DIVISION OF GLOBAL SURGERY

Research Strategy

2022–2030

GLOBAL SURGERY

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Our story so far

Our vision and mission

The vision of the Division of Global Surgery is of a world in which everyone has access to comprehensive, safe, quality surgical care. Our mission is to improve the quality of surgical care in Africa through research, capacity building, implementation, and advocacy. We have a special emphasis on underserved populations and populations in crisis, and on improving equity and social justice in healthcare systems.

Our objectives

- Lead an academic programme to build surgical leadership in Africa and internationally.
- Advance social justice through advocacy for accessible surgical care and implementation.
- Promote a comprehensive and cost-effective approach to surgical care.

Where we are based

Through a multidisciplinary effort, the Division of Global Surgery was established as a new discipline at the University of Cape Town (UCT) in July 2019, and formally established as a Division in the Department of Surgery in the Faculty of Health Sciences in 2020.

UCT is the highest-ranking university for scientific productivity in South Africa and the highest-ranking African university in the Times Higher Education (THE) World University Rankings, Quacquarelli Symonds (QS) World University Rankings and the Shanghai Jiao Tong Academic Ranking of World Universities. The Faculty of Health Sciences has been consistently ranked in the world top 100 in the World University Rankings for medicine, public health and, clinical, preclinical and health categories.

The Faculty of Health Sciences is the oldest medical school in sub-Saharan Africa and has built a reputation for distinction in teaching, training, service, and cutting-edge research. The Faculty has signed contracts valued at R1,5 billion in 2021 reflecting 71.9% of UCT total value in 2021. The Faculty of Health Sciences researchers produced 2101 articles in accredited journals (46% of UCT's accredited journal outputs) in 2021.

Why is Global Surgery research essential in Africa?

Global Surgery Research is concerned with the role of surgery in addressing the priorities of the:

- Sustainable Development Goals (SDGs) (ref 3), with due consideration of the ripple effect of SDG #3 on other goals,
- Social Determinants of Health,
- Indicators of the Lancet Commission of Global Surgery, and the delivery of the Bellwether surgical procedures for safe and affordable surgery for all, (ref 2) while acknowledging the patient as the centre of the research, and
- National and Local Government objectives to improve health and wellbeing of their peoples.

Surgery accounts for approximately one third of population health requirements. While surgery is a necessary healthcare intervention, more deaths follow surgery than deaths from HIV, TB and malaria combined (ref 1). In low- and middle-income countries, especially in Africa, where the surgical needs are higher, the risk of surgical complications is also comparably higher. It is estimated that approximately 95% of the population do not have access to safe and affordable surgery (ref 2). There is an urgent need to make surgery safe and affordable in Africa.

What do we have to offer the global research agenda?

The problem

Surgery in Africa is neither safe, accessible nor affordable for all (ref 2). Furthermore, the outcomes following surgery are poor with postoperative mortality twice that of the global average (ref 4). There are several factors contributing to the increased mortality. These include the epidemiology of the changing burden of disease, and limited resources to provide surgical care, including a limited workforce, facilities and procedures (ref 4). The surgical system is poorly coordinated in both the public and private sectors with dysfunctional surgical pathways. In this austere environment, it is unsurprising that the quality of care is poor (ref 5). To improve surgical outcomes, we must increase and capacitate the surgical workforce including growing the role of nurses in surgical care and focussing on appropriate surgical delivery at the district hospital level (ref 6).

The solution

The Division of Global Surgery acknowledges several strategic advantages to research conducted in the local environment. These include:

- Local context-specific clinical expertise and well-established clinical researchers.
- Access to the clinical platform in the Western Cape and South Africa more broadly.
- Building on already-established links to facility, district and provincial health management authorities, in anticipation of scaling these relationships to both national and regional levels.
- A collaborative research network across Africa; the African Perioperative Research Group (APORG).
- The integration of the four clusters of the Division (Education, Research, Implementation, Advocacy) into a single vision and mission statement, supporting a scope of work that creates an ideal environment for high impact interdisciplinary and transdisciplinary research.
- The development of research capacity within Africa through a well-structured research and education programme.

Research within the Division of Global Surgery leverages local expertise and an established African research collaborative (APORG) to conduct world class, impactful research (Refs 4,7,8). Based within a leading research university, we are well-placed to address the surgical population health priorities across the continent.

The various clusters of the Division allow for research knowledge translation through the education and implementation clusters. The advocacy cluster allows for a drive to policy initiatives to establish surgical health within the national and international health programmes, and engagement with communities on research that is both locally relevant and applicable.

Our research framework

We acknowledge that research is an important, yet scarce resource, especially in the African environment. For this reason, we will ensure that the research is impactful through a deliberate approach of research prioritisation, in alignment with UCT's Vision 2030.

We have agreed that for research to be prioritised, it needs to fulfil most, if not all, of the following requirements:

- Would the surgical benefits be widespread and significant to vulnerable populations, and advance equity and social justice?
- Would the research increase the evidence-base for high-quality, low-cost, surgical systems?
- Are we using a research methodology which is ethical, robust and efficient?
- Would we be best placed to undertake this research, based on our context and skill set?
- Would the research advance the SDGs, and UCT's Vision 2030?

We acknowledge that excellent research is built upon rigorous methodologies, and the critical role that innovation may play in leap frogging barriers to quality surgical care and producing surgical techniques and technologies suitable for low resource settings.

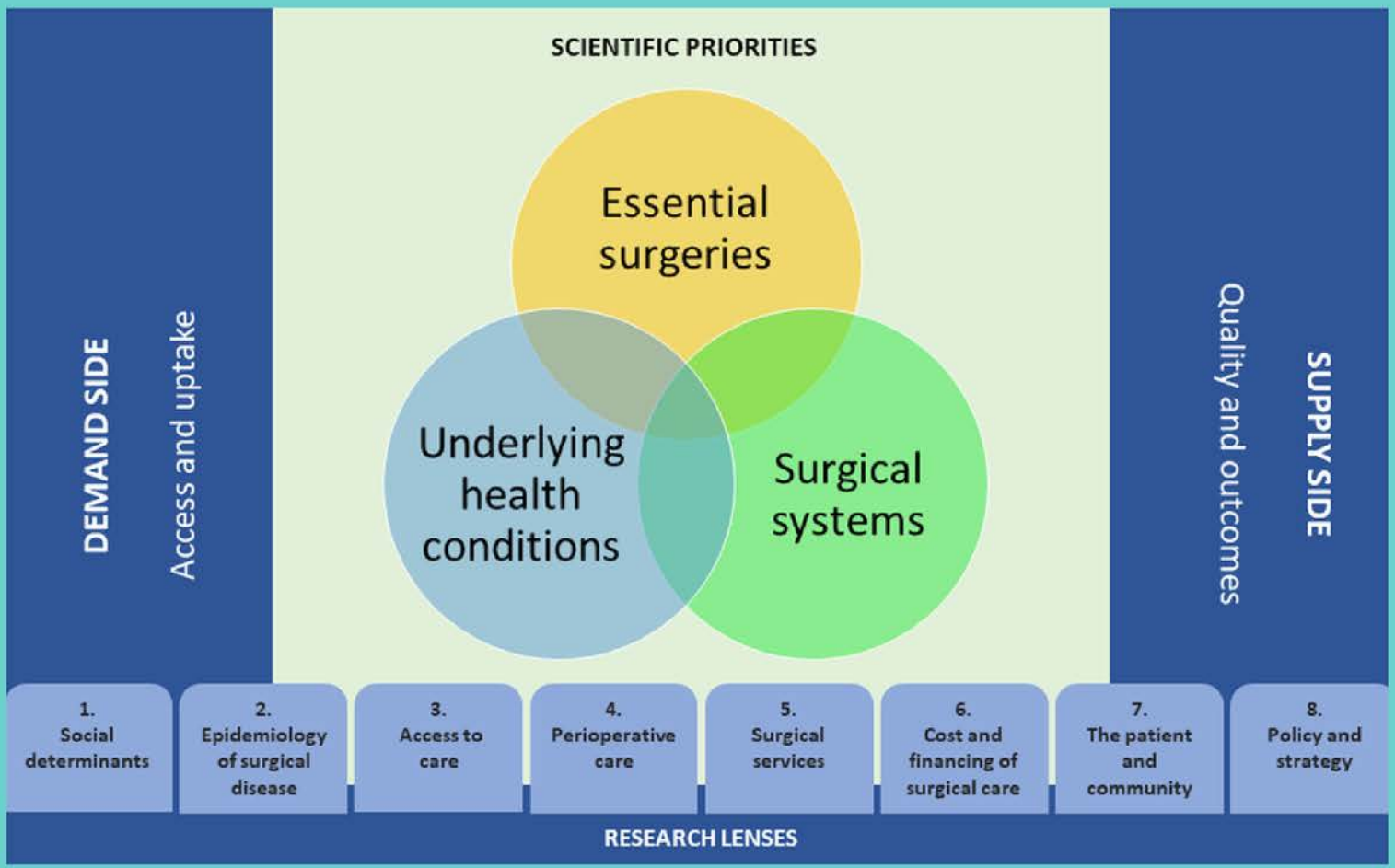
Our interdisciplinary network of researchers uses diverse methodologies across medical, physical and social sciences to address research objectives. This strategy is built on the assumption that global surgery research should be needs-driven and solutions-oriented, and that research questions and findings should be ideally co-produced with potential users, building their capacity in the process.

These prioritisation criteria are underpinned by a Research Framework which follows a pathway of evidence generation based upon three principles:

- What is the state of the current surgical environment?
- How can we optimise the conditions for surgery in this environment?
- How can we best bring about systemic change to embed surgical therapies for universal healthcare in the healthcare system?

The Research Framework illustrates the tension between the demand for surgery and the ability to supply quality surgical services through the two pillars. It demonstrates the continuum of surgical care (and associated research) from access to policy through the research lenses. Finally, it articulates the scientific priorities of the Division of Global Surgery relevant to South Africa and Africa, recognising the underlying health conditions of the patients, the essential surgeries needed, and the surgical systems.

Research Framework



Two research pillars

The pillars of access and uptake, and quality and outcomes have been identified as drivers of surgical health, reflecting the tension between the demand for surgical care, and the quality of the care delivered. These are balanced between:

- the social determinants of health and access, and
- barriers to quality healthcare, including but not limited to infrastructure, resources, and skills.

These pillars acknowledge the dynamic context and environment in which the surgical health is delivered.

The research lenses

Understanding and improving surgical health is dependent on several contexts and disciplines. We have described these as research lenses which track surgical disease across the spectrum from the need for surgical care to a conclusion where known efficacious interventions are embedded in policy. Any research question straddles many, if not nearly all the research lenses. These lenses and their associated priority questions are unpacked in this research strategy.

Our scientific priorities

The scientific priorities were identified through the need to address the disease priorities of the Theory of Change of the Division, the need to provide essential surgery in low- and middle-income countries and the need to strengthen the surgical systems providing care in this environment. The scientific priorities acknowledge the role that the epidemiological transition of the underlying medical conditions play in adverse outcomes in the African context, especially in an environment characterised by poor primary health care.

Our scientific priorities

1 SURGICAL SYSTEMS

The challenges facing systems for surgical delivery in an African context require further research to develop a clear understanding on which to base cost effective solutions. Priorities include capacitating district hospitals to provide surgical services (ref 6), strengthening the role of community surgical education (ref 9), capacitating nursing surgical care (ref 9), appropriate surgical referral (ref 2), and improving the quality of surgical care (ref 7).

2 ESSENTIAL SURGERIES

Through the work we've already conducted in this environment, we have identified the following surgeries as essential to advance safe surgery in a resource-limited environment:

- Appendicectomy (ref 10),
- Emergency laparotomy (ref 2),
- Salpingectomy for ectopic pregnancy (ref 11),
- Surgery for trauma due to injuries and violence (including gun violence, and drug and alcohol abuse-related trauma and injury) (ref 12),
- Caesarean section (maternal mortality is up to 50x higher than high-income countries) (ref 13),
- Paediatric surgery, including congenital issues (paediatric mortality is up to 10x higher than high-income countries) (ref 14),
- Neglected subspeciality surgeries (ref 15), and
- Cancer surgery, as a result of rising non-communicable diseases (ref 16).

3 UNDERLYING MEDICAL CONDITIONS

The burden of the following diseases is rising in resource-limited environments, and adversely affect surgical outcomes, and are therefore prioritised:

- Cardiovascular disease,
- Diabetes,
- Obesity, and
- Hypertension (ref 17).

Furthermore, HIV is prioritised due to the substantial burden in our environment, and the potential impact on surgical outcomes.

This research strategy has been developed with an eye on the 2030 targets. However, this Research Framework reflects our responses to a dynamic, changing outside world with all its complexities, and we recognise that the strategy may change with the assimilation of evidence, and changes in the surgical environment before 2030.

Our priority research questions

through eight research lenses

Through an interdisciplinary and collaborative process, we have identified specific priority research areas and questions. While we acknowledge that all research questions cover a number of research lenses, we have framed our research priorities according to the primary research lens below, in order to promote an understanding of the specific research questions in each category.

1. Social Determinants of Health

What are the social determinants of surgical health?

While the social determinants of other diseases are well described, there is a greater need to understand the determinants of surgical pathologies. Due to the low volume of surgical care in low resource environments (ref 18), this is a relatively neglected area of research for some surgical pathologies, particularly in under-represented or neglected surgeries.

Prioritised 'Social determinants' research questions:

- What are the social determinants to accessing surgical care?
  - What aspects of economic stability, neighbourhood and built environment, social and community context, education access and quality, shape access to surgical care?
- What are the evolving vulnerabilities to surgical health?
- What socioeconomic factors result in increased burden of surgical disease?
  - What is the role of firearm injuries, drug and alcohol abuse and interpersonal violence in the burden of surgical disease?
  - What is the role of food security and nutrition in non-communicable diseases?
- How do specific vulnerable populations experience surgical care?
- How can we positively impact on the social determinants of health to improve surgical health?
  - What interventions can be implemented to prevent surgical conditions?

2. Epidemiology of surgical disease

What is the burden of surgical disease?

While we have conducted important work on the epidemiology of surgical disease in Africa (ref 4) we acknowledge that the granular detail needed to understand and manage surgical disease in our environment is limited. It is therefore important to ensure we adequately understand the surgical indicators in our environment (ref 19), and their associated outcomes.

Prioritised 'Epidemiology of surgical disease' research questions:

- What is the burden of surgical disease?
  - What surgical procedures are being performed (time; place; person)?
  - What is the greatest unmet surgical need in terms of volume and impact?
- What are the outcomes of surgeries regarding mortality, disability, complications, and quality of life?
- What is the epidemiology of surgical complications?
  - What is the association between non-communicable diseases and surgical complications?
  - What is the association between infectious diseases and surgical complications?

Useful definition

Social Determinants of Health: The social determinants of health (SDH) are the non-medical factors that influence health outcomes. They are the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life.

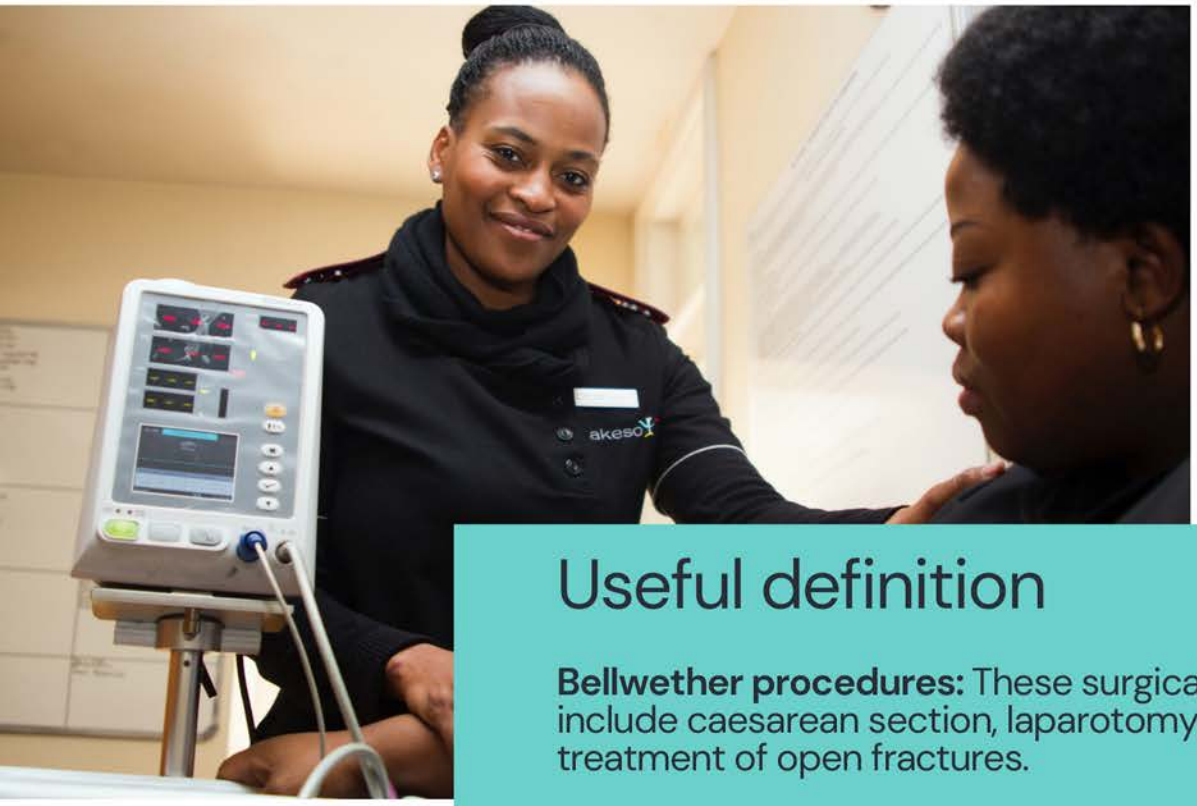
3. Access to Care

How do we increase access to surgical care?

It is well known that the delivery of surgical care is limited in low resource environments (ref 18). It is a priority to ensure that we increase access to surgery if we want to improve surgical health. These are the specific research questions which will help understand this problem and increase access to surgical care.

Prioritised 'Access to care' research questions:

- What surgical services are available?
  - What is the geographic availability of surgical facilities and services?
  - When and who provides these surgical services?
- What barriers exist to accessing surgical care?
  - What are the reasons for patients not making the decision to seek care or not being aware of the option to seek care?
  - What health-related resource constraints make accessing care difficult?
  - What factors determine the decision to refer or operate?
    - What are the perspectives of healthcare workers on disease?
    - What are the perspectives of healthcare workers on surgery?
- How can we increase patient access to surgeries?
  - What are the existing referral pathways and how can we strengthen them?
    - What are the barriers to accessing surgical care?
    - What is the experience of clinicians of the referral pathway?
    - What is the experience of the patients of the referral pathway?



Useful definition

Bellwether procedures: These surgical procedures include caesarean section, laparotomy, and surgical treatment of open fractures.

4. Perioperative care

What perioperative interventions improve patient outcomes?

Perioperative care is essential to ensuring the quality of surgical care provided. This is particularly important as almost all the morbidity follows surgery (and is not in the operating room) (ref 19). There is a clear indication that due to poor primary care, it is important to improve the patient's risk profile prior to surgery in our context (ref 20).

Prioritised 'Perioperative care' research questions:

- What is the current state of perioperative care?
  - What is essential perioperative care?
  - What perioperative care is currently available for elective and emergency surgery?
- What are the barriers and enablers of quality perioperative care?
- How can we implement quality, evidence-based perioperative care?
  - What preoperative strategies can we implement to improve perioperative care?
  - What are the perioperative care pathways that can improve patient outcomes?
  - How can we improve post operative care and detect and manage deteriorating surgical patients?

Useful definition

Comprehensive surgical care: Comprehensive surgical care spans the full patient experience, from diagnosis and referral, through surgery, to post-surgical care in hospital and ongoing rehabilitation.

5. Surgical services

What are the current and required characteristics of the surgical services available for safe surgical care at facility level?

The current surgical system is dysfunctional due to the inability to provide appropriate surgical care at each level of the surgical pathway (ref 2). If we are to improve surgical care, we have to ensure that surgical care is delivered at the appropriate level in the surgical pathway. These research questions support this need.

Prioritised 'Surgical services' research questions:

- What is the state of current surgical services?
- What surgical services are needed to meet the needs of the population (appropriate minimum requirements in terms of human resources; service delivery; infrastructure; technology; information systems; governance; finance)?
- What are the human resources needed for surgery?
  - What are the training needs of the surgical workforce?
  - What are the barriers to expanding the surgical workforce, particularly nursing workforce?
- What are the barriers and enablers to providing quality surgical services?
- How can we improve the quality and outcomes of surgical services?

Useful definition

African Perioperative Research Group (APORG): A research network which spans more than 40 African countries representing over 700 hospitals and nearly 2000 clinician investigators.

6. Cost and financing of surgical care

What are the costs of surgeries for patients and health care providers?

Cost and finance are a significant barrier to accessing surgical care. In sub-Saharan Africa there is good data supporting health spending which is wasteful and inefficient (ref 21). Furthermore, the costs of accessing surgeries by patients are often prohibitive in this environment (ref 22). Decreasing the costs of surgical care is important to improving access to quality surgical care.

Prioritised 'Cost and financing of surgical care' research questions:

- What are the current financial impacts of surgery?
  - What are the direct and indirect costs of surgery to patients and communities?
  - What are the direct and indirect benefits of surgery to patients and communities?
  - What are the costs of surgical procedures in state facilities?
  - What is the cost of a poorly functioning clinical service at an individual, facility, and system level?
  - What is the cost of well-functioning clinical surgical service?
- What are the barriers and enablers to cost effective surgical care?
- What are the strategies needed to provide cost effective surgical care?

Useful definition

Sustainable Development Goals (SDGs): The Sustainable Development Goals are a universal call to action to end poverty, protect the planet and improve the lives and prospects of everyone, everywhere. The 17 Goals were adopted by all UN Member States in 2015, as part of the 2030 Agenda for Sustainable Development which set out a 15-year plan to achieve the Goals.

7. The patient and community

What best supports a patient's understanding of the need for surgical health?

There is almost no work on the patient's perspective and understanding of surgical health, and the role patients can play in optimising their surgical health. This is a neglected area which requires urgent attention. It is critical to take patient and community experiences and understandings of surgical care into account to ensure that needs are met, expectations are managed and that barriers to access and uptake are considered in the design of surgical services.

Prioritised 'Patient and community' research questions:

- What are the community perspectives and understanding of comprehensive surgical care?
  - What are community priorities for surgical care?
  - What are the communities' perspectives on risks and benefits of surgical care?
- What are the patient experiences and understanding of comprehensive surgical care?
  - What are the patient perspectives and experience of the care they have received?
  - What is the patient's understanding of disease and/or surgical conditions?
  - What is the patient's understanding of surgical risks and/or surgical benefits?
  - What is the health seeking behaviour (acceptability)?
- What patient and community interventions can improve the interface between communities, patients, and the surgical health system?

8. Policy and strategy

What policies and strategies are needed to support essential surgical care?

To be socially impactful, Global Surgery research should ideally feed directly into knowledge translation and policy implementation (ref 23). To ensure a high return on health outcomes based on our research, we have prioritised an understanding of strategies and policies to embed good surgical practices in national policies.

Prioritised 'Policy and strategy' research questions:

- What is the policy implementation gap in relation to surgical care?
- What national and subnational policies and strategies need to be developed to improve comprehensive surgical care?
- What are the clinical governance structures and processes necessary for the delivery of high-quality surgical services?
- What are the policy discrepancies across the continent that speak to surgical care?
- What are the national indicators of surgical conditions, and what is our progress towards achieving them?
- How can research institutions best partner with local and national governments to sustainably improve the quality of surgical services in Africa?

Useful definition

Vulnerability: There are aspects of a person's identity, life or lifestyle that may render them vulnerable to being disadvantaged in accessing quality surgical care. These include, but are not limited to: race, gender identity, sexual orientation, age (in particular the young or elderly), economic status, psychological capacity/psychiatric disease, language, refugee status, homelessness, patients with rare diseases and geographical situation (rural vs urban).

Conclusion

This Research Strategy document provides the background to the need for impactful surgical research in Africa to improve population health, the justification for how to prioritise surgical research in our environment, what we consider scientific priorities in Africa, and finally specific research questions that should be addressed within our environment. The Research Strategy provides a guide to members, partners and funders as we move forward collaboratively, towards achieving our vision of a world in which everyone has access to comprehensive, quality surgical care.

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