

Patient and Public Involvement

CPGs are tools that aim to directly impact patient care and guide clinician-patient engagement. In South Africa, there is little research evidence regarding patients' views about CPGs. The research question was developed with patients in mind, but we were seeking perspectives of provincial and district health managers in primary care, and neither patients nor the public were included. The results of the research will be shared with the participants.

Data collection and management

Individual interviews were considered most appropriate to provide in-depth insights into people's lived experiences (55). We used a semi-structured interview guide (Supplementary file 1), asking about experiences of CPG adaptation and implementation processes, and about potential barriers to and enablers of successful implementation. The guide was adapted iteratively, drawing on insights from previous interviews and included open-ended questions to allow participants to direct the emphasis of the interview (55). Interviewers received training in interviewing and two interviewers were present at all interviews. TK, a medical doctor with qualitative interview training, led most of the interviews, accompanied by AA, JM or other research team members. Interviews were conducted in English and lasted 60 – 90 minutes. There were no requests for translation despite the various first languages spoken in the provinces. All interviews were individual, with two exceptions in which colleagues joined the interview at the request of the invited participant. One interviewtook place telephonically at their request due to challenges with scheduling.

All interviews were recorded. After each interview, reflections and summaries were written to capture initial insights and identify points for further exploration in subsequent interviews. Interviews were transcribed verbatim, and reviewed for accuracy (TK, TM). Data were stored electronically on password-protected computers; and consent forms stored in a locked cabinet.

Analysis

We used an iterative, thematic content analysis approach (55, 56). Three researchers read initial transcripts (TK, AA, SA) and agreed on the general meaning and main issues presented. One researcher (TK) then re-read transcripts, performing open coding to explore barriers to and enablers of CPG implementation, extracting the relevant quotes/coding units. TK then used the quotes to explore the

topics raised, unpack the meanings of statements made, while categorising the arising themes (57). Categories and their related quotes were further examined (TK, SC, BS, SA) to identify meaningful themes (58). Following this, results were discussed with SA to develop the analysis further and then presented to all authors for input and verification prior to finalisation. The research team was interdisciplinary including public health, medical doctors, and social scientists enabling various views to enrich the interpretation.

Trustworthiness

Several measures were undertaken to ensure that the research process was trustworthy, authentic and dependable in order that the findings would be a credible reflection of reality. Detailed capturing and rich description of our approaches, including that of sampling, data collection, data management, and analysis, were conducted to enhance the dependability of our findings (58). Quotations were included to provide readers the opportunity to interpret data, establish confirmability and to show data richness. Complementary research competencies and experiences of the multidisciplinary team of researchers (social science, medical practice, CPG development and implementation) influenced data interpretation and strengthened study rigour. Transferability to a broader readership was demonstrated through information about the sample, setting and provision of a sufficiently detailed report to consider relevance to others. Reflexivity and the researchers' positionings were considered throughout the process of data collection and analysis, thus enhancing the comfirmability of the findings.

Results

Twenty semi-structured interviews were held with 22 participants from September 2015 to August 2016 (Table 1). Participants had previously worked in clinical positions as nurses (n = 15), or doctors (n = 7), but were currently occupying management positions. These provincial and district managers were responsible for health-service delivery and worked in PHC generally or within specific clinical

programmes (e.g. HIV, non-communicable diseases), or in operational roles. Amongst these were the District Clinical Specialists worked at primary and district healthcare facilities providing management and clinical governance oversight. Our final sample included provincial managers representing four provinces; district managers from two districts in each of the four provinces. District Clinical Specialists were included in in Limpopo, KZN and Eastern Cape, however, the Western Cape has not implemented the DCST programme.

Table 1. Description of the research participants Provincial and district managers and trainers with primary healthcare guideline implementation roles	20 interviews (22 participants)
	Previous clinical disciplines: nurses = 15, doctors = 7
	Province conducted: *KwaZulu-Natal*: 4 interviews (1 in province, 3 in district offices) *Limpopo*: 4 interviews (2 in province and 2 in district offices) *Eastern Cape*: 6 interviews (2 in province, 4 in district offices) *Western Cape*: 6 interviews (5 in province, 1 in district offices)

Most participants considered CPGs credible sources to guide clinical practice and, importantly, believed that CPGs impact positively on patients' health. Some participants described that CPGs can '*save a life'*. District managers with a medical background particularly shared views regarding the value of CPGs, stating that they are '*evidence-based and it works… mortality goes down when we do things properly'.* Further sentiments supporting CPGs included '*harmonisation of practice'*, '*quality improvement',* and '*rational*' medicine use.

Despite widespread belief in the credibility and positive impact of CPGs, participants felt that CPG implementation is currently inadequate and described the multiple challenges they face in this regard. We have organised these into two main themes namely: 1) health-system factors and, 2) socio-cultural contextual issues.

Health-system factors

Provincial managers experienced CPG implementation as challenging, under-resourced, and sometimes insufficiently planned. They suggested that CPGs were not the issue, but rather that the capacity of the health systems to support implementation posed the greatest challenge. A provincial manager who had worked in several provinces explained: *'training and the guidelines are fine, but the bed rock on which we are building is not – we are building on shaky ground'* (Provincial manager, WC*).*

Financial constraints

Financial constraints were recurring issues across provinces. Frustration was expressed by some that funding across different conditions was inequitable, with more funding for HIV and tuberculosis, '*but the other big killers'* such as non-communicable diseases received little or *'no support'.* This situation was often driven by international donor funding, which influenced which CPGs were prioritised for implementation.

Access to the right tools and equipment was perceived as a prerequisite for successful CPG implementation. However, all participants spoke about budgetary constraints, and a resulting lack of, or poorly serviced, clinic equipment and stocks with the associated impact on CPG implementation. A PHC district manager stated:

'Budgetary constraints are still a challenge, the systems are still a challenge, they are hindering the implementation of these guidelines. For you to get a blood-pressure machine, you have to wait for more than two months. If this scale is broken, you should follow a tender process for that scale to be repaired, so the systems are killing the implementation of guidelines also, the procurement and supply-chain systems' (District manager, EC).

Furthermore, the simple issue of limited access to CPG copies on site, due to budgetary constraints, was highlighted as an additional barrier for using CPGs. As reflected on by a district manager in rural Eastern Cape '*I mean you are just lucky if you get them*'.

Several district managers also mentioned that '*the challenge is about printing the guidelines'* due to budget allocations from national government. Solutions were offered to overcome both the poor quality of, and poor access to, CPG copies. A dominant view was that digital access would mitigate these issues and increase '*click and check*' CPG access. Several managers suggested, however, that both the printed and digital versions are needed; for example, one rural district manager said: '*They [older healthcare providers] like the booklet, but the young ones like the app'* (Provincial manager, LP).

Despite many participants highlighting the potential value of increasing digital CPG access, financial barriers were expressed in all provinces, as one manager suggested *'no computers, no internet, there's no connection'* (District manager, KZN). This was repeated by others: *'I don't think you will find a single computer that's got any connection to anything'* (District manager, KZN).

In addition, a district manager in an urban context explained the dilemma of investing in digital solutions in the face of limited funding. She asked: '*Do you want to buy more computers, or do you want more medication?*' (District manager, WC).

Governance and leadership

Senior managers explained that effective CPG implementation required strong governance including clarity regarding responsibility, and how implementation should be delivered and monitored. *'…it's an issue of governance, how is implementation of guidelines governed and whose responsibility is it and do we have enough capacity to manage governance'* (Provincial manager 2, WC).

District management was perceived as demotivated because the volume of policies requiring implementation left them feeling *'completely bombarded and confused'.* In addition, lack of support for implementation, or in some circumstances the punitive approach taken towards managers struggling with implementation within very challenging health systems, was perceived as demoralizing. A senior manager, having worked in several provinces with differing infrastructure, described his experience:

> *'There are good people at ground level, but without a level of protection and support they kind of just get nailed. So every new policy is looked upon with dread because you are worried that at some point somebody is going to come and say you are not implementing it*' (Provincial manager, WC).

Managers offered various solutions, explaining that it was not only the remit of public servants to lead CPG implementation. Community champions and leaders were suggested as additional enablers of CPG implementation. Within the health workforce, this included senior academics who inspired junior staff; while in the community it was community leaders, including traditional chiefs or religious leaders who endorsed local facilities and encouraged patients to follow guidance.

Further recommendations to support governance included developing relationships with non-governmental organisations (NGOs), known as 'partners'. Given the limited provincial budgets, partners were often perceived as the only means for providing training or developing materials for CPG dissemination. Partners were mentioned, particularly in the Eastern Cape, both at the provincial and

district level, as one district manager explained *'when the guideline is out, we need to call them [NGO partners] to be part of us'*. However, this also raised the issue of sustainability as there was a risk that when NGO funding ended, services would be withdrawn, and local government lacked capacity to maintain the activities, potentially undermining care.

Accountability approaches

Several managers suggested accountability mechanisms to enhance implementation. For example, audits and feedback to measure CPG use was an accountability and quality-improvement approach cited by various participants. This approach was reportedly functioning better in certain provinces. A provincial manager in the Western Cape described a constructive experience:

> *'(Based on the) situational analysis and audits … we pick up the gaps in quality and we start looking at what is our opportunity to, either tweak a guideline, develop a guideline or a tool or piece of stationary or an algorithm or flow chart that will close that gap' (*Provincial manager, WC*).*

While accountability mechanisms were perceived by some as essential, most managers, on the contrary, described audits as punitive and obstructive, with potential negative consequences. This statement by one provincial manager is indicative of many similar statements by others: *'then comes the monitoring and evaluation people to monitor that thing, not in a nurturing way, but in a"why didn't you hit your targets kind of way"' (*Provincial manager, WC*).* This concept of punitive audits emerged from several provinces. One senior manager spoke about a '*compliance culture'* in which focus was directed primarily to what is measurable, such as structural inputs like infrastructure, and the blame that ensues if these targets are unmet.

'… when it comes to focusing on clinical guidelines if no one is auditing that in the same way. So, the Auditor General is this big bogey man out there. If anything goes wrong, then, of course, the province gets into big trouble. So, there is a lot more gravitas or seriousness attached when the Auditor General says something…' (Provincial manager, WC).

Another participant from the Eastern Cape provided an analogous account:

'We will comply and complain later, if there is a time to complain. But what is emphasised, is compliance. There is that strict compliance. Compliance. If you don't comply, it means you are failing your district, or your sub-district, or your clinic or your people. *There is no time for complaining or reflecting, it is compliance*' (District manager, EC).

The compliance culture and aversion to punitive action was thought to have negative effects on CPG implementation and patient care. Participants indicated how the compliance and audit systems '*just adds to the frustration', 'distracts*' from the focus on clinical care and ultimately results in rushing ahead to meet targets, or as one manager put it: '*running around like a headless chicken' (*District manager, EC).

Human resource constraints

Health workforce constraints were emphasised as pertinent to CPG implementation. Managers described the mismatch between the growing workload and unchanging staff numbers:

'we have this burden of disease that is growing. We have resources that are shrinking. So more of our health workers are being asked to do more with less resources' (Provincial manager, WC*).*

Health workforce barriers to CPG use were described as three-fold: staff shortages, insufficient time, and inappropriately qualified staff unable to fulfill required tasks. These issues resulted in staff being

'*overstretched'* and '*not coping'*. It was suggested that staff experience considerable time pressures due to their heavy workloads, '*continuously dealing with patients'* as well as pressure from patients wanting them to work '*fast, fast, fast'.* As one provincial manager lamented:

*'…they [nurses] have no time to look at guidelines, they have no time to do quality work to check the quality issues because they are continuously dealing with patients' (*Provincial manager, LP).

Capacity gaps and opportunities

Linked with human resources is capacity building. Training was emphasised as the primary means by which CPGs are implemented. Participants generally agreed that to support implementation '*you can't just automatically know how to do things, you need to be trained*'. Therefore, building skills and knowledge was understood as a prerequisite to changing practice.

Primary care nurse training gaps

An issue raised mostly by nurse managers was the poor state of professional training of PHC nurses. Nurses were described as '*not skilled'* and the nurse training syllabuses '*outdated*', raising concerns that nurses entering practice were inadequately prepared. In the most extreme example, a provincial manager suggested that '*student nurses come out blank… they are the ones that are causing all these deaths*'.

Several suggestions were made for optimising training and support through: 1) training delivery approaches; and, 2) post-training clinical support.

Considerations during training

Regarding training itself, access to workshops and ensuring adequate coverage of staff was identified as a significant challenge. Various participants indicated that '*onsite training is the best one'*, as when

training was delivered off-site, fewer staff could attend, and disseminating learning when back at facilities was ineffective: '*they [the nurses] don't cascade the information*'. However, '*lack of time*' and '*budgetary constraints'* to provide training in every facility was their reality. Therefore, finding contextually appropriate training approaches were suggested, such as '*training local people to be trainers*' and working with NGOs that have more training resources. Furthermore, ensuring that DCSTs are maximally used to provide training was considered key. As a district manager in Limpopo suggested:

> *'DCST staff are now doing the training per facility, no more calling people to a centralised place… and also [doing] the support visit in the facility'* (District manager, LP).

Several participants recommended that training should be interactive, not didactic. Many commended the practical skills training, so-called '*fire drills'*, used for maternal health training. This training requires staff to demonstrate a response to an emergency during the training, but also subsequently on-site at unexpected intervals.

Despite many challenges identified regarding nurse training, nurses were still considered to have better access to training that doctors, resulting in outdated practices by doctors. It was reported that doctors are excluded from training. Participants recommended that training should be interdisciplinary, bringing all clinical disciplines onto the same level. As a senior manager with a medical background suggested, '*the nurse now knows more than the doctor. So you have to train everybody at the same time'* (District clinician, KZN).

Post-training recommendations

Following training, a critical gap raised repeatedly was the absence of '*clinical support'* and '*mentoring*'. As a district clinician suggested, '*we desperately, desperately need mentors*'. It was emphasised that

even with access to up-to-date, high-quality CPGs, when post-training support is poor, implementation gaps were likely, as captured by the following quote:

> *'On-site facility mentoring, it's a problem … without that, we can have much, much guidelines, good guidelines, but if there's no on-site mentoring, we are just wasting the government's money'* (District clinician, KZN).

Socio-cultural and geographic challenges to CPG implementation

In addition to health-system factors, socio-cultural and geographic factors were raised by most participants, particularly those in district settings presumably closer to the day-to-day requirements of health-service delivery. The explanation given was that there is a mismatch between what is recommended in CPGs and what was acceptable due to culture or feasible in rural settings.

Acceptability and cultural considerations

Several specific CPGs that posed challenges to implementation were mentioned. For example, the CPG recommending voluntary male medical circumcision was emphasised as being at odds with cultural beliefs and norms in settings where traditional circumcision required specific rituals. As one female manager with a nursing background described:

> *'…. male circumcision, it is a taboo for me to talk about circumcision. Now you tell people go and do the medical male circumcision. It is as now you are insulting their culture'* (District manager, EC).

Another example related to when mothers with newborns require follow-up clinic visits after delivery, whereas, in some traditional cultures, leaving home for a specified period post-delivery is frowned upon:

> *'After birth, she must stay at home until 10 days'* (District manager, EC).

Geographic barriers

Geography also posed barriers to CPG implementation. The distance and difficult environmental circumstances under which many patients must travel to attend clinic appointments make the implementation of certain CPG recommendations unfeasible:

> *'A woman in the Eastern Cape will have to travel 5 kilometres or even more to reach the clinic, so how would you ensure that you reach the clinic 6 days after birth? Those are things that, at times, are impossible when you look at the guidelines'* (District manager, EC).

> *'… in rural areas, people are scattered, and there are rivers when it is raining, they can't go to that facility … there was rain for the whole month and then there were floods, and maybe the bridges are then just swept away with the floods. And then people who can't go to that clinic to go and fetch their treatment for diabetes and hypertension'* (Provincial manager, EC).

One size fits all approach to CPG development

Critically, the disparity between CPG recommendations and their feasibility was perceived to result in unsuccessful CPG implementation and subsequent failure on standardised national indicator '*report cards':*

> *'Most of the time we will be Number 0 [on audit reports] …., because it [the guideline] is not implemented in the Eastern Cape. It's not working. But they [national government] will always say Eastern Cape is Number 0. It's Number 0 because the tool does not fit here, it's [the guideline] is just not right, they are using something which is round in a square hole…'* (Provincial manager, EC).

Many provincial managers reported that consultation between national and provincial government was happening, prior to finalisation of a CPG, to address contextual barriers:

> *'So I think in terms of implementation what I've seen works really well is when people have been part of the process from the policy development side from the word go'* (Provincial manager, WC).

However, many participants, particularly district managers, did not feel consultations were done consistently and in meaningful ways to ensure that the final CPGs and linked indicators were aligned with geographical and cultural contexts. Many felt that CPG content was '*one size fits all*' and that examples of contextually appropriate implementation were limited.

Despite participants emphasising the importance of context, processes for the contextual adaption of CPGs were not routinely described. One exception was an example provided about the structured approach to adopt, adapt, or develop new CPGs in the Western Cape. A provincial manager noted:

> *'… either use the policy from national as is or we either translate it for the local context or we develop policy, because national just hasn't done it' (*Provincial manager, WC).

Discussion

This study explored perspectives of South African provincial and district health managers on potential barriers to and enablers of primary care CPG implementation. Two major themes emerged. The first related to broader health-system factors, such as financial constraints, governance and health workforce capacity gaps. The second emphasised the importance of socio-cultural and geographic factors, and the need for CPGs to be adapted to fit local contexts.

Regarding health-system factors, we found that, despite managers' willingness to support PHC CPG use, the relative dysfunction of the health system posed barriers to doing so. Aspects of this theme mirrored several of the often cited WHO health system building blocks, including leadership and governance; financial arrangements; health service arrangements and implementation strategies, such as training (59, 60).

Strong leadership is required to drive CPG implementation (60, 61). Participants, all of whom occupy responsible management positions, described governance gaps affecting CPG implementation, a factor also identified in other studies in sub-Saharan African countries (62). Participants described volumes of incoming policies without time for consultation, adaptation or planning; and rushed implementation responding to political drivers rather than healthcare quality considerations. To address this challenge, managers often partnered with community leaders and NGOs. This was deemed necessary, particularly in the Eastern Cape, a province where many health system and financial issues were emphasised by our participants and have been highlighted in national reports (7, 9). CPG implementation strategies take many forms, including professional development, dissemination of summary products to patients and healthcare providers, use of key opinion leaders, to name a few (33). In the South African setting, delegating responsibility to partners with relevant skills and resources is necessary, however, participants were concerned about sustainability of donor-funded activities.

Relatedly, accountability was a reported gap, and, in particular, clarity regarding who is responsible for CPG implementation and how best to monitor success. For monitoring, audit and feedback was proposed, a quality improvement strategy premised on the notion that clinicians may change their performance when they receive feedback regarding sub-standard practice (63). Those we spoke to provided examples of constructive audit and feedback allowing managers to adapt implementation to address gaps. However, mostly, audits were experienced as punitive, driving managers to '*comply*' rather than innovate. A systematic review of 49 trials of audit and feedback found that this approach should benefit CPG implementation (63). Importantly, this review identified success factors that need be considered, including whether the baseline performance of health professionals is low to start with; feedback is recurrent and given both verbally and in writing; and, the process includes clear targets and action plans (63). Our findings suggest that further factors may need to be considered, such as feasibility and context, to ensure that implementers feel empowered, rather than discouraged or demotivated, by audit and feedback systems.

Most participants described CPG implementation as reactive, rather than proactive, driven by demands to implement without adequate time or funds to do so effectively. Participants spoke of a '*compliance culture'* and explained that requirements were heavily weighted towards administrative reporting rather than consideration of clinical quality improvement. Within the field of 'quality of care' measurement, a long-standing model posited by Donabedian proposed three measurable facets of quality of care: 1) structure (e.g. inputs to care such as facilities, staffing); 2) process (e.g. clinical care); and, 3) outcomes (e.g. health outcomes, patient satisfaction) (64, 65). In South Africa, the apparent emphasis on structural measurement, is unlikely to be sufficient, as shown by a multi-country, cross-sectional study in similarly poor settings which found that infrastructure reports correlated poorly with clinical care or CPG

adherence (66). Drawbacks of this narrower structural and process focus have also been described in the UK's National Health Service, where attempts to create efficiency resulted in '*compliance-oriented bureaucratised management*' and was felt to hinder rather than enable quality service delivery (67).

Financial constraints were identified as critical factors limiting effective CPG implementation. Lack of basic equipment, and CPG books was described as the norm. Additionally, lack of infrastructure, including internet or devices, was a perceived barrier to using CPGs. These views mirrored those of PHC providers in the same districts that we spoke to who described that they would be more likely to use CPGs if digital access was possible (37). However, like the managers, they perceived lack of internet in facilities, and exorbitant costs of data required for downloading CPGs, as barriers to digital access (37).

Human resource constraints, such as clinical workload and understaffing, was another health-system issue hindering CPG implementation, a finding that echoes a sub-study of PHC clinical staff in these districts (37). Training is the mainstay of capacity building for human resources for health. It is vital for building skills and knowledge to implement CPGs, but is also a form of enablement for teams more generally. In South Africa, like many low- or middle-income settings, nurses are the backbone of PHC services. Yet, poor-quality nurse training was a concern, associated with outdated curricula, inaccessible training sites and a presumed impact on patient care. Similar findings have been reported from other research in South Africa, for example in the context of antenatal care guideline adherence (68). This is a global challenge, with the WHO recognising the importance of quality health workforce training in realising UHC (69). One of the contradictions from our findings was that despite training gaps and primary care provider workload, one of the doctors said that '*nurses know more than doctors*'. This was in reference to the view that nurses have more training opportunities and are also more motivated to use current CPGs than doctors. Our previous research with primary care providers supports this finding

of more willingness to use guidelines by nurses, compared to doctors, but further research is needed to explore this issue (37).

To overcome these challenges, many participants pointed to the importance of post-training clinical mentorship. When in place, this was perceived to provide the necessary, case-based, in-facility support for CPG implementation and role-modelling of CPG use. This view has been reported by other South African studies, in particular a study exploring the Ideal Clinic programme implementation suggested that family doctors in the DCSTs have similar perspectives regarding the importance of mentorship (70, 71).

In addition to health-systems issues, the importance of context emerged as a significant theme. Within the public sector, CPG production in South Africa is generally the responsibility of the National Department of Health and implementation a provincial mandate, with further devolvement of decision making to districts (9). This decentralised approach is advocated globally, particularly for health systems progressing to UHC to enable more responsive, ground-up health services (72). However, we learned from our participants that the problem with this is two-fold. Firstly, health indicators are aligned with national strategies, which do not consider differences between provinces. Secondly, local teams lack time and specific training in the adaptation of the CPGs for their setting. These concerns were also expressed by national primary care CPG developers, who described that the fragmentation between and within provinces likely hampers implementation (43). According to our participants, implementation of a 'one size fits all' national CPG may result in several negative consequences, including poor scores on national indicators due to unfeasible recommendations that are not adequately implemented ('round peg in a square hole' analogy); and rushed implementation to align with a national programme or political drive.

Despite, and perhaps because of, the contextual challenges these managers encountered, many described innovative approaches to overcome geographic barriers or cultural issues. For example, a female manager in the Eastern Cape led the development of a male nurse-led programme for medical male circumcision because in her setting for women to discuss circumcision is a cultural taboo. In addition, where geographical barriers arose, such as flooding rivers, district managers tried to provide vehicles and airtime to community healthcare workers to reach patients. This was not always successful, due to financial barriers and inadequate procurement processes. A number of managers described plans that required impressive ingenuity and commitment to overcome health system and contextual barriers, despite all odds, and seemingly with little recognition. Additionally, despite the managers' evident wealth of knowledge, experience and creative solutions, when pressed, there was a notable absence of examples provided by participants of opportunities to share lessons learned, innovative approaches, and successes or challenges between and within districts or provinces.

Taken together, these health-system and contextual barriers to CPG implementation are recognised in various CPG frameworks as potential challenges to implementation (31, 73). However, arguably, those frameworks, largely developed in higher-income settings, contain more detail regarding the CPG and healthcare provider characteristics and less regarding the social, political and contextual factors. In South Africa, availability of CPGs and motivation of healthcare providers and managers to support CPG use are less of an issue than those of context and health systems (37).

Implications for policy and practice

. In this study, participants made recommendations regarding structural barriers that hinder CPG implementation and ultimately impact on patient care and its quality, and through these on UHC.

Participants emphasised the importance of strengthening leadership, clarifying roles and putting in place constructive accountability measures. Skilled nursing and other clinical services are required to address the health burden, along with the equipment and supplies to deliver their services as recommended by evidence-informed CPGs. Quality assurance of PHC training programmes, particularly nurses, and facilitating interdisciplinary training to ensure all staff are adhering to CPGs was suggested. Innovations, such as the DCSTs, are filling a reported gap in providing clinical mentorship, but these collaborative working groups need further strengthening. Finally, for effective CPG implementation in health services to occur, considerations of the unique settings in each province, including culture, geography and social needs, must be undertaken. Systematic use of available CPG implementation checklists to explore, understand and plan for implementation will assist to tailor strategies to address local needs, making best use of limited resources for quality healthcare (31, 34, 73).

Limitations

Elsewhere we have discussed limitations within the broader SAGE qualitative study (37, 44). In brief, exploring CPG implementation for all PHC CPGs encompasses a very broad research area. Many PHC CPGs are available, each likely has different barriers. However, in our exploratory research, we found many cross-cutting issues such as access, training and supply chain factors. Future research can build on our findings and identify CPG-specific barriers and enablers. In particular, the thematic area on socio-cultural-geographic issues, although important, included relatively fewer findings. This requires further exploration with additional participants from various groups including patients and community leaders. To provide further specific contextual insights.

Another potential limitation is the sample, including provincial and district managers in four provinces, which may not sufficiently capture all views for this sub-group of the health services. Additionally, we

used a mix of purposive and convenience sampling, resulting in inclusion of participants who were more likely to be available or responsive. Despite this, common themes emerged across provinces and reflect previous research. As this is not a static situation, research during the evolving process to UHC is necessary. Moreover, while many of the same themes emerged amongst interviewees, complete data saturation was not reached in this sub-study. Time and financial restraints prevented further data collection and additional concepts may have emerged if we had spoken to more people. Further research amongst this population would thus be potentially useful.

Finally, we cannot rule out the possibility of response bias, in which participants respond according to what they believe we want to hear (55). However, many rich issues emerged from most participants.. Using the individual interview approach may have provided a safe space and achieved the depth that we have been able to capture and share in this paper.

Conclusion

CPGs are amongst the suggested policy tools to achieve evidence-informed, effective and cost-effective universal healthcare (15). Sub-national health managers reported that health-system challenges, along with socio-cultural and geographic context, are central issues hampering successful CPG implementation. Our study adds to a body of knowledge regarding evidence-informed policy implementation. Our participants provide practical insights relevant to primary care CPG implementation for lower-resourced settings aiming for UHC.

List of abbreviations

CPG Clinical practice guideline

DCST District Clinical Specialist Team

EC Eastern Cape

HIV Human immunodeficiency virus

KZN KwaZulu-Natal

LP Limpopo

PHC Primary healthcare

UHC Universal health coverage

WC Western Cape

Declarations

Ethics approval and consent to participate

The study was approved by the Research Ethics Committees of the South African Medical Research Council (EC002-2/2014) and Stellenbosch University (N14/02/008). The informed-consent form was sent to the individuals prior to the interviews and was also explained and confirmed at the start of interviews. All participants provided individual written informed consent. The names of participants have been captured but are saved with restricted access. We referred to the Consolidated criteria for reporting qualitative research (COREQ) to ensure comprehensive reporting (36).

Consent for publication

Not applicable

Availability of data and material

The datasets generated and/or analysed during the study are not publicly available as these may be linked to specific health managers interviewed and as such are not available as open-use data.

Should anyone wish to have access or is interested in further exploration of the data, you may contact the author: tamara.kredo@mrc.ac.za.

Competing interests

TK has contributed evidence to the National Department of Health Essential Drugs List Adult level standard treatment guideline (non-funded); and facilitated workshops and capacity development for under and post-graduate students, researchers, policymakers and practitioners on clinical practice guidelines and evidence-informed practices. JV has been involved in guideline development globally and regionally, he has been on advisory committees for clinical guidelines in the Western Province and has facilitated workshops and capacity development for under- and postgraduate students, researchers and practitioners on clinical practice guidelines and evidence-informed practices. SC, SA, AA, BS and JM have no competing interests to declare.

No financial competing interests to declare for any contributors to this research.

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Authors' contributions

TK drafted the protocol, with input from JV and AA, amongst others involved with the initial SAGE project. TK, AA and JM were involved with data collection. TK, SA, JV, AA, JM, SC and BM contributed to discussions regarding analysis of findings. TK drafted the manuscript, with input from all authors. All authors approved the final version of the manuscript.

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Guideline implementation

Supplementary file 1. Interview schedule for semi-structured interviews

BACKGROUND QUESTION: what is your experience and understanding of what a guideline is or does?
1. What is your context (role, position) as it links to clinical practice guidelines?
2. What processes of primary care clinical practice guideline development, contextualisation, adapting, and implementation are in place?
3. Who is involved/ role players?
4. What works for clinical guideline development? What could be better? (if relevant to the informant)
5. What works for clinical guideline implementation? What could be better? (if relevant to the informant)
6. If we want to know more, who should we speak to?

Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups

SAGE provincial managers paper

31 October 2019

No / Item	Guide questions/description	Section in paper
Domain 1: Research team and reflexivity		
Personal Characteristics		
1. Interviewer/facilitator	Which author/s conducted the interview or focus group?	Details provided in methods and in previous publications. See section on 'data collection and management'
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	Provided in methods – not provided in detail, but provided in 'data collection and management' section of methods
3. Occupation	What was their occupation at the time of the study?	Outlined in methods.
4. Gender	Was the researcher male or female?	Not mentioned in the manuscript. Interview teams were all female, and the research team included both sexes. However, given the interviews were with senior managers, the sex of the interview team was not deemed of central importance.
5. Experience and training	What experience or training did the researcher have?	Outlined in methods – training was provided for interviewing, along with mentoring of the lead interviewer TK. Further, post interview reflection enabled learning and enhanced practice.
Relationship with participants		
6. Relationship established	Was a relationship established prior to study commencement?	In the methods section we refer to the sampling approach which was purposive, not prior relationships existed.
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	See point 6 above - no prior relationship.
8. Interviewer characteristics	What characteristics were reported about the	The details regarding the interviewers/ researches is

	interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	reported in the section on 'data collection and management'. This includes reference to their training and the interdisciplinary mix of researchers.
Domain 2: study design		
Theoretical framework		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	This appears in the methods section along with detailed reporting of the process.
Participant selection		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Within the methods section, we outline that both purposive sampling (for the participants role in guideline implementation) and convenience sampling (where specific people were suggested and available) was used.
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	Included in methods section. We describe the face to face semi-structured interviews.
12. Sample size	How many participants were in the study?	Reported in results section in narrative and table.
13. Non-participation	How many people refused to participate or dropped out? Reasons?	Included in methods – there was no non-participation. All agreed to participate, none dropped out or refused.
Setting		
14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	Provided in methods and previous publications – all interviews took place in work place, except one telephone call that was chosen for convenience for the participant.
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	Not included, as there were no non-participants, all were interviewed following informed consent.
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	Relevant details provided in methods – however, only basics regarding their role,

		professional background and sex were gathered
Data collection		
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Approach outlined in methods and guide provided in appendix. The semi-structured guide informed the interviews, was also adapted iteratively as the interviews proceeded.
18. Repeat interviews	Were repeat interviews carried out? If yes, how many?	n/a
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	We used digital recordings which is described in methods section.
20. Field notes	Were field notes made during and/or after the interview or focus group?	Reported in methods - We captured some field notes, and also post-interview reflections on the data and process of the interviews.
21. Duration	What was the duration of the interviews or focus group?	Described in methods – approximately 60 – 90 minutes
22. Data saturation	Was data saturation discussed?	This is mentioned in the discussion, under study limitations.
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	Not done
Domain 3: analysis and findings		
Data analysis		
24. Number of data coders	How many data coders coded the data?	Details of analysis in methods – the lead researcher did the coding.
25. Description of the coding tree	Did authors provide a description of the coding tree?	Not provided here
26. Derivation of themes	Were themes identified in advance or derived from the data?	Described in methods, the codes were derived from data inductively.
27. Software	What software, if applicable, was used to manage the data?	Not used
28. Participant checking	Did participants provide feedback on the findings?	Not done
Reporting		
29. Quotations presented	Were participant quotations presented to illustrate the themes / findings? Was each quotation identified? e.g. participant number	Several quotations are included with an identifier to illustrate the data.

30. Data and findings consistent	Was there consistency between the data presented and the findings?	Aligned throughout the manuscript to ensure the results reflect the data
31. Clarity of major themes	Were major themes clearly presented in the findings?	In results - outlined major themes and categories
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Results section - differing views are included.

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'Building on shaky ground' – challenges to and solutions for primary care guideline implementation in four provinces in South Africa: a qualitative study

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'Building on shaky ground' – challenges to and solutions for primary care guideline implementation in four provinces in South Africa: a qualitative study

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Abstract

Objectives:

Clinical guidelines support evidence-informed quality patient care. Our study explored perspectives of South African sub-national health managers regarding barriers to and enablers for implementation for all available primary care guidelines.

Design:

We used qualitative research methods, including semi-structured, individual interviews and an interpretative perspective. Thematic content analysis was used to develop data categories and themes.

Setting:

We conducted research in four of nine South African provinces with diverse geographic, economic and health-system arrangements (Eastern Cape, Western Cape, KwaZulu-Natal, Limpopo). South Africa is a middle-income country with high levels of inequality. The settings represented public-sector rural and peri-urban health facilities.

Participants:

Twenty-two participants with provincial and district health management roles, that comprised implementation and/or training on primary care guidelines, were included.

Results:

Participants recommended urgent consideration of health-system challenges, particularly financial constraints, impacting on access to the guidelines themselves and to medical equipment and supplies necessary to adhere to guidelines. They suggested that overcoming service-delivery gaps requires strengthening of leadership; clarification of roles; and, enhanced accountability. Participants suggested that inadequate numbers of skilled clinical staff hampered guideline use and, ultimately, patient care. Quality assurance of training programmes for clinicians, particularly nurses; interdisciplinary training; and, strengthening post-training mentorship were recommended. Furthermore, fit-for-purpose

guideline implementation necessitates considering the unique settings of facilities, including local culture and geography. This requires guideline development to include guideline end-users.

Conclusions

Guidelines are one of the policy tools to achieve evidence-informed, cost-effective and universal healthcare. But, if not effectively implemented, they have no impact. Sub-national health managers in poorly resourced settings suggested that shortcomings in the health system, along with poor consultation with end-users, affects implementation. Short-term improvements are possible through increasing access to and training on guidelines. However, health-system strengthening and recognition of socio-cultural-geographic diversity, are prerequisites for context-appropriate evidence-informed practice.

Key words: qualitative research, clinical practice guidelines, implementation, primary care, quality of care, health-systems research, health-services research, policy implementation, quality improvement

Strengths and limitations of this study

- The qualitative research methods used enabled us to explore in-depth perspectives of those involved with guideline implementation regarding what is working and what can be improved in a lower-income setting with high levels of inequality.
- We report interviews with provincial and district health managers in four culturally and geographically diverse South African provinces, that are likely to reflect settings in other low- and middle income countries. There are many primary care guidelines available in South Africa with

different target users, further interviews may elucidate specific barriers to and enablers of guideline implementation.

- This health systems research addressed a knowledge gap important for effective guideline implementation.

Background

Primary healthcare, often the first point of contact for people within a public health system, aims to provide comprehensive, accessible, quality, cost-effective care throughout a person's life (1, 2). A functioning primary healthcare system is considered indicative of a strong health system and a necessary precursor to achieving Universal Health Coverage (UHC) (2, 3). Despite clear goals and many multinational agreements over several decades, a 2017 World Bank and World Health Organization (WHO) report measuring UHC success stated that at least half of the global population does not yet access high quality basic health services (3).

Like many low- and middle-income countries, South Africa has committed to enhancing and improving the quality of primary care for UHC (4, 5). However, despite the political will indicated by the White Paper for a National Health Insurance Scheme to fund UHC, the investment thus far has not been sufficient to overcome the challenges posed by colliding communicable and non-communicable epidemics alongside recognised health-system deficiencies (6-8). Health outcomes remain poor relative to other middle-income countries with similar health spend; and health care remains inequitably distributed within a two-tiered public and private system where 40% of the health budget is consumed by the private sector, despite serving only 17% of the population (9, 10). Several strategic initiatives aim to address these deficiencies, including PHC re-engineering, with an emphasis on strengthening district health managers; and advancing policy planning for National Health Insurance (7, 11). These initiatives place importance on clinical governance, with clinical practice guidelines (CPGs) as one named strategy for health care strengthening.

CPGs are recognised tools for health-policy implementation and quality improvement (12, 13). Evidence-informed CPGs aim to recommend effective prevention, diagnostic and treatment interventions, while minimising harm, within the limits of what a health system can afford. Well conducted guidelines

provide evidence-informed recommendations to guideline patient care (13).. In South Africa, at least 175 CPGs have been developed since 2012, largely for the management of non-communicable diseases and mostly by the Department of Health (14). While the number of CPGs available is substantial, they provide no benefit if inadequately implemented. Studies in South Africa and elsewhere have found potential implementation gaps where, despite the availability of CPGs, clinical care does not meet required standards (15-18).

Evidence-to-practice gaps pose a substantial challenge in all healthcare settings and how best to overcome them has been a longstanding debate (19, 20). There are checklists available that outline potential approaches for best-practice CPG implementation (21-23). However, which strategies work, under which conditions, remains a complex and evolving research field. Generally, tailored, multifaceted interventions addressing specific barriers are better, but the benefit to health or process outcomes is often modest at best and difficult to extrapolate to different contexts (20, 24, 25). Increasingly, theory-informed approaches are used to design the complex interventions required to change behaviour, yet the cost of doing this relative to the benefit remains unclear (26, 27). In South Africa, several trials evaluating evidence-informed approaches for CPG implementation find a small, but consistent benefit from targeted strategies, yet, roll-out of these context-specific strategies remains a gap (28).

Given the limited resources allocated to health, particularly in low- and middle-income settings such as South Africa, knowing how best to intervene efficiently and effectively, resulting in best quality care, is paramount (29). In this context, exploring the views of those involved with CPGs is a reasonable way to learn about local needs. The South African Guidelines Excellence (SAGE) project aimed to understand primary care CPG development, implementation and capacity needs. For the qualitative component of SAGE, we interviewed diverse role players involved in primary care CPG development, implementation

and/or use. We have reported the findings from national CPG developers (30, 31); frontline healthcare workers who use CPGs (32); as well as allied healthcare providers regarding CPG development and implementation (33-36). In this paper, we build on this work but delve further into the area of health system and service governance to explore the perspectives of provincial and district health managers who have responsibility for CPG implementation. We aimed to explore the perspectives of these provincial and district managers regarding barriers to and enablers for primary care CPG implementation in four provinces in South Africa

Methods

Design

We used qualitative methods from an interpretative paradigm to understand the experiences and perspectives of provincial and district managers responsible for primary care guideline implementation. The methods and study context have been described in detail elsewhere (32), and thus only a summary is provided here, together with a detailed description of the participants and analysis methods used.

Study settings

South Africa is an upper middle-income country with a population of 58.8 million in 2019 (37); however, its population faces amongst the highest rates of inequality globally (38). Over several decades, the national government has increased emphasis on PHC services managed through 44 district offices across nine provinces, ranging from two to 10 districts in each province (7, 37, 39, 40). Districts are administrative sub-sections of the province, usually run as part of local government. Legislation has recently been introduced that supports the implementation of UHC, through a National Health Insurance system (41). In general, national government develops health strategies and CPGs; and provincial governments implement them through regional, district, or community healthcare facilities

and their providers (9). Primary care providers include nurses, doctors, nutritionists, physiotherapists, dentists, occupational therapists and social workers. However, primary care clinics are largely nurse-run, with access to the additional providers intermittently or at larger district facilities. There are several primary care guidelines endorsed by the national government for public-sector use. These include condition-specific guidelines (e.g. basic antenatal care, human immune deficiency virus (HIV) and tuberculosis) or integrated guidelines (e.g. Essential Medicines list, Adult Primary Care, Integrated Management of Childhood Illness) (42). Several programmes to strengthen district clinical governance have been introduced and are linked to CPG implementation: 1) The Ideal Clinic, defined as a "clinic with good infrastructure, adequate staff, adequate medicine and supplies, good administrative processes, and sufficient adequate bulk supplies", includes ensuring access to and use of CPGs (42); and, 2) 'primary health care re-engineering' which aims to strengthen district healthcare management through community health workers; school health programmes; and District Clinical Specialist Teams (DCSTs) (11). DCSTs include: a family physician, primary healthcare nurse, obstetrician, advanced midwife, paediatrician, paediatric nurse and anaesthetist. The family physician and primary health care nurse are central to primary care CPG implementation through their clinical governance role, including ensuring the provision of training and mentorship to implement nationally endorsed CPGs. They have limited clinical roles, but rather take on management and supervision roles for the facilities they support.

As outlined in the introduction, this is a sub-study of the larger SAGE Project that interviewed a range of role players in primary care guideline development, implementation and use in South Africa. In this sub-study, we explore the views of provincial and district health managers responsible for guideline implementation. This includes provincial managers with oversight of programmes such as Primary Care an district managers with strictly management roles and those with clinical governance and support/training roles (e.g. members of the District Specialist Clinical Teams) or those responsible for training. All participants we interviewed have roles in primary care CPG implementation.

Sampling and recruitment

Sampling took place in four of the nine provinces in South Africa - Western Cape (WC), KwaZulu-Natal (KZN), Eastern Cape (EC) and Limpopo (LP)- chosen for their socio-economic , geographical and cultural diversity. (32, 39). Within each province, we aimed to interview 20 participants from the about provincial office and from two district offices in person at their place of work or a preferred venue.We obtained approval from Provincial Research Units prior to conducting interviews. In the Eastern Cape we were invited to present at a provincial research day, where we received buy-in for our planned research (32). In the Western Cape we contacted known provincial managers involved with PHC CPGs. In the other provinces, we invited individuals recommended by the Provincial Research Units. Hence sampling was both purposive, as we sought to include individuals with specific experience in PHC CPG implementation; and, through convenience, when specific individuals, meeting our criteria, were recommended and available to be interviewed. Once access was negotiated, all those invited agreed to participate.

Data collection and management

Individual interviews were considered most appropriate to provide in-depth insights into people's lived experiences (43). We used a semi-structured interview guide (Supplementary file 1), asking about experiences of CPG adaptation and implementation processes, and about potential barriers to and enablers of successful implementation. The guide was adapted iteratively, drawing on insights from previous interviews and included open-ended questions to allow participants to direct the emphasis of the interview (43). Interviewers received training in interviewing and two interviewers were present at all interviews. TK, a medical doctor with qualitative interview training, led most of the interviews,

accompanied by AA, JM or other research team members. Interviews were conducted in English and lasted 60 – 90 minutes. There were no requests for translation despite the various first languages spoken in the provinces. All interviews were individual, with two exceptions in which colleagues joined the interview at the request of the invited participant. One interview took place telephonically at their request due to challenges with scheduling.

All interviews were recorded. After each interview, reflections and summaries were written to capture initial insights and identify points for further exploration in subsequent interviews. Interviews were transcribed verbatim, and reviewed for accuracy (TK, TM). Data were stored electronically on password-protected computers; and consent forms stored in a locked cabinet.

Analysis

We used an iterative, thematic content analysis approach (43, 44). Three researchers read initial transcripts (TK, AA, SA) and agreed on the general meaning and main issues presented. One researcher (TK) then re-read transcripts, performing open coding to explore barriers to and enablers of CPG implementation, extracting the relevant quotes/coding units. TK then used the quotes to explore the topics raised, unpack the meanings of statements made, while categorising the arising themes (45). Categories and their related quotes were further examined (TK, SC, BS, SA) to identify meaningful themes (46). Following this, results were discussed with SA to develop the analysis further and then presented to all authors for input and verification prior to finalisation. The research team was interdisciplinary including public health, medical doctors, and social scientists enabling various views to enrich the interpretation.

Trustworthiness

Several measures were undertaken to ensure that the research process was trustworthy, authentic and dependable in order that the findings would be a credible reflection of reality. Detailed capturing and rich description of our approaches, including that of sampling, data collection, data management, and analysis, were conducted to enhance the dependability of our findings (46). Quotations were included to provide readers the opportunity to interpret data, establish confirmability and to show data richness. Complementary research competencies and experiences of the multidisciplinary team of researchers (social science, medical practice, CPG development and implementation) influenced data interpretation and strengthened study rigour. Transferability to a broader readership was demonstrated through information about the sample, setting and provision of a sufficiently detailed report to consider relevance to others. Reflexivity and the researchers' positionings were considered throughout the process of data collection and analysis, thus enhancing the comfirmability of the findings.

Patient and Public Involvement

CPGs are tools that aim to directly impact patient care and guide clinician-patient engagement. In South Africa, there is little research evidence regarding patients' views about CPGs. The research question was developed with patients in mind, but we were seeking perspectives of provincial and district health managers in primary care, and neither patients nor the public were included. The results of the research will be shared with the participants.

Results

Twenty semi-structured interviews were held from September 2015 to August 2016 (Table 1). Two interviews included more than one individual, at the request of the invited participant, and as such there

were 22 included participants. Participants had previously worked in clinical positions as nurses (n = 15), or doctors (n = 7), but were currently occupying management positions. These provincial and district managers were responsible for health-service delivery and worked in PHC generally or within specific clinical programmes (e.g. HIV, non-communicable diseases), or in operational roles. Our final sample included provincial managers representing four provinces; district managers from two districts in each of the four provinces. District Clinical Specialists were included in in Limpopo, KZN and Eastern Cape, however, the Western Cape has not implemented the DCST programme.

Table 1. Description of the research participants

Total 20 interviews with 22 participants	*KwaZulu-Natal*	*Limpopo*	*Eastern Cape*	*Western Cape*
Total interviewed	4	5	7	6
Provincial office	1	2	3	5
District office	3	3	4	1

Most participants considered CPGs credible sources to guide clinical practice and, importantly, believed that CPGs impact positively on patients' health. Some participants described that CPGs can '*save a life'*. District managers with a medical background particularly shared views regarding the value of CPGs, stating that they are '*evidence-based and it works… mortality goes down when we do things properly'.*

Further sentiments supporting CPGs included '*harmonisation of practice'*, '*quality improvement',* and '*rational*' medicine use.

Despite widespread belief in the credibility and positive impact of CPGs, participants felt that CPG implementation is currently inadequate and described the multiple challenges they face in this regard. We have organised these into two main themes namely: 1) health-system factors and, 2) socio-cultural contextual issues.

Health-system factors

Provincial managers experienced CPG implementation as challenging, under-resourced, and sometimes insufficiently planned. They suggested that CPGs were not the issue, but rather that the capacity of the health systems to support implementation posed the greatest challenge. A provincial manager who had worked in several provinces explained: *'training and the guidelines are fine, but the bed rock on which we are building is not – we are building on shaky ground'* (Provincial manager, WC*).*

Financial constraints

Financial constraints were recurring issues across provinces. Frustration was expressed by some that funding across different conditions was inequitable, with more funding for HIV and tuberculosis, '*but the other big killers'* such as non-communicable diseases received little or *'no support'.* This situation was often driven by international donor funding, which influenced which CPGs were prioritised for implementation.

Access to the right tools and equipment was perceived as a prerequisite for successful CPG implementation. However, all participants spoke about budgetary constraints, and a resulting lack of, or

poorly serviced, clinic equipment and stocks with the associated impact on CPG implementation. A PHC district manager stated:

> *'Budgetary constraints are still a challenge, the systems are still a challenge, they are hindering the implementation of these guidelines. For you to get a blood-pressure machine, you have to wait for more than two months. If this scale is broken, you should follow a tender process for that scale to be repaired, so the systems are killing the implementation of guidelines also, the procurement and supply-chain systems'* (District manager, EC).

Furthermore, the simple issue of limited access to CPG copies on site, due to budgetary constraints, was highlighted as an additional barrier for using CPGs. As reflected on by a district manager in rural Eastern Cape '*I mean you are just lucky if you get them*'.

Several district managers also mentioned that '*the challenge is about printing the guidelines'* due to budget allocations from national government. Solutions were offered to overcome both the poor quality of, and poor access to, CPG copies. A dominant view was that digital access would mitigate these issues and increase '*click and check*' CPG access. Several managers suggested, however, that both the printed and digital versions are needed; for example, one rural district manager said: '*They [older healthcare providers] like the booklet, but the young ones like the app'* (Provincial manager, LP).

Despite many participants highlighting the potential value of increasing digital CPG access, financial barriers were expressed in all provinces, as one manager suggested *'no computers, no internet, there's no connection'* (District manager, KZN). This was repeated by others: *'I don't think you will find a single computer that's got any connection to anything'* (District manager, KZN).

In addition, a district manager in an urban context explained the dilemma of investing in digital solutions in the face of limited funding. She asked: '*Do you want to buy more computers, or do you want more medication?*' (District manager, WC).

Governance and leadership

Senior managers explained that effective CPG implementation required strong governance including clarity regarding responsibility, and how implementation should be delivered and monitored. *'…it's an issue of governance, how is implementation of guidelines governed and whose responsibility is it and do we have enough capacity to manage governance'* (Provincial manager 2, WC).

District management was perceived as demotivated because the volume of policies requiring implementation left them feeling *'completely bombarded and confused'.* In addition, lack of support for implementation, or in some circumstances the punitive approach taken towards managers struggling with implementation within very challenging health systems, was perceived as demoralizing. A senior manager, having worked in several provinces with differing infrastructure, described his experience:

> *'There are good people at ground level, but without a level of protection and support they kind of just get nailed. So every new policy is looked upon with dread because you are worried that at some point somebody is going to come and say you are not implementing it*' (Provincial manager, WC).

Managers offered various solutions, explaining that it was not only the remit of public servants to lead CPG implementation. Community champions and leaders were suggested as additional enablers of CPG implementation. Within the health workforce, this included senior academics who inspired junior staff; while in the community it was community leaders, including traditional chiefs or religious leaders who endorsed local facilities and encouraged patients to follow guidance.

Further recommendations to support governance included developing relationships with non-governmental organisations (NGOs), known as 'partners'. Given the limited provincial budgets, partners were often perceived as the only means for providing training or developing materials for CPG dissemination. Partners were mentioned, particularly in the Eastern Cape, both at the provincial and district level, as one district manager explained *'when the guideline is out, we need to call them [NGO partners] to be part of us'*. However, this also raised the issue of sustainability as there was a risk that when NGO funding ended, services would be withdrawn, and local government lacked capacity to maintain the activities, potentially undermining care.

Accountability approaches

Several managers suggested accountability mechanisms to enhance implementation. For example, audits and feedback to measure CPG use was an accountability and quality-improvement approach cited by various participants. This approach was reportedly functioning better in certain provinces. A provincial manager in the Western Cape described a constructive experience:

> *'(Based on the) situational analysis and audits … we pick up the gaps in quality and we start looking at what is our opportunity to, either tweak a guideline, develop a guideline or a tool or piece of stationary or an algorithm or flow chart that will close that gap' (*Provincial manager, WC*).*

While accountability mechanisms were perceived by some as essential, most managers, on the contrary, described audits as punitive and obstructive, with potential negative consequences. This statement by one provincial manager is indicative of many similar statements by others: *'then comes the monitoring and evaluation people to monitor that thing, not in a nurturing way, but in a"why didn't you hit your targets kind of way"' (*Provincial manager, WC*).* This concept of punitive audits emerged from several

provinces. One senior manager spoke about a '*compliance culture'* in which focus was directed primarily to what is measurable, such as structural inputs like infrastructure, and the blame that ensues if these targets are unmet.

> *'… when it comes to focusing on clinical guidelines if no one is auditing that in the same way. So, the Auditor General is this big bogey man out there. If anything goes wrong, then, of course, the province gets into big trouble. So, there is a lot more gravitas or seriousness attached when the Auditor General says something…' (Provincial manager, WC).*

Another participant from the Eastern Cape provided an analogous account:

> *'We will comply and complain later, if there is a time to complain. But what is emphasised, is compliance. There is that strict compliance. Compliance. If you don't comply, it means you are failing your district, or your sub-district, or your clinic or your* people. *There is no time for complaining or reflecting, it is compliance*' (District manager, EC).

The compliance culture and aversion to punitive action was thought to have negative effects on CPG implementation and patient care. Participants indicated how the compliance and audit systems '*just adds to the frustration', 'distracts*' from the focus on clinical care and ultimately results in rushing ahead to meet targets, or as one manager put it: '*running around like a headless chicken' (*District manager, EC).

Human resource constraints

Health workforce constraints were emphasised as pertinent to CPG implementation. Managers described the mismatch between the growing workload and unchanging staff numbers:

'we have this burden of disease that is growing. We have resources that are shrinking. So more of our health workers are being asked to do more with less resources' (Provincial manager, WC*).*

Health workforce barriers to CPG use were described as three-fold: staff shortages, insufficient time, and inappropriately qualified staff unable to fulfill required tasks. These issues resulted in staff being '*overstretched'* and '*not coping'*. It was suggested that staff experience considerable time pressures due to their heavy workloads, '*continuously dealing with patients'* as well as pressure from patients wanting them to work '*fast, fast, fast*'. As one provincial manager lamented:

*'…they [nurses] have no time to look at guidelines, they have no time to do quality work to check the quality issues because they are continuously dealing with patients' (*Provincial manager, LP).

Capacity gaps and opportunities

Linked with human resources is capacity building. Training was emphasised as the primary means by which CPGs are implemented. Participants generally agreed that to support implementation '*you can't just automatically know how to do things, you need to be trained'*. Therefore, building skills and knowledge was understood as a prerequisite to changing practice.

Primary care nurse training gaps

An issue raised mostly by nurse managers was the poor state of professional training of PHC nurses. Nurses were described as '*not skilled'* and the nurse training syllabuses '*outdated'*, raising concerns that nurses entering practice were inadequately prepared. In the most extreme example, a provincial manager suggested that '*student nurses come out blank… they are the ones that are causing all these deaths*'.

Several suggestions were made for optimising training and support through: 1) training delivery approaches; and, 2) post-training clinical support.

Considerations during training

Regarding training itself, access to workshops and ensuring adequate coverage of staff was identified as a significant challenge. Various participants indicated that '*onsite training is the best one'*, as when training was delivered off-site, fewer staff could attend, and disseminating learning when back at facilities was ineffective: '*they [the nurses] don't cascade the information'*. However, '*lack of time*' and '*budgetary constraints'* to provide training in every facility was their reality. Therefore, finding contextually appropriate training approaches were suggested, such as '*training local people to be trainers*' and working with NGOs that have more training resources. Furthermore, ensuring that DCSTs are maximally used to provide training was considered key. As a district manager in Limpopo suggested:

> *'DCST staff are now doing the training per facility, no more calling people to a centralised place… and also [doing] the support visit in the facility'* (District manager, LP).

Several participants recommended that training should be interactive, not didactic. Many commended the practical skills training, so-called '*fire drills'*, used for maternal health training. This training requires staff to demonstrate a response to an emergency during the training, but also subsequently on-site at unexpected intervals.

Despite many challenges identified regarding nurse training, nurses were still considered to have better access to training that doctors, resulting in outdated practices by doctors. It was reported that doctors are excluded from training. Participants recommended that training should be interdisciplinary, bringing all clinical disciplines onto the same level. As a senior manager with a medical background suggested,

'*the nurse now knows more than the doctor. So you have to train everybody at the same time*' (District clinician, KZN).

Post-training recommendations

Following training, a critical gap raised repeatedly was the absence of '*clinical support*' and '*mentoring*'. As a district clinician suggested, '*we desperately, desperately need mentors*'. It was emphasised that even with access to up-to-date, high-quality CPGs, when post-training support is poor, implementation gaps were likely, as captured by the following quote:

> *'On-site facility mentoring, it's a problem … without that, we can have much, much guidelines, good guidelines, but if there's no on-site mentoring, we are just wasting the government's money'* (District clinician, KZN).

Socio-cultural and geographic challenges to CPG implementation

In addition to health-system factors, socio-cultural and geographic factors were raised by most participants, particularly those in district settings presumably closer to the day-to-day requirements of health-service delivery. The explanation given was that there is a mismatch between what is recommended in CPGs and what was acceptable due to culture or feasible in rural settings.

Acceptability and cultural considerations

Several specific CPGs that posed challenges to implementation were mentioned. For example, the CPG recommending voluntary male medical circumcision was emphasised as being at odds with cultural

beliefs and norms in settings where traditional circumcision required specific rituals. As one female manager with a nursing background described:

> *'…. male circumcision, it is a taboo for me to talk about circumcision. Now you tell people go and do the medical male circumcision. It is as now you are insulting their culture'* (District manager, EC).

Another example related to when mothers with newborns require follow-up clinic visits after delivery, whereas, in some traditional cultures, leaving home for a specified period post-delivery is frowned upon:

> *'After birth, she must stay at home until 10 days'* (District manager, EC).

Geographic barriers

Geography also posed barriers to CPG implementation. The distance and difficult environmental circumstances under which many patients must travel to attend clinic appointments make the implementation of certain CPG recommendations unfeasible:

> *'A woman in the Eastern Cape will have to travel 5 kilometres or even more to reach the clinic, so how would you ensure that you reach the clinic 6 days after birth? Those are things that, at times, are impossible when you look at the guidelines'* (District manager, EC).

> *'… in rural areas, people are scattered, and there are rivers when it is raining, they can't go to that facility … there was rain for the whole month and then there were floods, and maybe the bridges are then just swept away with the floods. And then people who can't go to that clinic to go and fetch their treatment for diabetes and hypertension'* (Provincial manager, EC).

One size fits all approach to CPG development

Critically, the disparity between CPG recommendations and their feasibility was perceived to result in unsuccessful CPG implementation and subsequent failure on standardised national indicator '*report cards':*

> *'Most of the time we will be Number 0 [on audit reports] …., because it [the guideline] is not implemented in the Eastern Cape. It's not working. But they [national government] will always say Eastern Cape is Number 0. It's Number 0 because the tool does not fit here, it's [the guideline] is just not right, they are using something which is round in a square hole…'* (Provincial manager, EC).

Many provincial managers reported that consultation between national and provincial government was happening, prior to finalisation of a CPG, to address contextual barriers:

> *'So I think in terms of implementation what I've seen works really well is when people have been part of the process from the policy development side from the word go'* (Provincial manager, WC).

However, many participants, particularly district managers, did not feel consultations were done consistently and in meaningful ways to ensure that the final CPGs and linked indicators were aligned with geographical and cultural contexts. Many felt that CPG content was '*one size fits all'* and that examples of contextually appropriate implementation were limited.

Despite participants emphasising the importance of context, processes for the contextual adaption of CPGs were not routinely described. One exception was an example provided about the structured approach to adopt, adapt, or develop new CPGs in the Western Cape. A provincial manager noted:

*'… either use the policy from national as is or we either translate it for the local context or we develop policy, because national just hasn't done it' (*Provincial manager, WC).

Discussion

This study explored perspectives of South African provincial and district health managers on potential barriers to and enablers of primary care CPG implementation. Two major themes emerged. The first related to broader health-system factors, such as financial constraints, governance and health workforce capacity gaps. The second emphasised the importance of socio-cultural and geographic factors, and the need for CPGs to be adapted to fit local contexts.

Regarding health-system factors, we found that, despite managers' willingness to support PHC CPG use, the relative dysfunction of the health system posed barriers to doing so. Aspects of this theme mirrored several of the often cited WHO health system building blocks, including leadership and governance; financial arrangements; health service arrangements and implementation strategies, such as training (47, 48).

Strong leadership is required to drive CPG implementation (48, 49). Participants, all of whom occupy responsible management positions, described governance gaps affecting CPG implementation, a factor also identified in other studies in sub-Saharan African countries (50). Participants described volumes of incoming policies without time for consultation, adaptation or planning; and rushed implementation responding to political drivers rather than healthcare quality considerations. To address this challenge, managers often partnered with community leaders and NGOs. This was deemed necessary, particularly

in the Eastern Cape, a province where many health system and financial issues were emphasised by our participants and have been highlighted in national reports (4, 7). CPG implementation strategies take many forms, including professional development, dissemination of summary products to patients and healthcare providers, use of key opinion leaders, to name a few (24). In the South African setting, delegating responsibility to partners with relevant skills and resources is necessary, however, participants were concerned about sustainability of donor-funded activities.

Relatedly, accountability was a reported gap, and, in particular, clarity regarding who is responsible for CPG implementation and how best to monitor success. For monitoring, audit and feedback was proposed, a quality improvement strategy premised on the notion that clinicians may change their performance when they receive feedback regarding sub-standard practice (51). Those we spoke to provided examples of constructive audit and feedback allowing managers to adapt implementation to address gaps. However, mostly, audits were experienced as punitive, driving managers to '*comply*' rather than innovate. A systematic review of 49 trials of audit and feedback found that this approach should benefit CPG implementation (51). Importantly, this review identified success factors that need be considered, including whether the baseline performance of health professionals is low to start with; feedback is recurrent and given both verbally and in writing; and, the process includes clear targets and action plans (51). Our findings suggest that further factors may need to be considered, such as feasibility and context, to ensure that implementers feel empowered, rather than discouraged or demotivated, by audit and feedback systems.

Most participants described CPG implementation as reactive, rather than proactive, driven by demands to implement without adequate time or funds to do so effectively. Participants spoke of a '*compliance culture'* and explained that requirements were heavily weighted towards administrative reporting rather

than consideration of clinical quality improvement. Within the field of 'quality of care' measurement, a long-standing model posited by Donabedian proposed three measurable facets of quality of care: 1) structure (e.g. inputs to care such as facilities, staffing); 2) process (e.g. clinical care); and, 3) outcomes (e.g. health outcomes, patient satisfaction) (52, 53). In South Africa, the apparent emphasis on structural measurement, is unlikely to be sufficient, as shown by a multi-country, cross-sectional study in similarly poor settings which found that infrastructure reports correlated poorly with clinical care or CPG adherence (54). Drawbacks of this narrower structural and process focus have also been described in the UK's National Health Service, where attempts to create efficiency resulted in '*compliance-oriented bureaucratised management*' and was felt to hinder rather than enable quality service delivery (55).

Financial constraints were identified as critical factors limiting effective CPG implementation. Lack of basic equipment, and CPG books was described as the norm. Additionally, lack of infrastructure, including internet or devices, was a perceived barrier to using CPGs. These views mirrored those of PHC providers in the same districts that we spoke to who described that they would be more likely to use CPGs if digital access was possible (32). However, like the managers, they perceived lack of internet in facilities, and exorbitant costs of data required for downloading CPGs, as barriers to digital access (32).

Human resource constraints, such as clinical workload and understaffing, was another health-system issue hindering CPG implementation, a finding that echoes a sub-study of PHC clinical staff in these districts (32). Training is the mainstay of capacity building for human resources for health. It is vital for building skills and knowledge to implement CPGs, but is also a form of enablement for teams more generally. In South Africa, like many low- or middle-income settings, nurses are the backbone of PHC services. Yet, poor-quality nurse training was a concern, associated with outdated curricula, inaccessible training sites and a presumed impact on patient care. Similar findings have been reported from other

research in South Africa, for example in the context of antenatal care guideline adherence (56). This is a global challenge, with the WHO recognising the importance of quality health workforce training in realising UHC (57). One of the contradictions from our findings was that despite training gaps and primary care provider workload, one of the doctors said that '*nurses know more than doctors*'. This was in reference to the view that nurses have more training opportunities and are also more motivated to use current CPGs than doctors. Our previous research with primary care providers supports this finding of more willingness to use guidelines by nurses, compared to doctors, but further research is needed to explore this issue (32).

To overcome these challenges, many participants pointed to the importance of post-training clinical mentorship. When in place, this was perceived to provide the necessary, case-based, in-facility support for CPG implementation and role-modelling of CPG use. This view has been reported by other South African studies, in particular a study exploring the Ideal Clinic programme implementation suggested that family doctors in the DCSTs have similar perspectives regarding the importance of mentorship (58, 59).

In addition to health-systems issues, the importance of context emerged as a significant theme. Within the public sector, CPG production in South Africa is generally the responsibility of the National Department of Health and implementation a provincial mandate, with further devolvement of decision making to districts (7). This decentralised approach is advocated globally, particularly for health systems progressing to UHC to enable more responsive, ground-up health services (60). However, we learned from our participants that the problem with this is two-fold. Firstly, health indicators are aligned with national strategies, which do not consider differences between provinces. Secondly, local teams lack time and specific training in the adaptation of the CPGs for their setting. These concerns were also

expressed by national primary care CPG developers, who described that the fragmentation between and within provinces likely hampers implementation (30). According to our participants, implementation of a 'one size fits all' national CPG may result in several negative consequences, including poor scores on national indicators due to unfeasible recommendations that are not adequately implemented ('round peg in a square hole' analogy); and rushed implementation to align with a national programme or political drive.

Despite, and perhaps because of, the contextual challenges these managers encountered, many described innovative approaches to overcome geographic barriers or cultural issues. For example, a female manager in the Eastern Cape led the development of a male nurse-led programme for medical male circumcision because in her setting for women to discuss circumcision is a cultural taboo. In addition, where geographical barriers arose, such as flooding rivers, district managers tried to provide vehicles and airtime to community healthcare workers to reach patients. This was not always successful, due to financial barriers and inadequate procurement processes. A number of managers described plans that required impressive ingenuity and commitment to overcome health system and contextual barriers, despite all odds, and seemingly with little recognition. Additionally, despite the managers' evident wealth of knowledge, experience and creative solutions, when pressed, there was a notable absence of examples provided by participants of opportunities to share lessons learned, innovative approaches, and successes or challenges between and within districts or provinces.

Taken together, these health-system and contextual barriers to CPG implementation are recognised in various CPG frameworks as potential challenges to implementation (22, 61). However, arguably, those frameworks, largely developed in higher-income settings, contain more detail regarding the CPG and healthcare provider characteristics and less regarding the social, political and contextual factors. In

South Africa, availability of CPGs and motivation of healthcare providers and managers to support CPG use are less of an issue than those of context and health systems (32).

Implications for policy and practice

. In this study, participants made recommendations regarding structural barriers that hinder CPG implementation and ultimately impact on patient care and its quality, and through these on UHC. Participants emphasised the importance of strengthening leadership, clarifying roles and putting in place constructive accountability measures. Skilled nursing and other clinical services are required to address the health burden, along with the equipment and supplies to deliver their services as recommended by evidence-informed CPGs. Quality assurance of PHC training programmes, particularly nurses, and facilitating interdisciplinary training to ensure all staff are adhering to CPGs was suggested. Innovations, such as the DCSTs, are filling a reported gap in providing clinical mentorship, but these collaborative working groups need further strengthening. Finally, for effective CPG implementation in health services to occur, considerations of the unique settings in each province, including culture, geography and social needs, must be undertaken. Systematic use of available CPG implementation checklists to explore, understand and plan for implementation will assist to tailor strategies to address local needs, making best use of limited resources for quality healthcare (22, 25, 61).

Limitations

Elsewhere we have discussed limitations within the broader SAGE qualitative study (31, 32). In brief, exploring CPG implementation for all PHC CPGs encompasses a very broad research area. Many PHC CPGs are available, each likely has different barriers. However, in our exploratory research, we found many cross-cutting issues such as access, training and supply chain factors. Future research can build on our findings and identify CPG-specific barriers and enablers. In particular, the thematic area on socio-

cultural-geographic issues, although important, included relatively fewer findings. This requires further exploration with additional participants from various groups including patients and community leaders. To provide further specific contextual insights.

Another potential limitation is the sample, including provincial and district managers in four provinces, which may not sufficiently capture all views for this sub-group of the health services. Additionally, we used a mix of purposive and convenience sampling, resulting in inclusion of participants who were more likely to be available or responsive. Despite this, common themes emerged across provinces and reflect previous research. As this is not a static situation, research during the evolving process to UHC is necessary. Moreover, while many of the same themes emerged amongst interviewees, complete data saturation was not reached in this sub-study. Time and financial restraints prevented further data collection and additional concepts may have emerged if we had spoken to more people. Further research amongst this population would thus be potentially useful.

Finally, we cannot rule out the possibility of response bias, in which participants respond according to what they believe we want to hear (43). However, many rich issues emerged from most participants.. Using the individual interview approach may have provided a safe space and achieved the depth that we have been able to capture and share in this paper.

Conclusion

CPGs are amongst the suggested policy tools to achieve evidence-informed, effective and cost-effective universal healthcare (41). Sub-national health managers reported that health-system challenges, along with socio-cultural and geographic context, are central issues hampering successful CPG implementation. Our study adds to a body of knowledge regarding evidence-informed policy

implementation. Our participants provide practical insights relevant to primary care CPG implementation for lower-resourced settings aiming for UHC.

List of abbreviations

CPG	Clinical practice guideline
DCST	District Clinical Specialist Team
EC	Eastern Cape
HIV	Human immunodeficiency virus
KZN	KwaZulu-Natal
LP	Limpopo
PHC	Primary healthcare
UHC	Universal health coverage
WC	Western Cape

Declarations

Ethics approval and consent to participate

The study was approved by the Research Ethics Committees of the South African Medical Research Council (EC002-2/2014) and Stellenbosch University (N14/02/008). The informed-consent form was sent to the individuals prior to the interviews and was also explained and confirmed at the start of interviews. All participants provided individual written informed consent. The names of participants have been captured but are saved with restricted access. We referred to the Consolidated criteria for reporting qualitative research (COREQ) to ensure comprehensive reporting (36).

Consent for publication

Not applicable

Availability of data and material

The datasets generated and/or analysed during the study are not publicly available as these may be linked to specific health managers interviewed and as such are not available as open-use data. Should anyone wish to have access or is interested in further exploration of the data, you may contact the author: tamara.kredo@mrc.ac.za.

Competing interests

TK has contributed evidence to the National Department of Health Essential Drugs List Adult level standard treatment guideline (non-funded); and facilitated workshops and capacity development for under and post-graduate students, researchers, policymakers and practitioners on clinical practice guidelines and evidence-informed practices. JV has been involved in guideline development globally and regionally, he has been on advisory committees for clinical guidelines in the Western Province and has facilitated workshops and capacity development for under- and postgraduate students, researchers and practitioners on clinical practice guidelines and evidence-informed practices. SC, SA, AA, BS and JM have no competing interests to declare.

No financial competing interests to declare for any contributors to this research.

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Authors' contributions

TK drafted the protocol, with input from JV and AA, amongst others involved with the initial SAGE project. TK, AA and JM were involved with data collection. TK, SA, JV, AA, JM, SC and BM contributed to discussions regarding analysis of findings. TK drafted the manuscript, with input from all authors. All authors approved the final version of the manuscript.

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Guideline implementation

Supplementary file 1. Interview schedule for semi-structured interviews

BACKGROUND QUESTION: what is your experience and understanding of what a guideline is or does?
1. What is your context (role, position) as it links to clinical practice guidelines?
2. What processes of primary care clinical practice guideline development, contextualisation, adapting, and implementation are in place?
3. Who is involved/ role players?
4. What works for clinical guideline development? What could be better? (if relevant to the informant)
5. What works for clinical guideline implementation? What could be better? (if relevant to the informant)
6. If we want to know more, who should we speak to?

Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups

SAGE provincial managers paper

31 October 2019

No / Item	Guide questions/description	Section in paper
Domain 1: Research team and reflexivity		
Personal Characteristics		
1. Interviewer/facilitator	Which author/s conducted the interview or focus group?	Details provided in methods and in previous publications. See section on 'data collection and management'
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	Provided in methods – not provided in detail, but provided in 'data collection and management' section of methods
3. Occupation	What was their occupation at the time of the study?	Outlined in methods.
4. Gender	Was the researcher male or female?	Not mentioned in the manuscript. Interview teams were all female, and the research team included both sexes. However, given the interviews were with senior managers, the sex of the interview team was not deemed of central importance.
5. Experience and training	What experience or training did the researcher have?	Outlined in methods – training was provided for interviewing, along with mentoring of the lead interviewer TK. Further, post interview reflection enabled learning and enhanced practice.
Relationship with participants		
6. Relationship established	Was a relationship established prior to study commencement?	In the methods section we refer to the sampling approach which was purposive, not prior relationships existed.
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	See point 6 above - no prior relationship.
8. Interviewer characteristics	What characteristics were reported about the	The details regarding the interviewers/ researches is

	interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	reported in the section on 'data collection and management'. This includes reference to their training and the interdisciplinary mix of researchers.
Domain 2: study design		
Theoretical framework		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	This appears in the methods section along with detailed reporting of the process.
Participant selection		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Within the methods section, we outline that both purposive sampling (for the participants role in guideline implementation) and convenience sampling (where specific people were suggested and available) was used.
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	Included in methods section. We describe the face to face semi-structured interviews.
12. Sample size	How many participants were in the study?	Reported in results section in narrative and table.
13. Non-participation	How many people refused to participate or dropped out? Reasons?	Included in methods – there was no non-participation. All agreed to participate, none dropped out or refused.
Setting		
14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	Provided in methods and previous publications – all interviews took place in work place, except one telephone call that was chosen for convenience for the participant.
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	Not included, as there were no non-participants, all were interviewed following informed consent.
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	Relevant details provided in methods – however, only basics regarding their role,

		professional background and sex were gathered
Data collection		
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Approach outlined in methods and guide provided in appendix. The semi-structured guide informed the interviews, was also adapted iteratively as the interviews proceeded.
18. Repeat interviews	Were repeat interviews carried out? If yes, how many?	n/a
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	We used digital recordings which is described in methods section.
20. Field notes	Were field notes made during and/or after the interview or focus group?	Reported in methods - We captured some field notes, and also post-interview reflections on the data and process of the interviews.
21. Duration	What was the duration of the interviews or focus group?	Described in methods – approximately 60 – 90 minutes
22. Data saturation	Was data saturation discussed?	This is mentioned in the discussion, under study limitations.
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	Not done
Domain 3: analysis and findings		
Data analysis		
24. Number of data coders	How many data coders coded the data?	Details of analysis in methods – the lead researcher did the coding.
25. Description of the coding tree	Did authors provide a description of the coding tree?	Not provided here
26. Derivation of themes	Were themes identified in advance or derived from the data?	Described in methods, the codes were derived from data inductively.
27. Software	What software, if applicable, was used to manage the data?	Not used
28. Participant checking	Did participants provide feedback on the findings?	Not done
Reporting		
29. Quotations presented	Were participant quotations presented to illustrate the themes / findings? Was each quotation identified? e.g. participant number	Several quotations are included with an identifier to illustrate the data.

30. Data and findings consistent	Was there consistency between the data presented and the findings?	Aligned throughout the manuscript to ensure the results reflect the data
31. Clarity of major themes	Were major themes clearly presented in the findings?	In results - outlined major themes and categories
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Results section - differing views are included.