Current Research in Translational Medicine 73 (2025) 103516

Contents lists available at ScienceDirect

Current Research in Translational Medicine

journal homepage: www.elsevier.com/locate/retram

General review

Organ transplantation in Africa: Confronting socioeconomic, cultural, and infrastructural hurdles

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ARTICLE INFO

Keywords:
Organ transplantation
Africa
Healthcare infrastructure
Cultural barriers
Non-communicable diseases
Public awareness

ABSTRACT

Background: Organ transplantation is a critical procedure offering life-saving treatment for patients with end-stage organ failure. In Africa, however, the accessibility and development of organ transplantation are severely hampered by numerous barriers. Socioeconomic disparities, inadequate healthcare infrastructure, legal and ethical gaps, cultural resistance, and the dual burden of infectious and non-communicable diseases are among the significant challenges faced. This review aims to comprehensively explore these barriers and propose actionable strategies to address them.

Method: A narrative review was conducted by searching electronic databases, including PubMed, Google Scholar, Scopus, and JSTOR. The review prioritized studies addressing the challenges of organ transplantation in Africa, focusing on socioeconomic factors, healthcare infrastructure, cultural beliefs, legal frameworks, and the impact of infectious and non-communicable diseases. Studies offering solutions tailored to the African context were also included.

Results: The review identified several key obstacles, including high costs of transplantation, a limited number of transplant centers, and a critical shortage of skilled healthcare professionals. Cultural beliefs and widespread misconceptions impede organ donation acceptance. Additionally, infectious and non-communicable diseases complicate the transplantation process and outcomes. Weak legal frameworks exacerbate the risks of organ trafficking and unethical practices, while low public awareness further undermines efforts to enhance organ donation rates.

Conclusion: Addressing these multifaceted challenges necessitates a comprehensive approach. Strengthening healthcare infrastructure, enhancing capacity-building programs, developing robust legal and ethical frameworks, and implementing targeted public education campaigns are critical for improving organ transplantation in Africa.

1. Introduction

Organ transplantation has emerged as a vital medical intervention, providing life-saving treatment for individuals suffering from organ failure [1]. The demand for transplantable organs has steadily increased due to the rising prevalence of chronic diseases that result in organ failure, including end-stage renal disease, liver disease, heart failure, and lung failure [2–4]. Organ transplantation improves the quality of life for recipients and notably enhances their long-term survival rates compared to individuals who do not undergo transplantation [1,3,5]. In many parts of the world, the success of organ transplantation, facilitated by advancements in medical technology, infrastructure, and healthcare policies, has resulted in a significant increase in the number of people seeking this treatment [3,4,6], leading to an unparalleled shortage of

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https://doi.org/10.1016/j.retram.2025.103516
Received 17 January 2025; Accepted 28 April 2025
Available online 28 April 2025

available organs [7,8].

The global organ shortage crisis is significant. The World Health Organization (WHO) estimated that merely 10 % of the global demand for organ transplantation has been met [4]. In high-income countries such as the United States, approximately 103,000 individuals are on the waiting list for organ transplantation, with 17 people dying daily among those on the waiting list [9]. Likewise, in the United Kingdom, around 7500 people are on the transplant waiting list, with 415 dying in 2023/2024 waiting for transplant [10]. On the other hand, there is a paucity of data on organ transplantation and associated mortality rates in Africa. Data from the Global Observatory on Donation and Transplantation (GODT) reported that only 286 transplants were recorded in the African region in 2022 [11]. This figure indicates a significant decrease from the 643 organ transplants recorded in 2016 [12]. Compared to other regions recorded in 2022, like the Americas (62, 180), Eastern Mediterranean (8490), Europe (40,369), South-East Asia (17,214), and Western Pacific (29,014) [11], organ transplantation in Africa is significantly low. This is unsurprising, as only seven countries, including Algeria, Cote d'Ivoire, Uganda, Namibia, Nigeria, Kenya, and Ethiopia, have functional transplantation programs [8]. Of these seven countries, only Namibia and Uganda have one heart transplant center each [8].

Organ transplantation in Africa faces numerous significant challenges that hinder its development and implementation. One of the most pressing challenges to organ transplantation in Africa is socioeconomic disparities, such as financial constraints, lack of access to healthcare, and geographical location (e.g., urban vs. rural areas), rooted in significant economic and infrastructural challenges that may hinder the development and sustainability of effective organ transplant programs across most of Africa [13,14]. Another pressing challenge is the scarcity of organ donors. Organ donation rates in Africa are notably low. For instance, the total deceased and living donor rate for kidney transplantation in Africa is 0.21 donors per million population [11]. South Africa is one of the few countries with reported data, having a deceased organ donor rate of 1.4 donors per million population [15]. This rate is lower than in other countries like Croatia or Spain, which have a rate of 29.00 and 49.38 donors per million population, respectively [16]. One of the major factors that hamper organ donation is cultural and religious beliefs, further intensifying the scarcity of available organs. Myths and misconceptions about organ donation impede the willingness of individuals to participate in organ donation [12,17]. Other than that, legal, ethical, and socioeconomic status (e.g., literacy level) also hinder the practice of organ transplantation in Africa, leading to a significant gap between the need for transplantation and the availability of services [13,14,18]. This may result in inadequate patient outcomes and limited access to life-saving treatments.

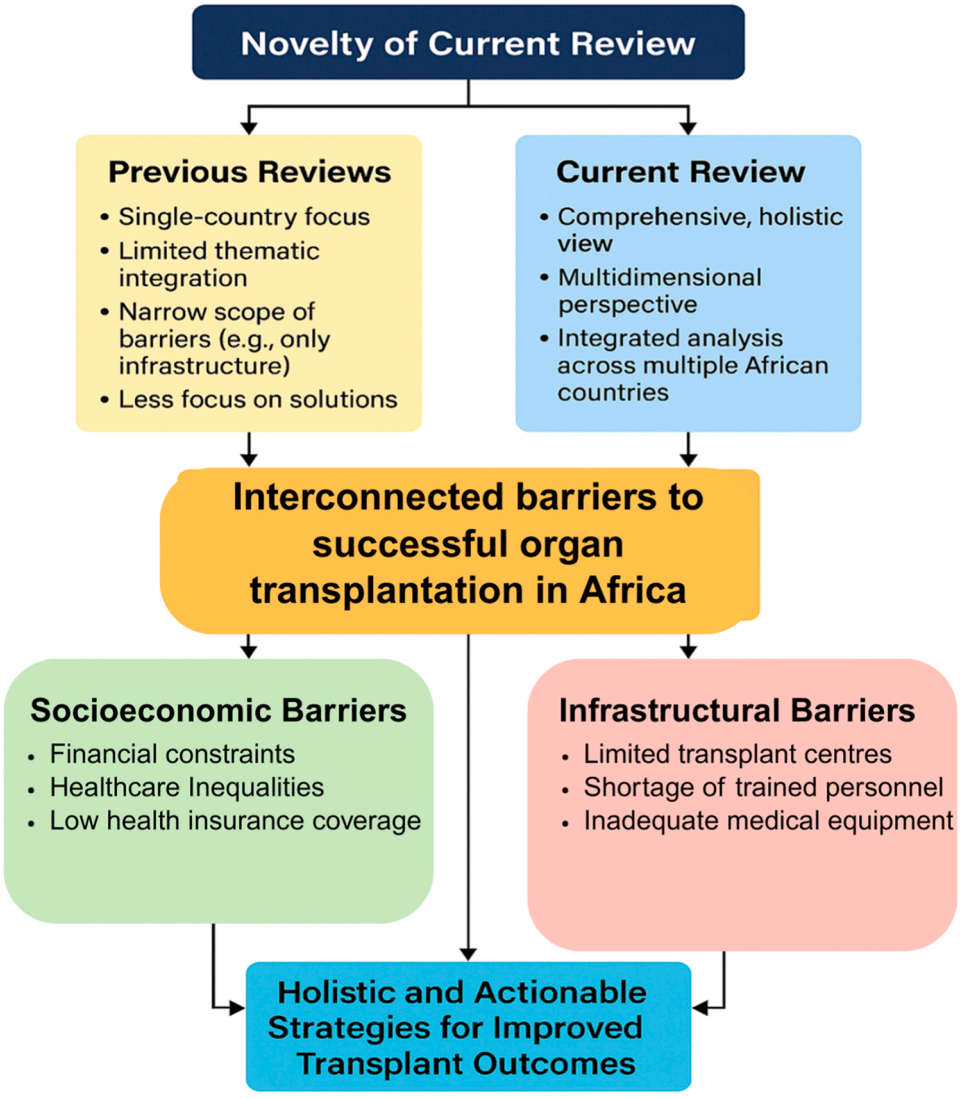

Fig. 1. Flowchart of the novelty and barriers addressed in the current review.

Given the crucial importance of organ transplantation as a life-saving medical intervention, it is essential to thoroughly identify and address the unique challenges faced across Africa. While previous studies have often focused on isolated aspects, such as healthcare infrastructure or cultural barriers, this narrative review differs by offering a comprehensive, multi-dimensional analysis that synthesizes socioeconomic, cultural, legal, ethical, and disease-related factors affecting transplantation on the continent. Unlike earlier reviews that primarily concentrate on single-country data or specific barriers, this review draws from a broader range of sources across African regions to provide a more inclusive and comparative perspective. Fig. 1 visually illustrates the novelty of the current review by contrasting it with previous studies and showcasing its integrated approach. The figure highlights how these three core barriers are deeply interconnected and collectively hinder successful organ transplantation. By acknowledging the overlap between financial constraints, cultural beliefs, and healthcare system limitations, the review proposes holistic and context-specific strategies aimed at improving transplant outcomes throughout the continent. Its novelty lies in integrating diverse thematic areas and highlighting real-world examples and country-level practices, thereby offering policymakers, healthcare professionals, and stakeholders a practical and contextualised foundation for intervention. The review's primary objective is to illuminate the current landscape, propose actionable, region-specific strategies, and contribute to the development of more effective, equitable organ transplantation systems in Africa.

2. Methodology

This narrative review was conducted to comprehensively analyze the challenges and strategies related to organ transplantation in Africa. To enhance transparency and reproducibility, a structured search strategy was employed across four major electronic databases: PubMed, Google Scholar, Scopus, and JSTOR. The literature search covered studies published between 2010 and June 2024 to ensure the inclusion of both historical context and recent developments.

2.1. Search strategy and study selection

A predefined set of keywords was used to capture relevant literature, including *"organ transplantation in Africa," "challenges in organ transplantation," "healthcare infrastructure in Africa," "cultural barriers to organ donation," "legal frameworks for transplantation,"* and *"non-communicable diseases and organ failure in Africa."* The search results were screened based on title and abstract relevance, followed by a full-text review to determine eligibility.

2.2. Inclusion and exclusion criteria

The inclusion criteria were designed to prioritize studies that directly address the barriers to organ transplantation in Africa while ensuring a balanced representation of socioeconomic, infrastructural, cultural, legal, and ethical challenges. Studies were included if they:

- Were published between 2010 and June 2024 in peer-reviewed journals.
- Focused on organ transplantation within African countries or provided relevant case studies from comparable low-resource settings.
- Examined specific barriers such as healthcare infrastructure, socioeconomic disparities, cultural attitudes, legal and ethical frameworks, and the burden of diseases affecting transplantation.
- Proposed strategies or interventions aimed at improving organ transplantation accessibility and outcomes in Africa.

Exclusion criteria were carefully defined to minimize selection bias:

- Studies published before 2010, as older findings may not accurately reflect current trends and challenges.
- Articles focused exclusively on non-African regions without clear applicability to Africa.
- Non-peer-reviewed sources, including editorials, opinion pieces, and conference abstracts.
- Studies lacking substantial empirical evidence, defined as those without clear methodology, data, or references to support claims.

Fig. 2 presents the PRISMA flowchart illustrating the selection process for the included studies. A total of 318 records were initially identified through database searches. After screening, 172 were excluded due predefined criteria. Subsequently, 146 full-text articles were assessed for eligibility, with 69 articles excluded for not meeting the inclusion criteria. Ultimately, 77 studies were included in the review. This systematic approach ensures a transparent and structured selection process, reducing the risk of bias and enhancing the reliability of the findings.

2.3. Data extraction and analysis

Data extraction was conducted using a standardized framework to collect information on study objectives, methodologies, key findings, and proposed interventions. Studies were then thematically categorized based on common barriers and proposed solutions, including:

1. Healthcare Infrastructure – availability of transplant centers, medical equipment, and trained personnel.
2. Socioeconomic Barriers – financial constraints, health insurance gaps, and economic disparities.
3. Cultural and Religious Beliefs – attitudes toward organ donation and misconceptions.
4. Legal and Ethical Challenges – regulatory frameworks, organ trafficking risks, and consent issues.
5. Disease Burden – impact of infectious and non-communicable diseases on organ availability and transplantation success.

Fig. 3 illustrates the distribution of 77 included articles across key themes in organ transplantation in Africa. Healthcare infrastructure (15 articles) had the most coverage, followed by legal and ethical challenges (14) and socioeconomic barriers (12). Other themes, including disease burden (11), cultural beliefs (10), public awareness (8), and policy (7), were also represented. This distribution highlights the diverse challenges affecting organ transplantation in Africa.

3. Concerns regarding organ transplantation in Africa

Table 1 highlights the primary barriers to organ transplantation in Africa, encompassing infrastructural, socio-economic, legal, and health system challenges. It underscores the lack of specialized transplant facilities and skilled personnel, with only a few countries like South Africa, Egypt, and Tunisia having advanced infrastructure. Low organ donation rates, driven by cultural and religious beliefs and limited public awareness, further restrict the availability of organs. The high cost of transplantation procedures, often exceeding $10,000, coupled with inadequate health insurance coverage, renders treatment inaccessible for most patients. Legal and ethical challenges, including the absence of standardized regulations, heighten the risks of organ trafficking and exploitation. Limited follow-up care and access to anti-rejection medications reduce post-transplant success rates, while the prevalence of infectious diseases like HIV and Hepatitis B among potential donors restricts the viable donor pool. These factors collectively highlight the need for comprehensive reforms to improve organ transplantation outcomes across Africa.

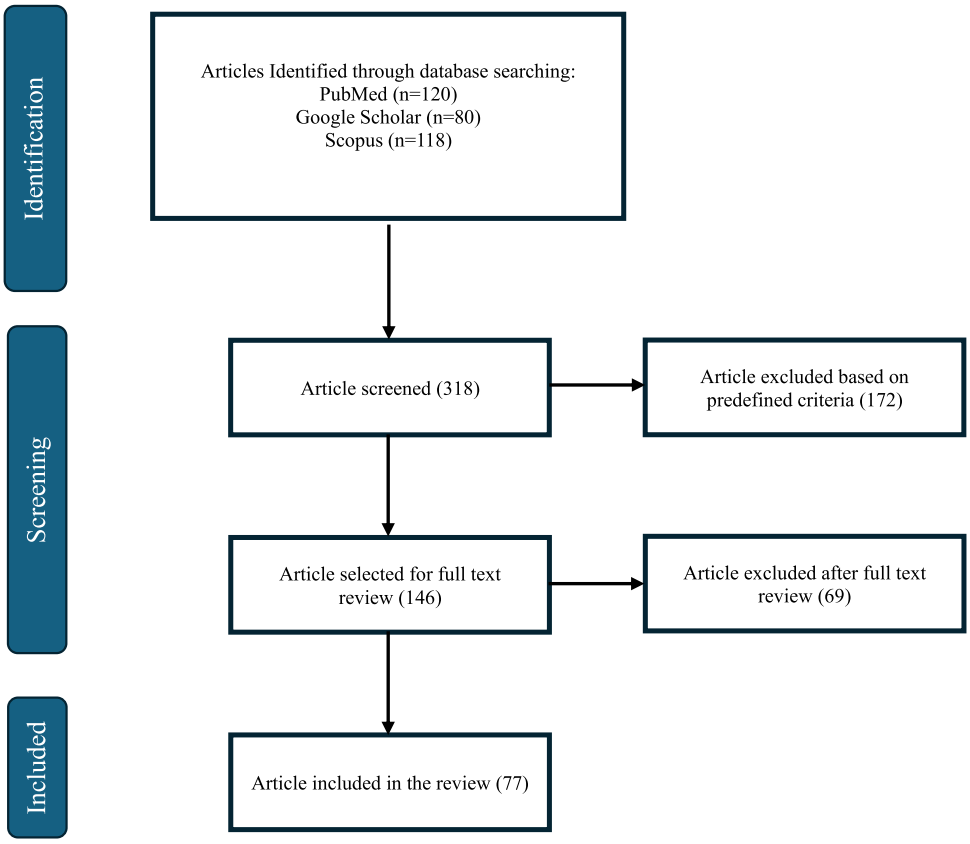

Fig. 2. PRISMA flowchart for selection of included studies.

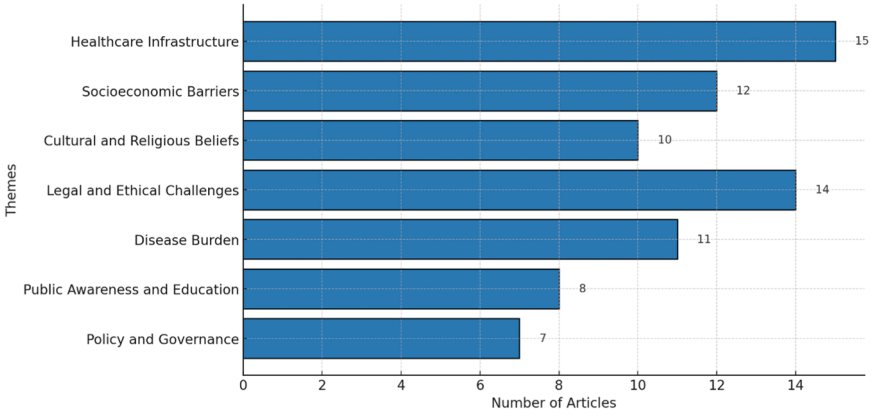

Fig. 3. Distribution of included articles across themes.

3.1. Socioeconomic factors

Socioeconomic factors play a pivotal role in shaping the healthcare landscape in any region, and Africa is no exception. These factors encompass a range of issues, including poverty, income inequality, education levels, and access to healthcare services [41,42]. In organ transplantation, socioeconomic disparities significantly influence the demand for and supply of transplant services [12,42,43]. For instance, economic constraints can limit the development of healthcare infrastructure, restrict the availability of necessary medical equipment and medications, and reduce the number of trained healthcare professionals [44,45]. This creates a cascade of challenges that ultimately affect the feasibility and success of organ transplantation programs. Understanding and addressing these socioeconomic factors is crucial for improving the accessibility and quality of transplant services across the continent.

3.2. Poverty and limited resources

Poverty remains a fundamental barrier to organ transplantation in Africa, affecting both patients and healthcare systems [12,46]. A significant portion of the African population lives below the poverty line, which severely restricts their access to healthcare [14,47,48]. The high cost of organ transplantation procedures, which includes surgery, post-operative care, immunosuppressive medications, and long-term follow-up, is prohibitive for many [12,49]. Even with public healthcare systems, out-of-pocket expenses can be devastatingly high, leading to inequities in life-saving treatments [50]. The financial limitations extend to healthcare infrastructure as well. Many African countries

Table 1
Key challenges in organ transplantation across Africa.

Concern	Details
Lack of infrastructure	Lack of specialized transplant facilities, advanced equipment, and trained personnel [12,14]. Only a few, like South Africa, Egypt, and Tunisia, have advanced transplant infrastructure [19,20].
Low organ donation rates	Hampered by cultural beliefs, religious beliefs, and limited public awareness [21–23].
High cost of transplant procedures	Due to limited healthcare funding, transplants are unaffordable for most patients, with costs exceeding around US$10,000 [8,18,24].
Lack of skilled medical personnel	The shortage of specialized professionals and support staff is increasing, and most African countries often rely on international healthcare professionals [25–27].
Legal and ethical challenges	There are few comprehensive regulations on organ donation and transplantation, leading to ethical concerns, lack of standard protocols, and potential exploitation [8,18,28].
Organ trafficking risks	Due to high demand and low supply, organ trafficking is a concern. A lack of regulation exacerbates this problem, endangering vulnerable populations [8,12].
Limited follow-up care	Aftercare for transplant patients is critical. However, limited access to anti-rejection drugs and follow-up medical care reduces transplant success rates [28–30].
Infectious disease risks	The high prevalence of infectious diseases, like HIV and Hepatitis B, among potential donors limits the pool of viable organs [31–34]. Screening is also limited due to resource constraints [35–37].
Health insurance gaps	Many African countries lack universal health coverage, meaning most patients cannot afford the cost of transplants or related healthcare without extensive financial support [38–40].

allocate a small percentage of their gross domestic product (GDP) to healthcare, resulting in underfunded and overburdened public health systems [18,50]. Hospitals often lack the necessary facilities and equipment to perform complex transplant surgeries. This includes a shortage of dialysis units, operating theaters, and intensive care units (ICUs) essential for pre- and post-transplant care [8,13,22]. Without adequate investment, it is challenging to establish and maintain high-quality organ transplantation programs.

In addition to direct healthcare costs, poverty affects the overall health of the population, increasing the prevalence of conditions that necessitate organ transplants. Poor living conditions, limited access to clean water, and inadequate nutrition contribute to the high incidence of diseases such as chronic kidney disease, liver cirrhosis, and heart failure [18,26,46,51]. These conditions are often diagnosed late due to a lack of regular medical check-ups and screening programs, less accessible to impoverished populations [12,18]. Consequently, the demand for organ transplants is high, but the capacity to meet this demand is critically low [8,20]. Moreover, poverty impacts the ability of potential donors to participate in organ donation programs. Financial incentives for living donors, while ethically contentious, are often non-existent or insufficient to cover even the minimal costs associated with donation, such as travel, lodging, and lost wages [8,52,53]. This further limits the availability of organs for transplantation and exacerbates the existing organ shortage.

Furthermore, socioeconomic disparities influence the distribution of healthcare resources within countries. Urban areas, typically more affluent, have better healthcare facilities and specialized medical personnel than rural areas [47,50,54]. This urban-rural divide means that individuals in rural areas, often poorer, have even less access to transplant services. They face additional challenges, such as long travel distances to reach transplant centers, which can be costly and logistically difficult.

3.3. Healthcare funding

Insufficient and unstable funding is one of the primary obstacles undermining the development, implementation, and sustainability of organ transplantation programs in Africa [12,20,24]. Unlike in high-income countries where organ transplantation is often covered by universal health coverage or private insurance, many African nations rely heavily on out-of-pocket payments, sporadic government subsidies, non-governmental organisations (NGOs), and international aid to support transplantation services [20,24,38]. These sources of funding are often fragmented, inconsistent, and inadequate to cover the comprehensive costs associated with organ transplantation, thus impeding the sustainability of such programs.

This chronic underfunding affects all stages of the transplantation process. In the pre-operative phase, donor identification and organ procurement are particularly capital-intensive. These tasks require well-funded public awareness campaigns and community engagement efforts to encourage donation, alongside trained personnel to evaluate donor eligibility [8,23,55]. However, limited financial resources often mean such initiatives are either underdeveloped or absent in most countries [14,24,43]. Furthermore, the cost of organ retrieval, transport, and preservation is significant, and without sustained funding, organs may be wasted or left unused due to logistical breakdowns [3,12].

The surgical phase also suffers due to lack of capital investment. Organ transplantation requires sterile, high-tech operating environments, skilled surgical teams, and advanced medical equipment such as imaging devices and anaesthesia monitoring systems [56]. In many public hospitals, such resources are scarce due to budgetary constraints [47,50]. Delays caused by malfunctioning or unavailable equipment can compromise transplant success, further undermining public confidence in such procedures [8,41,14].

Post-operative care is equally compromised by financial limitations. Transplant recipients must be closely monitored for signs of rejection or infection, and they require life-long access to immunosuppressive medications to maintain graft survival [57–60]. These medications are often prohibitively expensive for many patients, and they are not typically included in national drug subsidy lists or insurance schemes [13]. Without consistent follow-up care—including blood tests, renal/liver function monitoring, and physician consultations—patients face increased risks of graft loss and mortality.

Additionally, underfunding affects human resource development. Organ transplantation demands a highly trained, multidisciplinary workforce including surgeons, nephrologists, hepatologists, anaesthetists, transplant nurses, and coordinators [2,3,12]. Yet most African nations lack sufficient investment in training institutions or fellowship programs to develop this workforce. Opportunities for skill enhancement and continued professional development are limited due to resource scarcity, contributing to brain drain, where trained professionals migrate to better-funded health systems abroad [25,44,45].

To improve sustainability, it is imperative for African countries to adopt multi-pronged funding models that combine public financing, donor agency support, private sector involvement, and inclusion of transplantation in national health insurance schemes. Stable, predictable funding is essential not only to expand transplant access but also to retain talent, improve infrastructure, and foster long-term program success.

3.4. Healthcare infrastructure

Healthcare infrastructure is critical to any successful medical system, encompassing the physical and organizational structures needed to deliver quality healthcare services. This includes hospitals, clinics, specialized medical centers, as well as medical equipment and technologies. In organ transplantation, healthcare infrastructure also involves well-equipped transplant centers, trained medical personnel, and support systems for post-operative care and long-term patient monitoring [8,13]. The effectiveness and accessibility of organ transplantation services heavily depend on the robustness of the healthcare infrastructure. However, in many African countries, healthcare

infrastructure is underdeveloped and unevenly distributed, posing significant challenges to providing transplant services [8,50].

3.5. Limited transplant centers

Africa has a limited number of transplant centers, and these facilities are predominantly concentrated in a few urban areas, leading to significant disparities in access to transplant services. In countries with large geographical areas, such as Nigeria, South Africa, and Kenya, this concentration means that patients in rural and remote regions often face substantial barriers to accessing transplant care [12,14,23]. Traveling long distances to reach urban transplant centers imposes additional financial and logistical burdens on patients and their families, exacerbating the already significant challenges of seeking advanced medical care [13,52,61].

The scarcity of transplant centers also means the existing facilities are often overburdened and under-resourced. High patient volumes can lead to long waiting times for transplant surgeries, delaying critical treatments and negatively impacting patient outcomes [14]. The limited availability of transplant centers restricts the ability to perform a high number of transplants, which is necessary to meet the demand from patients suffering from end-stage organ failure [8,20]. As a result, many patients may not receive timely access to the life-saving procedures they need. The uneven distribution of transplant centers reflects broader healthcare inequalities within countries. Urban areas, typically more affluent and better developed, have better access to healthcare resources, including specialized medical personnel and advanced medical technologies, while rural areas often lack basic healthcare facilities, let alone specialized transplant centers [47,50,54].

3.6. Inadequate medical equipment and facilities

Even in regions that are fortunate enough to have transplant centers, the lack of necessary medical equipment and infrastructure poses a significant barrier to performing complex transplant surgeries [62,63]. These inadequacies are widespread, affecting various critical aspects of the transplantation process and ultimately compromising patient care and outcomes. The absence of essential medical equipment hinders the success of surgeries and impacts pre-operative and post-operative care, leading to a cascade of challenges for patients and healthcare providers [64,65]. One of the most glaring deficiencies is the lack of adequately equipped operating theaters. Many transplant centers in Africa are forced to operate with outdated or insufficient equipment, which can compromise the quality of the procedures [12,14]. The availability of state-of-the-art imaging devices, such as MRI and CT scanners, is also limited, making it difficult to conduct thorough pre-operative evaluations and plan surgeries effectively [47,50].

Moreover, the inadequacy extends to essential services that support the transplant process. Intensive care units (ICUs) are critical for the immediate post-operative care of transplant patients, who require close monitoring and specialized care to manage potential complications such as infections, organ rejection, and surgical complications [18,66]. Unfortunately, many transplant centers in Africa lack fully equipped ICUs, which can lead to suboptimal care and increased mortality rates among transplant recipients. Dialysis units are another crucial component of the infrastructure, particularly for kidney transplant patients who often require dialysis before and after surgery [67,68]. The shortage of dialysis machines and the limited availability of dialysis services in many African countries pose significant challenges for patients with end-stage renal disease [67–70]. Without adequate dialysis support, patients may not be stable enough to undergo transplant surgery, and those who have received transplants may face increased risks of postoperative complications [67,70].

Laboratories for tissue typing and cross-matching are indispensable in ensuring the compatibility of donor organs with recipients. However, the lack of well-equipped laboratories and the necessary reagents and technologies means these critical tests may not be performed accurately or promptly [12,71–73]. This can result in delays, failed transplants, and increased patient risks. The deficiencies in medical equipment and facilities also extend to the maintenance and availability of essential supplies [64,74]. Sterile environments are paramount in preventing infections during and after surgery, but many transplant centers struggle with maintaining sterility due to inadequate supplies of sterilization equipment and disposable medical materials [75]. Frequent shortages of basic medical supplies, such as gloves, syringes, and antiseptics, further exacerbate the situation.

3.7. Shortage of trained personnel

One of the most significant challenges facing organ transplantation in Africa is the critical shortage of healthcare professionals trained in this highly specialized field, including transplant surgeons, nephrologists, and specialist nurses [12,27,76]. The scarcity of trained professionals limits the number of transplants that can be performed and affects the quality of patient care [25,27], thereby impacting overall outcomes and survival rates. Transplant surgeons are at the forefront of this issue. Performing an organ transplant requires exceptional skill and extensive training, both of which are in short supply in many African countries [20,26]. The limited availability of specialized surgical training programs within the continent means that few medical graduates have the opportunity to acquire the necessary expertise. This gap is often filled by international training programs, but the number of surgeons able to take advantage of such opportunities is insufficient to meet the growing demand for transplants [77].

Anesthesiologists, crucial in managing patients' perioperative care, are also in short supply [78]. The complexity of transplant surgeries requires anesthesiologists with specialized training in managing the unique challenges associated with these procedures. However, like transplant surgeons, anesthesiologists with this level of expertise are few and far between. The shortage of anesthesiologists can lead to delays in surgeries and increase the risk of perioperative complications, further hindering the effectiveness of transplant programs [27,78]. Furthermore, the lack of nephrologists trained in transplantation means that many patients do not receive the comprehensive care they need, leading to poorer outcomes and an increased risk of graft failure [79,80].

Overall, the shortage of trained healthcare personnel in Africa is compounded by several factors, including brain drain, unfavorable working conditions, and fewer opportunities for professional development [25,79,81]. This has led to massive migration, which leaves a significant void in the healthcare workforce, further straining the already limited resources available for organ transplantation [41,50].

Addressing this shortage, particularly in resource-limited African regions, requires strategies that address financial and infrastructural limitations and regional healthcare demands. One effective approach is task-shifting, where specific healthcare responsibilities are delegated to less-skilled health personnel. For instance, training mid-level healthcare workers, like nurse practitioners and physician assistants, to handle routine and preventive care can reduce the burden on specialists [82]. One of the countries engaging in task-shifting initiative is Ghana through the Community Health Planning and Services (CHPS) program to train health workers in health education and promotion, minor ailment case management, and deploy them to rural regions to increase access to healthcare [83]. This initiative currently has 6500 CHPS operating, covering approximately 46 % of the country. With this initiative, training these mid-level healthcare workers in managing post-operative care and education on immunosuppressive medications will be easy and effective. Another approach is addressing the brain drain in countries such as Nigeria by implementing retention incentives (e.g., providing rural service bonuses), initiatives such as tax breaks and research grants to encourage Nigerian healthcare professionals abroad to return [41].

4. Legal and ethical issues

Legal and ethical issues form a crucial part of the organ transplantation landscape, particularly in regions where regulatory frameworks and ethical guidelines are underdeveloped or lacking. These challenges are pronounced in Africa, with many countries struggling to establish and enforce comprehensive legal structures to oversee organ transplantation practices [8,12,18]. The absence of robust regulatory frameworks not only creates a vacuum that can be exploited for unethical practices such as organ trafficking but also undermines the overall integrity and efficacy of transplant programs [8,18,30]. Furthermore, obtaining informed consent from potential donors and ensuring equitable allocation of organs present additional ethical dilemmas, especially in contexts characterized by low literacy levels [28,29]. Addressing these legal and ethical challenges is essential for developing Africa's fair, transparent, and effective organ transplantation system.

4.1. Lack of regulatory framework

Legal and ethical challenges surrounding organ transplantation differ significantly across African countries due to varying levels of regulatory development and enforcement. While some countries like South Africa and Egypt have made strides in establishing organ transplantation laws and oversight bodies, many others still lack comprehensive and enforceable legal frameworks [12,18]. This disparity creates a fragmented regulatory landscape that fosters inconsistency in transplantation practices and standards across the continent [14].

In countries with weak or absent legal structures, the absence of clear policies governing organ donation, procurement, and allocation exposes the system to unethical practices, including organ trafficking and donor exploitation [8]. Vulnerable groups, particularly those living in poverty or with limited education may fall victim to coercion, manipulation, or misinformation, sometimes agreeing to donate organs under false pretenses or without informed consent, violating ethical principles of autonomy and justice [8,12]. In contrast, countries with more developed frameworks have mechanisms in place to oversee ethical compliance, such as national registries, ethics committees, and standardized donor-recipient matching protocols [14,30]. However, even within these better-regulated nations, enforcement can be uneven due to resource constraints, corruption, or lack of trained personnel.

The variation in legal maturity also affects the quality and equity of care. Countries with established regulations can ensure standardized procedures for donor evaluation, organ procurement, transplantation surgeries, and post-operative follow-up, thereby improving patient outcomes and public trust [30,47]. Meanwhile, in countries where legislation is either outdated or nonexistent, healthcare providers may operate without clear guidelines, leading to inconsistent medical practices, inequitable organ allocation, and diminished transplant success rates. These differences underscore the urgent need for regional harmonization and capacity building, including the adoption of model legal frameworks aligned with WHO guidelines, the development of ethical oversight bodies, and cross-border collaboration to combat organ trafficking and promote ethical standards across Africa.

4.2. Informed consent and ethical concerns

Obtaining informed consent for organ donation is a fundamental ethical requirement, but it presents significant challenges in many African contexts. Informed consent requires that individuals are provided with all necessary information regarding the donation process, potential risks, and benefits and that they voluntarily agree to donate without coercion or undue influence. However, in environments where educational resources are scarce, and misconceptions about organ donation are prevalent, achieving valid informed consent can be difficult [28,29]. Many people may not have access to the information needed to make an informed decision, and there may be cultural or religious beliefs that influence their willingness to donate [84,85]. Ensuring that consent is genuinely informed, and voluntary is critical to maintaining ethical standards in organ transplantation. Fig. 4 summarizes the key legal and ethical challenges in organ transplantation in Africa by illustrating the four primary legal and ethical challenges facing organ transplantation in Africa.

Necessitating legislative actions is crucial to combat organ trafficking and unethical practices associated with organ transplantation. This includes developing robust laws that criminalize organ trafficking, and transplant tourism, which must encompass clear definitions, penalties, and enforcement mechanisms [8,14]. Stringent regulations should be implemented to ensure transparent and fair organ distribution by setting up national registries and oversight bodies to monitor transplant activities [8,86]. Victims' protection, rehabilitation, and reintegration should be provided, including medical, psychosocial, and legal support for affected individuals [87,88]. Mandatory public awareness campaigns to educate communities about dangers and legal consequences of organ trafficking, to reduce vulnerability, should be established [87].

In combating the issues of organ trafficking, the African Union adopted the Ouagadougou Action Plan in 2006, aiming to combat trafficking in human beings, especially women and children [89]. Furthermore, in Tanzania, the Anti-Trafficking in Persons Act of 2008 serves as the cornerstone of Tanzania's efforts against human trafficking, with the country working on specific organ transplant regulations since 2023 [90]. Though the mentioned plans signify progress, there is a need for more African member states to adopt legislative measures in comprehensively addressing the legal and ethical challenges of organ trafficking.

5. Cultural barriers

Cultural barriers play a crucial role in shaping the landscape of organ transplantation in Africa. Deeply ingrained beliefs, traditions, and social norms significantly influence the acceptance and practice of organ donation and transplantation [22,91]. These cultural factors can either facilitate or hinder the willingness of individuals and communities to participate in organ donation programs [12,14,92]. Understanding and addressing these cultural barriers is essential for developing effective strategies to promote organ donation and improve transplantation rates.

5.1. Beliefs and attitudes towards organ donation

Cultural and religious beliefs surrounding organ donation vary significantly across different African regions and communities, deeply influencing the public's willingness to donate organs [12,22,84]. In many societies, traditional views about life, death, and the sanctity of the human body create powerful social barriers to donation. For instance, among the Zulu people of South Africa, maintaining bodily wholeness after death is considered essential for spiritual continuity [90]. Similarly, in Ghana, ethnic groups like the Ewe regard post-mortem body mutilation as disrespectful to ancestors, discouraging consent for organ retrieval [93]. These culturally embedded beliefs contribute to low donation rates by fostering resistance to the removal of organs, even when it could save another life.

Religious perspectives also significantly affect attitudes, though their influence varies by denomination, interpretation, and region. For example, while some North African Islamic scholars have issued fatwas in favour of organ donation, viewing it as a compassionate act, others in West Africa may interpret religious texts more conservatively. In some African countries, organ donation is encouraged as an altruistic and charitable act. In contrast, in parts of West Africa, such as Nigeria, some Muslim and Christian communities remain hesitant, believing that organ donation may interfere with divine will or the afterlife [91,94]. This divergence highlights how local religious interpretations can either

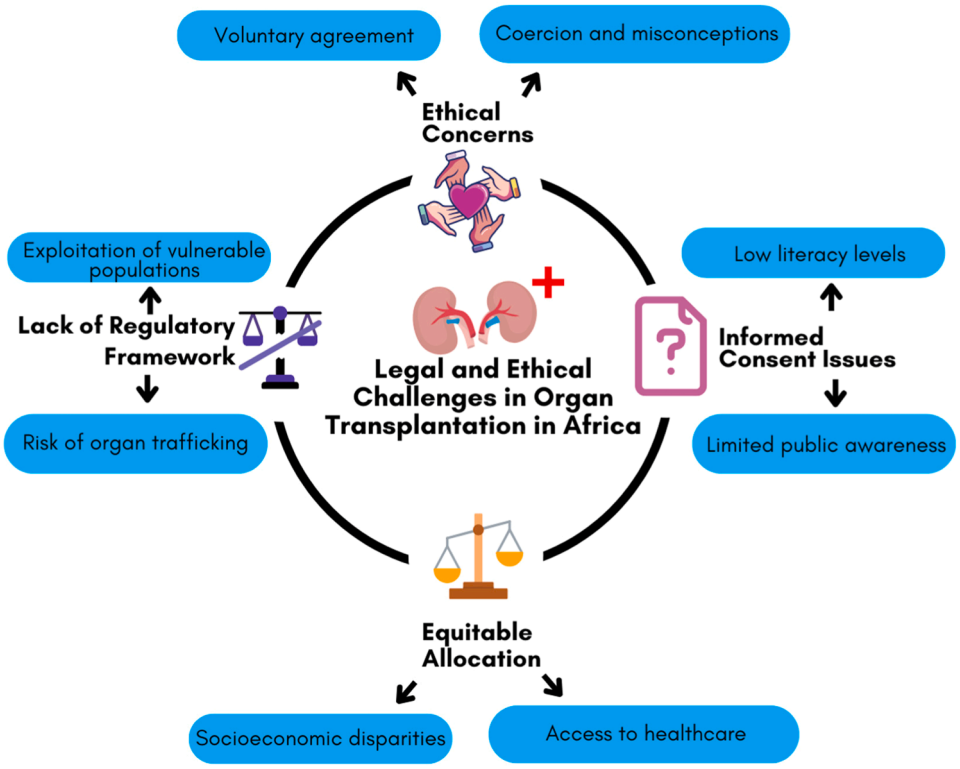

Fig. 4. Legal and ethical challenges in organ transplantation in Africa.

hinder or facilitate organ donation efforts [84,85].

In addition to individual beliefs, family dynamics often determine final decisions on organ donation. In many African contexts, especially in collectivist cultures, decisions are made by the extended family rather than the individual [14,23]. This often means that even if an individual is willing to donate, the family may override that decision due to shared traditional values or fear of spiritual consequences. When dominant family members hold conservative or traditional views, this collective decision-making can result in a refusal to donate, even if some members are willing [85]. The lack of prior discussion about organ donation within families further complicates the process, especially in emergency or end-of-life situations.

To improve donation rates, culturally tailored strategies are essential. These may include collaboration with religious leaders, community sensitization campaigns, and the integration of organ donation education into local health programs. Understanding region-specific cultural and religious dynamics and addressing them through respectful dialogue and inclusive engagement are critical for the success of organ transplant programs in Africa.

5.2. Awareness and education

Awareness and education about organ donation and transplantation are critical for the successful implementation and acceptance of organ transplant programs. However, in many African countries, there is a significant gap in public knowledge and understanding of these processes [95,96]. Public education efforts are often fragmented, poorly funded, or entirely absent, leading to the persistence of myths and misconceptions. Notably, some countries have adopted structured strategies to improve awareness. In South Africa, the Organ Donor Foundation (ODF) has launched multiple initiatives, including a toll-free helpline, distribution of informative leaflets at transplant centers, interactive educational talks at schools and community centres, and targeted social media campaigns to engage the youth and tech-savvy population [97]. Similarly, in Nigeria, the Transplant Association of Nigeria (TAN), in collaboration with Clarion Call Care Foundation, conducts radio talk shows, local town hall sensitisation meetings, and testimonial-based campaigns involving transplant recipients and donors to humanise the subject and reduce stigma [98].

In addition, community-based peer education, where respected local leaders or health workers deliver culturally tailored messages, has been shown to build trust and increase willingness to participate in organ donation programs. Incorporating organ donation topics into secondary and tertiary school curricula and training healthcare providers to initiate conversations about organ donation during patient consultations have also been effective [14,99]. Without widespread and continuous education through such structured and culturally sensitive strategies, public misconceptions, such as fears of body mutilation, religious prohibitions, or commercial exploitation, are likely to persist [12,18]. Therefore, a multi-pronged approach that includes formal education, mass media engagement, community outreach, and digital platforms is essential to close the knowledge gap and increase organ donor registration across Africa.

5.3. Misconceptions and myths

Misconceptions and myths about organ donation are prevalent and can significantly hinder the willingness of individuals to donate organs. Common myths include beliefs that organ donation is against certain religious teachings, that the body will be mutilated, or that organs might be sold illegally [12,22]. One prevalent myth is the fear that organ donation will interfere with funeral rites and traditions [22]. Many cultures place a high value on the physical integrity of the body after death, and the idea of organ removal can be seen as disrespectful or harmful to the deceased's journey to the afterlife [91,100]. Fig. 5 illustrates the primary cultural barriers affecting organ transplantation in Africa by demonstrating how these cultural barriers are interconnected and deeply rooted in African societies, affecting various aspects of organ donation and transplantation acceptance. Another common myth is the belief that only certain types of people can be donors, such as those who

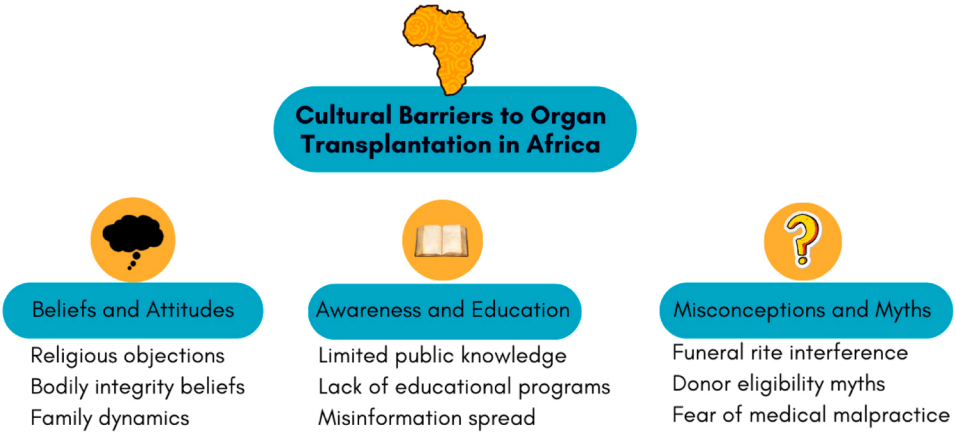

Fig. 5. Cultural barriers to organ transplantation in Africa.

die under specific circumstances or in certain age groups [13,94]. This misconception limits the number of potential donors by excluding individuals who might otherwise be willing and eligible to donate. Understanding and dispelling these myths and misconceptions is crucial to increasing organ donation rates and saving lives.

6. Disease burden

The disease burden in Africa is a major factor that undermines the success of organ transplantation across the continent, primarily due to the dual burden of infectious and non-communicable diseases (NCDs) [12,101,102]. This overlap presents a uniquely complex health environment for both organ donors and recipients, intensifying the challenges associated with transplantation. Infectious diseases such as HIV, hepatitis B and C, and tuberculosis are widespread, increasing the risk of transmitting infections through transplanted organs and complicating both pre- and post-operative care [12,18,103]. For instance, transplant recipients who are HIV-positive or who receive organs from HIV-positive donors must be managed with specialized antiretroviral regimens to avoid opportunistic infections and graft rejection [32,33]. Similarly, latent tuberculosis (TB) infections in donors or recipients can be reactivated under post-transplant immunosuppression, leading to significant morbidity and mortality [35,104]. These risks necessitate advanced screening tools and clinical protocols, which are often lacking in resource-constrained settings.

Simultaneously, the continent is experiencing a surge in non-communicable diseases like diabetes, hypertension, and chronic kidney disease, which are now among the leading causes of end-stage organ failure [101,102]. Poor disease surveillance, late diagnoses, and inconsistent access to essential medications (e.g., insulin and antihypertensives) often result in patients presenting at advanced stages of disease, reducing transplant eligibility and increasing perioperative risks [101]. Additionally, the coexistence of multiple NCDs, such as diabetic nephropathy and hypertensive heart disease, elevates the likelihood of complications during and after transplantation, thereby negatively affecting long-term graft and patient survival rates [103].

This interplay between infectious and non-communicable diseases amplifies the complexity of transplantation management, requiring comprehensive pre-transplant evaluations, risk-adapted immunosuppression protocols, and intensive long-term monitoring, all of which are difficult to sustain in many African healthcare systems [12,18]. Addressing this dual burden is crucial to improving transplantation outcomes, and it underscores the need for integrated disease management, improved diagnostic infrastructure, and equitable access to both infectious disease treatment and chronic disease control.

6.1. High prevalence of infectious diseases

The high prevalence of infectious diseases such as HIV, tuberculosis (TB), and hepatitis in Africa significantly complicates the organ transplantation process. These infectious diseases are widespread across the continent and have a profound impact on both potential organ donors and recipients [13,37]. The presence of these diseases can introduce substantial risks at every stage of the transplantation process, from the evaluation of candidates to the post-transplant management of patients, leading to increased complications and poorer outcomes [14,34].

HIV, which remains a major public health issue in Africa, poses unique challenges for organ transplantation [33,34]. In the past, HIV was considered an absolute contraindication for organ transplantation due to concerns about the progression of the disease under immunosuppressive therapy and the risk of transmission through transplanted organs [32,33]. However, with the advent of effective antiretroviral therapy (ART), HIV-positive individuals can now be considered for both organ donation and transplantation [33]. Despite this progress, the transplantation of organs from or to HIV-positive individuals requires specialized knowledge and careful management, as these patients are at higher risk for complications, including opportunistic infections and organ rejection.

Tuberculosis (TB) is another prevalent infectious disease in Africa that complicates organ transplantation [103,104]. TB can be particularly problematic because it can be reactivated in patients who are immunosuppressed after a transplant [35]. The immunosuppressive drugs necessary to prevent organ rejection can lower the body's defenses, making it easier for latent TB infections to become active, which can be life-threatening [35,104]. Moreover, the diagnosis of TB in transplant candidates or recipients is challenging, as the symptoms can be masked or confused with other conditions [103,104], and the usual diagnostic tools may be less effective in immunocompromised patients.

Hepatitis B and C viruses (HBV and HCV) are also highly prevalent in Africa [31,105], which can present significant challenges for organ transplantation. Chronic liver disease caused by HBV or HCV is a common indication for liver transplantation in many parts of the world [106,107], including Africa. However, the presence of these viruses in potential organ donors or recipients complicates the transplantation process. Transplanting organs from donors infected with HBV or HCV requires careful consideration and management to prevent the transmission of the virus to the recipient [106,108]. Similarly, recipients with these infections require close monitoring and treatment to manage the disease post-transplant and to avoid liver graft dysfunction or failure [36,109].

6.2. Non-communicable diseases

Non-communicable diseases (NCDs) are emerging as a significant health burden in Africa, with conditions such as diabetes and hypertension becoming increasingly prevalent across the continent [110–112]. These diseases are now recognized as leading causes of end-stage organ failure, including kidney failure, heart failure, and liver cirrhosis, all of which necessitate organ transplantation as a treatment option [111,112]. However, the rapid rise of NCDs presents substantial challenges to healthcare systems in Africa, which are often ill-equipped to manage the chronic nature of these conditions and their associated complications [112,113]. The rise of NCDs in Africa is driven by several factors, including urbanization, changes in diet and lifestyle, and increased life expectancy [113,114]. As populations shift from rural to urban areas, there is a corresponding increase in sedentary lifestyles, higher consumption of processed foods, and greater exposure to environmental pollutants [114,115]. These changes have led to a surge in the incidence of NCDs, such as diabetes, hypertension, obesity, and cardiovascular diseases [113,114], which were previously less common in many African countries.

Diabetes and hypertension, in particular, have become major public health concerns. Diabetes, a condition characterized by chronic high blood sugar levels, can lead to severe complications such as diabetic nephropathy [112,116], which is a leading cause of chronic kidney disease (CKD) and subsequent kidney failure [112,116]. Hypertension, or high blood pressure, is another significant contributor to CKD, as well as heart failure and stroke [111]. The persistent high blood pressure damages blood vessels and organs over time, leading to organ failure if not adequately managed.

6.3. Impact on organ transplantation

The interplay between infectious and non-communicable diseases and organ transplantation in Africa introduces various complexities. The transmission of infections from donor to recipient remains a significant concern, highlighting the need for rigorous donor screening and advanced diagnostic technologies to detect potential infectious pathogens [117,118]. The increasing utilization of donors with increased Public Health risk, including those with Hepatitis C and HIV, has become more common [117]. The lack of effective illness reporting systems in most African regions further complicates identifying and managing donor-derived infections [118]. Early diagnosis of infectious diseases is crucial for guiding the treatment and further investigations. Additionally, prophylactic treatments, such as immunosuppressive therapy in organ recipients, can prevent reactivation of latent infections and improve post-transplant outcomes [109,119].

The growing burden of NCDs adds another layer of complexity to organ transplantation efforts, as its management requires regular monitoring, access to medications, and lifestyle modifications, which are difficult to achieve in resource-limited settings [113,114]. In many African countries, access to essential medications such as insulin for diabetes or antihypertensive drugs is inconsistent and unaffordable for large population segments [120,121]. This lack of consistent care leads to the progression of these diseases to advanced stages.

Addressing the intersection of infectious diseases, NCDs, and transplantation in Africa requires a comprehensive and integrated strategy. This includes optimizing immunosuppression to reduce infection risk while preventing rejection, implementing targeted prophylactic measures against prevalent opportunistic infections, and utilizing advanced diagnostic tools for early infection detection. Furthermore, there is a need for collaborative effort among healthcare professionals, researchers, policymakers, and community stakeholders to develop and implement evidence-based strategies tailored to the specific needs and challenges of the African context. Fig. 6 succinctly illustrates the complex interplay of disease burdens that complicate organ transplantation efforts in the region. is divided into two main sections: Infectious Diseases and Non-Communicable Diseases (NCDs).

7. Major African countries and their transplant capabilities

Organ transplantation in Africa remains limited due to disparities in healthcare infrastructure, donor shortages, and financial constraints. While some nations have advanced transplant programs, challenges such as cultural resistance to organ donation, inadequate post-transplant care, and ethical concerns persist. Many patients rely on dialysis or seek transplants abroad due to the scarcity of local facilities. Expanding transplant services requires increased investment in healthcare, public awareness campaigns, and policy reforms to improve accessibility and sustainability.

7.1. Kidney transplantation in South Africa

South Africa is the foremost nation in Africa for organ transplantation, especially kidney transplants. Groote Schuur Hospital in Cape Town has been fundamental in advancing transplantation services since the first heart transplant in 1967 [122,123]. Nonetheless, kidney transplantation encounters numerous obstacles. This encompasses a lack of organ donors attributable to cultural and religious convictions, insufficient public knowledge, and substantial disparities in access to transplantation treatments across private and public healthcare systems

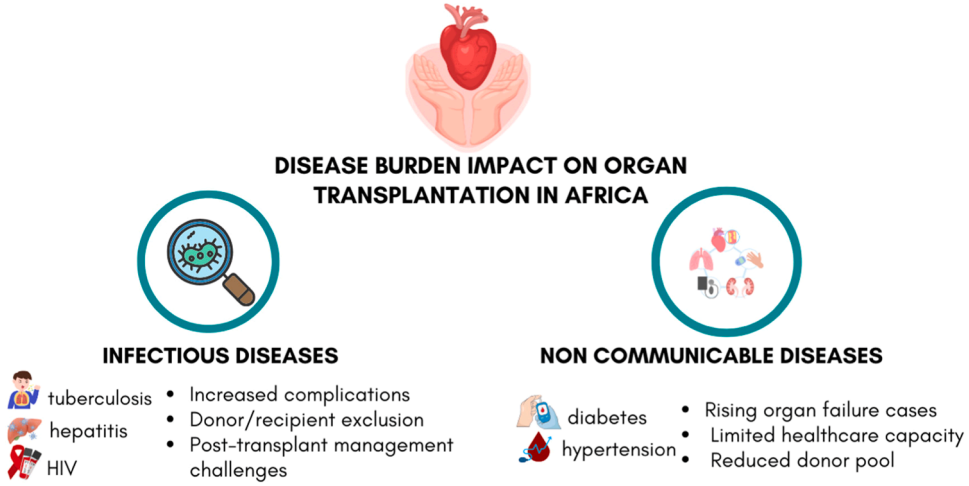

Fig. 6. Disease burden impact on organ transplantation in Africa. Major African countries and their transplant capabilities.

[22,122,124]. Studies indicate that although transplantation services in South Africa are more developed than in most other African countries, organ availability remains low, with merely 5 % of patients suffering from end-stage renal diseases undergoing transplants [12,18,122]. Specific implemented measures include the establishment of transplant centers in major cities, training for transplant surgeons and medical personnel, and public awareness campaigns to promote organ donation [97,122].

7.2. Liver transplantation in Egypt

Egypt has one of the highest liver transplantation rates in Africa, attributed to the widespread prevalence of chronic liver diseases such as hepatitis C [125–127]. Cairo University Hospital has pioneered liver transplant procedures in the region, with the program rapidly growing in the past two decades [126]. The nation's transplantation program mostly depends on living donor liver transplants, as deceased organ donation is uncommon due to cultural and religious opposition [125,126,128]. Concerns regarding the exploitation of donors have emerged, as economic disparities frequently result in financial motives for organ donation [129,130]. Post-transplant care presents considerable challenges, including the cost of immunosuppressive medicines and the necessity for long-term patient monitoring [125,131]. Despite these challenges, Egypt has attained notable success in liver transplants, with results comparable to international standards [126,132]. The development of specialized centers has enhanced patient access [133,134]. The improvement of histocompatibility testing, organ preservation, and immunosuppression has contributed to this success [125]. However, challenges remain in preventing chronic rejection and managing long-term complications, coupled with ethical dilemmas and the equitable allocation of resources [133,134].

7.3. Kidney transplant program in Nigeria

Nigeria has one of the highest prevalence rates of chronic kidney disease in Africa, exacerbated by limited access to kidney transplants [12,135,136]. In light of infrastructure challenges, the majority of CKD patients depend on dialysis, which can often be unsustainable and expensive [18,137,138]. In recent years, a few private and public institutions have established kidney transplant programs [139,140]. The lack of adequate medical facilities and financial constraints in the absence of universal healthcare hinder the development of a comprehensive transplant program [8,14,18,140]. Cultural and religious beliefs restrict organ donation, which remains a significant barrier [23,91,138]. Research indicates that although kidney transplants in Nigeria have succeeded, their limited scale and accessibility present significant barriers [8,138,139]. Shortages of donors and financial limitations lead patients to pursue transplantation alternatives in other countries (e.g., India) [12,14,47]. Increasing the number of donors and decreasing the waiting list for organs will go a long way in boosting the effectiveness of organ transplantation in Nigeria.

7.4. Kidney transplantation in Kenya

Kenya commenced transplantation in 2009 and has performed approximately 200 transplants in 10 years [8,18]. Kidney failure rates in Kenya are high due to diabetes and hypertension; nevertheless, the situation is worsened by a scarcity of dialysis facilities and low organ donation rates [24,141]. Although transplantation services are expanding, accessibility remains limited to urban centers [12,142]. Inadequate infrastructure and regulatory challenges hinder Kenya's organ transplantation efforts [19,143]. Local authorities and international health groups have advocated for more stringent policies to combat illegal organ trafficking and to foster ethical transplantation practices [8,12,14]. Partnership with international transplant centers can provide valuable training opportunities for Kenyan healthcare professionals and facilitate knowledge and technology transfer.

7.5. Kidney transplantation in Tanzania

Tanzania launched its first kidney transplantation program at Muhimbili National Hospital (MNH) in 2017, marking a significant milestone [26,144]. Previously, transplantation programs included government-funded transplantation overseas [1]. Kidney transplantation in Tanzania is still in its infancy. While MNH has improved in dialysis and renal care, transplantation services have been limited due to insufficient infrastructure, lack of skilled personnel, and inadequate funding [26,67,144,145]. Cultural beliefs and low awareness about organ donation further hinder local transplantation efforts [12,18]. Additionally, many patients face financial barriers to seeking transplantation abroad, leading to high mortality rates among those with end-stage renal disease [24,67]. Efforts are needed to increase public awareness on organ donation. Building community trust through education and dialogue is essential in increasing organ donation rates [99].

8. Discussion

Addressing the numerous challenges that impede the success of organ transplantation programs in Africa requires a comprehensive multifaceted approach. All the barriers mentioned in this review are significant. However, there are pressing ones that require urgent attention. One of the most critical barriers is awareness and education regarding organ donation. Understanding why people do or do not participate in organ donation can help inform policies to address the organ supply shortage [55]. In addition to cultural sensitivity, effective campaigns can utilize various communication channels, including traditional media (e.g. billboards, television), social media, community events, and religious institutions [146]. Celebrity endorsements and personal testimonials from transplant recipient and donor families can also be a powerful tool for raising awareness and prompting action in people [147]. Furthermore, educational programs targeting healthcare professionals are essential for ensuring they are well-informed about the organ donation process and equipped to discuss it sensitively with patients and families [148]. Successful models often involve close collaboration with government agencies, non-profit organizations, and transplant centers. For example, some countries like Spain have implemented national organ registries and public awareness campaigns that have significantly increased donor registration rates [149]. Such centralized systems streamline the donation process and ensure that organs are allocated fairly and efficiently. Moreover, exploring the Spanish model of organ donation can serve as a valuable benchmark for African nations.

Another critical barrier is addressing socioeconomic disparities. Policies aimed at reducing financial constraints on patients and their families are crucial. Initiatives to subsidize the transplantation cost, procedures, medications, and post-operative care, making these life-saving treatments more accessible to low-income individuals [8,18,22,150]. Integrating organ transplantation services into national health insurance schemes can help reduce the financial barriers to healthcare access [19,63,151]. Furthermore, social support programs that assist families of transplant patients, such as financial aid, counseling services, and support groups, can mitigate the impact of socioeconomic disparities on transplantation outcomes [8,152,153]. Only through such efforts can the life-saving efforts of organ transplantation be effective in African nations, ensuring that people, regardless of socioeconomic status, can benefit from this transformative medical intervention [1,3,55].

Lastly, strengthening healthcare infrastructure is important in supporting the development and sustainability of organ transplantation programs in Africa. Establishing more transplant centers across the continent will address the current disparity in access to transplantation services [20,26,50]. These centers should be strategically located to serve both urban and rural populations, reducing the need for patients to

travel long distances to receive care, and also equipped with medical technology, such as imaging technologies and laboratory facilities, as well as intensive care units to manage post-surgical interventions and handle complications [64,101]. Additionally, ensuring that healthcare facilities are adequately staffed, properly maintained and equipped is fundamental to successful transplantation programs.

To address the multifaceted challenges of organ transplantation in Africa, several recent advancements and pilot programs have emerged as promising models. In Tanzania, the establishment of a kidney transplant program at Muhimbili National Hospital has significantly reduced the need for overseas transplants and represents a milestone in developing in-country surgical capabilities [26,144,145]. Kenya has made strides through policy reforms and collaborations with international transplant centres, enabling local healthcare professionals to receive specialised training and facilitating knowledge and technology transfer [141–143]. In South Africa, renewed efforts are being made to improve deceased donor rates through the implementation of national donor registries and coordinated public awareness campaigns led by the Organ Donor Foundation [15,97]. Additionally, Egypt has continued to expand its living donor liver transplant program at institutions such as Cairo University Hospital, while also exploring ethical frameworks to ensure donor protection and equitable organ allocation [125,126,129,133]. These initiatives demonstrate that, with strategic investments and stakeholder engagement, sustainable and locally tailored solutions can be developed to improve organ transplantation outcomes across the continent.

Based on the findings of this review, several key policy recommendations emerge that can be practically implemented within African healthcare systems to enhance organ transplantation efforts. First, governments should prioritize the integration of organ transplantation into national health insurance schemes, ensuring financial protection for patients and reducing the burden of out-of-pocket expenses. Second, establishing and equipping regional transplant centres with the necessary infrastructure, laboratory support, and intensive care capacity will improve access across urban and rural areas. Third, targeted investments in workforce development, including the training and retention of transplant surgeons, nephrologists, and specialized nurses, are essential to address the current shortage of skilled personnel. Fourth, countries should develop and enforce robust legal and ethical frameworks that regulate organ donation, prevent trafficking, and standardize procedures to ensure transparency and fairness. Lastly, nationwide public education campaigns should be implemented in collaboration with community leaders, faith-based organisations, and civil society to combat myths and cultural resistance, thereby increasing organ donation rates. Collectively, these policy measures are feasible and scalable within existing healthcare structures and offer a sustainable path forward for improving transplantation outcomes in Africa.

9. Limitations of the review

This narrative review provides a comprehensive synthesis of the barriers to organ transplantation in Africa and proposes strategies for improvement. However, several limitations should be acknowledged. While the review employs structured inclusion and exclusion criteria, these were not quantifiable or explicitly standardized, potentially introducing selection bias. The lack of a systematic approach limits the reproducibility of the findings, a recognized limitation of narrative reviews. Secondly, no formal tools were utilized to assess the quality or reliability of the included studies. This omission may affect the robustness of the findings, as some of the referenced studies, particularly those with small sample sizes or limited scope, may not be generalizable to broader populations. A more rigorous appraisal of study methodologies and results would have strengthened the conclusions drawn.

Additionally, the review relies heavily on published literature, which may be subject to publication bias. Studies with positive findings are more likely to be published, potentially skewing the available evidence. Furthermore, the rapidly evolving nature of healthcare and transplantation practices means that some findings could become outdated, particularly in the context of emerging technologies and policies. Lastly, the variability in healthcare systems, cultural practices, and socioeconomic conditions across African countries presents challenges in generalizing findings. While this review attempts to highlight region-specific challenges and solutions, the diversity within the continent means that some conclusions may not be universally applicable. Despite these limitations, this review provides valuable insights into the challenges of organ transplantation in Africa and offers actionable strategies for improvement. Future research incorporating systematic methodologies and robust quality assessment tools is recommended to further enhance the evidence base.

10. Conclusion

The challenges of organ transplantation in Africa are complex and multifaceted, spanning socioeconomic, infrastructural, legal, ethical, and cultural dimensions. Each of these challenges is deeply interwoven, creating a landscape that is difficult to navigate and even more challenging to transform. However, these challenges are not insurmountable. Addressing them requires a comprehensive and coordinated approach involving significant investment in healthcare infrastructure to build and equip more transplant centers and capacity-building initiatives to train and retain skilled healthcare professionals. Legal reforms are essential to establish robust regulatory frameworks that protect donors and recipients, prevent organ trafficking, and ensure equitable organ allocation. Public education and awareness campaigns are crucial to changing cultural attitudes, dispelling myths, and encouraging broader participation in organ donation. Moreover, addressing socioeconomic disparities is vital to making organ transplantation accessible to all, regardless of economic status. By tackling these issues holistically, Africa can significantly improve its organ transplantation capabilities, thereby providing life-saving treatments to thousands in need and enhancing overall health outcomes across the continent. The path forward is challenging, but with concerted effort and collaboration, the potential for progress is substantial.

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