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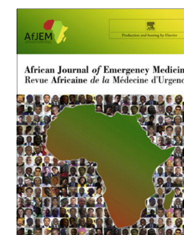

COMMENTARY

The state of emergency care in Democratic Republic of Congo

L'état des soins d'urgence en République démocratique du Congo

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The Democratic Republic of Congo (DRC) is the second largest country on the African continent with a population of over 70 million. It is also a major crossroad through Africa as it borders nine countries. Unfortunately, the DRC has experienced recurrent political and social instability throughout its history and active fighting is still prevalent today. At least two decades of conflict have devastated the civilian population and collapsed healthcare infrastructure. Life expectancy is low and government expenditure on health per capita remains one of the lowest in the world. Emergency Medicine has not been established as a specialty in the DRC. While the vast majority of hospitals have emergency rooms or *salle des urgences*, this designation has no agreed upon format and is rarely staffed by doctors or nurses trained in emergency care. Presenting complaints include general and obstetric surgical emergencies as well as respiratory and diarrhoeal illnesses. Most patients present late, in advanced stages of disease or with extreme morbidity, so mortality is high. Epidemics include HIV, cholera, measles, meningitis and other diarrhoeal and respiratory illnesses. Lack of training, lack of equipment and fee-for-service are cited as barriers to care. Pre-hospital care is also not an established specialty. New initiatives to improve emergency care include training Congolese physicians in emergency medicine residencies and medic ranger training within national parks.

La République démocratique du Congo (RDC) est le deuxième plus grand pays du continent africain, avec une population de plus de 70 millions d'habitants. Il s'agit également d'un carrefour majeur pour l'Afrique, le pays partageant des frontières avec neuf pays. Malheureusement, la RDC a été le théâtre d'instabilité politique et sociale récurrente au cours de son histoire, et des combats sont toujours en cours à l'heure actuelle. Au moins deux décennies de conflit ont dévasté la population civile et anéanti les infrastructures de santé. La durée de vie est faible, et les dépenses publiques de santé par personne restent au nombre des plus faibles du monde. La médecine d'urgence n'a pas été élevée au rang de spécialité en RDC. Si la grande majorité des hôpitaux dispose de salle des urgences , cette désignation n'est associée à aucun format convenu et il est rare d'y trouver des médecins ou infirmières formés aux soins d'urgence. Les motifs de consultation incluent les urgences de chirurgie générale et obstétrique, ainsi que les maladies respiratoires et diarrhéiques. La plupart des patients se présentent tardivement, à des stades de maladie avancée ou avec une morbidité extrême, la mortalité est donc élevée. Les épidémies incluent le VIH, le choléra, la rougeole, la méningite et autres maladies diarrhéiques et respiratoires. L'absence de formation, d'équipement et le fait que les services soient facturés à l'acte sont cités comme des obstacles aux soins. Les soins préhospitaliers ne constituent pas non plus une spécialité reconnue. Les nouvelles initiatives visant à améliorer les soins d'urgence incluent la formation des médecins congolais à la médecine d'urgence en résidence, ainsi qu'une formation d'infirmier destinée aux gardes forestiers dans les parcs nationaux.

African relevance

- Emergency medicine is not a specialty in the Democratic Republic of Congo but both a need and desire exist for it to be.
- At present, foreign emergency physicians train generalists in Democratic Republic of Congo, or doctors seek emergency medicine training outside DRC.
- Inroads have been taken to establish pre-hospital training for some park rangers in Democratic Republic of Congo.

Introduction

Interest in emergency medicine (EM) has significantly increased over the past decade on the African continent.

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Dedicated postgraduate EM residency training programmes now exist in nine countries: Ethiopia, South Africa, Republic of Tanzania, Sudan, Egypt, Botswana, Ghana and Uganda with post-graduate EM training also reported in Rwanda, Kenya and in Democratic Republic of Congo (DRC). Despite this growth, there is little published information available about many of these programmes and there is no current mechanism to track individual efforts or share best practices.

The purpose of this manuscript is to report on the state of EM in Democratic Republic of Congo. This report was written as part of the on-going series on the state of EM for the African continent featured by the African Journal of Emergency Medicine. Given that many countries in Africa have well-known high burdens of trauma and unacceptably high all-cause mortality in emergency centres, initiatives such as this are one means to develop and improve emergency patient care on this important continent.

This descriptive report is divided into eight sections: methods of investigation, country background, general health, healthcare infrastructure, healthcare education, emergency medicine, pre-hospital care, and finally a short synopsis on progress to date towards building emergency medicine systems within the country.

Methods of investigation

Little information is available on health systems in Democratic Republic of Congo. Authors primarily used two methods as sources for this manuscript. First, an extensive review of the literature was done using online sources, PUBMED, Google scholar, USAID and WHO. Search terms included, "Democratic Republic of Congo" and "health", "war", "epidemics", "gender based violence/sexual violence", "emergency medicine", "salle des urgences", "Africa & epidemics", "medical education", and "African medical education". The search yielded 243 citations that directly related to DRC, only 52 of which were of interest on abstract review. DRC and war rendered 21 citations, DRC healthcare systems – eight citations, DRC emergency medicine – three citations, DRC medical education – two citations and DRC health and sexual violence more than 18 citations.

Second, in order to obtain information regarding current emergency care, a semi-structured questionnaire was administered to healthcare providers who staff emergency centres (referred to locally as salle des urgences but for this manuscript will be referred to as emergency centres). Respondents were contacted by chain referral sampling. The questionnaire was in French, the official language in the DRC. The questionnaire has 14 closed and open-ended questions. Questionnaire responses were hand-tallied and responses most reported were included in the written section of the manuscript.

Country background

The DRC is the second largest country on the African continent (Nigeria being the largest) with a population of over 70 million. DRC is considered a major African continental crossroad being bordered by Rwanda, Uganda, Burundi and Tanzania to the east, Central African Republic and South Sudan to the north, Angola and Zambia to the south and Republic of Congo to the west. Formally established as a Belgian colony in 1908, DRC gained independence in 1960, became Zaire in 1972 and formally DRC in 1997. DRC is now host to over 200 different ethnic groups and distinct languages with French, Lingala, Kingwana, Kikongo, and Tshiluba considered the national languages.[1,2]

DRC has experienced recurrent political and social instability since its civil war (1997–2003), and active conflict remains today most notably in the east despite the signing of multiple peace accords. Often referred to as *Africa's World War*, the conflict has created areas of chronic insecurity and over 1.7 million internally displaced persons.[3] In 1999, the UN Security Council mandated a UN Peacekeeping mission to stabilise the area and protect civilians. This force is now called MONUSCO and maintains over 16,500 uniformed peacekeepers. Unfortunately, eastern DRC still continues to be home to multiple armed groups with fighting despite MONUSCO's presence.[4–6]

The conflict in DRC has resulted in a health-system collapse and created a humanitarian disaster.[7,8] An estimated 5.4 million excess deaths occurred from 1997 to 2004, with fewer than 10% attributable to violence and the rest to preventable and treatable medical conditions such as malaria, diarrhoea, pneumonia and malnutrition.[9] In eastern Congo, the prevalence of rape and other sexual violence is documented as among the highest in the world.[10–12]

General health

DRC has a very low standing in the Human Development Index (168/169) and is at the bottom of two major indices of well-being; maternal mortality at 545/100,000 and infant mortality at 92/1000 live-births.[13–15] Life expectancy at birth is low at 48 years. The population is generally young with an estimated median age in 2012 of 17.4 years.[31] No national census has been completed since the republic was formed so population-based statistics are estimated. About 70% of the population lacks access to adequate food, and one child in four is malnourished. Causes of food insecurity include population displacements, lack of access to basic social services, low agricultural productivity, lack of road infrastructure and chronic poverty.[16] In 2012, the main causes of morbidity and mortality were malaria, HIV/AIDS, tuberculosis, parasitic infections, respiratory infections, malnutrition and reproductive health issues.[14,15]

Epidemics are a part of life for most Congolese, most notably measles, cholera and meningitis. Infected patients often present in extremis due to lack of vaccination programmes, poor healthcare access and fee-for-service barriers.[17] The most recent large meningitis outbreak was in 2009 in Western DRC.[18] The WHO last declared a measles epidemic in 2012 and documented 3,896 cases of cholera with 265 associated deaths the same year.[19–22] Helminth diseases including ascaris, hookworm and trichurus are endemic with greater than 50% of paediatric and women of child bearing age testing stool positive in South Kivu Province in the eastern part of the country and Maniema Province in the central part of the country.[23] Helminth infestation is thought to be at least one cause of the large prevalence of anaemia, diarrhoeal disease and chronic malnourishment.

Prevalence of HIV averages 8–9% in urban areas and 1.1% in the eastern areas of conflict. Only 12% of HIV-positive

patients in DRC are receiving antiretroviral (ARV) drugs, and 95% of women living with AIDS do not have access to treatment.[24]

Healthcare infrastructure

DRC's health sector faces many challenges. Historically, the DRC had a legacy of a well-organised and functioning district primary healthcare and referral system. However, the health system has dramatically deteriorated over the last 20 years and now faces poor infrastructure, security risks and a growing burden of non-communicable diseases.[25] Government expenditure on health is one of the lowest at two-dollars per capita (2% of GDP in 2009).[26] WHO recommends a minimum of $35.00 per capita to safeguard a country's population. A recent estimate of population needs reported DRC would need to spend $17.91 per inhabitant per year to provide comprehensive essential health services. This would include maternal, neonatal, and child healthcare; reproductive health services; surgery; internal medicine and chronic care, specifically tuberculosis, HIV/AIDS, and malaria care; communicable disease care; preventive medical services; and management and maintenance services.[26] However, emergency services were not explicitly considered in this model and no estimates exist regarding cost effectiveness of introducing emergency care in post conflict environs such as this (this area warrants further study).

The number of physicians per 100,000 people in rural areas (which make up 70% of population) or urban areas is not published. Healthcare is provided by many groups, specifically, national, international non-governmental organisation (INGOs,) non-governmental organisations (NGOs), academic institutions, private and religious groups.

The country has a long tradition of primary healthcare-based district health systems. Care starts with local health centres, specifically called *centre-de-Sante*. *Centre-de-Santes* are staffed with providers ranging from non-licensed individuals with minimal training to nurses who have graduated from government certified programmes. Many centres were destroyed during the recent resurgence of fighting and have yet to be rebuilt. The next level is primary care clinics staffed by licensed nurses and linked to secondary health centres. Secondary centres are hospitals and clinics staffed by medical doctors. These hospitals often provide definitive treatment and also refer patients to regional or provincial hospitals (Fig. 1). Finally, there is a national referral hospital in Kinshasa. A health systems stabilisation strategy (HSSS) designed by the Ministry of Health in conjunction with the WHO Department for Health Systems Governance and Financing was published in 2014 which would create a model district resource plan to provide essential health services at the district level. Currently, "the amount donors and government are spending in the health sector per capita (approximately $6–7/inhabitant/year) is simply too low to enable implementation."[26]

Most healthcare services in DRC charge a fee as the State is disengaged from regulation and financing the health sector. Unregulated, fee-for-service payments are now widespread and have resulted in a completely unpredictable cost of care for the patient. Direct payment is usually requested for every single intervention, including drug prescriptions, laboratory examinations, IV fluids or a single injection.[25] While there are exceptions, such as settings that feature some level of external support from bilateral or non-governmental organisations e.g. *Medecins Sans Frontiers*, on a country-wide scale, these are rare and predominant in rural areas. One comprehensive study of emergent obstetric care in a referral hospital of Kinshasa concluded that bringing cash payment was essential for rapid life-saving care, as treatment would otherwise be withheld.[27] Another study on childhood malaria in the Kinshasa area reported that more than 80% of households with a child affected by severe malaria face health expenditures that exceed their capacity to pay.[28]

Medical education and residency training programmes

There are currently 39 nationally recognised medical schools, most of which are located in urban areas. Schools are typically underfunded and all medical studies including residency are fully self-funded. There has been a recent proliferation (more than 500) of technical schools known as Technical Medical Institutes, Medical Teaching Institutes or Higher Technical Medical (*Instituts des Techniques Medicales* - ITM , *Instituts d'Ensiengment Medical* - IEM, or *Institue Superieur de Technique Medicales*) which offer different levels of medical training. These institutes however, are not regulated, open without official approval and often operate as for-profit enterprises.[25] Few students from any of the schools have the opportunity to spend the required years in clinical rotations due to a lack of participating hospitals. The overall result is an education of doubtful quality.[25,29] Residency training is rare with

Figure 1 Levels of healthcare centres. *Note:* Facilities of three different levels of healthcare centres. Left: *Centre de la Sante* in Lumbala, Idgwi Island, Middle: Hospital General de Kindu in Kindu, Right: Provincial referral hospital HEAL Africa Hospital in Goma.

approximately 2.5% of the rural-school graduates and 15.2% of urban-school graduates entering formal residency programmes. Little analysis has been done, but one report showed a lower proportion of students graduating from DRC medical schools than other African universities.[29]

Emergency medicine

The majority of the following information was obtained from 18 questionnaires received by email or research assistant interview from nine hospitals in the eastern and central cities of Goma (North Kivu Province), Likasi (Katanga Province), Kindu (Maniema Province) and Bene (North Kivu Province).

Emergency Medicine as a specialty has not yet been established in DRC. There is no postgraduate or university training in emergency care for nurses or physicians. While WHO guidelines, namely Emergency Triage Assessment and Treatment (ETAT) for approaching acutely ill patients are available and open-source, there are no formal national guidelines to use these or other resources. The designation of *urgentiste* or *anesthesiste reanimateur*, a French term used for anaesthesiologist and critical care providers, is sometimes used by those who self-identify as emergency care providers but their level of training is unregulated and largely unknown.[30] Queries of questionnaire responses ($n = 18$) identified barriers to the delivery of emergency care as a lack of staff training, a lack of appropriate equipment, and the cost of service to the patient. Examples included critical emergency care equipment such as defibrillators and ventilators going unused for years due to lack of knowledge regarding their purpose and/or utility. Many respondents also described a near universal lack of oversight and regulation. Examples cited included concerns regarding untrained nurses, medical students and physicians performing procedures such as caesarean sections, appendectomies and cholecystectomies with poor outcomes resulting in high rates of preventable death.[30]

Healthcare providers from referral hospitals report five services accepting the majority of emergency patients: obstetrics and gynaecology, internal medicine, general surgery, orthopaedics and paediatrics. Providers from secondary level hospitals report no specialty services and patients are seen by either nurses or generalists who staff both the emergency centre and the in-patient ward. In general, common orthopaedic emergencies include acute and neglected fractures, infections, and complications of clubfoot. Obstetric emergencies include ectopic pregnancies, vaginal bleeding in pregnancy, obstructed labour and gynaecological emergencies including trauma from sexual violence. Surgical emergencies are most commonly trauma, intestinal obstructions, perforations, intra-abdominal infections including abscesses and typhoid enteritis. Most traumatic injuries are due to motor vehicle crashes, and to a lesser extent gunshot wounds and other war related violence.[31] Internal medicine sees a high rate of gastrointestinal bleeds, respiratory and diarrhoeal infectious diseases, acute complications of HIV/AIDS, as well as complications of vascular and diabetic disease. Among children, malaria is still the leading cause of emergency admissions although children also present with respiratory, meningitis and diarrhoeal diseases with morbidity exacerbated by malnourishment.[30]

Pre-hospital care

At this time, respondents reported no functioning national or provincial pre-hospital care (i.e., emergency medical services, paramedic programmes), but individual hospitals do provide ambulance service. As there are no medic training programmes, the driver is presumed to be untrained in emergent response. Hospitals also use ambulances to transport equipment and physicians for security rather than emergent patient transport.[30] Patients arrive in various ways, private vehicle, moto, taxi, cukudu (i.e. hand carried stretcher) or on foot and often present late in the course of disease. One study in eastern DRC reported patients presenting with long bone fractures arrived, on average, twenty-seven days after injury. Patients cited expense of x-rays and treatment, often expected to be paid up-front, and distance to the hospital as the primary barriers to accessing care.[32]

Progress-to-date

There is currently no dedicated emergency care training integrated into medical or graduate schools. HEAL Africa Hospital (HAH), a Provincial referral hospital in Goma, has started an emergency centre training programme using visiting emergency medicine faculty (i.e., physicians and nurses) from Australia, Canada and USA as instructors. They have a dedicated emergency centre with triage, five beds, and a procedure room. HAH is a partnership between a Congolese private NGO and the Ministry of Health. The physicians-in-training start as generalists but can then choose a specialty with emergency medicine as one option. HAH currently has a resident at Muhimbili University of Health and Allied Sciences, Emergency Medicine Residency Program in Dar es Salaam, Tanzania who plans on returning to direct the centre. A second Congolese physician is in his second-year in a South African residency programme. The first in-country emergency medicine professional organisation, *RDC Urgences* has been formed and will be meeting in the fall of 2015 in the City of Bukavu. There may be more emergency medicine programmes integrated into the health system, but information was unavailable at time of publication.

Interest in pre-hospital care is also growing. The Innovations and Tech Transfer for Enhanced Affordability (ITTea) and Care Under Fire, both NGOs in eastern DRC, are working with the medical directors of Virunga and Lamomi National Parks to design a medic programme for park rangers. Virunga is one of the oldest national parks in Africa and a UNESCO heritage site with >400 rangers on staff. A two-year analysis of ranger-related traumatic injuries, by Virunga park medical directors, determined many injuries could have been treated by trained medical staff in the field; 48% of injuries were from motor vehicle crashes, 46% from gunshot injuries, 2% from animal attacks, 1% from explosions and 1% other.[33]

Limitations

The most notable limitation is lack of published information on health systems in DRC. The studies found were small in number and usually limited to one region. DRC is a large country with extensive differences between regions particularly east and west and what happens in one region may not

necessarily reflect the other. A second limitation is the method of interview used to provide information in the emergency medicine and pre-hospital care sections. That information is limited to the number of individuals interviewed and cannot be verified in the field. A country-wide survey was not conducted due to lack of centralised list of care facilities, poor internet access, and lack of national postal service for dissemination.

Conclusion

Emergency medicine is currently not a specialty in DRC, but there is both a need and an interest in establishing the field. There are currently Congolese physicians in board-certified training programmes and a new ranger-medic training programme at Virunga National Park.

Author contributions

M.S. and L.K. conceived the original idea. L.S., K.M., R.Z., K.D. and M.M. conducted interviews. A.B., C.D. and S.W. prepared the manuscript. L.K., M.M., K.D. and T.R. edited the manuscript.

Conflict of interest

The authors declare no conflict of interest.

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