

Lest we forget, primary health care in Sub-Saharan Africa is nurse led. Is this reflected in the current health systems strengthening undertakings and initiatives?

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Background Primary health care (PHC) in most African countries is nurse led. In South Africa, PHC has a unique history where efforts to provide holistic health care to rural communities began in the early 1940s. There are initiatives to ensure that doctors including General Practitioners (GPs) get to public clinics in South Africa—great initiatives but bearing in mind the current doctor patient ratios and the difficulties to get doctors into rural areas, until we get there, nurses will be and are providing most of PHC services.

Methods We tracked policy implementation aimed at achieving Universal Health Coverage in one pilot district in South Africa from 2011–2015. Qualitative data was collected during three phases 2011–2012 (Contextual mapping), 2013–2014 (Phase 1) and 2015 (Phase 2). A theory of change approach was employed. Semi-structured in-depth interviews were held with participants using a standard interview guide. Participants ranged from provincial, district, sub-district and facility actors involved in policy implementation.

Results Many health systems strengthening activities are being carried out namely; PHC re-engineering package made up of district clinical specialists, school health and ward based teams, referral systems strengthening, management strengthening, and general practitioner (GP) contracting.

Conclusions We found no targeted health systems strengthening initiatives to counteract the challenges faced by PHC nurses which are well documented in literature. What we see currently missing are initiatives directed at the work done by nurses in a PHC setting, to assist them resolve the so well documented challenges they are faced with in their daily work. If PHC is nurse led, we advocate going step by step with the aid of the nursing process and assess what could be done to streamline, strengthen, innovate and support the work a PHC nurse does, guided by systems thinking, hence we propose a Framework for Health Systems Strengthening in a nurse led PHC setting, that takes into account the challenges and the roles of a PHC nurse (**Figure 1**).

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Figure 1. Proposed Health System Strengthening approaches in a PHC setting.

Primary healthcare (PHC) is defined as essential health care based on practical, scientifically sound and socially acceptable methods and technology, made universally accessible to individuals and families in the community, through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination (1). PHC in most African countries is nurse led (2). In South Africa, primary health care has a unique history where efforts to provide holistic health care to rural communities began in the early 1940s (3).

Improving the quality of health care is central to the proposed health care reforms in South Africa aimed at achieving Universal Coverage (2). There is well-documented evidence globally, that the number, competencies, and effectiveness of nurses are critical in determining the quality of care in health systems and the nature of patient outcomes (4, 5). There is a positive association between the amount of time nurses spend with patients and patient or nurse satisfaction, as well as patient outcomes and safety (6). PHC nurses including nurse managers spend most of their time on direct patient care (6).

Primary Health Care as an approach to deliver health care was initially adopted by the South African Government in 1994 (7). Since then, much has been done to gear up the health system to implement PHC. Nine provincial departments of health have been established out of the fragmented state of pre-1994 South Africa. Racial and gender inequalities in the managerial structures have been largely eliminated. There has been a large investment in infrastructure and building of new clinics and facilities to make health services more accessible. Services have been massively scaled up to deal with the burden of disease that includes HIV and associated TB epidemic (7). PHC implementation has been fraught with obstacles including failures in leadership and stewardship and weak management that have led to inadequate implementation of what are often good policies (8, 9). According to Harrison (2010), the district based system was one of the biggest post 1994 innovations making health management more responsive to local conditions and distributing resources more equitably. Its success has been hamstrung by the failure to devolve authority fully and the erosion of efficiencies through lack of leadership and low staff morale (7).

PHC Nurse expected roles

There are many policies being rolled out, one of them to ensure that doctors including General Practitioners (GPs) get to public clinics in South Africa (10), but bearing in mind the current doctor patient ratios and the difficulties to get doctors into rural areas, until we get there, nurses will be and are providing most of PHC services. Before one can contribute meaningfully to the strengthening of primary health care, it is pertinent to understand the expected role of a PHC nurse in the South African health system. A PHC nurse is expected to have knowledge and skills in the following areas;

- Chronic diseases and Geriatrics
- Home based care
- Health information system
- HIV/AIDS and sexually transmitted infections (STI)
- Mother and child's health including immunization, integrated management of childhood illnesses, family planning and antenatal care.
- Mental health
- Minor ailment treatments

- Prevention of mother to child transmission (PMTCT)
- School health services
- Tuberculosis

The above programmes have to be implemented at clinic level and it is the responsibility of the primary health care nurse to ensure proper assessment, diagnosis, treatment (implementation) evaluation (meeting of targets, monitoring of achievements and non-achievements and remedial action (development of action plans to address failures) to ensure positive patient outcomes (11). Below we look at the challenges PHC nurses are facing as revealed in literature.

Challenges experienced by primary health care nurses

Challenge 1: Data demands

Primary health care centres have reporting requirements to the District Health Information System (DHIS) for the purpose of monitoring and evaluation of healthcare programmes. At present, data in these PHCs is handwritten in registers by nurses and aggregated into data sheets for submission to the District office. Problems with this approach include a high writing burden, constantly changing data formats without supportive training often cited as a reason for poor data quality (12, 13).

There are at least 17 registers per community health centre (CHC) for recording the attendance of single events related to patient care, specific conditions or procedures such as births, tuberculosis, immunisations and patient consultations (13, 14). In each one, patients' demographic data have to be recorded leading to duplication which nurses perceived to be a waste of time (14). Separation of data in different registers raises concerns related to continuity of care, stemming from the lack of a complete chronological record. Challenges associated with the current paper-based patient record system reported in literature include high recording workload, time spent looking for old registers, entering data after the day's work is finished, duplicate entries, difficulty in keeping track of patients (data in different registers), missing files and lack of training (12, 13). When there is a high workload, actual recording of data may be done long after the event, recording data the next day-leading to inaccuracies (14). In addition, stationery sometimes goes out of stock, leading to recording on scraps of paper that can get lost or misplaced (14).

PHC nurses feel that they are neglecting patient care in favour of collecting data;

'It's like we're nursing the books than the patients'. (P26, Female, 37) (14).

Challenge 2: Time management, multiple demands and reduced time for patient care

With more chronically ill patients, public clinics are unable to dedicate sufficient resources for assisting all patients (3) and nurses are unable to provide the government's ideal of administering personalized, community-oriented care (3). The practice environment with staff shortages and performance problems, resource constraints, sub-optimal communication, and unplanned activities exacerbate the difficulties of PHC nurses to deliver high-quality patient care (15). PHC nurses seem to be spending a lot of their time in meetings they are summoned to by District or Provincial supervisors and as these meetings are not well coordinated, several meetings can be planned for the same day albeit different venues (15) further depleting staff at facility level.

Challenge 3: Cocktail of epidemics at the backdrop of resource shortage (Human and Material)

Barriers to access and equitable care are related to poverty and compounded by lack of trained human resources for health and poorly functional health systems (16). New and re-emerging diseases have created a new scenario in service delivery as many

diseases have defied conventional medical technology. The development of drug resistance complicates the already difficult situation and the situation worsens as people seek health care too late requiring sophisticated treatment, additional drugs, prolonged hospital visits, and slower recoveries. This is aggravated by weak systems of governance on one hand and ecological stress on the other as well as the inability to quantify and analyse the situation with credible data regarding the performance of the health system and the health status undermining the ability of effective decision making (17). Sub-Saharan Africa is experiencing a rapidly increasing epidemic of non-communicable diseases (NCDs), while it continues to face longstanding challenges from infectious diseases. This double burden of disease accompanied by violence and instability, have devastating impact on already strained health systems with significant resource constraints including human resources and brain drain (18).

Challenge 4: Human resource shortages, task shifting and supervision challenges

Gains in global maternal and child health and survival are by no means equal and wide global disparities persist. Sub-Saharan Africa continues to have the highest under-five mortality rate among all regions, with 83 deaths per 1000 live births annually. Although Millennium Development Goal 4 was achieved in some high-mortality countries in Sub-Saharan Africa and South Asia, there are still 58 low- and middle-income countries (LMICs) who are still to reach this target (16). Globally interventions for new born care in community settings have substantially improved through task shifting using various health-care providers, especially community health workers (CHWs) adding more supervisory duties to the already burdened PHC nurse (16). Community health workers (CHWs) are an increasingly important component of health systems and programs. Despite the recognized role of supervision in ensuring CHWs are effective, supervision is often weak and under-supported (19). Supervision by formal health workers gives CHWs a sense of legitimacy in the eyes of other health workers, the communities served by CHWs, and CHWs themselves (20) and a lack of supervision can contribute to CHW dissatisfaction and poor outcomes (21). Ideally, some CHWs would like the PHC nurse to accompany them in the field for support (22). Given the clustering of maternal and new born burden of disease in rural settings and among the urban poor, strategies for promoting community demand as well as appropriate outreach through community health workers with appropriate supervision (16) seems not only a challenge but also adds supervisory demands on the already burdened PHC nurse.

Challenge 5: Lack of supportive supervision, mentoring and problem solving deficiency

PHC nurses themselves report challenges in getting supportive supervision which they describe as erratic and involving more policing than mentoring (7, 15). There seems to be a talking culture but no action culture when it comes to dealing with challenges in the PHC system. One manager revealed the following;

We keep talking about the problem – but it is never solved – the meetings, meetings, meetings, take up a lot of time. (Respondent 12, public maternity unit) (15).

You identify a problem but you have no way to solve it (22).

Improving the quality of health care is central to the proposed health care reforms in South Africa (15). A health system is made of six building blocks, service delivery, financing, pharmaceutical and drug supply, human resources, health information systems and leadership. Nurses are the main providers of primary healthcare in South Africa. They are also the largest professional group generating and recording health-care information (14) and if the data generated is inaccurate, inconsistent and incomplete, the whole health system planning will be based on inaccurate data. If PHC is to be strengthened, it is worth looking at the duties and challenges of a PHC nurse and

devise interventions aimed at streamlining processes, and supporting the PHC nurse to do her work effectively and efficiently thereby improving patient outcomes.

Challenge 6: PHC staffing norms have not been revised to meet the new epidemiological profiles

The national PHC staffing norms of 1:30 patients for medical officers (16 minutes per patient per day) and 1:40 patients for professional nurses (12 minutes per patient per day) have not been reviewed recently to accommodate emergent disease profiles and comorbidities (23). PHC reengineering proposes a revised three stream approach. These three streams are a ward-based PHC outreach team for each electoral ward; School health team strengthening; and district based clinical specialist teams with an initial focus on improving maternal and child health (24). The ward based and school health teams would provide some curative care, but be responsible for prevention and health promotion. These activities have long been neglected, although they would also add to the duties of a PHC nurse to include support and supervision of these health teams. The District Clinical Specialist Team (DCST) is an additional supervisory team that can provide support to the PHC nurse but also adds additional reporting and data demands on top of the current District reporting and data demands. Where does this additional time needed come from?

Current Health system strengthening initiatives

Multiple health system strengthening initiatives are being done by the Department of Health in conjunction with other partners' eg,

- Leadership and management strengthening
- Referral system strengthening
- Drug supply and supply chain improvement
- District clinical specialist team
- Ward based teams
- School health teams
- General practitioner contracting

These interventions though needed are often done in isolation from each other, and without coordination with the overall PHC system. If the backbone of PHC in Africa is nurses then we ought to align Health system strengthening interventions to aid these nurses do their work efficiently and effectively. In-order to assess the value of an initiative, one could ask the question: What do we want to achieve? Are we:

1. Streamlining work?
2. Enhancing capacity?
3. Strengthening infrastructure?
4. Providing resources?
5. Improving research, evidence generation and innovation?

Bearing in mind the PHC is nurse led; these questions ought to be asked with regard to the duties of a PHC nurse.

Identified gap

What we see currently missing are initiatives directed at the work done by nurses in a PHC setting, to assist them resolve the so well documented challenges they are faced with in their daily work. We advocate going step by step with the aid of the nursing process and as-

sess what could be done to streamline, strengthen and support the work a PHC nurse does, guided by systems thinking. If PHC is nurse led, it is imperative to look at those tasks and responsibilities a PHC nurse does and actively take steps to streamline, innovate and equip the nurses to provide quality patient care hence we propose a Framework for Health Systems Strengthening in a PHC setting that is nurse led, that takes into account the challenges and the roles of a PHC nurse.

Why systems thinking

Primary health care like other health systems are complex adaptive systems and the problems faced by these health systems cannot be understood and managed through the cognitive tools we have thus far chosen to use. We need to grasp the increasingly complexity of our social, environmental, health and political arrangements and reach solutions by moving from addressing symptoms and using quick fixes and rather work toward long term solutions using systems thinking (25-27). In 2015, the world transitioned from the MDGs to the Sustainable Development Goals (SDGs). Although the maternal, neonatal, child and adolescent health issues remain central, the SDGs are all encompassing and the health goal (SDG3) will require close linkages with other contributing SDGs. These systems are interrelated. For example although a lack of skilled birth attendants and qualified health workers is a large part of the problem, poor health outcomes are also related to complex issues such as maternal empowerment, sociocultural taboos, and care-seeking practices and behaviours during pregnancy and child-birth (28). It is, however, no longer sufficient to address the major social challenges through a sectoral division of labour and with a short-term perspective when the challenges themselves interact, are interconnected and have long-term effects, hence we advocate systems thinking. Complexity science demonstrates that the wicked problems have no simple cause or simple solution, and interventions in one area could have unintended harmful effects (29-31) in another, hence we recommend systems thinking in dealing with PHC challenges.

The WHO Alliance for Health Policy and Systems Research published in 2009 a seminal report on *System Thinking for Health Systems Strengthening* (31) demonstrating the need to go beyond conventional approaches to better design and assess health systems interventions. Pathways to good and poor health can be nonlinear and hard to predict, and health is increasingly understood as a product of complex, dynamic relationships among distinct types of determinants. The health system alone does not have the tools to solve all our health challenges (30). Systems thinking approach is aimed at replacing the traditional linear logic of technical determinism, allowing more realistic evaluations through heuristic generalization (i.e., to achieve a clearer understanding of what is happening in PHC's in sub-Saharan Africa, what works currently, what does not and for whom) that way we can respond more appropriately to policy needs taking better account of context, system behaviour, and outcome effects. Of concern is that the conversations and debates surrounding Universal Health Coverage are rarely tied to those relating to health systems strengthening, community health-worker models, or other health-care delivery priorities (32).

Assessing PHC systems utilizing the nursing process (in nurse-led PHCs) in conjunction with systems thinking, could assist in identifying gaps and opportunities in current HSS initiatives in Primary Health Care systems in sub-Saharan Africa. We reckon this could lead to positive health outcomes as countries move towards Universal Health Coverage. Proposed PHC HSS strengthening framework (Table 1).

Limitations of study

This study was carried out in South Africa and the challenges experienced by PHC nurses here might be different from other contexts.

Table 1. Health System Strengthening Framework for nurse led PHC systems

NURSING PROCESS	CHALLENGES	CURRENT HEALTH SYSTEM STRENGTHENING (HSS) INITIATIVES	HEALTH SYSTEM STRENGTHENING (HSS) OPPORTUNITIES	HEALTH SYSTEM STRENGTHENING (HSS) APPROACH	SYSTEMS THINKING
ASSESSMENT:	Equipment shortages and lack of maintenance e.g. Sphygmomanometers that are never recalibrated leading to spurious readings	New equipment being bought	No Equipment management, condemning etc.	Providing resources	Systems thinking: How does this phase affect the other phases and how does this contribute to the performance of the system as a whole?
	Little time to focus on patient (12 minutes for one patient with multiple co-morbidities)	Clinical skills training	No efficient and effective supply chain management	Research and evidence and innovation	Financing; Service delivery-enhancing capacity – clinical skills training; Pharmaceutical products; Leadership; Human resources(HR); Health Information system
	High patient volumes (cocktail of epidemics)	Central Chronic Medicine Dispensing and Distribution (CCMD)	Revision of PHC staffing norms to accommodate the evolving disease profiles and comorbidities-research based	Streamlining work	
	Multiple registers	Ward based teams	One register	Streamlining work	Time saved from duplicate data entry etc. can then be spent on patient care; Accurate data (HIS) leads to improved planning (leadership and governance and responsive health systems; Accurate assessment of patient impacts diagnosis, treatment and consequently patient outcomes
			Electronic medical records	Innovation	
DIAGNOSIS:	Results take long to get back to clinic		Onsite basic lab services	Enhancing capacity	Systems thinking: How does this phase affect the other phases and how does this contribute to the performance of the system as a whole?
	Results get lost along the way		Electronic Medical Records	Strengthening infrastructure	Financing; Service delivery; Pharmaceutical products; Leadership; Human resources (HR). Health Information system
				Providing resources Research and evidence and innovation	Where is high leverage? What is the feedback saying? Accurate diagnosis of patient impacts treatment plan and consequently patient outcomes
TREATMENT AND NURSING PLAN:	Drug stock-outs	Supply chain management training	Task shifting: Pharmacy assistants could take over dispensing-freeing up time for nurses to focus on patient	Streamlining work	Systems thinking: How does this phase affect the other phases and how does this contribute to the performance of the system as a whole?
	Prescribing and dispensing at the same time		Time management-Meeting management		Financing; Service delivery; Pharmaceutical products-Supply chain mx training; Leadership; HR; Health Information system
	Too much paper work-use of bar codes				Where is high leverage? What is the feedback saying? Informed planning impacts, implementation of treatment and consequently patient outcomes
IMPLEMENTATION:	Staff shortages	Leadership training	Human resources for health (HRH) plan	Enhancing capacity	
	Multiple, Impromptu and ad hoc meetings, workshops and trainings		District Health systems (DHS) set up, establishment and management	Research, evidence and innovation	Systems thinking: How does this phase affect the other phases and how does this contribute to the performance of the system as a whole? Financing; Service delivery; Pharmaceutical products; Leadership; HR; Health Information system Where is high leverage? What is the feedback saying? Example: supporting broader capacity building, in light of (nurse) health-worker shortages across the developing world (32); Successful implementation is dependent upon assessment and planning and impacts patient outcomes.

Table 1. Continued

NURSING PROCESS	CHALLENGES	CURRENT HEALTH SYSTEM STRENGTHENING (HSS) INITIATIVES	HEALTH SYSTEM STRENGTHENING (HSS) OPPORTUNITIES	HEALTH SYSTEM STRENGTHENING (HSS) APPROACH	SYSTEMS THINKING
EVALUATION:	Time pressure and lack of continuity of care (multiple registers that get lost etc.)		Revision of PHC Supervision culture	Enhancing capacity	Leadership and Management strengthening
	Policing culture rather than mentoring approach to supervision		Revision of staffing norms	Research, evidence and innovation	Data use locally-Monitoring & Evaluation of own facility performance and designing plans for improvement Systems thinking; How does this phase affect the other phases and how does this contribute to the performance of the system as a whole? Financing; Service delivery; Pharmaceutical products; Leadership; HR; Health Information system; Where is high leverage? What is the feedback saying? Example: turning vertical funds directly to strengthen health systems or to assure health care for all members of society (for example, through Universal Health Coverage (UHC) tied to health systems strengthening (32); What is working, for whom, where and why? Evaluation feeds back into planning and subsequent nursing processes leading to continuous improvement.

CONCLUSIONS

If PHC is nurse led, it is imperative to look at those tasks and responsibilities a PHC nurse does and actively take steps to streamline, innovate and equip the nurses to provide quality patient care for example Central Chronic Medicine Dispensing and Distribution (CCMD) (33) initiatives to decongest the clinics so that nurses have enough time to assess, diagnose, plan, implement and evaluate patient care they provide. While the expansion of the public health care workforce would certainly improve the situation of PHC and nurses and hopefully decrease the long waiting times (2), there are more challenges confronting the nurses hence the need for a framework to aid in identifying the gaps and opportunities in current PHC systems strengthening initiatives, based on challenges faced by PHC nurses on the ground.

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REFERENCES

- 1 World Health Organization. Social determinants of health. Geneva: World Health Organization; 2008.
- 2 Department of Health. National Health Insurance for South Africa. Pretoria: Department of Health; 2015.
- 3 Maillacheruvu M, McDuff E. South Africa's return to Primary Care: The struggles and strides of the Primary Health Care System. *Journal of Global Health*. 2014. Available: <http://www.ghjournal.org/south-africas-return-to-primary-care-the-struggles-and-strides-of-the-primary-health-care-system/>. Accessed 9 March 2018.
- 4 Unruh LY, Hassmiller SB, SC Reinhard SC. The importance and challenge of paying for quality nursing care. *Policy Polit Nurs Pract*. 2008;9:68-72. PubMed <https://doi.org/10.1177/1527154408320046>
- 5 Kurtzman ET, Corrigan JM. Measuring the contribution of nursing to quality, patient safety, and health care outcomes. *Policy Polit Nurs Pract*. 2007;8:20-36. PubMed <https://doi.org/10.1177/1527154407302115>
- 6 Westbrook JI, Woods A, Rob MI, Dunsmuir WT, Day RO. Association of interruptions with an increased risk and severity of medication administration errors. *Arch Intern Med*. 2010;170:683-90. PubMed <https://doi.org/10.1001/archinternmed.2010.65>
- 7 Harrison A. An Overview of Health and Health care in South Africa 1994 2010: Priorities, Progress and Prospects for New Gains. 2010. Available: <http://ftp.bhfglobal.com/files/bhf/overview1994-2010.pdf>. Accessed: 9 March 2018.
- 8 Mangham LJ, Hanson K. Scaling up in international health: What are the key issues? *Health Policy Plan*. 2010;25:85-96. PubMed
- 9 World Health Organization. the World Bank. Tracking Universal Health Coverage: First Global Monitoring Report. 2015. Available: http://apps.who.int/iris/bitstream/10665/174536/1/9789241564977_eng.pdf. Accessed: 9 March 2018.
- 10 Hongoro C, Funani II, Chitha W, Godlimpi L. An assessment of private General Practitioners contracting for public health services delivery in O.R. Tambo District, South Africa. *J Public Health Africa*. 2015;6:525. PubMed <https://doi.org/10.4081/jphia.2015.525>
- 11 Wentzel S. The role of a clinic manager in a primary health care setting in South Africa. 2009. University of South Africa (thesis).
- 12 Heunis C, Wouters E, Kigozi G, Engelbrecht M, Tsibolane Y, van der Merwe S, et al. Accuracy of tuberculosis routine data and nurses' views of the TB-HIV information system in the Free State, South Africa. *J Assoc Nurses AIDS Care*. 2011;22:67-73. PubMed <https://doi.org/10.1016/j.jana.2010.06.003>
- 13 Garrib A, Stoops N, McKenzie A, Dlamini L, Govender T, Rohde J, et al. An evaluation of the District Health Information System in rural South Africa. *S Afr Med J*. 2008;98:549-52. PubMed
- 14 O'Mahony D, Wright G, Yogeswaran P, Govere F. Knowledge and attitudes of nurses in community health centres about electronic medical records. *Curationis*. 2014;37:1150. PubMed <https://doi.org/10.4102/curationis.v37i1.1150>
- 15 Armstrong SJ, Rispel LC, Kekana LP. The activities of hospital nursing unit managers and quality of patient care in South African hospitals: a paradox? *Glob Health Action*. 2015;8:26243. PubMed <https://doi.org/10.3402/gha.v8.26243>
- 16 Bhutta ZA. Community-based primary health care: a core strategy for achieving sustainable development goals for health. *J Glob Health*. 2017;7:010101. PubMed <https://doi.org/10.7189/jogh.07.010101>
- 17 Kaseje D. Health care in Africa: Challenges, opportunities and an emerging model for improvement. 2006. Available: <https://www.wilsoncenter.org/sites/default/files/Kaseje2.pdf>. Accessed: 9 March 2018.
- 18 Nyirenda MJ. Non-communicable diseases in sub-Saharan Africa: understanding the drivers of the epidemic to inform intervention strategies. *Int Health*. 2016;8:157-8. PubMed <https://doi.org/10.1093/inthealth/ihw021>
- 19 Hill Z, Dumbaugh M, Benton L, Källander K, Strachan D, ten Asbroek A, et al. Supervising community health workers in low-income countries – a review of impact and implementation issues. *Glob Health Action*. 2014;7:24085. PubMed <https://doi.org/10.3402/gha.v7.24085>
- 20 Kane SS, Gerretsen B, Scherpbier R, Dal Poz M, Dieleman M. A realist synthesis of randomised control trials involving use of community health workers for delivering child health interventions in low and middle income countries. *BMC Health Serv Res*. 2010;10:286. PubMed <https://doi.org/10.1186/1472-6963-10-286>
- 21 Kok M, Muula A. Motivation and job satisfaction of health surveillance assistants in Mwanza, Malawi: an explorative study. *Malawi Med J*. 2013;13:5-11. PubMed
- 22 Austin-Evelyn K, Rabkin M, Macheke T, Mutiti A, Mwansa-Kambafwile J, Dlamini T, et al. Community health worker perspectives on a new primary health care initiative in the Eastern Cape of South Africa. *PLoS One*. 2017;12:e0173863. PubMed <https://doi.org/10.1371/journal.pone.0173863>

- 23 Department of Health. KwaZulu-Natal. Provincial Strategic Plan 2010 – 2014. Available: <http://www.kznhealth.gov.za/stratplan2010-14.pdf>. Accessed: 9 March 2018.
- 24 Barron P. The implementation of PHC re-engineering in South Africa. 2011. PHASA. Available: <https://www.phasa.org.za/the-implementation-of-phc-re-engineering-in-south-africa/>. Accessed: 9 March 2018.
- 25 Costa RD. The watchman's rattle: A radical new theory of collapse. Vanguard Press: New York, NY; 2010.
- 26 Senge P. The fifth discipline. The Art and Practice of the Learning organisation. Random House: New York, NY; 2006.
- 27 Marmot M. The Health Gap: The challenge of an unequal world. Bloomsbury: London; 2015.
- 28 Bhutta ZA, Black RE. Global maternal, new-born, and child health—so near and yet so far. *N Engl J Med*. 2013;369:2226-35. PubMed <https://doi.org/10.1056/NEJMra1111853>
- 29 World Health Organization. Governance for health in the 21st century. 2012. Available: http://www.euro.who.int/__data/assets/pdf_file/0019/171334/RC62BD01-Governance-for-Health-Web.pdf. Accessed: 9 March 2018.
- 30 Adams T, de Savigny D. Systems thinking for health systems strengthening in LMICs: seizing the opportunity. *Health Policy Plan*. 2012;27:1-66.
- 31 de Savigny D, Adams T. System Thinking for Health Systems Strengthening. WHO Alliance for Health Policy and Systems Research. 2009. Available: <http://www.who.int/alliance-hpsr/resources/9789241563895/en/>. Accessed: 9 March 2018.
- 32 Clinton C, Sridhar D. Financing universal healthcare coverage. 2017. Available: <https://blog.oup.com/2017/02/financing-universal-healthcare-coverage-excerpt/>. Accessed: 9 March 2018.
- 33 SA news24. Collect chronic medicines closer to home or work. 2016. Available: <https://www.news24.com/SouthAfrica/Local/Stanger-Weekly/collect-chronic-medicines-closer-to-home-or-work-20160607>. Accessed: 9 March 2018.