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Guide to research in academic global surgery: A statement of the Society of University Surgeons Global Academic Surgery Committee

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ABSTRACT

Global surgery is an emerging academic discipline that is developing in tandem with numerous policy and advocacy initiatives. In this regard, academic global surgery will be crucial for measuring the progress toward improving surgical care worldwide. However, as a nascent academic discipline, there must be rigorous standards for the quality of work that emerges from this field. In this white paper, which reflects the opinion of the Global Academic Surgery Committee of the Society for University Surgeons, we discuss the importance of research in global surgery, the methodologies that can be used in such research, and the challenges and benefits associated with carrying out this research. In each of these topics, we draw on existing examples from the literature to demonstrate our points. We conclude with a call for continued, high-quality research that will strengthen the discipline's academic standing and help us move toward improved access to and quality of surgical care worldwide.

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The first 3 months of 2017 saw >5,000 “#globalsurgery” tweets and >12 million impressions: a phenomenon that was unimaginable just a few years ago. The excitement behind the burgeoning field, clearly manifest on social media, is also seen among academic surgeons. Today, global surgery as an academic discipline is building upon the previous humanitarian efforts of surgeons and

is pivoting toward research on how to improve surgical care for patients in resource-constrained environments worldwide.

Academic global surgery is developing in tandem with numerous policy and advocacy initiatives that are occurring in the field. A report from the Lancet Commission on Global Surgery¹ and the World Bank's Disease Control Priority, third edition,² summarized the state of global surgical care and placed surgery squarely in the global health agenda. The World Health Assembly resolution 68.15 toward “strengthening emergency and essential surgery as a part of universal health coverage” brought political clout to the table. The founding of the G4 Alliance to build “political priority for surgical, obstetric, trauma and anesthesia care” created a unified voice for advocacy in global surgery.³ With this surging momentum toward improving surgical care worldwide, academic global surgery will serve as barometer for measuring the progress that is made while also helping identify innovative new approaches to improving care.

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However, as a nascent discipline, there must be rigorous standards for the quality of work that emerges from academic global surgery. Thus far, the field has been dominated by descriptive approach to research. In recent years, however, there has been a call for improving the scientific standards for research in the discipline.⁴ The purpose of this white paper is to respond to these calls by providing rationales for the importance of research in global surgery and discussing the types of research that are needed. To do so, we draw on examples of strong research methodology from global health research. Additionally, we discuss the unique aspects of global surgery that can make academic research both challenging and rewarding for this new discipline.

Importance of Research

Where health services are scarce, the value of research is easy to overlook in favor of clinical care delivery. Providers may at times rely on good clinical initiatives and conventional wisdom, but in global health, we have seen such initiatives fail. In the first decade of the 2000s, the concept of the “sunk cost” effect was promoted to combat malaria. It was based on the idea that bed net utilization could be improved by charging users for bed-nets instead of giving them out for free. Cohen and Dupas, however, demonstrated that women receiving free nets were no less likely to use them than those who paid for them.⁵ A more recent study on bed-nets in Haiti, provided a starker challenge to the conventional wisdom about the protective benefits of bed nets.⁶ Steinhardt et al noted in the Caribbean and Latin America, people are more susceptible to mosquito bites during the day time than at night. As a result, they found that campaigns to distribute bed nets were ineffective at combating clinical malaria.

As in the case of bed-nets, assumptions about global surgical interventions must also be rigorously studied. For example, academic global surgeons must ask: Does providing more resources for surgery have the anticipated beneficial effect? Is the balance between costs, benefits and financial risk protection considered? Will the standards developed be maintained in a scalable and sustainable way? Is the proposed intervention valid for different settings? Answering these types of questions necessitates the collection and careful analysis of data. Strong global surgery research thus can move us beyond supposition and provide evidence to guide the development of interventions that are relevant to their setting and make the most of scarce resources.

Principles for Research in Global Surgery

The Lancet Commission on Global Surgery, published in May of 2015, is an expansive document that suggests numerous areas for future research in global surgery.¹ As in the commission report, we think it is critical that global surgery research questions be relevant to the population being studied. The principle of equity challenges investigators to study the burden of disease experienced by the population and, importantly, test interventions with contextual relevance to the research subjects.

At the level of the health-systems, research questions must be policy relevant. For example, a modelling study on road traffic injury prevention strategies in low and middle-income countries (LMICs) found that the most cost-effective strategies differed by subregion and provides implementable information to policy makers.⁷ Similarly, clinical research must also be locally and clinically relevant. A study of breast cancer in Ghana identified a high prevalence of hormone receptor-negative and triple-negative breast cancers and opened up debate on whether the biology of breast cancer and therapeutic approaches are universalizable.^{8,9}

A point that cannot be stressed enough for all research in global surgery is that the research must be carried out in partnership with

local researchers. Local academicians are vital to ensuring a beneficent, equitable, and high-quality research on relevant topics and this is best achieved through early and sustained engagement with local collaborators. Researchers from high-income countries may be able to provide technical and methodologic support; however, they are limited in truly understanding the context in which surgical care is delivered in LMICs. Local researchers, who may be limited by extremely high clinical demands, are best able identify study questions relevant to their practice and understand the context in which a study is being carried out. An example of a mutually beneficial partnership may be one in which a young surgeon from an LMIC completes academic requirements for entry into their national College through the support of partnering researchers from societies such as ours.

Additionally, local supervision of studies is essential while they are being conducted to ensure that the data obtained are high quality and that study protocols are followed. This includes local ethics committee supervision of studies to ensure that the research is in-line with the ethical standards of the community in which the research is conducted. It should be acknowledged that this article reflects the opinion of a committee based in North America, and thus the authorship is reflective of that. However, just as with global surgery research, committees such as ours would be well served by including members from LMIC.

Studies Designs for Global Surgery Research

The bar for high quality global surgery research should be as rigorous as for any other field. A relevant, hypothesis-driven study question should be identified and evaluated with the most rigorous design possible. Where applicable, reporting guidelines such as those collected by the Equator network (<http://www.equator-network.org>) should be followed. Here we consider a few study designs and provide examples that demonstrate the attributes of high-quality global surgery research. These examples are notable for identifying questions relevant to the population and using the strongest methodology possible. The examples provided also avoid some very common pitfalls. Notably, most of the study designs directly or indirectly measure the counterfactual (i.e., what would have happened in the case of no intervention). This is critical for understanding the true effect size of the intervention.

Of note, our examples are limited to quantitative research. Certainly, qualitative research and the growing field of implementation sciences have made very valuable contributions in terms of how we understand and approach problems. For the purposes of this article, however, we limit our examples to quantitative research.

Randomized controlled trials

The randomized controlled trial (RCT) has been held as the gold-standard research design. Despite numerous logistic, financial and technical challenges to carrying out such research, there are several examples of quality RCTs in global surgery. The CRASH-2 trial, published in 2010, evaluated the use of tranexamic acid in trauma patients across 20,000 patients in 40 countries, most of which were LMIC.¹⁰ While such large-scale trials require substantial funding, smaller RCTs focused on global surgery-specific questions also have been carried out. Meier and colleagues compared the use of soap with methylated spirit (alcohol) to povidone-iodine and demonstrated the efficacy of this cheaper skin-preparation in inguinal hernia repair.¹¹ More recently, Lofgren et al published a trial in which patients in Uganda were randomized to hernia repair with commercial mesh versus mesh made from mosquito net.¹² While these trials, such as others in high-income countries, are open to criticism, the latter, for example, has been criticized for being

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