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Equity in the cardiothoracic surgical workforce: addressing training gaps and workforce distribution in Africa–a narrative review

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Abstract

Cardiothoracic surgery (CTS) remains one of the least diverse surgical specialties, marked by significant gender and racial disparities. Despite increased medical school enrollment and the inclusion of more women and underrepresented minorities in the medical workforce, the number of locally trained cardiothoracic surgeons remains disproportionately low, particularly in regions with limited access to specialized care. This lack of diversity is compounded by systemic barriers such as limited exposure to the specialty, a shortage of mentors and role models, and the persistence of gender bias and discrimination. These factors contribute to a workforce that does not adequately reflect the demographic diversity of the patient population, further hindering access to quality care. To address these challenges, this article outlines several policy recommendations aimed at improving equity in CTS training and workforce development. Key strategies include increasing awareness and exposure to CTS among medical students, expanding training opportunities, and establishing regional centers of excellence. Gender equity should be prioritized through the implementation of zero-tolerance policies for discrimination and harassment, and financial incentives should be introduced to retain cardiothoracic professionals locally. Additionally, mentorship, collaboration, and international partnerships can enhance surgical skills and knowledge sharing across regions. Public health policies focusing on improving access to cardiothoracic services, particularly in underserved communities, are critical for reducing disparities. Enhanced community awareness campaigns, improved data collection, and strengthened healthcare infrastructure are vital to ensure equitable access to care. Ultimately, achieving equity in CTS requires collaborative efforts between governments, academic institutions, healthcare providers, and international partners, aimed at building a resilient and diverse cardiothoracic workforce capable of meeting the needs of diverse populations.

Keywords Cardiothoracic surgery, Gender diversity, Racial disparity, Mentorship, Healthcare equity, Workforce development, Africa

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Introduction

Cardiothoracic surgery (CTS) in Africa has long struggled with limitations in resources, training facilities, and research, affecting its overall growth and impact. However, significant progress has been made in certain countries, such as Ghana, where the establishment of an active national cardiothoracic center has served as a model for West Africa [1]. Ghana's pioneering center has not only improved access to CTS locally but has also helped reduce healthcare costs and mortality related to cardiothoracic diseases across the region [1]. While countries like South Africa have made strides in developing CTS programs, challenges such as limited funding, a shortage of qualified surgeons, and inadequate infrastructure continue to hinder the expansion of these programs [2]. Studies highlight the severe shortage of surgeons in sub-Saharan Africa, with a ratio of one surgeon per 3.3 million people, underscoring the urgent need for more training to improve surgical care [3]. Furthermore, in the College of Surgeons of East, Central, and Southern Africa (COSECSA) region, only six out of fourteen countries have active training programs, leading to a concerning shortage of specialists [4]. These issues necessitate substantial investment in specialized training programs to ensure sustainable growth and quality improvement in cardiothoracic surgery across the continent.

The disparity in access to cardiothoracic care is another significant issue, particularly in low- and middle-income countries, where racial minorities and economically disadvantaged populations bear a disproportionate burden of cardiovascular diseases. These groups often face the greatest barriers to accessing care, resulting in higher morbidity and mortality rates [5–7]. However, racial and socioeconomic factors are not the sole contributors to these disparities; gender, age, and underlying health conditions also play critical roles [8]. To address these inequities, experts advocate for interventions framed within the context of health equity, emphasizing the need for improved quality control in cardiac care and the involvement of surgeons as advocates for change [5–7].

One of the primary challenges in expanding access to CTS care is the shortage of trained professionals, particularly in rural areas, where recruitment and retention remain major hurdles. Factors contributing to this include the poor quality of medical curricula, inadequate workforce planning, and the migration of healthcare workers to urban centers [9–11]. To address these issues, a collaborative approach involving healthcare providers, policymakers, and other stakeholders is essential, with a focus on understanding the interplay between demographic shifts and healthcare needs [9, 11]. The disparities in education and practice within cardiothoracic surgery worldwide have directly impacted patient access to care [12]. Bridging these gaps requires partnerships aimed at training healthcare professionals in low- and middle-income countries, ultimately increasing the number of qualified surgeons in underserved regions [13]. These initiatives will improve access to quality CTS training and care, which is crucial for enhancing global health outcomes. Thus, our study seeks to tackle the urgent need for equity in the cardiothoracic surgical workforce by addressing the critical gaps in training and workforce distribution across Africa.

Methodology

This narrative review synthesizes existing literature to explore equity in the cardiothoracic surgical workforce, focusing on training gaps and workforce distribution in Africa. The review highlighted disparities and provided insights into workforce retention and distribution strategies within low-income settings.

A literature review of peer-reviewed research articles focusing on equity in the cardiothoracic surgical workforce, including training gaps and workforce distribution, was conducted. Articles published between January 1995 and December 2024 were identified through a PubMed search. The following MeSH terms and keywords were used: ("Equity in surgeon distribution" OR "Training gaps" OR "Workforce distribution" OR "Workforce retention") AND ("Cardiothoracic Surgery" OR "Cardiovascular Surgery" OR "Thoracic Surgery") AND ("Africa" OR "Low-income countries" OR "LMICs" OR "Low-income setup").

Articles were included if they addressed cardiothoracic surgical workforce distribution, training gaps, or physician retention strategies in African or low-income contexts. Only articles available in English were reviewed. Studies focusing on unrelated specialties, written in a language other than English, and lacking relevant data were excluded. This review relied on publicly accessible data and did not involve human or animal subjects; therefore, ethical approval was not required.

A total of 58 articles were included in this review after removing duplicates and applying relevance criteria. Summary of the retrieved articles for each mesh term (Table 1) and thematic grouping of selected articles are mentioned below (Table 2).

Training gaps in cardiothoracic surgery: challenges and opportunities

A 2024 study on the critical shortage of cardiothoracic surgeons in the COSECSA region revealed that only 43% of COSECSA member countries currently offer training in cardiothoracic surgery, leaving 8 out of 14 countries without active training programs. Despite some countries such as Gabon and South Africa having relatively higher ratios, the overall availability remains low across the continent, highlighting critical gaps in access to specialized

Table 1 Summary of search terms, records retrieved, and Articles included in the review Article

Keyword Group	Search Terms Used	Records Retrieved	Included in Review
Workforce and Equity	("Equity in surgeon distribution"[All Fields] OR "Training gaps"[All Fields] OR "Workforce distribution"[All Fields] OR "Workforce retention"[All Fields]) AND ("1995/01/01"[Date - Publication]: "2024/12/31"[Date - Publication])	619	23
Specialty	("Cardiothoracic Surgery"[All Fields] OR "Cardiovascular Surgery"[All Fields] OR "Thoracic Surgery"[All Fields]) AND (Africa[MeSH Terms] OR "Low-income countries" OR LMICs OR "low-income setup") AND ("1995/01/01"[Date - Publication]: "2024/12/31"[Date - Publication])	889	41
Geographic/ Economic Context	("Africa"[MeSH Terms] OR "East Africa"[All Fields] OR "Sub-Saharan Africa"[All Fields]) AND ("Low-income countries"[All Fields] OR "LMICs"[All Fields] OR "Developing countries"[All Fields]) AND ("Workforce distribution"[All Fields] OR "Cardiothoracic surgery"[All Fields] OR "Surgical workforce"[All Fields])	66	22
Combined/ Final Search (using AND)*	("Equity" OR "Training" OR "Workforce" OR "Retention" OR "Disparities") AND ("Cardiothoracic Surgery" OR "Cardiovascular Surgery" OR "Thoracic Surgery" OR "Cardiac Surgery") AND ("Africa" OR "Low-income countries" OR "LMIC*" OR "Developing countries")	245	58

*excluding overlapping papers

Table 2 Distribution of included articles by review section

Review Section	Included studies
Introduction	13
Training Gaps in Cardiothoracic Surgery: Challenges and Opportunities	10
Workforce Distribution: Geographic and Socioeconomic Disparities	34
Gender and Diversity in the Cardiothoracic Surgical Workforce	10
Policy Recommendations for Achieving Equity in CT Surgery Training	3
Total number used in review*	58

*excluding overlapping papers

cardiac care and training [14, 15] (Fig. 1). Compared to high-income countries, the number of cardiothoracic specialists in low-income countries is significantly lower. The density of specialists varies widely, ranging from 1 per 400,000 people in Namibia to 1 per 8,000,000 in Ethiopia [4]. The disparity ranges from 0.12 adult cardiac surgeons and 0.08 pediatric cardiac surgeons per million population (sub-Saharan Africa) to 11.12 adult cardiac surgeons and 2.08 pediatric cardiac surgeons (North America). This showed the correlation between a strong economy and access to cardiothoracic surgery services [16].

The WHO recommendation for 400 open heart surgeries per million population is not yet achieved, even the Pan-African Society for Cardiothoracic Surgery (PASCaTS) recommended 40 open heart surgeries per million is unmet by many centers providing cardiothoracic surgeries in Sub-saharan African countries [3]. Political instability, including crises, wars, and other forms of unrest, is strongly linked to delays in the advancement of cardiothoracic surgery within affected countries [1].

Despite significant government investment in cardiac surgery centers, the lack of sufficient resources for maintenance and future development has hindered progress in the field [17]. The high cost of cardiothoracic surgery, combined with a reliance on out-of-pocket payments and limited insurance coverage for procedures like open-heart surgery in Africa, restricts access to care for many individuals [16]. One of the key factors influencing the availability and level of cardiac surgery in low-income countries is the allocation of resources, as reported in other studies. The extent to which these services are established often depends on government commitment and the financial resources available to support infrastructure, workforce development, and essential consumables [18].

For example, a shortage of essential consumables—such as cardiac and anesthetic medications, valves, oxygenators, cannulation tubes, and sutures—remains the primary barrier to uninterrupted cardiac procedures, leaving thousands of patients on waiting lists. This challenge is particularly severe in centers that provide free care, such as Cardiac Center Ethiopia, where limited funding constrains the procurement of these critical supplies [19]. This issue has also been reported in studies conducted in Ethiopia, highlighting the widespread impact of consumable shortages on surgical care [20]. Beyond affecting patient outcomes, the scarcity of consumables significantly hinders the training of cardiothoracic surgeons. Given that surgical training is inherently hands-on and dependent on the volume of procedures performed, a lack of essential supplies directly limits operative exposure, ultimately restricting the development of the next generation of specialists.

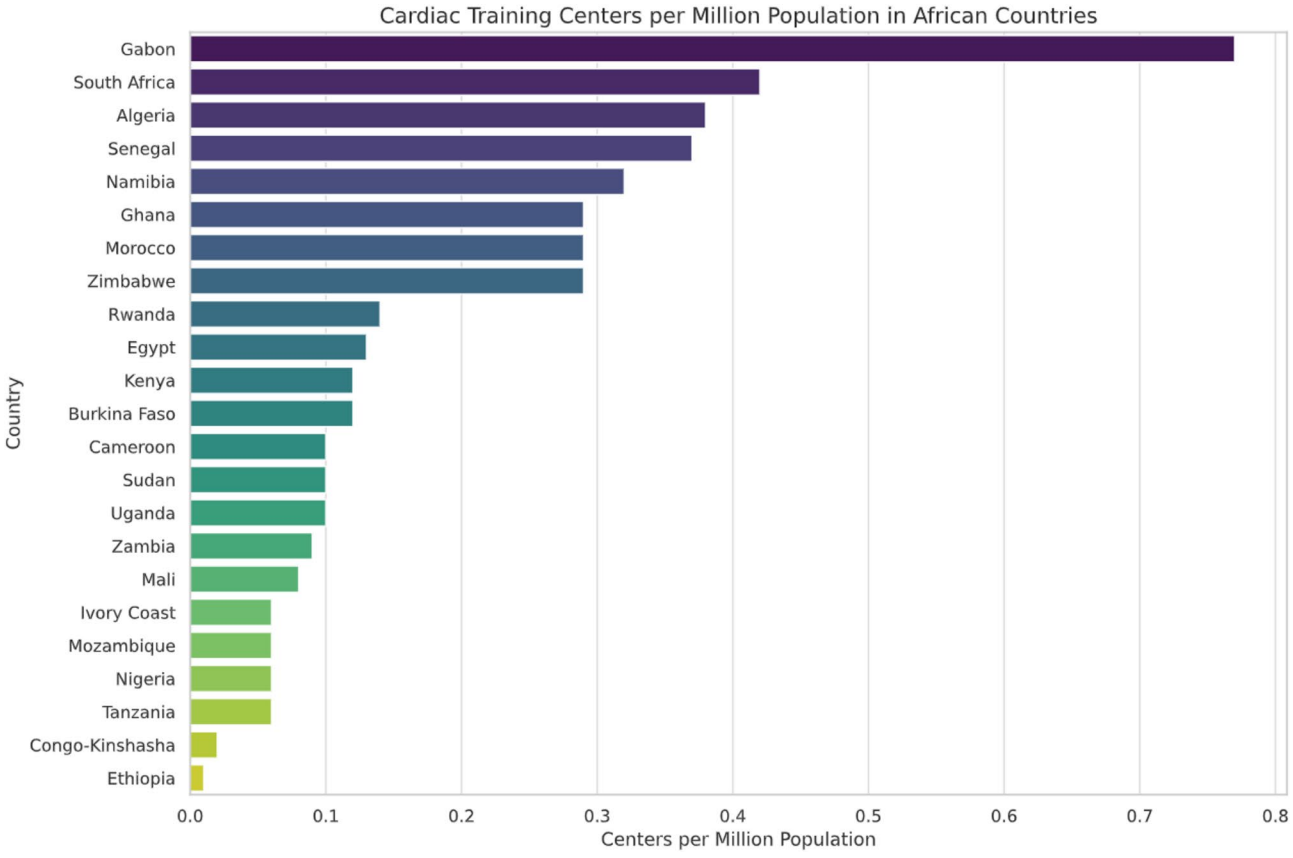

Fig. 1 Distribution of cardiac training centers per million population across selected African countries

Administrative inefficiencies also exacerbate the problem, as the demand for cardiothoracic services far exceeds available capacity. This imbalance leads to frequent cancellations, long waiting lists, and delayed treatments, largely due to insufficient power supply, water access, blood products, skilled personnel, and essential surgical equipment [17]. As a result, many patients across Africa seek quicker and higher-quality surgical options abroad, particularly in countries like India [3].

Several additional challenges to the growth of cardiothoracic surgery in Africa include inadequate infrastructure, a shortage of support staff, insufficient funding, low pay, lack of incentives, poor working conditions, and challenges related to security, governance, and skill retention [21]. Political instability, such as wars and other crises, worsens these issues, leading to significant delays in the development of necessary surgical services [1]. Furthermore, many patients in rural areas face financial barriers, including the inability to afford transportation or basic necessities, resulting in missed follow-up appointments and late hospital visits, often when their condition has become terminal. The lack of formal palliative and rehabilitation care in most African countries only compounds this situation [17]. Overcoming these challenges will require focused efforts to educate healthcare professionals, raise awareness among community health workers, and strengthen primary healthcare systems. A better understanding of cardiothoracic conditions, emergency symptoms, and early diagnosis will improve referral systems, leading to fewer late-stage presentations and reduced preventable deaths [17].

Mentorship is a key factor in developing the next generation of cardiothoracic surgeons and helping them succeed in this demanding specialty [22]. For example, Zambia collaborates with Italy for annual mentorship on complex cases, while Uganda uses telemedicine to train and support physicians through international partnerships. Namibia offers multiple in-service mentorship programs. These initiatives, along with collaboration, have helped increase the volume of procedures and improve surgical techniques. However, despite these efforts, Uganda, Zambia, and Namibia lack formal postgraduate training programs or specialized cardiothoracic fellows. To address these gaps, expanding online learning platforms and telemedicine could complement hands-on training, improving knowledge retention, skill development, and the confidence of cardiothoracic specialists [17].

Across the continent, the Pan-African Society for Cardiothoracic Surgery (PASCaTS) has been collaborating

with international organizations, including the European Association for Cardiothoracic Surgeons (EACTS), to enhance cardiothoracic care and improve surgical outcomes. To connect African cardiothoracic centers to the global community, PASCaTS has focused on digital education, offering a series of webinars, and providing onsite support through partnerships with international collaborators [3]. Additionally, the society organizes an annual forum in partnership with EACTS, where disparities and gaps in cardiothoracic services are identified. The forum also explores strategies for capacity building, advanced training through innovative approaches, and the vital role of clinical research in advancing cardiothoracic surgery [3]. Furthermore, Association of Future African Cardiothoracic and Vascular surgeons (AFAC), which was founded in an attempt to increase the interest of medical student in the field of cardiothoracic surgery through providing educational webinars, and hands-on rotations at different African based institutions. Moreover, helping cardiothoracic surgery residents in West and Mid-Africa to obtain training in well-established programs in North African countries such as Egypt.

Even though significant efforts are being made to address the shortage of cardiothoracic surgeons in Africa, numerous challenges remain, including disparities in surgeon density, inadequate infrastructure, limited formal training programs, and the high costs of surgery. However, promising solutions are emerging through initiatives such as mentorship programs, international collaborations, and digital education platforms like telemedicine, which aim to improve training and expand access to cardiothoracic care. Increased government commitment will be essential to ensuring the sustainability and continued progress of cardiothoracic surgery across the continent.

Workforce distribution: geographic and socioeconomic disparities

Addressing the inequitable distribution of cardiothoracic surgeons requires understanding the challenges rural areas and low-income regions face. Studies have shown that rural populations consistently have less access to thoracic surgeons than urban populations, a disparity observed across multiple time points. Moreover, this access deficit has worsened over time in all rural subcategories, including micropolitan, and remote areas. These trends reflect the growing centralization of surgical services in metropolitan areas, often driven by the concentration of high-volume centers and residency programs in urban locations. Compounding this issue is the aging and retiring surgical workforce, further exacerbating the decline in available specialists in rural settings [23].

The decline in thoracic surgery availability in rural areas reflects broader systemic challenges in maintaining equitable healthcare access. Studies have shown that despite federal reimbursement policies favoring rural hospitals offering surgical services, rural patients increasingly bypass these facilities in favor of urban centers [24]. This trend may be attributed to the perceived or actual differences in the quality of care and the availability of advanced surgical technologies in metropolitan hospitals. The rising number of rural hospital closures further exacerbates the issue, reducing thoracic surgery density in these underserved areas [25].

The global disparity in access to cardiothoracic surgery is starkly evident, with availability heavily influenced by economic status and geographical location. Low- and middle-income countries (LMICs) bear a disproportionate burden of diseases requiring surgical intervention, such as rheumatic heart disease (RHD) and congenital heart disease [16]. RHD, for example, affects over 33 million people globally, yet 97% of cases are concentrated in LMICs and marginalized groups within high-income countries [26]. Despite its prevalence, only 11% of RHD patients in low-income countries undergo surgery, a reality that underscores the interplay between poverty, limited healthcare infrastructure, and systemic social injustices [27]. These gaps highlight the need for targeted interventions that address the unique challenges faced by resource-poor regions.

There is a notable difference in the distribution of cardiothoracic surgeons and cardiac centers worldwide. For example, high-income regions like North America and Western Europe have 27–28 cardiothoracic surgeons per 120,000 people and one cardiac surgery center per 120,000 people [21, 28]. In contrast, sub-Saharan Africa has one surgeon per 4 million people and one center per 38 million [3, 28].

Beyond availability, the economic status of patients directly influences access to surgical care. While high-income countries centralize services in advanced, high-volume centers, billions in LMICs face geographical, financial, and systemic barriers. Approximately 4.5 billion people globally lack access to cardiac surgery, leaving many preventable deaths and disabilities unaddressed [29]. Reducing this gap requires training more surgeons, ensuring fair resource distribution, and addressing diseases like RHD that heavily impact vulnerable populations.

Surgeon retention in underserved areas is hindered by multiple systemic challenges, with inadequate resources and poor healthcare infrastructure being central issues. Studies have shown that many low- and middle-income countries (LMICs) struggle with weak health system infrastructure, including insufficient medical facilities, outdated equipment, and limited access to essential resources. These factors create a challenging environment for surgeons, making it difficult to deliver

high-quality care and contributing to burnout. Furthermore, government corruption in many LMICs exacerbates these issues by diverting funds meant for healthcare development, leading to further resource scarcity and poor working conditions. This lack of institutional support and unstable working conditions often leads to high rates of surgeon migration, both within and outside of the country, as medical professionals seek more stable and rewarding opportunities [30–35].

Studies have shown that the living conditions in these regions significantly impact physician retention. Limited access to amenities such as reliable communication systems, internet, and recreational facilities often contribute to the decision of physicians to leave rural or deprived areas. These deficiencies create an environment that, while professionally rewarding, can be personally isolating, making it challenging for physicians to maintain long-term commitments to these regions [36, 37]. Male physicians are more likely to serve in rural and underdeveloped areas than female physicians. Additionally, older physicians tend to stay longer in such regions compared to their younger counterparts. These demographic trends suggest that gender and age influence physicians' willingness to commit to serving in areas with fewer resources and more challenging living conditions [38–40].

Another significant factor in physician retention is the opportunity for professional growth. Physicians in rural areas often report that limited opportunities for skill development and career advancement in addition to the absence of essential surgical equipment and medications are key reasons for their decision to leave [40]. Studies have indicated that the lack of specialized colleagues, research opportunities, and professional development programs in underserved regions may prevent physicians from enhancing their expertise, ultimately impacting their job satisfaction and career trajectory [41, 42]. In addition, financial compensation remains a critical barrier to retaining physicians in underserved regions. Studies have consistently shown that low salaries, inconsistent payments, and a general lack of incentives are significant deterrents for physicians working in rural and underdeveloped areas [43–46].

Sub-Saharan Africa still faces constraints to patient care such as a low specialist-to-patient ratio, with only 0.2 million cardiothoracic patients per million population in comparison to the 7.15 million in high-income and developed nations [4]. Non-governmental and governmental organizations have an important role to play in order to bridge those gaps by funding and capacitating surgeons within the region [47]. Surgical societies can also coordinate and oversee the humanitarian actions being implemented [6]. Stakeholders can improve existing disparities by prioritizing and investing in health workforce training, advocating for workforce retention via incentives, collaborating with international institutes and utilizing telemedicine [4, 47].

Considering the necessity of accessible surgical care, focusing on equitable distribution as opposed to just technological development is now needed more than ever [48]. One of the most important ways to ensure equity is through the adoption and implementation of a diverse and inclusive culture [49, 50]. The culture, however, requires intentional action and a commitment to a top-down organizational change [18, 50]. These efforts are instrumental in reducing healthcare disparities and inequitable access.

Gender and diversity in the cardiothoracic surgical workforce

Cardiothoracic surgery (CTS) remains one of the least diverse surgical specialties in terms of gender and race [49]. Dr. Lindiwe Sidali's achievement as Africa's first female cardiothoracic surgeon underscores the severe underrepresentation of women and minorities in the field [51]. Despite a 34% increase in medical school enrollment in South Africa, with a higher number of female and African-Black students, the number of locally trained cardiothoracic surgeons remains low [52]. Dr. Vosloo highlights the scarcity of female role models in thoracic surgery, with only a few practicing female cardiothoracic surgeons across the continent, a situation often attributed to gender bias and discrimination [53]. Historically, women have made up just 9% of all practicing surgeons in Africa, reflecting a significant gender disparity in surgical specialties [54].

Barriers to entry and progression for female and underrepresented minority trainees in cardiothoracic surgery include a long-standing lack of exposure, encouragement, mentorship, and sponsorship to actively attract these groups to the specialty [50]. Furthermore, low diversity in cardiothoracic faculty may discourage underrepresented students and residents, limiting access to role models and mentors. Trainees also face racial and sexual discrimination, as well as harassment [18, 55]. Additionally, surgical education experts have proposed an action framework to address the training crisis, which includes increasing investments in cardiothoracic surgery (CTS) education, establishing regional centers of excellence, offering retention incentives and opportunities for women, and leveraging international partnerships. These initiatives collectively aim to promote diversity and enhance leadership opportunities in surgical training [4].

Patients often report greater satisfaction when treated by providers of the same ethnicity, as shared cultural and linguistic contexts improve communication and understanding [49]. Similarly, diversity and inclusion in cardiothoracic surgery enhance patient care, foster innovation, and address future challenges by building a workforce

that reflects and effectively serves a diverse patient population [56].

Policy recommendations for achieving equity in cardiothoracic surgery training and workforce

Achieving Equity in Cardiothoracic Surgery Training and Workforce is one strategy for achieving good health outcomes. The following are policies governments, academic institutions, and international bodies can adopt to improve equity in training and workforce distribution in cardiothoracic surgery.

One key strategy to address the shortage of cardiothoracic surgeons is to increase access to training by establishing awareness programs for undergraduate medical students, thereby sparking interest in the cardiothoracic field. Integrating cardiothoracic surgery internships into the current medical education curriculum will provide students with valuable exposure and foster early awareness. Additionally, training programs should be expanded and strengthened, with more cardiothoracic centers established at the local level, as most are currently centralized. This approach would not only encourage more medical professionals to enter the field, but it would also allow local communities to access these services, reducing the need to travel to tertiary care centers, and thus saving time, money, and effort. Recruitment strategies should focus on including underrepresented and local healthcare professionals in training programs. Furthermore, incorporating cardiothoracic surgery modules into undergraduate education will ensure that all medical graduates are well-informed about the field, its training pathways, and the services it provides.

Promoting gender equity in cardiothoracic surgery training programs and eliminating discrimination is another crucial policy strategy. To promote a more inclusive cardiothoracic surgical workforce, training institutions should implement clear, zero-tolerance policies against discrimination and harassment while also creating opportunities and a supportive environment that encourages female medical professionals to pursue residency in the field [57, 58].

Increasing financial support and incentives for healthcare professionals is a crucial policy to retain cardiothoracic surgeons, as many trained professionals often leave for better compensation abroad. These opportunities typically offer higher pay, flexible schedules, part-time work options, ample leave, and a better work-life balance. To retain cardiothoracic surgeons locally, it is essential to provide strong financial support, adequate incentives, and a supportive work environment backed by government investments.

Equally important is ensuring post-training support, collaboration, and mentorship. Countries like Uganda, Zambia, and Namibia have successfully used mentorship, collaboration, and partnership models to increase the number of cases operated on and improve surgical techniques. To replicate this success, other African countries should implement online learning platforms, telemedicine, onsite mentorship, and partnerships with established cardiothoracic institutions. Additionally, intercontinental collaboration can further enhance knowledge sharing and skill retention. Programs like the College of Surgeons of East, Central, and Southern Africa (COSECSA) can also play a significant role in enhancing resources, knowledge sharing, and collaboration in the field [17].

Equity in cardiothoracic care is a critical policy recommendation, particularly in Africa, where most cardiothoracic surgery expenses are out-of-pocket, and the government is unable to subsidize this service in many countries [17]. To improve accessibility for low-income and underserved populations, governments should prioritize cardiothoracic services by implementing national insurance plans. Additionally, since most cardiothoracic centers are centralized in capital cities, patients often delay seeking care until their condition worsens or complications arise. To address this, mobile clinics and outreach programs should be established in every district to provide cardiothoracic screenings and follow-up care for existing patients. Training and awareness initiatives for primary healthcare professionals should also be implemented to enable early detection of cardiothoracic disease manifestations and ensure prompt referrals to specialized centers [17].

Enhancing community awareness campaigns is a crucial policy recommendation for achieving equity in cardiothoracic surgery training and workforce development. These programs should focus on educating the community about cardiovascular health, recognizing common and life-threatening symptoms, and the importance of early intervention and follow-up care. Additionally, the public needs to be informed about the availability of cardiothoracic services and the locations where they can access care. Such initiatives will help promote proactive health management and ensure more timely referrals to cardiothoracic specialists.

Enhancing data collection and publication is another vital policy recommendation. Cardiothoracic institutions should establish robust data collection systems and prioritize publishing scientific papers and reports. This will help identify existing gaps in service and training, track progress, and develop strategies to address challenges. Furthermore, it will offer an opportunity for other cardiothoracic centers to learn from the experiences of countries that have already published their findings, fostering knowledge exchange and collaboration.

Strengthening the health system is another crucial policy recommendation. Governments should prioritize

health and healthcare services by addressing the challenges faced by health institutions across Africa. This can be achieved through improvements such as ensuring uninterrupted power supply, increasing access to water, training more healthcare professionals, and providing essential surgical equipment and consumables. Additionally, building supportive infrastructure and offering adequate remuneration, incentives, and favorable working conditions are essential to enhance workforce satisfaction and retain healthcare professionals.

Achieving equity in cardiothoracic surgery training and workforce requires strong collaboration among governments, academic institutions, healthcare providers, and the community. Enhancing intercountry partnerships and collaborating with international cardiothoracic centers will be crucial in this effort. Such collaborations will contribute to building a resilient healthcare system that ensures universal health coverage, ultimately making cardiothoracic services accessible to all citizens, especially the most vulnerable populations.

Conclusion

Addressing the disparities in the cardiothoracic surgical workforce is vital to improving equitable healthcare access across Africa. While substantial challenges exist, including surgical workforce shortages, poor surgeon retention in rural areas, and surgical skills/training gaps, promising solutions such as international collaborations, mentorship programs, and enhanced resource allocation provide hope for progress. Achieving equity in cardiothoracic care will require sustained commitment and investment from governments, academic institutions, and healthcare stakeholders. Bridging these gaps is essential for building resilient health systems that accommodate cardiothoracic surgical care and improving outcomes for underserved populations.

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S.G. Conceptualization, Reviewed and edited the second draft. N. A. Reviewed and edited the final draft. All authors: literature search, review, compilation, synthesis, and write-up. They also reviewed and edited the first draft.

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Consent for publication
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Human ethics and consent to participate statement
Our manuscript was not applied on human beings and thus requires no ethical approval.

Competing interests
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