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POLICY ARTICLE

Building the emergency care workforce in a low resource setting; The Seed Global Health experience in Uganda

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ABSTRACT

Introduction: Low- and middle-income countries (LMICs) face a disproportionate burden of diseases requiring emergency care. In Uganda, road traffic trauma in the context of rapid urbanization, particularly motorcycle accidents, accounts for 48% of medical emergencies. The burden of road traffic accidents, obstetric complications, and non-communicable diseases necessitate robust emergency care, yet Uganda faces systemic challenges in this sector. Following the 60th and 72nd sessions of the World Health Assembly that called for strengthened emergency, critical and operative care to achieve universal health coverage, Uganda committed to strengthening emergency medical services through taking key steps such as developing a national Emergency Medical Services (EMS) Policy. The EMS Policy outlined twelve key focus areas including development of human resources for emergency medical services, key among are emergency physicians. To support these efforts, Seed Global Health, the Ugandan Ministry of Health, Makerere University, and Mbarara University of Science and Technology partnered to strengthen the emergency medicine training between 2019 and 2024.

Methods: We conducted a desk review to evaluate the collaborative effort between Seed Global Health, Ministry of Health, Makerere University and Mbarara University of Science and Technology. We reviewed policy documents, health records, and program reports to assess initiatives by Seed Global Health that were focused on developing human resources for emergency medical services, including emergency physicians training, emergency nurses and the contributions of local and international faculty.

Results: The partnership between Seed Global Health, Ministry of Health, Mbarara University of Science and Technology and Makerere University successfully trained 21 new emergency physicians, with 43 more residents currently in training. It introduced essential clinical resources, enhancing diagnostic and treatment capacities for improved patient care while improving learning environments through skills laboratory support, simulation support and classroom equipment. Additionally, it supported the coordination of emergency services within emergency departments in hospitals as well as enhanced advocacy efforts to improving emergency care in Uganda. However, despite these tremendous milestones, challenges persist including a shortage of specialists relative to the high demand for services, a need for increased investment for emergency medical services and a need for better integration of emergency services within the healthcare system.

Conclusion: This article highlights the value of international collaborations, long term partnership and targeted training in addressing emergency care gaps in LMICs. We recommend expanding emergency medicine programs, increasing government investment in facilities and human resources, and strengthening interdisciplinary emergency response teams. These measures are essential for providing sustainable, quality emergency care to address Uganda's growing needs.

Keywords: Human Resources, Emergency Medical Services, Emergency Medicine, Partnership, Collaboration, Training

Introduction

The global burden of diseases requiring emergency response is disproportionately high in low and middle income countries (LMICs) contributing significantly to a preventably high mortality rate[1–4]. Timely management and prevention of urgent, life-threatening health conditions can minimize delays in diagnosis and treatment, improve access to care, and administer quality healthcare[4]. Over one-third of all deaths in LMICs are preventable with early intervention[1,4]. While high income countries have invested in robust emergency medical response and services, these systems are lacking in many other parts of the world including sub-Saharan Africa[5,6].

Uganda experiences a wide range of medical emergencies across all disease burdens. Road traffic trauma is a significant contributor, especially motorcycle accidents within rapidly urbanizing areas – these accidents account for 48% of medical emergencies[2,3]. Road traffic accidents in Uganda have a mortality rate of 217/100,000 and an injury disability prevalence proportion of 2800/100,000[7]. Furthermore, Uganda faces a high burden of obstetric and neonatal emergencies[8]. Approximately 16 maternal deaths occur daily, primarily due to postpartum hemorrhage (46%) and hypertensive disorders (11%)[8]. An estimated 40,000 stillbirths happen annually[8]. The rising incidence of non-communicable diseases, including cardiac disorders, diabetes, and sickle cell disease, further compounds the issue, leading to medical emergencies like strokes and cardiac arrests[8].

The 2014 Uganda Hospital and Health Centre IV Survey Report revealed major shortcomings in the capacity of hospitals and health centers to provide emergency services. Only 5% and 25% of these facilities were rated as having "very good" and "good" responsive capacity, respectively. The remaining facilities were classified as "moderate" (35%), "poor" (38%), and "very poor" (5%)[8]. The report also emphasized the scarcity of emergency care specialists[8].

In line with the 60th and 72nd sessions of the World Health Assembly resolutions 60.22 and 76.2[6] which called for timely additional efforts globally to strengthen the planning and provision of emergency, critical care and operative services as part of universal health coverage, Uganda committed to strengthening emergency care services through taking key steps such as developing a national Emergency Medical Services Policy. Launched in 2021 by the Ugandan Ministry of Health, the National Emergency Medical Services Policy outlined twelve key focus areas including development of human resources for emergency medical services. Enshrined in this is a strategy to train emergency specialists while improving rural coverage through targeted training for non-physician providers in identification and prompt management of emergencies[9].

In 2019, to help address this need, the Ministry of Health of Uganda partnered with Seed Global Health (Seed), a non-profit working in the country to train health workers, and the Ugandan universities, Makerere University and Mbarara University of Science and Technology to strengthen the emergency health workforce, practice and policy environment. Given the paucity of domestically trained emergency physicians, Seed sourced faculty internationally to teach for at least one academic year cycles at both

Makerere University and Mbarara University of Science and Technology. The program was supported by private philanthropy to cover salaries and programmatic investments. Graduates were hired by the Government of Uganda as faculty to continue to pipeline of teaching. When the public budgets could not cover all the graduates, Seed supported the faculty positions to help cement progress and support the learning environment and teaching resources.

This article takes the form of a policy review and highlights the challenges, successes and opportunities of the joint program to address the emergency needs in the country.

Methods

STUDY DESIGN:

We conducted a desk review to evaluate the collaborative efforts of Seed, the Government of Uganda, and two Ugandan universities. Our focus was on their work to enhance emergency medical services in the country through the development of human resources for emergency medical services. The study team specifically examined initiatives undertaken, achievements made, and challenges encountered within the period of 2019 to 2024.

Data Sources:

The study team reviewed data from all partners and both public and private sources to ensure comprehensive coverage and accuracy:

Policy Documents and National Health Records: The study team reviewed the National Emergency Medical Services Policy, the Uganda Hospital and Health Centre IV Survey Report, the National Emergency Medical Services Strategic Plan and other relevant policy documents issued by the Ugandan Ministry of Health. These materials helped contextualize the emergency care landscape in Uganda and the government's response and prioritization to identified needs.

Program Reports and Records: The study team reviewed annual reports, program evaluations, and training records provided by Seed and partner universities We also reviewed enrollment and graduation data from Makerere University and Mbarara University of Science and Technology's emergency medicine residency programs. These documents offered insights into program implementation, educational outcomes, and logistical challenges.

DATA ANALYSIS:

The collected data were subjected to thematic analysis to identify key themes, trends, and patterns relevant to the development of the emergency care workforce in Uganda. This process manually coded textual data, categorizing codes into themes, and interpreting the findings in relation to the objectives of the policy review.

ETHICAL CONSIDERATIONS:

All data used in this review were obtained from publicly available sources, internal programmatic assessments by Seed and partner universities or data sourced from partner institutions with the assurance of confidentiality and ethical compliance. This policy review did not require ethical approval as it only required review of program documents and reports. No interviews of patients or health workers were conducted.

Results

ACHIEVEMENTS OVER THE PAST FIVE YEARS

Developing a pipeline of frontline health workers: The collaboration between the Ministry of Health of Uganda, Seed, Makerere University and Mbarara University of Science and Technology has yielded tangible achievements in the realm of emergency medical education. Between August 2019 and March 2024, twenty-three emergency physicians and five emergency nurses have been seconded by Seed as educators at both Makerere University and Mbarara University of Science and Technology. They set out to strengthen emergency physician education and lay a foundation for planned emergency nurse education. The joint collaborative has led to a marked increase in the number of emergency medicine graduates. Since 2020, 14 emergency physicians have certified the requirements for the award of Master of Medicine in emergency medicine at Mbarara University of Science and Technology and 7 at Makerere University bringing an additional 21 emergency physicians to the Ugandan health workforce. There are currently 43 emergency medicine residents enrolled in the two programs, 14 at Mbarara University of Science and Technology and 29 at Makerere University.

Building sustainable department leadership: As additional faculty have been trained and retained, the program has undergone a transition in leadership roles from internationally sourced to locally trained emergency physicians. At Mbarara University of Science and Technology, the Emergency Medicine department is now wholly led by Ugandan faculty, all trained at the same program, a significant milestone that underscores the progress towards self-sustained medical education in the country. This transition has been pivotal to demonstrating the sustainability of the program and helps to ensure contextual relevance of the programs through provision of context-specific learning scenarios and solutions in resource limited settings. Local providers can help ensure culturally relevant care, improve communication with patients and improve a deeper understanding of the social determinants of health, beliefs, and attitudes of their patients. They can also help ensure efficient and effective quality improvement and other care interventions.

Improved classroom and clinical teaching environments: In addition to the numbers of graduates and the growing pipeline, this initiative has significantly contributed to enhancing the learning environment by improving the quality of teaching. This impact has been through dedicated didactic and clinical education improvements, including: 1) providing comprehensive classroom and clinical instruction; 2) sourcing teaching resources; 3) strengthening curricula and syllabi; 4) benchmarking international best practices for education inform of clinical elective placements and conference attendance, and 5) having trainees represent and advocate for emergency medicine in non-academic leadership platforms. Teaching resources and enhancements to the learning environment have been needs-based, derived from objective assessment and participatory planning cycles. Enhancements in educational resources have included the procurement of various teaching aids, such as simulation mannequins, information technology equipment, and essential medical devices

including point-of-care ultrasound units, patient monitors, electrocardiogram machines, and defibrillators. A case in point is provision of diagnostic equipment to the University whereby Makerere University and the national referral hospital which serves as a teaching hospital for the university did not have ECG Machines, point-of-care ultrasound, or defibrillators. These were identified as essential needs by faculty and clinical staff, requested Seed for support and in turn Seed was able to provide these equipment to the two entities. The addition of essential equipment not only improved teaching but also improved patient diagnosis and care. One example was in the identification of myocardial infarction in a woman presenting to the emergency department with no obvious symptoms. With the use of the ECG machine provided by Seed, residents were able to diagnose a complete heart block and make prompt referral to the Uganda Heart Institute. This and more cases of patients whose lives have been saved by diagnostic equipment demonstrate how such academic collaborations improve patient care and save lives.

Improved infrastructure for Emergency Medicine Departments within the Universities: The collaboration has also identified opportunities to invest in infrastructure within the emergency medicine departments. Core investments have included expansion of teaching spaces, and skills and simulation laboratories. These additional resources have facilitated knowledge transfer and comprehensive clinical teaching needed for effective patient care. For example, at Makerere University, the Department of Anesthesia under which emergency medicine falls was able to identify adequate teaching space within the national referral complex. Additionally, they were able to secure private funding for a fully equipped simulation laboratory that is used not only for emergency residents but also for other postgraduate programs such as anesthesia, surgery, as well as undergraduate medical programs. Seed has subsequently supported the simulation laboratory with the required consumable supplies and instructors required for training. This laboratory is also available for use by other universities with advance notice and approvals. At Mbarara University of Science and Technology, in collaboration with Seed, the Emergency Medicine Department most recently acquired a dedicated space which is composed of administrative offices, classrooms and simulation rooms. This is a huge milestone for the department as its previous space was re-assigned for patient care leaving the department with no teaching space. With ample and conducive teaching environments, learning and interactions between faculty and residents can happen at scheduled times as well as ability to conduct simulation-based learning in structured and well-equipped simulation laboratories improving the overall learning experience for residents.

Improving coordination of emergency services within respective teaching hospitals: The collaboration between Seed, Makerere University and Mbarara University of Science and Technology has led to the transition from the fragmentation of emergency care that was provided across consulting specialties such as internal medicine, surgery, critical care, to a "one stop shop" coordinated by emergency care practitioners as a critical mass of emergency care providers is built. This

ensures that care processes for emergency medicine can be implemented, and emergency patients can have immediate access to a specialist to manage their urgent care needs prior to consultation with any other specialists. This ensures that the sickest patients can receive the critically needed timely care helping to prevent death and/or complications that may have otherwise resulted from the long waiting time and consultation processes.

Increasing interest in emergency medicine as a specialty among medical students: The collaboration with the two academic institutions has led to the set-up of emergency medicine interest groups (EMIGs). Initiated by residency programs, EMIGs bring together undergraduate students enthusiastic about emergency medicine and provide avenues for sharing. Albeit, difficult to quantify, these initiatives have led to observed growth in interest in short-term trainings on key emergency principles (like basic life support, basic emergency care) thereby preparing the students for their clinical rotations as such skills are critical for clinical practice.

Advocacy for improved emergency services in the country: Seed's collaborative efforts with professional associations, local communities, and the Ministry of Health have been instrumental in improving the delivery of emergency medical residency training, feeding into the needs for Emergency Medical Services and advocating for the expansion of the health workforce to meet both urban and rural healthcare needs comprehensively. For example, faculty, residents, professional association members with support from Seed have contributed to the development of schemes of service essential for staff recruitment and Job descriptions for emergency care providers by the Ministry of Health.

Challenges:

Despite these successes, challenges remain. The most pressing issue is the persistent high demand for emergency care with still a too-limited number of specialists. With only 21 emergency physicians serving Uganda's population of approximately 45 million, a significant gap in emergency care persists, particularly in rural areas. In addition to the unmet need of clinical care, this further contributes to a persistent limited pool for faculty recruitment. The paucity of emergency physicians may consequently cause burn out of the available these specialists which could impact future training of emergency physicians and loss of investment in existing trained emergency physicians.

Currently, Uganda boasts of two public and one private institution offering training programs for emergency physicians. However, with this restricted number of programs, the country will struggle to fulfill the requirement for emergency physicians to serve the needs of its 45 million inhabitants. Hence, there is a pressing demand to expand the existing programs or establish new ones to address the urgent need. Training capacity is further limited by financial barriers, particularly tuition and subsistence scholarships for trainees and faculty development inhibiting the expansion of the emergency medicine workforce.

Although the Ugandan government has recognized the importance and role of

emergency physicians through establishment of a staffing structure and schemes of service, there isn't a clear investment case to prioritize the uptake of emergency physicians into the public system. To date, only two out of the 17 Regional Referral hospitals and one National Referral Hospital have advertised for positions for emergency physicians. The lack of available positions undermines the retention of emergency physicians into the public sector.

Furthermore, emergency departments in most Ugandan hospitals are set up as medical and surgical units, instead of one single unit as recommended by the Emergency Medical Services policy, and yet building emergency services in Uganda is ultimately reliant on a multidisciplinary team equipped with the tools and medicines required to provide care. Although there are steps underway to establish an ER nursing program which is an important frontline component of delivering emergency services, Uganda does not have any formal emergency nursing training programs. There have been efforts to provide basic emergency care short-courses and in-service trainings for nurses and other providers however, these are inadequate to create sustainable change in the partner teaching hospitals. For complete working systems, there is need to train a cadre of nurses particularly skilled in emergency care and establish training programs dedicated to the same. The products would then complement emergency physicians and promote interdisciplinary care within emergency units.

Additionally, the shortage of consistent supply and maintenance of basic, cost effective tools and emergency medicines limits ability of emergency physicians to train and practice within their full scope increasing burnout and attrition. The basic equipment includes ECG Machines, defibrillators, airway equipment, pediatric sized equipment, diagnostic tests, bedside ultrasound, emergency drugs and consumables. While partnerships have alleviated some of these constraints by providing essential clinical resources, significant gaps remain, necessitating ongoing investment and strategic planning.

Discussion and Lessons Learned:

The effort to build emergency medicine training has underscored the necessity of long-term investment and commitment in specialized fields such as emergency medicine. Developing a sustainable pipeline of essential care providers is a multiyear, iterative process with de-novo learning unique to resource limited settings such as Uganda. Long term financial investment and commitment allows the runway for training, recruitment, mentorship, and growth of self driven indigenous leadership that is key for sustenance of new programs. Seed's multi-year commitment to train at least 120 emergency physicians across three institutions highlights the importance of prolonged dedication to substantially improving human resource development within healthcare. This would be 20% of the targeted 400 emergency physicians by 2030[10].

Our training program experience has demonstrated that training specialists is a complex endeavor that requires a comprehensive approach. Seed uses a multifaceted policy, practice, and education strategy. This fully leverages on national, regional and partner institution resources. For example, seconding technical assistance in

the form of emergency physicians at the Ministry of Health elevates the visibility of emergency care in policy decisions including absorption of graduates, data quality improvement and availability of supplies complementing the education and care at teaching hospitals. Continuous advocacy to sustain the momentum in budgetary allocation for supplies and salaries remains crucial.

Collaborations have emerged as fundamental pillars for the success of these initiatives and their sustainability. Seed has fostered strong relationships based on respect and trust allowing for agility and shared decision making. This has led to significant advancements, including graduate retention in leadership roles for the new programs. This approach enhances the quality of training and contributes to the sustainability of the emergency medicine programs, reducing dependency on external faculty and fostering a self-sustaining model of medical education in Uganda.

Using a bottom-up needs-based approach that is participatory in nurture is key in successful collaboration with not only the government of Uganda but also the partner institutions. We emphasize the importance of partnering institutions clearly expressing the observed gap and leading the work-planning process to achieve a clear goal, and the flexibility of the supporting organization to meet emerging needs. This makes it easier to measure progress and tailor change according to the needs of the institution.

Limitations:

This review acknowledges potential biases inherent in self-reported data and the challenges of accurately measuring the impact of educational interventions in a dynamic healthcare environment. Additionally, the review recognizes the limitation of data availability, particularly in contexts where program documentation and healthcare reporting may be incomplete. It focuses on the immediate impact of the collaboration between the Government of Uganda, Makerere University, Mbarara University of Science and Technology and Seed and does not delve into the downstream impact of trained emergency physicians teaching in emergency programs, taking care of patients and training other non-specialist cadres in emergency care.

Conclusion

Over the past five years, Seed's collaborative efforts with the Ugandan Ministry of Health and two Ugandan universities have made significant strides in addressing the country's critical need for emergency physicians. This multifaceted partnership, addressing education, practice, and policy, has provided essential resources, including specialist educators, clinical equipment, and advocated with key stakeholders for investment in emergency care. The achievements including a growing pipeline of emergency physicians and educators with a count of 21 as of March 2024 sets a solid foundation to address the vast need for emergency care and the human resource gap, most disproportionately prevalent in rural areas. Learning from this collaboration, we make the following recommendations;

Recommendations:

To fully realize Uganda's vision of quality emergency care for its 45 million citizens, continued collaborative and long-term

investment is essential. Initiatives to address the persistent human resource deficit are crucial to improve the quality of emergency care.

There is an urgent need to scale up emergency physician training and introduce emergency nursing programs among other emergency cadres. This will ensure a sustained pipeline of emergency care professionals to meet the increasing demand.

To further improve training, there is an urgent need to standardize curricula and ensure a consistent approach to growing the mass of emergency physicians in the country. Investing in classrooms and hospitals with training and diagnostic equipment, and clinical supplies is crucial.

Finally, increased investment in national health systems, especially in the health workforce, is critical and will ensure continuous strengthening of emergency medical services. This will enable recruitment and retention of specialists including emergency physicians, nurses, and other cadres especially in rural Uganda, provision of adequate supplies and equipment there by further improving patient care and achieving universal health coverage. By addressing these challenges, Uganda can build a more sustainable, resilient, and equitable emergency care system.

Conflict of Interest:

None

Funding:

None

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