

## RESEARCH

# Global surgery in Africa: Access to surgery, an opportunity to adopt a participatory community-based approach

M Isiagi,<sup>1,2</sup> MSc(Med), BSc(Hons) Sport sci, BSc(Hons) Med ; S Maswime,<sup>1,2</sup> MBChB, FCOG(SA), MMED, PhD ; K Okop,<sup>3,4</sup> PhD, MPH 

<sup>1</sup> Department of Surgery, Division of Global Surgery, Faculty of Health Sciences, University of Cape Town, South Africa

<sup>2</sup> World Health Organization Collaborating Center on Integrated Clinical Care, University of Cape Town, South Africa

<sup>3</sup> Department of Medicine, Faculty of Health Sciences, University of Cape Town, South Africa

<sup>4</sup> Department of Prevention and Evaluation, Leibniz Institute for Prevention Research and Epidemiology, BIPS, Bremen, Germany

**Corresponding author:** M Isiagi (moses.isiagi@uct.ac.za)

South Afr J Health P 2025;8(1):2539. <https://doi.org/10.7196/SHS.2025.v8i1.2539>

The burden of surgical conditions in Africa is enormous, with one million people urgently needing access to safe and timely surgery. Despite this, Africa has made significant progress in improving health care.<sup>[1]</sup> The Africa Health Strategy (2007 - 2015), prompted by the African Union's ministers of health, aimed to address preventable disease, disability and death in Africa while strengthening health systems for equity and development, especially for the most marginalised and displaced populations. The initiative aimed to align existing health strategies across the continent, acknowledge Regional Economic Communities (RECs) and member states, and encourage member states to enhance their health strategies based on specific challenges.<sup>[1]</sup> While this approach may have supported policy development, there remains a critical need for tangible evidence of positive health outcomes.<sup>[1]</sup>

Global Surgery, as an emerging discipline and science, plays a unique role in strengthening health systems to address the unmet need for access to care and quality surgical care.<sup>[2]</sup> It seeks to implement solutions for equitable access to surgical and transdisciplinary surgical care, ultimately strengthening surgical healthcare delivery systems.<sup>[2]</sup> To achieve this, approaches like Citizen Science should be adopted to facilitate equitable access more effectively and acceptably.

### Collaborative Citizen Science and community based participatory research

Citizen Science is a research method that enables community members to gather, analyse and use community level data to identify important issues that advocate for healthy living in their communities.<sup>[3]</sup> It can be categorised into three major levels: contributory, collaborative and co-created.<sup>[3]</sup>

1. **Contributory Citizen Science** involves data collection by the scientists and patient community.
2. **Collaborative Citizen Science** extends to involvement by the patient community in the data analysis.

3. **Co-created Citizen Science** furthers the involvement of the patient community by inviting them to define the problem in their terms, heeding their perspectives and translating the research findings into public health interventions.

Citizen Science aims to integrate community perspectives into the whole research process. A much-needed interrogation is required to understand the barriers to accessing surgical services. The important questions in Global Surgery are:

- Are surgical services accessible?
- Are the required surgical services available?
- Are surgical services affordable?
- Are surgical services acceptable to the population?

Through a Citizen Science approach, evidence is generated from the stakeholders who utilise the services, not only as research respondents but also as partners in co-designing, analysing and translating the data.

Citizen Science utilising the community based participatory approach known as the 'Our Voice' Initiative, has been used as a tool to explore barriers to accessing healthcare services and to enhance community participation in service delivery, especially in low-resource and rural environments where inequities are pronounced.<sup>[3-6]</sup> The *Our Voice* Citizen Science model is a valid initiative developed at Stanford University and has been adopted globally to support community based Citizen Science for health equity. It emphasises beneficiary participation throughout the research process to explore health-related issues within communities, facilitating engagement and advocacy for change.<sup>[4]</sup> At the forefront of Citizen Science is the community, defined as a group of people residing and interacting within a distinct area.<sup>[7]</sup> This concept is further stratified into the provider community and the patient community.<sup>[7]</sup>

The provider community is a complex system comprising specialist and non-specialist surgical and anaesthetic clinicians, nurses, mid-level providers, community health workers and cadres

instrumental in surgical care provision.<sup>[7]</sup> Adopting the 'Our Voice' Citizen Science for health equity has supported several research initiatives and interventions in disadvantaged settings globally and can be effectively applied to Global Surgery.<sup>[6]</sup>

Included in the provider communities are professional associations that represent the collective voices of surgical providers, amplifying the unified voices of the surgical providers. Conversely, the patient community – recurrently neglected in the research process – includes patients, their families, caregivers, community health workers, community health forum leaders or liaison officers and advocacy groups. Overall, the community is a place where researchers can draw on the perspectives and empirical knowledge about the community.<sup>[7]</sup> Citizen Science actively involves the community in the research process, enhancing healthcare delivery within that community. This participatory approach presents a valuable opportunity for Global Surgery researchers.

## Global Surgery through the lens of participatory Citizen Science – enhancing access to surgical services and technologies

Global Surgery interrogates the availability, affordability, acceptability and accessibility of surgical services. Meanwhile, Citizen Science emphasises a participatory approach that involves patients, volunteers, decision-makers and other stakeholders in co-creating context-based solutions that benefit society. Integrating core aspects of these two fields can reduce barriers associated with geographical accessibility such as subjective v. objective assessments of access to healthcare facilities, which is one of the six core global surgery indicators.<sup>[2]</sup> Africa can benefit significantly from the intersection between collaborative Citizen Science and Global Surgery.

Participatory citizen-engaged research can be adapted to support the goal of Global Surgery in enhancing equity access to timely, quality and affordable surgical services and care worldwide. Also, participatory Citizen Science emphasises robust engagement of multi-stakeholders including study participants, researchers and community-level stakeholders, the use of digital technology and mobile-based data collection, data analysis and knowledge co-creation for the co-development of suitable intervention(s) and advocating for a change at a community level. Participatory Citizen Science focuses on the for-the-people and by-the-people models to achieve engagement for sustainable research and intervention adoption and use. Conventional science treats participatory research differently. Evidence has shown that in recent years, participatory Citizen Science, leveraging the *Our Voice* model, has been utilised to innovatively co-design and implement over 100 population-based research projects and interventions in poor and disadvantaged settings, with good results.<sup>[6]</sup>

A participatory community based approach is crucial for improving equitable access to surgery and care in poor and disadvantaged settings. Global Surgery is strategically placed to support the adoption of co-developed research and interventions by engaging communities, health workers, relevant stakeholders and researchers throughout the planning, implementation and evaluation stages.

## The Three Delays Framework

The 'Three Delays Framework' includes delays in seeking care, reaching a health facility and receiving appropriate care. Understanding the context in which healthcare is delivered introduces the geographical determinants of health and provides more insight into the disparities in health outcomes across different geographical regions. A much-needed approach to understanding the reasons for adverse surgical outcomes and the complexities associated with surgical services across regions.

## Opportunities for Citizen Science in Africa in the surgical spaces

Citizen Science leverages robust engagement and co-creation approaches that have the potential to bring about acceptable, sustainable and scalable strategies for low-resourced settings in Africa. The following are ways Citizen Science can be used in Global Surgery:

### Promoting community engagement

**Community involvement:** The patient community can be encouraged to actively participate in the design and execution of Global Surgery research, advocacy, implementation and education initiatives.<sup>[3]</sup> Community healthcare workers, community health forums and first aid responders are integral to advancing access to primary surgical care within the Global Surgery framework. Community health workers (CHWs) play a crucial role in addressing the specific needs of communities through their impactful services, including health promotion, disease prevention and post-discharge follow-up care.<sup>[8]</sup> They are integrated within the cultural, geographical and healthcare systems, providing essential support for health and wellness. Both paid and volunteer CHWs bring valuable expertise and training, significantly improving community well-being.<sup>[8]</sup>

**Capacity building:** Training and capacity building programmes can be implemented to empower the patient community with essential skills in research, health education, health promotion and basic emergency care. The skills would be invaluable to CHWs, first aid responders, and health forum leaders, who are often the first contact person in times of emergency.

**Funding and sustainability:** Participating in Citizen Science projects can facilitate securing funding from a variety of sources including non-governmental organisations (NGOs), the private sector and international funders. Many NGOs are open to funding projects that align with their missions and often provide grants or other forms of financial support. Companies in the private sector especially the health sector may also fund Citizen Science projects as part of their corporate/social responsibility initiatives. International funders usually offer grants for projects that address global challenges in public health.<sup>[3,9]</sup>

We recommend Citizen Science as a valuable approach to Global Surgery research. This approach can help practitioners understand and develop approaches and strategies to improve surgical health and delivery systems, particularly in Africa.

**Declaration.** None.

**Acknowledgements.** We would like to thank the South African Medical Research Council, the Division of Global Surgery and the Department of Medicine UCT.

**Author contributions.** MI conceptualised the study and contributed to the investigation, data curation, methodology, data analysis, original draft preparation and write-up, formal analysis and software validation. KOJ was involved in writing the review, investigation, formal analysis, data curation, revising the original draft critically for important intellectual content and approving the version to be published. SM contributed to conceptualisation, review and editing, resource allocation in the form of funds, transport, final draft preparation and writing of the original draft.

**Funding.** This study was funded, in part, by the South African Medical Research Council (SAMRC) Mid-Career Scientist grant (grant number MRC-MCRFC), through its Division of Research Capacity Development from funding received from the Public Health Enhancement Fund/South African National Department of Health. The content hereof is the sole responsibility of the authors and does not necessarily represent the official views of the SAMRC.

**Data availability statement.** Not applicable.

**Conflicts of interest.** None.

1. African Union. Third session of the African Union Conference of Ministers of Health Johannesburg, South Africa. Africa Health Strategy 2007 - 2015. 2007;5(April 2007):1-25. [https://healthresearchwebafrica.org.za/files/AFRICA\\_HEALTH\\_STRATEGY\\_FINAL.pdf](https://healthresearchwebafrica.org.za/files/AFRICA_HEALTH_STRATEGY_FINAL.pdf)
2. Meara JG, Greenberg SLM. The Lancet Commission on global surgery global surgery 2030: Evidence and solutions for achieving health, welfare and economic development. Surg 2015;157(5):834-835. [https://doi.org/10.1016/S0140-6736\(15\)60160-X](https://doi.org/10.1016/S0140-6736(15)60160-X)
3. Okop KJ, Murphy K, Lambert EV, et al. Community-driven citizen science approach to explore cardiovascular disease risk perception, and develop prevention advocacy strategies in sub-Saharan Africa: A programme protocol. Res Involv Engagem 2021;7(1):1-14. <https://doi.org/10.1186/s40900-020-00246-x>
4. King AC, Winter SJ, Chrisinger BW, Hua J, Banchoff AW. Maximizing the promise of citizen science to advance health and prevent disease. Prev Med 2019;119(December 2018):44-47. <https://doi.org/10.1016/j.ypmed.2018.12.016>
5. Longworth GR, Erikowa-Orighoye O, Anioto EM, et al. Conducting co-creation for public health in low and middle-income countries: A systematic review and key informant perspectives on implementation barriers and facilitators. Glob Health 2024;20(1):1-18. <https://doi.org/10.1186/s12992-024-01014-2>
6. Pedersen M, Wood GER, Fernes PK, Goldman Rosas L, Banchoff A, King AC. The "Our Voice" method: Participatory action citizen science research to advance behavioral health and health equity outcomes. Int J Environ Res Pub Health 2022;19(14773):1-16. <https://doi.org/10.3390/ijerph192214773>
7. Bust L, Ambrosio LD, Gajewski J, Chu K. We asked the experts: Community participation in global surgery research. World J Surg 2023;47(3):578-580. <https://doi.org/10.1007/s00268-022-06801-9>
8. Scott K, Beckham SW, Gross M, et al. What do we know about community-based health worker programs? A systematic review of existing reviews on community health workers. Hum Resour Health 2018 Aug 16;16(1):1-7. <https://doi.org/10.1186/s12960-018-0304-x>
9. Rosas LG, Espinosa PR, Jimenez FM, King AC. The role of citizen science in promoting health equity. Annual Rev Pub Health 2022;47(1):215-234 <https://doi.org/10.1146/annurev-publhealth-090419-102856>

*Received 15 August 2024. Accepted 2 December 2024.*