



The current state of emergency medical services in South Africa: A review

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Emergency medical services (EMS) are a vital component of the health system and provide pre-hospital emergency care and specialised transport for patients requiring access to health facilities, thereby contributing to universal health coverage and improving health outcomes. Evidence regarding the current state of EMS within South Africa to fulfil this role is lacking and was the motivation for this review. Our objective was to describe the current state of EMS in South Africa. A literature search was conducted using keywords, BOOLEAN operating terms, and eligibility criteria on Sabinet, EBSCOhost, Google Scholar, ProQuest, Medline, PubMed, and ScienceDirect databases to find articles related to the components of the EMS system in South Africa. The articles were critically assessed, and six themes emerged: leadership and governance; resources; preparedness (knowledge, attitude, and practices) of the emergency care provider; health and safety; training; and communications. Challenges were found in all themes at a provincial EMS level despite improvements in legislation, leadership, and governance from the National Department of Health. These themes demonstrate that all components in the EMS system are not functioning optimally and may be affecting its contribution to improving universal health coverage and health outcomes. The current state of EMS appears to be constrained and requires greater leadership and governance from the Provincial Departments of Health to improve poorly functioning components of the EMS system.

Significance:

The current state of EMS in South Africa lacks efficiency in its role to provide emergency care and transportation for patients wanting to access health facilities. Poorly functioning components of the EMS system have been identified and provide an opportunity for health authorities to make improvements so that the goal of universal health coverage and improved health outcomes can be realised.

Introduction

Inequalities in health infrastructure, inequitable access to services¹ and the burden of disease (identified through communicable and non-communicable diseases, injury, mental health, and maternal and child health)² remain healthcare challenges in South Africa. These challenges also exist globally, prompting the World Health Organization (WHO) to advocate for additional efforts to improve health care to “the most disadvantaged, marginalised and hard-to-reach populations, to ensure that no one is left behind”³. The WHO recommended that emergency services, also known as emergency medical services (EMS), be integrated into the health system to improve patient access to the appropriate level of care.³

In South Africa, the Integrated Healthcare Delivery Platform (Figure 1) is the model used.⁴ This model promotes the relationship between Core Health Services, Support Services (linked to the WHO health system building blocks)⁵, and Linkage Services which is expected to yield improved health outcomes. Integrating EMS with other health services improves universal health coverage, keeping with the recommendation of the WHO.³ The role of EMS within this model is to provide efficient emergency care and transport for patients requiring access to Core Health Services.⁴

While the EMS in South Africa is going through reform in emergency care education⁶ and clinical practice⁷, complaints and challenges of service delivery have also been noted⁸. In trying to understand the effectiveness of EMS in the integrated healthcare delivery model, our research question was developed: What is the current state of EMS in South Africa? There is a paucity of information to answer this research question, therefore we explored the current state of EMS in South Africa and make recommendations. The review approach was used to identify, analyse and learn from existing published South African EMS studies and to provide a background and context for subsequent studies.

Method

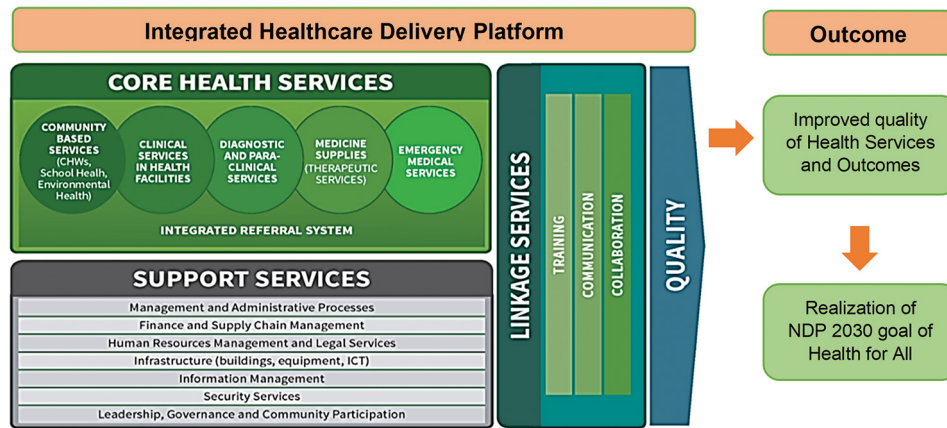
We conducted a literature search of Sabinet, EBSCOhost, Google Scholar, Proquest, Medline, PubMed, and ScienceDirect databases using the following keywords: ‘emergency medical service’, ‘EMS’, ‘paramedic’, ‘prehospital’, ‘pre-hospital’ and ‘South Africa’. These keywords were also used to search university repositories. The Boolean operating terms ‘OR’ and ‘AND’ were used to refine the database search.

The inclusion criteria were limited to the English language within the South African setting, and to the period 2010 to 2023. Sources of information included journal articles, dissertations/theses, official reports and government documents.

The Integrated Healthcare Delivery Platform, understood in the context of the WHO Health Systems Framework, provided key components (building blocks) of an EMS system. As the study was focused on the EMS system, articles were deemed eligible for inclusion if they related to the components of the EMS system. The state of EMS could therefore be described using these critical components, as proposed by Mehmood et al.⁹

Anecdotal information and articles that did not contain information about the components of EMS were excluded.

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Figure 1: Modified Integrated Healthcare Delivery Platform.

Results

The literature search process (Figure 2) returned 1548 records; of these, 1478 were excluded as they consisted of duplicate articles and those that did not meet the inclusion criteria. A further 33 articles were excluded after screening as they did not relate to the objective of the study, leaving a total of 37 articles that were analysed using a thematic coding approach.

Each article was read, and key findings were coded and tabulated on an electronic spreadsheet alongside the corresponding title, study location and reference. Codes with commonalities were grouped and developed into initial themes. Themes were selected based on their ability to provide information on the components of an EMS system, which was key to effectively addressing the research question. Finally, interrelated themes were grouped, titled and validated by all authors. The following themes emerged from the analysis of the articles:

- Leadership and governance
- Resources
- Emergency care provider preparedness
 - Knowledge
 - Attitude
 - Practice
- Health and safety
- Training
- Communication systems

Discussion

Background on emergency medical services

Prior to 1994, governance in South Africa comprised four 'white' provincial administrations (Cape of Good Hope, Orange Free State, Transvaal, and Natal) and four 'black' homelands (Transkei, Bophuthatswana, Venda, and Ciskei).^{10,11} During this apartheid era, the provision of EMS was the responsibility of the local authorities (municipalities), who also provided services such as firefighting and motor vehicle rescue in each town.¹¹ After the 1994 democratic elections, there was a redress of governance in South Africa which resulted in the establishment of nine provinces: Western Cape, Northern Cape, Eastern Cape, North West, Free State, Gauteng, Mpumalanga, Limpopo and KwaZulu-Natal.¹⁰ Redress also included removing the responsibility of EMS from the local authorities, leaving the latter to concentrate on fire and rescue services. EMS was deemed a provincial function (provincialised) and became governed by the Provincial Departments of Health (PDOH).¹²

Currently, EMS has been provincialised in all nine provinces. Table 1 illustrates the provincial geographical area in relation to the population size in South Africa¹³, thereby providing context for this review.

Theme 1: Leadership and governance

Governance

Leadership and governance are critical components of the Integrated Healthcare Delivery Platform and the pre-hospital EMS framework as they hold management accountable for the quality of health services rendered to the public.⁴ The EMS Regulations, promulgated under the *National Health Act, 2003*¹⁴, and regulating the operation of public and private EMS in South Africa, were published in 2017. This was a sign of improving governance as EMS providers were required to be accredited and licensed through the PDOH Inspectorate and Licensing Division.¹⁴

Regulations relating to standards of operating EMS in South Africa were, however, lacking in governance. Assessing the quality of service delivery is possible through standard quality assessment tools guided by governance policies and systems; however, in 2020, Howard et al. found

*no supporting documentation in the way of national policies and/or guidelines for EMS in either implementing quality systems, measuring quality or reporting performance. Furthermore, there was a general lack of policy outlining minimum standards for EMS quality systems altogether.*¹⁵

In 2022, the National Department of Health (NDOH) addressed issues of governance, whereby Regulations relating to Standards for EMS were promulgated under the *National Health Act, 2003* (Act No. 61 of 2003).¹⁶ While these regulations were going through the stages of becoming gazetted, the NDOH implemented the Ideal EMS Framework, including its assessment tools designed to evaluate the progress made towards achieving the EMS standards (Table 2).¹⁶ This approach demonstrates NDOH's focus on improving issues of governance.

According to the Regulations relating to Standards for EMS¹⁶, leadership and governance are the responsibility and accountability of the PDOH, whose role is to oversee and support the EMS by ensuring a functional governance structure exists and that there is quality in service delivery. The outcomes of provincial assessments are not yet in any published records; therefore, the quality of provincial leadership and governance remains to be determined.

Leadership

The Campaign on Accelerated Reduction of Maternal (and Child) Mortality in Africa (CARMMA) was a strategic plan introduced by the

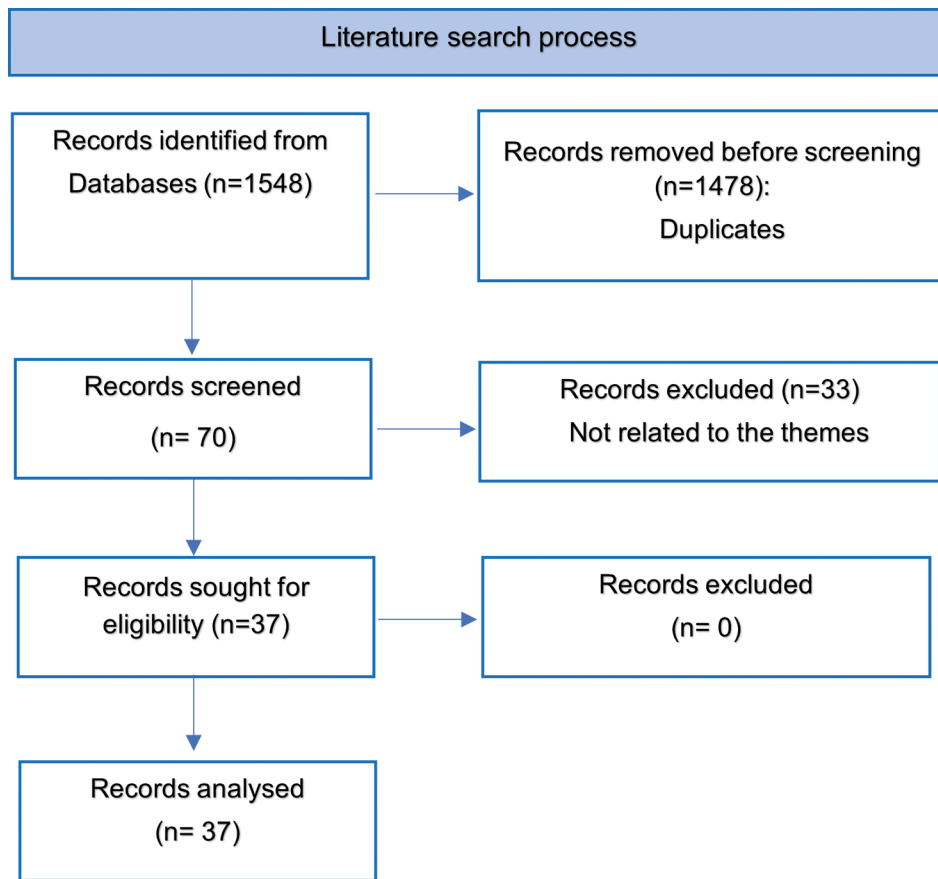


Figure 2: Flow diagram showing literature search, screening and search process.

Table 1: Provincial area size related to population size in South Africa

Provincial area size				Provincial population size	
Rank	Province	Area (km ²)	Percentage	Rank	Population estimate
1	Northern Cape	372 889	30.5	9	1 308 734
2	Eastern Cape	168 966	13.8	4	6 676 691
3	Free State	129 825	10.6	8	2 921 611
4	Western Cape	129 462	10.6	3	7 212 142
5	Limpopo	125 755	10.2	5	5 941 439
6	North-West	104 882	8.6	7	4 186 984
7	KwaZulu-Natal	94 361	7.7	2	11 538 325
8	Mpumalanga	76 495	6.3	6	4 720 497
9	Gauteng	18 178	1.5	1	16 098 571
		1 220 813	100%		60 604 994

Data source: Government Communication and Information System of South Africa¹³

NDOH, in 2009, to improve maternal and child health. This campaign required “allocating dedicated obstetric ambulances to every sub-district to ensure prompt transfer of women in labour and women with obstetric emergencies to the appropriate level of care”¹⁷. Most provinces implemented obstetric ambulances and resolved that obstetric cases be triaged as a priority.¹⁸ In 2015, Yancy et al. investigated the implementation status of obstetric ambulances in KwaZulu-Natal and Mpumalanga and found that the number of operational ambulances and staff was inadequate.¹⁹ The operation of dedicated obstetric

ambulances appears to be unsustainable given the shortage of staff and operational ambulances. NDOH leadership appears to be providing strategic direction, while provincial leadership needs improvement in implementation, oversight, and reform.

Recommendation regarding leadership and governance:

- Assessments of all components of EMS need to be urgently conducted by independent quality assurance bodies and validation provided to PDOH.

Table 2: Regulations relating to standards for emergency medical services (EMS)¹⁶

EMS standards	Requirements
Patient rights	<ul style="list-style-type: none"> Dignity of patients, information for patients, stakeholder satisfaction surveys, complaints management
Clinical governance and clinical care	<ul style="list-style-type: none"> Patient health records, clinical management of emergency care provision, dispatch of emergency vehicles, response management, clinical leadership and clinical risk, inter-facility transfers, planned patient transport services, patient safety incidents, prevention and control of infections, waste management
Clinical support services	<ul style="list-style-type: none"> Medicines and medical supplies, medical equipment management
Leadership and governance	<ul style="list-style-type: none"> Oversight and accountability
Operational management	<ul style="list-style-type: none"> General management, human resources management, occupational health and safety, emergency and disaster preparedness, fleet management
Facilities and infrastructure	<ul style="list-style-type: none"> Management of buildings and grounds, building engineering services, security services, linen services

Data source: National Health Act, 2003 (Act No. 61 Of 2003): Regulations Relating to Standards for Emergency Medical Services¹⁶

- The PDOH should develop and implement a quality improvement plan in response to the assessments and report outcomes to the NDOH that provides oversight to provinces.
- The NDOH needs to establish a standardised and comprehensive national database of provincial EMS resources and assessments for purposes of monitoring, evaluation, strategic planning, and reporting.

Theme 2: Resources

Ambulance availability and equipment

South Africa has a population of approximately 60 million people.¹³ The standard provision of 1 ambulance for every 50 000 people is an international recommendation²⁰; however, in South Africa, the national 'norm' is 1 ambulance per 10 000 people, which is dependent on socio-economic and geographic distribution.¹⁹ None of the provinces has achieved this norm.^{8,21} Studies have found that the high case load outweighs the number of scheduled ambulances.^{8,22} This situation is worsened when scheduled ambulances are unavailable due to repairs, accident damage, and awaiting vehicle parts (import delays). The high breakdown rate is due to the fleet operating with mileages beyond 300 000 kilometres.²¹

A study in KwaZulu-Natal found that response times for obstetric patients were delayed due to the unavailability of ambulances.²² Several studies in South Africa have also attributed poor patient outcomes to delayed ambulance availability.²³⁻²⁵

Ashokcoomar et al.²⁵ found problems such as a lack of essential equipment, malfunctioning equipment, and unsterile clinical procedures; and concluded that the emergency care providers in KwaZulu-Natal lacked preparedness to manage inter-facility neonatal transfers. Improving the number of fully equipped ambulances is vital for EMS to fulfil its role within the Integrated Healthcare Delivery Platform.

Recommendation regarding resources:

- The PDOH needs to prioritise and increase funding for EMS to assist with staffing and procurement of fully equipped ambulances to meet and maintain the norms and standards of the NDOH.

Helicopter emergency medical services

The helicopter emergency medical services (HEMS) is a vital resource for the EMS and is beneficial in cases such as long-distance patient transfer, inaccessible terrain, and when advanced clinical skills are unavailable in the districts. Studies show HEMS operations in the Western Cape, Eastern Cape, KwaZulu-Natal, Gauteng, Free State, Mpumalanga and North West provinces; the status of HEMS in other provinces is unknown due to the lack of published records.^{26,27} Studies into the operation of the HEMS revealed mixed outcomes. While challenges such as underutilisation of this resource²⁸, over-triage, and overuse²⁹ were

noted, Pule et al.³⁰ reported on the usefulness and appropriateness of the HEMS in long-distance transfers of patients who had major trauma. Similarly, Vlok et al.²⁷ found that HEMS served as a vital critical care transport resource for inter-facility transfers.

Recommendation regarding HEMS:

- HEMS provides invaluable support to the EMS and should be included as an additional service operated nationally with clearer dispatch guidelines developed through future studies.

Theme 3: Emergency care provider preparedness

Three levels of emergency care providers exist in the EMS in South Africa: Basic Life Support, Intermediate Life Support, and Advanced Life Support.⁹ Emergency care providers' knowledge, attitude, and practice (especially in Basic and Intermediate Life Support) was reported to be lacking in most of the articles reviewed, suggesting a lack of preparedness in managing patients.³¹⁻³⁵ For example:

- Emergency care providers lacked knowledge of the Glasgow Coma Scale³¹, triage³², management of attempted suicide³⁴ and management of psychiatric emergencies³⁶.
- Emergency care providers' attitude showed a lack of empathy³⁴, fear, and apprehension towards mental health care users³⁷. Mosca et al. found that emergency care providers expressed difficulty in managing paediatric emergencies due to the complexity of such cases, a lack of support such as protocols, and lack of specific equipment.³⁸
- Several studies have highlighted clinical practice challenges, including lack of equipment, delays in response to cases, and Emergency Communication Centre (ECC) problems.²²⁻²⁵ Vincent-Lambert et al.³⁹ found that 51% of trauma patients who arrived at an emergency department were hypothermic, with a core temperature of <36 °C.³⁸ In KwaZulu-Natal, Royal and McKerrow⁴⁰ found a mean time delay of 9 hours for inter-facility transfer of critically ill paediatric patients and that emergency care providers (mainly Basic Life Support) failed to keep these patients stable in transit.

The lack of preparedness of emergency care providers could increase the risk of negligence, clinical mismanagement, harm to the patient (maleficence), and litigation for the provider and the EMS.

Recommendations regarding emergency care provider preparedness:

- All emergency care providers need to be audited to determine compliance with the Health Professions Council of South Africa's (HPCSA) Continuing Professional Development policy.
- Training plans ought to be developed and implemented through collaboration between the provincial EMS, College of Emergency Care, and Human Resource Development structures.



- *Future studies are required to investigate the relationship between selection, recruitment and development and the preparedness of emergency care providers.*

Theme 4: Health and safety

According to Section 6 of the *Occupational Health and Safety Act 85 of 1993*, “Every employer shall take all practicable steps to ensure the safety of employees while at work”⁴¹. The *National Health Act No. 61 of 2003* also places responsibility on managers to ensure the safety of employees in the workplace.¹³ While legislation is in place, reports indicate that violence against emergency care providers is primarily initiated by patients and people known to the patient (family, community), which compromises health and safety.⁴²

The South African EMS Safety Forum reported that an increase in assault, theft of personal belongings, theft of equipment and damage to ambulances has affected the morale of emergency care providers and caused a noticeable increase in resignations, transfer requests, and absenteeism. EMS personnel did not feel supported by executive management.⁴²

Driver safety, physical fitness and mental fitness have also emerged as health and safety issues:

- **Driver’s safety**
Holgate⁴³ found that 54.2% of private and government EMS respondents have been exposed to motor vehicle accidents. Most respondents (74.4%) agreed that EMS management could do more to improve emergency vehicle driver safety and alluded to the need for specialised driver training.
- **Physical fitness**
The nature of EMS work requires a high level of physical fitness to perform strenuous tasks and emergency care providers who are not adequately prepared for this line of work increase their risk of injury. Mthombeni et al.⁴⁴ measured the physical fitness of emergency care providers in the North West Province and found that many participants were not physically fit to perform duties. The participants demonstrated a high body mass index and poor upper body and grip strength amongst other assessments. There was no evidence of physical fitness assessments or programmes in the other provinces. It may be generalised that emergency care providers in other provinces are also unfit to perform their duties.
- **Mental fitness**
Ntatamala and Adams⁴⁵ investigated the risk of Post-Traumatic Stress Disorder (PTSD) in emergency care providers in the Western Cape and found that this condition was prevalent in 30% of the respondents. PTSD and burnout were also found in a study in Limpopo⁴⁶ and paramedic trainees in Gauteng demonstrated high prevalence rates for PTSD (16%), depression (28%), alcohol abuse (24%) and alcohol dependence (8%)⁴⁷. These studies show that dysfunctional coping mechanisms such as smoking, abusing prescription drugs, drinking alcohol and using illicit drugs were common to manage PTSD. In a similar study, Van Rooyen et al.⁴⁸ found a high prevalence of stimulant use amongst emergency care providers as a coping mechanism to overcome work-related stress, to stay awake and to improve physical and mental performance.

The impact of work-related stress, with or without substance abuse, compromises the health and safety of emergency care providers^{44,45} and the performance of their duties^{37,38,45,47}, which could affect the availability of ambulances and the quality of care afforded to patients.

Recommendations regarding health and safety:

- *The PDOH Directorate for Employee Health and Wellness Programme needs to improve EMS participation in wellness programmes and ensure access to Employee Health and Wellness practitioners.*
- *The PDOH, guided by the South African EMS Safety Forum, needs to urgently develop and implement strategies to reduce attacks on emergency care providers.*

Theme 5: Training

In South Africa, emergency care providers hold qualifications from institutions that provide skills-based short-course training or from higher educational institutions that offer diplomas and degrees.⁹ ‘Short-course training’ ended as it was not compliant with the *National Qualifications Framework Act (NQF)*. The EMS colleges are now guided by the National Emergency Care Education and Training Policy, which aims to “align emergency care education and training with current education legislation, national education and training needs...”⁶.

The Higher Certificate in Emergency Medical Care (1-year programme) and the Diploma in Emergency Medical Care (3-year programme) are two new courses that have replaced short-course training. EMS colleges wanting to provide these NQF-accredited courses must be registered as higher education colleges, which requires accreditation with the Council on Higher Education, South African Qualifications Authority, and the HPCSA.^{6,49} The accreditation process has been slow, with only two of the nine provincial colleges receiving provisional accreditation.⁴⁹ In the interim, some provincial and private colleges have partnered with public universities such as the University of Johannesburg and Cape Peninsula University of Technology which offer one or both of these new courses.⁴⁹ The transformation in EMS training is a necessity to promote lifelong learning; however, many emergency care providers are struggling to meet the new course entry requirements.⁴⁹ Emergency care providers’ morale may therefore be low due to lost academic and career progression. Programmes and discussions are ongoing in an effort for emergency care providers to meet the course entry requirements.⁴⁹

While the accreditation process in EMS training continues, emergency care providers are required to attend training to keep abreast of current evidence-based clinical practice⁵⁰; however, we found poor compliance amongst emergency care providers in attending clinical update training. These findings appear to be correlated with the poor knowledge of emergency care providers described earlier. In 2019, the HPCSA released the new clinical practice guidelines that significantly increased the scope of practice of emergency care providers.⁶ Emergency care providers were required to attend and complete the clinical practice guidelines training; however, compliance with this directive is unknown.

Recommendations regarding training:

- *PDOH needs to develop and implement strategies to assist their provincial EMS colleges in achieving accreditation as higher educational institutions. This will enable emergency care providers to access new qualifications, thereby increasing their scope of practice and standard of care.*

Theme 6: Communication systems

Access to emergency services such as the police, the EMS, the fire department, and sea rescue has been traditionally through contacting their respective telephone numbers. A short code number – 112, the legislated emergency number for EMS – was launched in October 2019 and may now be used to access any of the emergency services in South Africa.¹⁰ The ‘old’ EMS emergency number (10177) will be phased out through a process of government notice.

The dispatching system used by EMS varies between provinces and ECCs, making integration impossible and information not directly accessible by the NDOH. The disparity also exists due to varying standard operating procedures, technology, infrastructure, and staffing.¹⁰ There are no nationally accepted criteria for ECC call handling and dispatch processes.

Studies have identified this component as one of the problems within EMS.^{13,25,36,51} In a study by Lambert and Wade⁵¹, respondents described the ECC as ineffective, due to problems such as unanswered calls, call takers not understanding basic medical terminology, and poorly co-ordinated inter-facility transfers.

Stander et al.³⁷ noted that challenges with the ECC dispatching system were one of the barriers to managing behavioural emergencies. Similarly, a study by Alshehri et al.⁵² found that the ECC was possibly over-triaging cases. Participants also highlighted challenges with the ECC dispatch

system, lack of training, and interpersonal conflict. Similar issues with the ECC were found in another study.⁵³ The ECC appears to be plagued with various issues that contribute to its less-than-satisfactory role within EMS.

Recommendation regarding communication systems:

- *The NDOH needs to develop a National EMS Communication Framework and Policy to guide standardisation of ECC technology, training and daily operations.*

Limitations

Firstly, despite the operation of EMS and its colleges in all provinces, the research articles available did not represent every province. As a result, official reports and government records were used to provide evidence for those provinces. Secondly, most articles focused on provincial EMS, while some articles had a mix of private and public EMS participants. Based on the principle of generalisability, our findings may represent only provinces with similar EMS challenges and geographical settings. Thirdly, we did not explore planned patient transport, inter-facility transfers, the role of EMS in disasters, ground rapid response services, or medical rescue services. These are also core services provided by EMS and require further study. Lastly, this review focused only on South African EMS studies, as context was needed for the development of a subsequent study.

Relevance of the study

In a study regarding the state of EMS in Africa, Mould-Millman et al.⁵⁴, citing the WHO⁵⁵ and Lopez et al.⁵⁶, stated:

*People in Africa bear a disproportionate burden of preventable and excess deaths before arrival at a health facility – the pre-hospital setting – even when compared to low- and middle-income countries on another continent.*⁵⁴

The study found that fewer than one in three African countries had an EMS system in place, and, where EMS systems existed, they were “inadequate to meet the demands of the population”⁵⁴. The relevance of the current study is that it adds to the body of knowledge of an African EMS system and provides an opportunity for other African countries to mitigate their approach in developing or modifying their EMS systems, thereby contributing to universal health coverage and outcomes.

Conclusion

The WHO Health Systems Framework provides key components (building blocks) of a functional health system. This study found that all components applicable to the EMS system are not functioning optimally, thereby contributing to the apparent constrained state of EMS. The six themes that emerged from the articles were: leadership and governance; resources; emergency care provider preparedness; health and safety; training; and communication systems. Challenges were found in all themes at a provincial EMS level, despite improvements in legislation, leadership, and governance by the NDOH. The evidence suggests that the EMS system is not adequately fulfilling its role in the Integrated Healthcare Delivery Platform in South Africa – a finding which requires further study and urgent intervention by the NDOH. Greater leadership and governance, especially from the provincial and district health levels, are required to improve poorly functioning components of the EMS system to ensure that the state of EMS improves.

Association to other research

This study was designed to provide information on the current state of EMS, to provide background and context to a current doctoral study regarding the management of obstetric haemorrhage by emergency care providers in the KwaZulu-Natal Province.

Ethical considerations

All ethical standards were followed. There was no direct contact with human or animal subjects.

Funding

No funding was received for this research.

Data availability

There are no data emanating from this study.

Declaration of AI use

This study was not aided through the use of AI.

Authors' contributions

S.G.: Conceptualised the study, performed the literature search, and drafted the manuscript. R.N.: Contributed data and statistics available to the NDOH. O.P.K. and J.M.: Revised the manuscript. All authors read and approved the final manuscript.

Competing interests

R.N. is the Director of Emergency Medical Services & Disaster Medicine, National Department of Health (NDOH), Gauteng, South Africa. R.N. did not inappropriately influence the writing of this article.

References

1. Achoki T, Sartorius B, Watkins D, Glenn SD, Kengne AP, Oni T, et al. Health trends, inequalities and opportunities in South Africa's provinces, 1990–2019: Findings from the Global Burden of Disease 2019 Study. *J Epidemiol Community Health*. 2022;76:471–481. <http://dx.doi.org/10.1136/jech-2021-217480>
2. South African Department of Health. Health research priorities (revised) for South Africa 2021–2024 [document on the Internet]. Pretoria: Department of Health; 2022 [cited 2023 Feb 20]. Available from: <https://knowledgehub.health.gov.za/elibrary/health-research-priorities-revised-south-africa-2021-2024>
3. World Health Organization (WHO). Emergency care systems for universal health coverage: Ensuring timely care for the acutely ill and injured [document on the Internet]. Geneva: WHO; 2019 [cited 2023 Feb 20]. Available from: https://apps.who.int/gb/ebwha/pdf_files/WHA72/A72_31-en.pdf
4. South African Department of Health. Referral policy for South African health services and referral implementation guidelines [document on the Internet]. Pretoria: Department of Health; 2020 [cited 2023 Feb 20]. Available from: <https://knowledgehub.health.gov.za/elibrary/referral-policy-soth-african-health-services-and-referral-implementation-guidelines>
5. World Health Organization (WHO). Everybody's business: Strengthening health systems to improve health outcomes. WHO's Framework for Action [document on the Internet]. Geneva: WHO; 2007 [cited 2023 Feb 20]. Available from: <https://www.who.int/publications/i/item/everybody-s-business---strengthening-health-systems-to-improve-health-outcomes>
6. South African Department of Health. National emergency care education and training policy [document on the Internet]. Pretoria: Department of Health; 2017 [cited 2023 Feb 20]. Available from: <https://www.hpcsablogs.co.za/wp-content/uploads/2018/08/national-emergency-care-education-and-training-policy.pdf>
7. Professional Board for Emergency Care. Clinical practice guidelines [document on Internet]. Pretoria: Health Professions Council of South Africa; 2018 [cited 2023 Feb 05]. Available from: https://www.hpcsa.co.za/Content/upload/professional_boards/emb/guidelines/CLINICAL_PRACTICE_GUIDELINES_PROTOCOLS_JULY_2018.pdf
8. Rapanyan MB. The dire shortage of ambulances in the South African healthcare system: Unblurring implications on the right to health. *Afr J Develop Stud*. 2022;12(3):61–81. https://hdl.handle.net/10520/ejc-aa_affrika1_v12_a4
9. Mehmood A, Rowther AA, Kobusingye O, Hyder AA. Assessment of prehospital emergency medical services in low-income settings using a health systems approach. *Int J Emerg Med*. 2018;11:53. <https://doi.org/10.1186/s12245-018-0207-6>
10. Gordon DF, Lowe CC, Nel A, Hall M, Vigne R, Cobbing JRD, et al. Union of South Africa [webpage on the Internet]. *Encyclopedia Britannica*; 2023 [updated 2023 Feb 18; cited 2023 Feb 21]. Available from: <https://www.britannica.com/place/South-Africa>



11. Vincent-Lambert C. International perspectives: South African ambulance services in 2020. In: Wankhade P, Mackway-Jones K, editors. *Ambulance services*. Cham: Springer International Publishing; 2015. p. 175–183. https://doi.org/10.1007/978-3-319-18642-9_15
12. Tucker JM, Chalkidou K, Pillay Y. Establishing the NHI service benefits framework: Lessons learnt and stakeholder engagement [document on the Internet]. Durban: Health Systems Trust; 2019 [cited 2023 Feb 20]. Available from: https://www.hst.org.za/publications/South%20African%20Health%20Reviews/04%20SAHR_2019_Establishing%20the%20NHI%20service%20benefits%20framework.pdf
13. Government Communication and Information System. South Africa's provinces [webpage on the Internet]. Pretoria: Government Communications; 2024 [cited 2024 Jun 12]. Available from: <https://www.gov.za/about-sa/south-african-provinces>
14. South African Department of Health. National Health Act, 2003 (Act No. 61 of 2003): Emergency service regulations [statute on the Internet]. Pretoria: Department of Health; 2017 [cited 2023 Jul 21]. Available from: https://www.gov.za/sites/default/files/gcis_document/201712/41287gon1320.pdf
15. Howard I, Cameron P, Wallis L, Castrén M, Lindström V. Understanding quality systems in the South African pre-hospital emergency medical services: A multiple exploratory case study. *BMJ Open Qual*. 2020;9(2), e000946. <https://doi.org/10.1136/bmjopen-2020-000946>
16. South African Department of Health. National Health Act, 2003 (Act No. 61 of 2003): Regulations relating standards for emergency medical services [statute on the Internet]. Pretoria: Department of Health; 2021 [cited 2023 Jul 21]. Available from: https://www.gov.za/sites/default/files/gcis_document/202102/44161gon94.pdf
17. South African Department of Health. Strategic plan for a campaign on accelerated reduction of maternal and child mortality in Africa (CARRMA) [document on the Internet]. Pretoria: Department of Health; 2012 [cited 2023 Jul 21]. Available from: <https://www.health-e.org.za/2015/10/08/policy-national-strategic-plan-for-a-cam>
18. South African Department of Health. National Health Council highlights in respect of emergency medical services [briefing document]. Pretoria: Department of Health; 2013.
19. Yancy AH, Mould-Millman N. The implementation status of obstetric EMS systems in selected South African health districts with recommendations for future development [technical report]. Unpublished report; 2015.
20. Thind A, Hsia R, Mabwejjano J, Hicks ER, Zakariah A, Mock CN. Prehospital and emergency care. In: Debas HT, Donkor P, Gawande A, Jamison DT, Kruk ME, Debas HT, editors. *Essential surgery: Disease control priorities*. 3rd ed (volume 1). Washington DC: The International Bank for Reconstruction and Development / The World Bank; 2015. p. 245–262. https://doi.org/10.1596/978-1-4648-0346-8_ch14
21. South African Department of Health. EMS readiness plans for COVID-19. Surge report. Pretoria: Department of Health; 2021.
22. Govender S. Emergency transport of obstetric patients within the Ugu Health District [master's thesis]. Durban: University of Technology; 2015 [cited 2023 Jun 11]. <https://hdl.handle.net/10321/688>
23. Chowdhury S, Navsaria PH, Edu S, Nicol AJ. The effect of emergency medical services response on outcome of trauma laparotomy at a level 1 trauma centre in South Africa. *S Afr J Surg*. 2016;54(4):17–21. https://scielo.org.za/scielo.php?script=sci_arttext&pid=S0038-23612016000400006
24. South African Department of Health. Saving mothers: Annual report for 2021 [document on the Internet]. Pretoria: Department of Health; 2017 [cited 2023 Jul 21]. <https://www.health.gov.za/wp-content/uploads/2023/09/Saving-Mothers-Report-2021.pdf>
25. Ashokcoomar P, Bhagwan R. Towards a safer and more efficient neonatal transfer system in South Africa: A qualitative inquiry with advanced life support paramedics. *Australas J Paramedicine*. 2021;18:1–9. <https://doi.org/10.33151/ajp.18.951>
26. McKelvin R. Prehospital medicine: South Africa vs. the United Kingdom. *Int Paramed Pract*. 2018;7(3). <https://doi.org/10.12968/ipp.2017.7.3.32>
27. Vlok N, Wylie C, Stassen W. A 12-month retrospective descriptive analysis of a single helicopter emergency medical service operator in four South African provinces. *Afr J Emerg Med*. 2023;13(3):127–134. <https://doi.org/10.1016/j.afjem.2023.05.007>
28. D'Andrea PA, van Hoving DJ, Wood D, Smith WP. A 5-year analysis of the helicopter air mercy service in Richards Bay, South Africa. *S Afr Med J*. 2014;104(2):124–126. <https://doi.org/10.7196/SAMJ.7310>
29. Muhlbauer D, Naidoo R, Hardcastle TC. An analysis of patients transported by a private helicopter emergency medical service in South Africa. *S Afr Med J*. 2016;106(2):201–205. <https://doi.org/10.7196/samj.2016.v106i2.9919>
30. Pule MS, Hodkinson P, Hardcastle T. A descriptive study of trauma patients transported by helicopter emergency medical services to a level one trauma centre. *Afr J Emerg Med*. 2022;12(3):183–190. <https://doi.org/10.1016/j.afjem.2022.03.004>
31. Butler MW, Adefuye AO. Assessing the knowledge of emergency medical care personnel in the Free State, South Africa, on aspects of paediatric prehospital emergency care. *Pan Afr Med J*. 2019;32, Art. #98. <https://doi.org/10.11604/pamj.2019.32.98.17718>
32. Allgaier R, Laflamme L, Wallis LA. Operational demands on prehospital emergency care for burn injuries in a middle-income setting: A study in the Western Cape, South Africa. *Int J Emerg Med*. 2017;10, Art. #2. <https://doi.org/10.1186/s12245-017-0128-9>
33. Nel D, Stassen W. The accuracy of Johannesburg based ambulance personnel in identifying stroke. *S Afr J Crit Care*. 2015;31(2):58–61. <https://doi.org/10.7196/sajcc.2015.v31i2.247>
34. Evans K, Geduld H, Stassen W. Attitudes of pre-hospital providers on transport decision-making in the management of patients with a suicide attempt refusing care: A survey based on the Mental Health Care Act of 2002. *S Afr J Psychiatr*. 2018;24, Art. #1156. <https://doi.org/10.4102/sajpsychiatry.v24i0.1156>
35. Erefaan I. Preparedness of Western Cape ALS providers to provide clinical stabilisation and intensive care for neonates during the patient journey. *Australas J Paramed*. 2020;17(1):1–6. <https://doi.org/10.33151/ajp.17.781>
36. Mothibi JD, Jama M, Adefuye AO. Assessing the knowledge of emergency medical care practitioners in the Free State, South Africa, on aspects of prehospital management of psychiatric emergencies. *Pan Afr Med J*. 2019;33, Art. #132. <https://doi.org/10.11604/pamj.2019.33.132.18426>
37. Stander C, Hodkinson P, Dippenaar E. Pre-hospital care providers' understanding of responsibilities during a behavioural emergency. *S Afr J Psychiatr*. 2021;27, Art. #1545. <https://doi.org/10.4102/sajpsychiatry.v27i0.1545>
38. Mosca CG, Stein C, Lawrence H. South African prehospital emergency care personnel's lived experiences of managing paediatric emergencies: A qualitative research design utilising one-on-one interviews. *Health SA*. 2021;26, Art. #1558. <https://doi.org/10.4102/hsag.v26i0.1558>
39. Vincent-Lambert C, Smith CM, Goldstein LN. Hypothermia in trauma patients arriving at an emergency department by ambulance in Johannesburg, South Africa: A prospective study. *Pan Afr Med J*. 2018;31, Art. #136. <https://doi.org/10.11604/pamj.2018.31.136.13615>
40. Royal C, McKerrow NH. A retrospective review of the transfer of critically ill children to tertiary care in KwaZulu-Natal Province, South Africa. *S Afr J Child Health*. 2015;9(4):112–118. <https://doi.org/10.7196/SAJCH.2015.v9i4.913>
41. South African Government. Occupational Health and Safety Act 85 of 1993 [statute on the Internet]. c1993 [cited 2023 Jul 21]. Available from: https://www.gov.za/sites/default/files/gcis_document/201409/act85of1993.pdf
42. Naidoo R. Update on EMS safety. Presentation at the South African EMS Safety Forum. Durban: Department of Health; 2019.
43. Holgate R. The opinion of Emergency Medical Service personnel regarding safety in prehospital emergency care practice [master's thesis]. Johannesburg: University of the Witwatersrand; 2015 [cited 2023 Jul 21]. Available from: <https://core.ac.uk/download/pdf/188774815.pdf>
44. Mthombeni S, Coopoo Y, Habib N. Fitness levels of rural emergency medical and rescue service providers in the Northwest Province, South Africa. *Occup Health*. 2020;26(3):111–116. Available from: https://www.occhealth.co.za/_assets/articles/332/2063.pdf
45. Ntatamala I, Adams S. The correlates of post-traumatic stress disorder in ambulance personnel and barriers faced in accessing care for work-related stress. *Int J Environ Res Public Health*. 2022;19(4), Art. #2046. <https://doi.org/10.3390/ijerph19042046>



46. Manganyi PS. Lived experiences of emergency medical personnel in Capricorn District: Towards the development of user-led model [PhD thesis]. Limpopo: University of Limpopo; 2021 [cited 2023 Jul 21]. Available from: http://ulspace.ul.ac.za/bitstream/handle/10386/3661/manganyi_ps_2021.pdf?sequence=1&isAllowed=y
47. Fjeldheim CB, Nöthling J, Pretorius K, Basson M, Ganasen K, Heneke R, et al. Trauma exposure, posttraumatic stress disorder and the effect of explanatory variables in paramedic trainees. *BMC Emerg Med.* 2014;14, Art. #11. <https://doi.org/10.1186/1471-227X-14-11>
48. Van Rooyen LR, Gihwala R, Laher AE. Stimulant use among prehospital emergency care personnel in Gauteng Province, South Africa. *S Afr Med J.* 2021;111(6):587–590. <https://doi.org/10.7196/SAMJ.2021.v111i6.15465>
49. South African Department of Health. Update on status of public EMS colleges. Cape Town: EMS Colleges Principals Forum; 2022.
50. Adefuye A, Wyk C, Sookram B. Non-compliance with continuing professional development requirements: Perspectives of emergency medical care practitioners in a resource-poor setting. *Austr J Paramed.* 2020;17, Art. #746. <https://doi.org/10.33151/ajp.17.746>
51. Vincent-Lambert C, Wade G. Challenges relating to the inter-facility transport of high acuity paediatric cases. *Afr J Emerg Med.* 2018;8(1):29–33. <https://doi.org/10.1016/j.afjem.2017.12.001>
52. Alshehri MF, Pigoga JL, Wallis LA. A mixed methods investigation of emergency communications centre triage in the Government Emergency Medical Services System, Cape Town, South Africa. *Afr J Emerg Med.* 2020;10(1):S12–S17. <http://doi.org/10.1016/j.afjem.2020.02.004>
53. Anest T, de Ramirez S, Balhara KS, Hodgkinson P, Wallis L, Hansoti B. Defining and improving the role of emergency medical services in Cape Town, South Africa. *Emerg Med J.* 2016;33(8):557–561. <http://doi.org/10.1136/emermed-2015-205177>
54. Mould-Millman N, Dixon J, Sefa N, Yancey A, Hollong B, Hagahmed M, et al. The state of emergency medical services (EMS) systems in Africa. *Prehosp Disaster Med.* 2017;32(3):273–283. <http://doi.org/10.1017/s1049023x17000061>
55. World Health Organization. World Health Report – Health systems: Improving performance [document on the Internet]. c2000 [cited 2023 Feb 20]. Available from: <https://apps.who.int/iris/handle/10665/42281>
56. Lopez AD, Mathers CD, Ezzati M, Jamison DT, Murray CJL. Global and regional burden of disease and risk factors, 2001: Systematic analysis of population health data. *Lancet.* 2006;367(9524):1747–1757. [http://doi.org/10.1016/s0140-6736\(06\)68770-9](http://doi.org/10.1016/s0140-6736(06)68770-9)