Existing infrastructure for the delivery of emergency care in post-conflict Rwanda: An initial descriptive study

Infrastructures existantes pour la fourniture de soins d’urgence dans le Rwanda d’après-conflit: Une première étude descriptive

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Abstract  Background: Rwanda is a landlocked East-African country that was the site of the 1994 genocide, during which much of its health infrastructure was destroyed. It remains one of the poorest and least developed countries in the world. In the last two decades, there have been significant efforts to rebuild its healthcare system. No study has since examined Rwanda’s emergency medicine (EM) infrastructure.

Study objective: To perform an initial descriptive study of EM infrastructure in post-conflict Rwanda.

Methods: We employed two methods. The first was 160 h of direct observation at six healthcare sites in the capital city of Kigali leading to a descriptive understanding of Rwanda’s EM infrastructure. The second was a survey of healthcare providers throughout Rwanda.

© LSW conducted the research and was the primary author of the manuscript. DMC helped to come up with the idea of the research, served as advisor during the investigation, and made substantial edits to the manuscript.

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infrastructure. The second method utilized face-to-face narrative interviews based on a 5-item open-ended questionnaire with a convenience sample of 54 healthcare workers.

**Results:** A relatively basic EM infrastructure was found to exist. Emergency care is available to all, though timely access and demand for payment are barriers to care. Emergency care is delivered at all levels, from local community health centers to district hospitals to national referral centers. The majority of physicians working in the Emergency Departments (EDs) are general practitioners, and only one hospital provides specialized training at the BLS level to EM practitioners. Prehospital care is almost entirely missing. The three most commonly cited problems facing EM infrastructure in Rwanda were lack of resources (94% of respondents), need for specialized EM training (89%), and absence of prehospital care (74%). All except one worker surveyed (98%) were satisfied with the progress Rwanda has made to improve EM in the last 10 years.

**Conclusion:** Despite ongoing challenges, the infrastructure for the delivery of emergency care is much improved since 1994, and Rwanda’s continuing progress can serve as a model for EM development in other developing and/or post-conflict countries in Africa.

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**Resume**

**Contexte:** Le Rwanda est un pays enclavé d’Afrique de l’Est, lieu du génocide de 1994, au cours duquel la majeure partie de ses infrastructures sanitaires a été détruite. Il demeure l’un des pays les plus pauvres et les moins développés du monde. Au cours des deux dernières décennies, des efforts importants ont été entrepris afin de reconstruire son système de soins. Aucune étude ne s’est depuis penchée sur les infrastructures de médecine d’urgence (MU) du Rwanda.

**Objectif de l’étude:** Réaliser une première étude descriptive des infrastructures de MU dans le Rwanda d’après-conflit.

**Méthodes:** Nous avons employé deux méthodes. La première a consisté en 160 heures d’observation directe dans six lieux d’administration de soins de la capitale, Kigali, permettant une compréhension détaillée des infrastructures de MU au Rwanda. La seconde consistait en des entretiens narratifs en face à face s’appuyant sur un questionnaire de cinq questions ouvertes avec un échantillon de commodités de 54 membres du personnel soignant.

**Résultats:** Il a été constaté que des infrastructures de MU basiques existaient. Les soins d’urgence sont disponibles pour tous, bien qu’un accès opportun et une demande de paiement constituent des barrières aux soins. Les soins d’urgence sont fournis à tous les niveaux, des centres de santé communautaires locaux aux hôpitaux de district en passant par les centres hospitaliers nationaux. La majorité des médecins travaillant dans les Services d’urgence (SE) sont des généralistes, et un seul hôpital propose aux généralistes de MU une formation spécialisée en premiers soins de réanimation. Les soins pré-hospitaliers n’existent quasiment pas. Les trois problèmes auxquels sont confrontées les infrastructures de MU les plus souvent cités sont le manque de ressources (94% des sondés), la nécessité d’une formation en MU spécialisée (89%) et l’absence de soins pré-hospitaliers (74%). Toutes les personnes interrogées, à l’exception d’une (98%), étaient satisfaites des progrès réalisés par le Rwanda pour améliorer la MU au cours des dix dernières années.

**Conclusion:** En dépit des défis actuels, les infrastructures nécessaires à la fourniture de soins d’urgence se sont beaucoup améliorées depuis 1994, et les progrès continus du Rwanda peuvent servir de modèle à un développement de la MU dans d’autres pays en voie de développement et/ou en situation d’après-conflit en Afrique.

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**Introduction**

International emergency medicine (EM) is a specialty in its nascency, with increased activity and blossoming interest occurring primarily in the last decade. While EM infrastructure is well-established and EM is a recognized specialty in some countries such as the US, Canada, the UK, and Australia, development of EM has only begun to take root in most other countries.

One country that warrants further study is Rwanda. Landlocked in East Africa, Rwanda was the site of the 1994 genocide, during which an estimated 500,000–1,000,000 people were murdered. During the genocide, much infrastructure, including virtually all hospitals, was destroyed, and the healthcare workforce was decimated. Lack of early intervention has had profound consequences on Rwanda’s public health, economy, and sense of security. Rwanda is one of the poorest and least developed nations in the world, ranking 161 of 177 in the
Materials and methods

We employed two methods to examine EM infrastructure. Both methods were carried out in 2007 solely by the first author, an EM resident physician and epidemiologist trained in health infrastructure surveying and has fluency in two of Rwanda’s three national languages. The first was 160 h of direct observation at six healthcare sites in the capital city of Kigali (two national referral centres; two public community centres; and two private NGO clinics) leading to a descriptive understanding of Rwanda’s EM infrastructure.

The second method utilized face-to-face narrative interviews based on a 5-item open-ended questionnaire (please see Box 1) with a convenience sample of 54 healthcare workers at these facilities. A total of 60 healthcare workers (12 physicians, 14 medical students, 29 nurses, and 5 administrators) were approached for interview over the course of a 3 week period, with 5–7 from each of the two public community centres and NGO clinics and the remaining evenly split between the two national referral centres. All healthcare workers encountered in the emergency department (ED) who worked full-time in the ED during this time period were approached. Six individuals from four sites (four nurses, one medical student, and one administrator) declined participating, citing lack of time. The remaining 54 completed the entire narrative interview. Data was collected by writing down the responses in real-time and collated using a password-protected Microsoft Excel document. Responses were de-identified except by profession (entered as physician, medical student, nurse, or administrator). Ethics approval was obtained from the Institutional Review Board at Washington University School of Medicine.

Box 1

The five questions in the survey were:

- Can you please describe your background: where you are from, where you obtained your education, and what is your current job description?
- How is healthcare delivered in Rwanda?
- What is the structure of emergency care delivery in Rwanda?
- What are the three major problems facing EM infrastructure in Rwanda?
- Are you satisfied with the progress that Rwanda has made to improve EM infrastructure in the last 10 years?

Results

Delivery of emergency care

Based on the direct observation of six healthcare centres, a relatively basic EM infrastructure was found to exist. Emergency care is delivered at all levels, from local community health centres to district hospitals to national referral centres. The decentralized primary care model that has been instituted in Rwanda is in effect, so that patients are first brought to the community health centre and then transferred up the level of care depending on need.

Prehospital care is almost entirely missing. There is no national or provincial emergency reporting system. A few ambulances exist, but there is no systematic use of ambulances to respond to emergencies or to transfer patients to higher levels of care. Patients and their families are supposed to “know” if they require more acute services, but there is no formal prehospital triage. During the period of observation, some acutely ill individuals including trauma victims with limb amputations and significant hemodynamic instability were brought to community health centres that were staffed only by nurses and clearly lacked resources available to treat them. These individuals were brought in by taxis and family members, and even after it was recognized that they needed a higher level of care, transfer took hours to facilitate.

In theory, emergency care is available to all, but in practice, there are several potent barriers to access. In Kigali, where there are two national referral centres with EDs (King Faisal Hospital and Centre Hospitalier Universitaire de Kigali [CHUK]), access to higher levels of care is available. In more remote areas, hours of travel are required before reaching even a small community health centre, and timely access is logistically impossible. A second issue is that payment is requested at the time of care, and, during the observation period, lack of payment was seen in approximately one-third of the time to prevent individuals from receiving needed treatment.

Almost all physicians working in the EDs are general practitioners. Of the 12 physicians interviewed, only one was specialty-trained (surgery)—he was the head of the emergency department at CHUK. There is no specialty EM society or post-graduate EM training programme. At the time of observation, only one hospital provided specialized training at the basic
life support (BLS) level to EM practitioners. No hospital provided additional standardised courses such as Advanced Cardiac Life Support (ACLS), Advanced Trauma Life Support (ATLS), or Paediatric Advanced Life Support (PALS) training.

Perceptions of ED healthcare workers

Fifty-four healthcare workers out of a total 60 encountered agreed to participate in the narrative interview survey. All 54 are originally from Rwanda. Thirty-six are female; 24 are male. The healthcare workers answered three questions about their background and to confirm information on overall healthcare and EM infrastructure in Rwanda. They were also asked two open-ended questions about their perceptions. The first was regarding the three major problems facing EM infrastructure in Rwanda. The three most commonly cited were lack of resources (94% of respondents), need for specialised EM training (89%), and absence of prehospital care (74%).

Regarding lack of resources, one doctor at CHUK remarked, “It is a problem we face every day. Here in Kigali, electricity can shut down for hours and all our equipment goes down. Just imagine what that is like in rural areas. In many parts of the hospital here, we do not have running water. Sometimes, we think ‘we could have saved that person if we just had that one piece of equipment,’ but what can you do? We have to make do with what we have.” Many commented on how much they can make do limited materials and the ingenuity that is required. Said one nurse at a public community health centre, “We have to be extra-creative because once we run out, there is nothing.”

Multiple individuals made mention of the numerous NGOs and private foundations that are providing healthcare in Kigali. Said an NGO administrator at a private clinic, “It is very good that we have these NGOs. But we do not know how long they will be here. Then their resources will go too. We need sustainable support that will, for sure, stay in the country.” Two nurses, one physician, and three medical students raised another concern with the influx of NGO: “Their salary is more than you get in public hospitals. There is increasing pressure to leave the public sector and go work for NGOs doing administrative or public health work. I want to help Rwanda and we have so few doctors and nurses, but it is hard to turn down a job that pays twice as much.”

Regarding the need for specialised EM training, a doctor at King Faisal who also works at a private NGO clinic commented, “The NGO paid for me to take additional courses in trauma. It was immensely helpful, and I think everyone, at least all the doctors who have to work in the ED, should get this training.” Two other doctors and five medical students remarked that they would like the opportunity to be specialists in EM “because it will help me improve quality of care for my patients,” though they are realistic that “we are many years away from that.”

The second question asked was how satisfied the respondent was with the progress Rwanda has made to improve EM infrastructure in the last 10 years. The response was overwhelmingly positive, with all but one worker surveyed (98%) answering that they were satisfied with Rwanda’s progress. Said one administrator who trained as a doctor, “Rwanda has gone through many bad things. At the end of the genocide, we had so little. We did not have hope. The government had many battles to fight. We do not have a perfect system, but Rwanda has come a long way.”

Discussion

The challenges in the development of EM infrastructure in post-conflict Rwanda provide some lessons for Rwanda that may also prove useful to other Africa nations. First, lack of resources is a major barrier, both in terms of funding and manpower, and overcoming it is not as simple as introducing additional outside funds. The influx of funding from NGOs has helped to improve health infrastructure in the short-term, but it remains to be seen how sustainable these interventions are for the medium- and long-term. In addition, as the discussed by the interviewees, the practices of NGOs could be a double-edged sword, as they draw trained healthcare workers into the private sector, working, in many cases, in a non-clinical capacity as administrators and researchers. While such opportunities may help the individual with a higher quality of life, they further deplete Rwanda of its health workforce—surely an undesirable consequence. Since this research was conducted, the NGO Partners in Health has been working with the Rwandan government to increase healthcare worker retention by conducting projects, for example, to train them in ultrasonography and other clinical skills. It will be instructive to evaluate the impact and sustainability of these programmes.

Second, it is clear that specialised training in EM is important to improving emergency care, but it is less clear what level of training and to what audience this would be the most beneficial. In other areas of sub-Saharan Africa, EM is becoming recognized as a specialty, with the accompanying start of EM training programmes, the most prominent of them being in South Africa. Without doubt, post-graduate EM specialty training would elevate the level of emergency care delivered; however, there is a question of whether resources would be better expended by ensuring that all providers in urban and rural areas fulfil at least a basic competency, i.e. BLS for everyone, ATLS for all doctors, etc. Special care should be taken to retain health providers within Rwanda so that the burgeoning health workforce there is not immediately depleted by the global brain drain that is occurring elsewhere in Africa.

Third, lack of prehospital care is a major contributor to inadequate EM infrastructure. A number of interventions need to be implemented, such as a prehospital triage system to ensure that patients are diverted to the appropriate level of care and an ambulance system that responds to emergencies and transports patients according to pre-established protocols. The government of Rwanda has committed to improving its prehospital coordination, and it will be useful to follow the changes and evaluate the outcomes.

Fourth, it is impressive how much Rwanda has been able to improve EM and its overall health infrastructure in a short span of time with very limited resources. To go from a country with almost no physical infrastructure and complete lack of manpower to one with a functional health system with intact basic EM infrastructure is no small feat. Doing so in the context of being one of the world’s poorest countries and in the aftermath of internal strife is a tremendous accomplishment. That virtually every healthcare worker interviewed responded positively about Rwanda’s progress is testament to the ingenuity and dedication of the Rwandan healthcare workers as well as the level of commitment of their government. Similar themes are emerging from other post-conflict African nations,
and there are important lessons about the rate of progress that can be applied to other developing nations around the world.

This study has three possible limitations. The first is that the research was conducted in 2007. Rwanda has continued to make progress since then, most notably in the area of pre-hospital care; however, our experience is that the same challenges and barriers affect Rwanda now as it did then. A second is the issue of confidentiality; perhaps it is possible that the interviewees were not as open as they could have been because of perceived lack of confidentiality. We did attempt to ameliorate this problem by assuring all interviewees of confidentiality, and, in fact, all responses were de-identified except by type of profession. That the researchers have no direct supervisory role over them should have also helped assure respondents of this. Third, there were six out of a total of 60 individuals who declined participation in the study. While 10% excluded is substantial, the individuals all cited lack of time as their reason for declining participation, and there is no reason to believe the experiences of these six would be significantly different from the participants.

Conclusion

The infrastructure for the delivery of emergency care in Rwanda has come a long way since its virtual destruction in the 1994 genocide. There are ongoing challenges, specifically with continuing lack of resources, need for specialised EM training, and deficiency of prehospital care, along with new questions about sources of funding and implications for the healthcare workforce. Despite these barriers, Rwanda’s progress offers lessons for continuing EM development there, and can serve as a model for EM development in other developing and/or post-conflict countries.

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