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Special Article

SPECIAL ARTICLE

Barriers to clinical research in Africa: a quantitative and qualitative survey of clinical researchers in 27 African countries

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Abstract

Background: There is a need for high quality research to improve perioperative patient care in Africa. The aim of this study was to understand the particular barriers to clinical research in this environment.
Methods: We conducted an electronic survey of African Surgical Outcomes Study (ASOS) investigators, including 29 quantitative Likert scale questions and eight qualitative questions with subsequent thematic analysis. Protocol compliant and non-compliant countries were compared according to WHO statistics for research and development, health workforce data, and world internet statistics.
Results: Responses were received from 134/418 of invited researchers in 24/25 (96%) of participating countries, and three non-participating countries. Barriers included lack of a dedicated research team (47.7%), reliable internet access (32.6%), staff skilled in research (31.8%), and team commitment (23.8%). Protocol compliant countries had significantly more physicians per 1000 population (4 *vs* 0.9, $P<0.01$), internet penetration (38% *vs* 28%, $P=0.01$) and published clinical trials (1461 *vs* 208, $P<0.01$) compared with non-compliant countries. Facilitators of research included establishing a research culture (86.9%), simple data collection tools (80%), and ASOS team interaction (77.9%). Most participants are interested in future research (93.8%). Qualitative data reiterated human resource, financial resource, and regulatory barriers. However, the desire to contribute to an African collaboration producing relevant data to improve patient outcomes was expressed strongly by ASOS investigators.
Conclusions: Barriers to successful participation in ASOS related to resource limitations and not motivation of the clinician investigators. Practical solutions to individual barriers may increase the success of multi-centre perioperative research in Africa.

Keywords: Africa; biomedical research; research personnel; surveys and questionnaires

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Editor's key points

- Barriers to clinical research participation in Africa were studied by an electronic survey of 27 countries.
- Absence of a skilled research team was the most important barrier to collaborative research participation in Africa, while lack of resources and reliable internet and regulatory barriers were also important.
- A desire to establish a research culture, use of simple data collection tools, and interaction with the African Surgical Outcomes Study (ASOS) research team were considered facilitators of collaborative research.

It is estimated that about 95% of Africans, or 1.1 billion people, do not have access to safe and affordable surgery.[1] Perioperative research is therefore urgently needed to guide improvements in delivery of this essential service.[2] However, African researchers contributed only 1% to global clinical medical publications between 2004 and 2008, nearly half of which were produced by South Africa.[3] The African environment has been labelled as non-conducive to research,[4] yet many of these challenges have not been formally explored. Through an improved understanding of the African research environment, potential international collaborative research to develop healthcare may be better harnessed.[4,5]

The African Surgical Outcomes Study (ASOS)[2] (ClinicalTrials.gov NCT03044899) was a large, multinational African collaborative study. Using the International Surgical Outcomes Study methodology,[6] perioperative outcomes were assessed in 25 African countries. The ASOS National Leaders accepted an agreement with the ASOS principal investigators to provide country data from a minimum of 10 surgical centres, and data on >90% of eligible patients for every participating hospital. However, despite this formal agreement, only 11/25 countries (44%) fulfilled the protocol data requirements, suggesting that these requirements were overly demanding for the African research environment. In addition, some countries failed to participate in ASOS despite prior national leader agreements to do so.

The reasons for country non-participation in ASOS and protocol data non-compliance are unknown. Our hypothesis is that there were important barriers to research participation and protocol compliance in ASOS. The aims of this study were to quantify and describe: (i) barriers, and (ii) facilitators of research participation encountered by ASOS investigators, and (iii) factors that would ensure future research participation in Africa.

Methods

This study was approved by the University of Cape Town Faculty of Health Sciences Human Research Ethics Committee on November 8, 2016 (HREC REF: 799/2016).

Data collection

This survey (see Supplementary material) was developed through a literature review of the African research environment and factors previously identified internationally to be associated with research productivity. As the literature was sparse, we proposed potential barriers through our experience conducting ASOS. In order to identify other previously unrecognised barriers, we specifically allowed for free-text responses. The survey was not piloted. The digital survey was distributed in English and French to 418 researchers originally approached for participation in ASOS. All participants provided explicit informed consent. Twenty-nine questions with 5-point Likert scales were used to quantitatively evaluate possible barriers and facilitators to research in Africa as informed by the ASOS experience. Eight free-text questions offered opportunities for elaboration and were evaluated qualitatively. Data collection was conducted between November 29, 2016 and April 2, 2017 with weekly email reminders to non-responders. Safe Surgery South Africa (SSSA) hosted the Research Electronic Data Capture System (REDCap)[7] platform and coordinated electronic distribution and data monitoring. Access to data was limited to the investigators and platform administrator. Investigators were blinded to the respondents, but the platform administrator was unblinded to facilitate survey follow-up.

Statistical analysis

Quantitative responses were graded on a Likert scale. We created a dichotomous variable to present the overall agreement with each statement, by amalgamating 'agree' and 'strongly agree'; and amalgamating 'neutral', 'disagree', and 'strongly disagree'. Categorical variables were described as proportions and compared using χ^2 tests, Fisher's exact tests, and Pearson's χ^2 tests, as appropriate. Continuous variables were described as mean and standard deviation if normally distributed or median and inter-quartile range if non-normally distributed. Comparisons of continuous variables between groups were performed using unpaired *t*-tests or Mann–Whitney *U*-tests as appropriate. The 95% confidence intervals are reported for quantitative data.

ASOS protocol compliant and non-compliant country data were compared according to WHO statistics for research and development,[8] WHO global health workforce data,[9] and world internet statistics.[10]

All free-text responses were analysed thematically. Two investigators (A.C. and R.D.) worked independently to familiarise themselves with the data-set before initial coding. Coded data were analysed inductively to extract initial themes. Through consensus, initial themes were refined and collated to create a coherent description of the central message of the data. The emergent themes from the thematic analysis were then integrated with the proposed themes identified by the ASOS authors that had already been examined in the quantitative questions of the survey. This produced a richer understanding of the barriers and facilitators that were already suggested, but also identified and explored several new themes not previously identified. By consensus, representative extracts from the data were selected for inclusion in the report.

We have not reported the country of origin of data to protect the identity of our respondents.

Results

A total of 184 (44.0%) responses (137 English and 47 French) were received from the 418 researchers originally invited to